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Section 4: Channel Menus

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Overview

This section describes in detail all the functions and parameters for each of the menus associated with the 13 Channel Menu buttons. The Channel menus transform the local channels (1A, 1B, 2A, 2B). Any changes you make in a Channel menu affects the Master channel plus any other delegated channels.

Non-unity Lights

The LED lights on the channel buttons are called *non-unity lights.* When the LED on a menu button is lit, it indicates that the menu is no longer in default, or unity, state. This feature is handy as a quick reference to figure out what menus you have worked in and that are affecting the image.

Delegating and Copying Channels
All the instructions you need for delegating channels and copying information and keyframes between channels can be found in Section 2 – Getting Started. See under *Delegating Channels* and *Copying Channel Settings.*

Note: All of the following examples show the parameters default, range and align for both 1 x .75 (SD) and 16 x 9 (HD). Keep in mind that you may change anamorph values in either SD mode or HD mode and the parameter ranges will change. For instance if you are in SD and working in 16 x 9 then your values will match the 16 x 9 (HD mode) values.

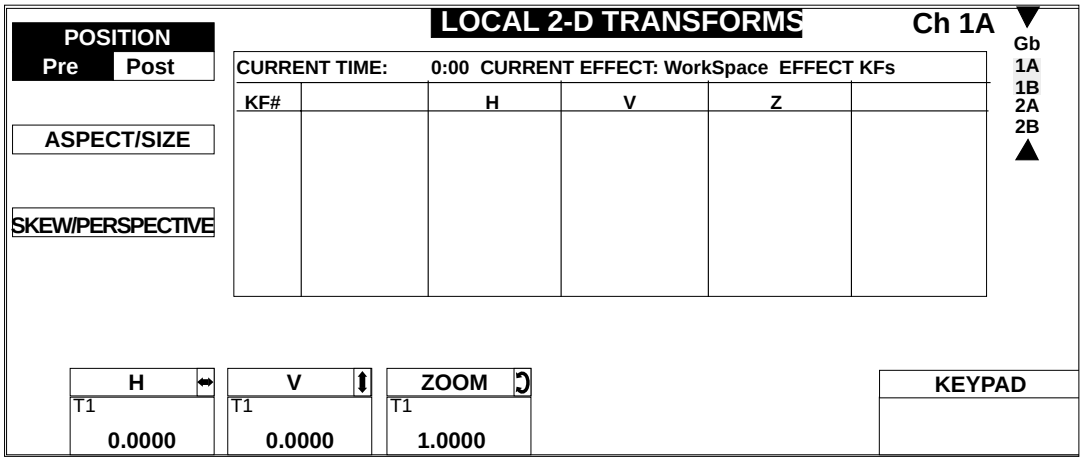
Note: All graphic representations of channel menus will be based on default SD mode parameters and settings.

2D Trans Menu

Pressing **2D TRANS** brings up the Local 2D Transforms menu. In **2D TRANS**, you can skew the image, change its aspect ratio, adjust the amount of perspective visible in a channel, and move the image and its perspective vanishing point. The 2D Trans controls are strictly two dimensional, changing only horizontal position, vertical position and size.

Position

The two 2D Trans controls, *Pre* and *Post*, are intended to resize and/or reposition the image either upstream of (Pre) or downstream of (Post) the 3D Trans controls.



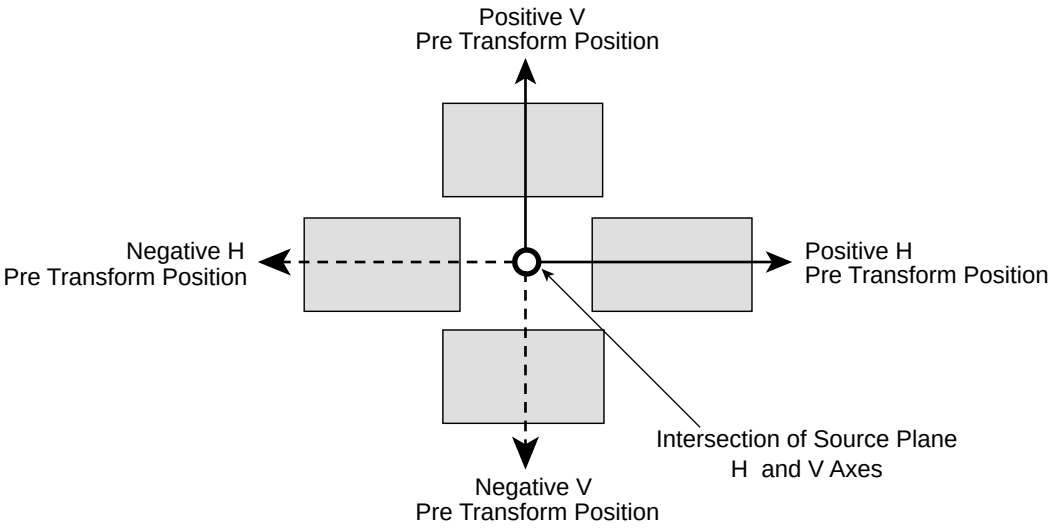
Pre

Pre controls position the image upstream of the 3D transformation, or in other words, before any 3D movement of the Source or Target planes.

H

Moves the image along the source plane's Pre transform horizontal axis. Moving the image in this mode moves it away from the axes' intersection.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125



V

Moves the image along the Source plane's Pre transform vertical axis. Moving the image in this mode moves it away from the axes' intersection.

	SD Mode (1 x .75)	**HD Mode (16 x 9)**
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125

Size

Changes the size of the image on the Source plane. A value of 0.0000 causes the image to disappear; a value of 1 is the default (full raster); a value larger than 1 makes the image larger than normal. The values indicate percentages of 100. For example, 0.5000 is 50% of full size in both the H and V directions, and so on. The same softknob, with the same values, appears under the *Aspect/Size* softkey.

	Both Modes
Default	1.0000
Range	0 - 99.9999
Align	Nearest multiple of .125

Note: The 3D Locate controls (Source or Target) move the entire plane with the image on it, so are not affected by the 2D size of the image.

Post

The Post controls position the image downstream of all the 3D transformation. Using the **Zoom** setting to move the image alters its apparent perspective. See the discussion of the ***Skew/Perspective*** softkey for more information on perspective.

H

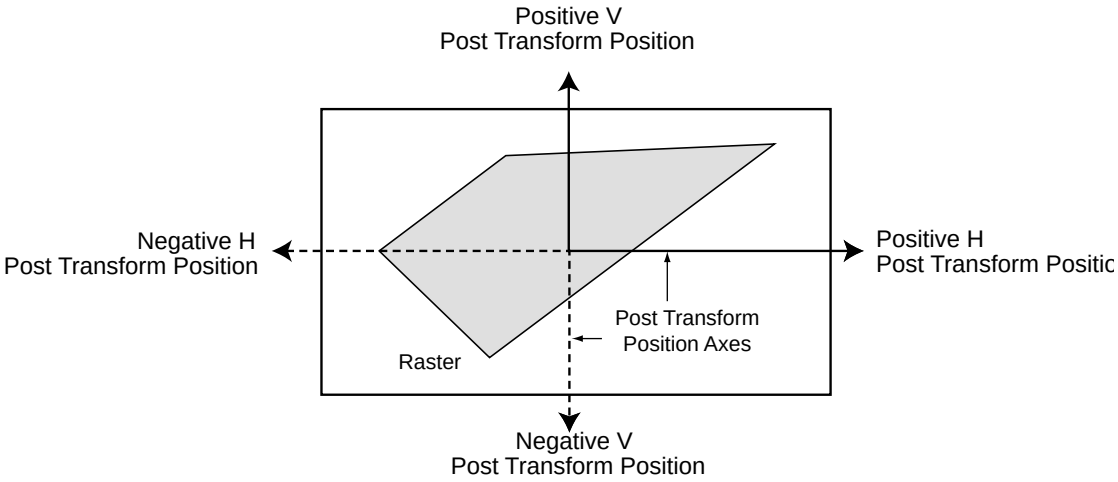
Moves the image horizontally, relative to the raster, no matter what Local or Global rotation have been applied.

	SD Mode (1 x .75)	**HD Mode (16 x 9)**
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125

V

Moves the image vertically, relative to the raster, no matter what local or global rotations have been applied.

	SD Mode (1 x .75)	**HD Mode (16 x 9)**
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125



Note: Image rotated in 3D space

Zoom

Simulates the effect of a camera zoom lens. Changing the zoom value does not affect the image's true size, nor the distance between the eye (viewing) point and the image. Instead, the image only seems larger and closer with values greater than 1.0000. Conversely, a value of 0.0000 zooms the image out to infinity, where it is not visible at all.

	SD Mode (1 x .75)
Default	1.0000
Range	0 - 99.9999
Align	Nearest multiple of .125

Aspect/Size

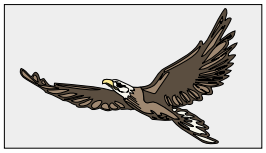
This menu function lets you alter the image's aspect ratio by providing independent H and V size controls. The normal aspect ratio of the standard definition television image is 4 x 3 or 1 x .75 while the normal aspect ratio of the high definition television image is a 16 x 9. Changing the aspect ratio distorts the input video.

H Aspect

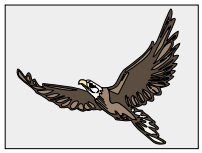
Compresses or expands the image along its (Pre transform) horizontal axis. Smaller values compress the image; larger ones expand it.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	1.0000	16.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .1250	Nearest multiple of .1250

HD H Aspect Ratio Examples



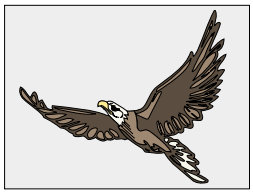
Normal HD (16 x 9) H Aspect Ratio



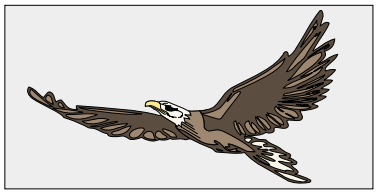
Compressed H Aspect Ratio

SD H Aspect Ratio Examples

Compressed SD



Normal SD (1 x .75)



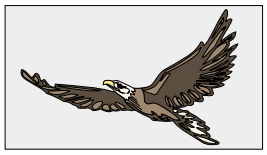
Expanded SD

V Aspect

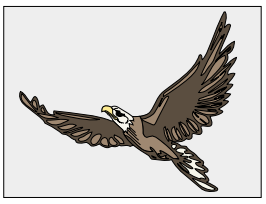
Compresses or expands the image along its (Pre transform) vertical axis. Smaller values compress the image, larger ones expand it.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.7500	9.0000
Range	+/- 99.9999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125

HD V Aspect Ratio Examples



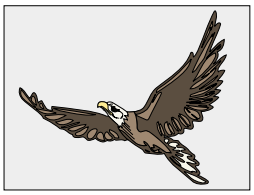
Normal HD V Aspect Ratio



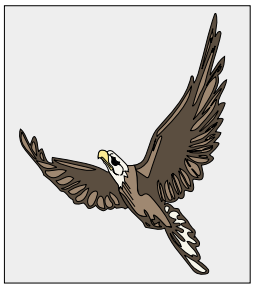
Expanded V Aspect Ratio

SD V Aspect Ratio Examples

Compressed V Aspect



Normal SD (1 x .75)



Expanded SD V Aspect

Size

Changes the size of the image on the plane. A value of .0000 causes the image to disappear; a value of 1.0000 is default (full raster). You can think of these values as percentages: 0.5000 is 50% of full size in both the H and V directions, 1.2500 is 125% of full size in both the H and V directions, and so on. This control is a duplicate of the Position/Pre Size control.

	Both Modes
Default	1.0000
Range	0 - 99.9999
Align	Nearest multiple of .125

Skew/Perspective

The normal video image is rectangle in shape. By definition, each corner is a 90 degree angle. Changing the corner angles by skewing them creates a parallelogram. You can think of skew as a type of rotation: a value of 0.2500 brings two adjacent corners one quarter of the way around the rectangle, where they meet the other corners and form a single (invisible) line. A value of .5000 inverts the image, since the corners have moved halfway around from their original position.

H Skew

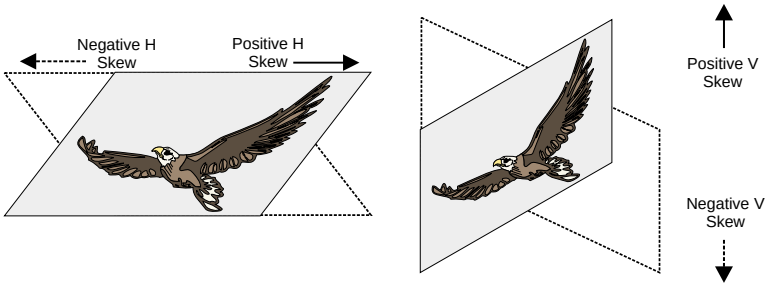
Skews the image along its (Pre transform) horizontal axis. Positive values skew the top of the image to the right, negative values to the left.

	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .125

V Skew

Skews the image along its (Pre transform) vertical axis. Positive values skew the right side of the image up, negative values down.

	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .125



Perspcv (Perspective)

Perspective is the depth given to a rotated two-dimensional image to make it appear as though it were in true three-dimensional space. Perspective makes the closer edges of the image appear longer than the farther edges, and determines the "vanishing point" to which all 3D spaces conform.

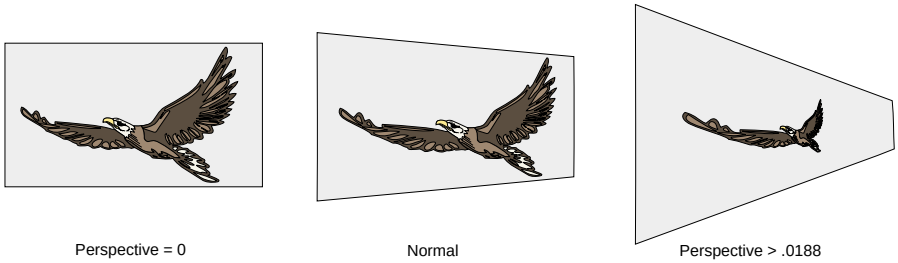
	SD Mode (1 x .75)	**HD Mode (16 x 9)**
Default	0.3000	0.0188
Range	0-6.5000	0-0.4063
Align	Nearest multiple of .125	

Note: Although Align works in all parameters, it is not a useful tool in the instances, such as above for Perspective in HD Mode, where the range cannot be easily divided into finite segments. In these instances Align has been left blank or not included.

The optically correct default value is 0.3000 for 1 x .75 and 0.0188 for 16 x 9. Smaller values make the perspective less pronounced: a value of 0 shows no visible difference between the near and far edges no matter how the image is rotated. Larger numbers exaggerate the perspective: the greater difference between the near and far edges makes the image look as though it stretches farther off into the distance.

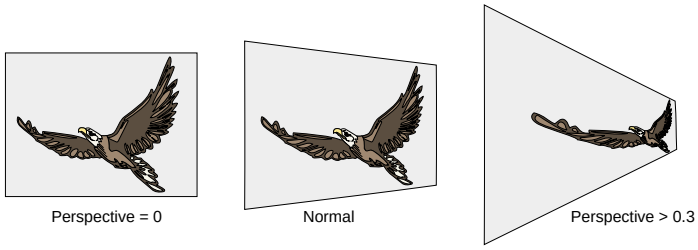
Note that the Post transform **Zoom** control affects the perspective of a rotated image, no matter which space you rotated it in. If you resize the transformed image with **Zoom**, you can multiply the default perspective value by the new **Zoom** value and enter the result in the **Perspcv** softknob to give the zoomed image normal peerspective.

HD Perspective Examples



Perspective on an image with the same H rotation

SD Perspective Examples

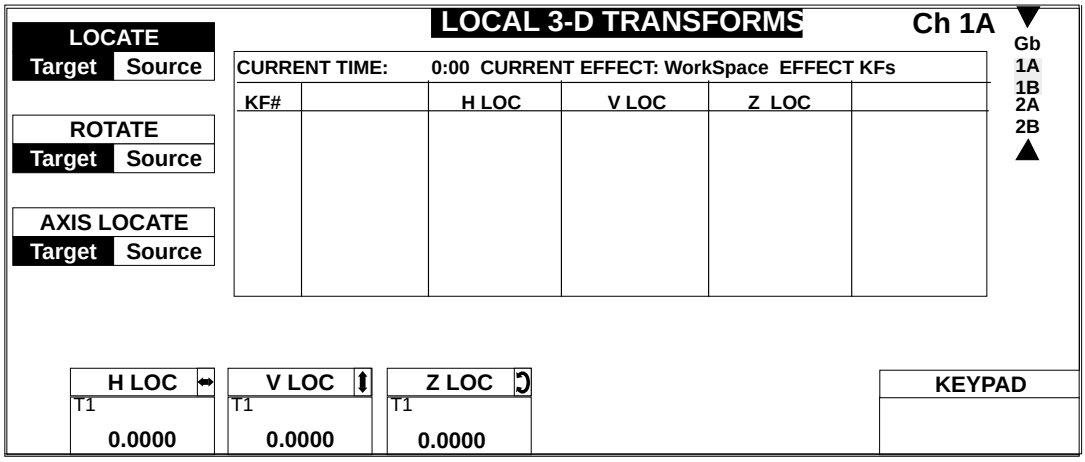


Perspective on an image with the same H rotation

Note: Take care not to accidentally adjust the Perspcv value when changing Skew. A perspective value other than 0.3000 for SD and 0.0188 for HD can produce unnatural-looking rotation and perspective effects.

3D Trans Menu

Pressing **3D TRANS** calls up the Local 3D Transforms menu. In **3D TRANS**, you can select either Source and Target spaces for moving or rotating an image and for setting the center of rotation.



Overview of 3D Transforms

Source and Target Space

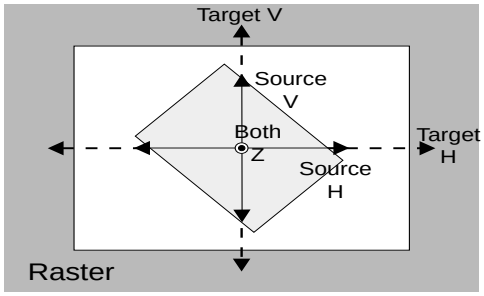
Dveous/MX lets you transform images in 3D space. You can rotate and locate images in both Source and Target space. All rotations use an axis point, which you can move in either space, and can view by pressing the **CURSOR** button.

The transformations you can use can apply to either the Source or Target space. Before using these controls, it is important to understand how these spaces affect the image and each other.

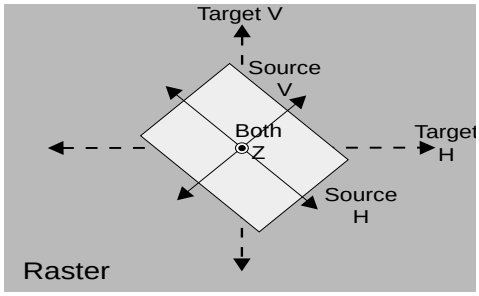
- **Source Space**

  Manipulations in source space are relative to the axes of the Source plane. Any H, V or Z controls move the image plane, but not the axes, regardless of any rotations applied. You can think of the Source axes as “locked” to the

Source plane, but not to the image. Or, you can think of Source space as "nested" inside Target space.



A 45 degree Z Axis rotate
In source space



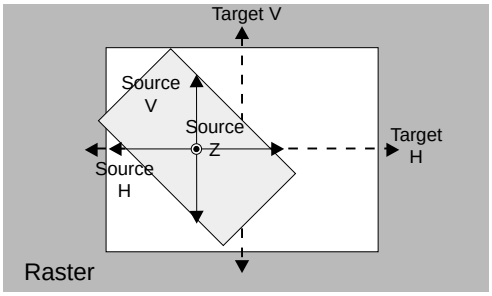
A 45 degree Z Axis rotate
In target space .

- **Target Space**

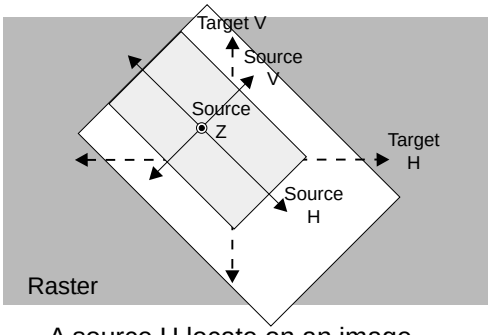
  Manipulations in Target space are relative to the Global Source axes. Any H, V or Z controls move the image relative to the Global settings. If the Global settings are at default, moves in Target space are relative to the raster.

The illustration below shows rotations in both spaces. Note the differences between Source and Target locates: Rotating the image in Source space does not affect either the Source or Target locates. However, rotating an image in Target space rotates the Source space axes, and so directly affects Source locates and rotates. Target locates are not affected in this case.

Section 3 – Transforms has more detailed discussions on the hierarchy of the transform spaces and how they interact.



A source H locate on an image
rotated in source space



A source H locate on an image
rotated in target space

Locate

Target/Source

The ***Locate*** function lets you move the image along its axes in 3D space. Toggle the softkey to *Source* or *Target* to highlight the location in which you want to move the image. All Source locates move the Source plane. All Target locates move the Target plane.

Unless you alter the **Perspcv** setting in the 2D Trans menu (default = 0.0188), all locates have true perspective.

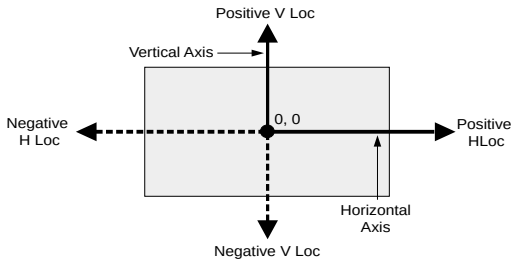
H Loc

Moves the image along the horizontal axis. Positive values move the image to the right; negative values move the image to the left.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125

V Loc

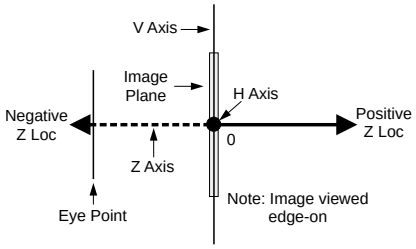
Moves the image along the vertical axis. Positive values move the image up; negative values move the image down.



	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125

Z Loc

Moves the depth of the image relative to the eye (viewing) point. The default (full raster) value for Z is 0.0000. Positive values move the image away, making it appear smaller. Negative values move the image closer, making it appear larger. In 16 x 9 a value of -26.6672 makes the image disappears because it has reached the eye point and is "behind you" in 3D space. In 1 x .75 a value of -1.6667 creates the same effect.



	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125

Rotate

Target/Source

The ***Rotate*** function lets you spin the plane and the image on it around the three axes. Rotate values indicate fractions of a complete rotation. For example, two and one quarter turns is 2.2500. You can find the numeric values for precise rotation by dividing the needed degree of rotation by 360. For example, a 33 degree rotation is 33/360=0.0917.

Toggle the ***Rotate*** softkey to highlight the space in which you want to perform the rotate: Source or Target. All Source rotates rotate the Source plane. All Target rotates rotate the Target plane.

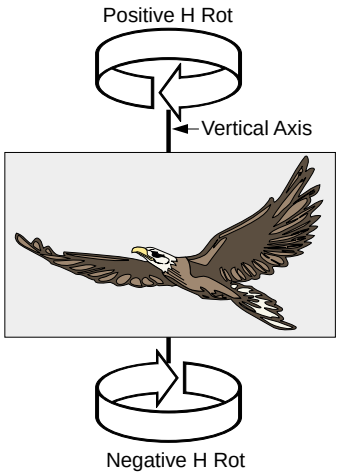
All rotates have true perspective, unless you alter the **Perspcv** setting in the 2D Trans menu.

H Rot

Rotates the image and its Z and H axes horizontally around its V (vertical) axis, but does not rotate the V axis. To rotate the V axis of the current plane, you must use the Rotate control of the next downstream plane.

Positive values move the right edge away from you; negative values move the left edge away.

	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .1250 (45 degrees)

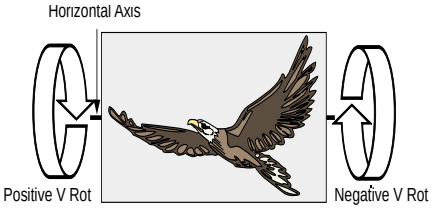


V Rot

Rotates the image and its Z axis vertically around its H (horizontal) axis, but does not rotate the V or H axes.

Positive values move the top edge away from you; negative values move the bottom edge away.

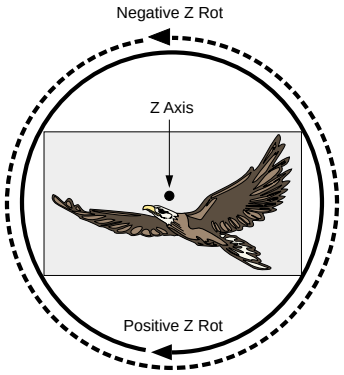
	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .1250 (45 degrees)



Z Rot

Rotates the image about the Z (perpendicular) axis, but does note rotate any axes. Positive values rotate clockwise; negative values rotate counterclockwise.

	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .1250 (45 degrees)



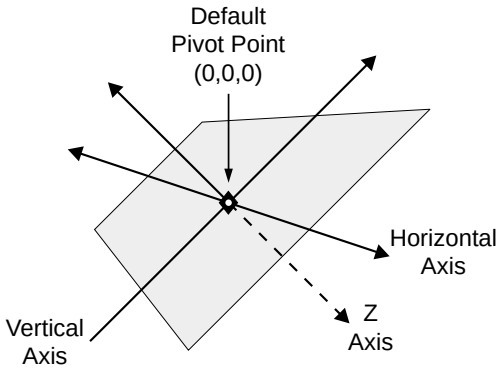
Axis Locate

Target/Source

Axis Locate sets the center of rotation for the image. The center of rotation is the single point at the intersection of the H, V and Z axes. The H, V and Z axes are perpendicular to each other, and you can use them to move their intersection (the "pivot point" for the image) in 3D space.

Toggle the function softkey to either Source or Target to select the space in which you want to move the pivot point. Moving the Source axis moves the pivot point on the Source plane. Moving the Target axis moves the pivot point on the Target plane.

Moving the pivot point lets you rotate the image about its corner, or create swinging door effects, for example. Move the pivot point on the Z axis and use H and V rotates to make the image "orbit" the pivot point.

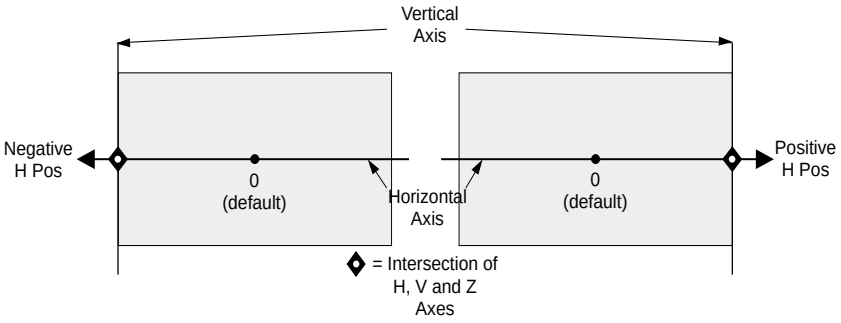


Enable the **CURSOR** button on the Control Panel to bring up a cursor that indicates the pivot point's current location. See Section 3 – Transforms for more details on the cursor display.

H Pos

Moves the pivot point along the horizontal axis. Positive values move the pivot point right; negative values move it left.

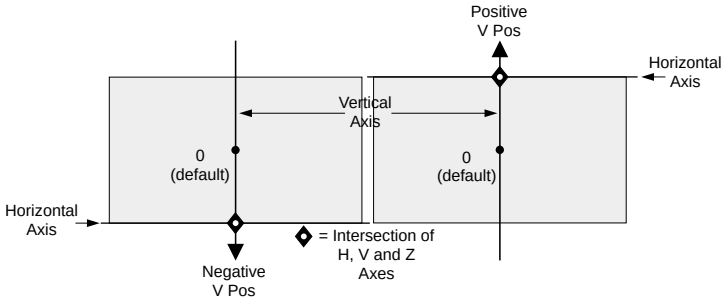
	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125



V Pos

Moves the pivot point along the vertical axis. Positive values move the pivot point up; negative values move it down.

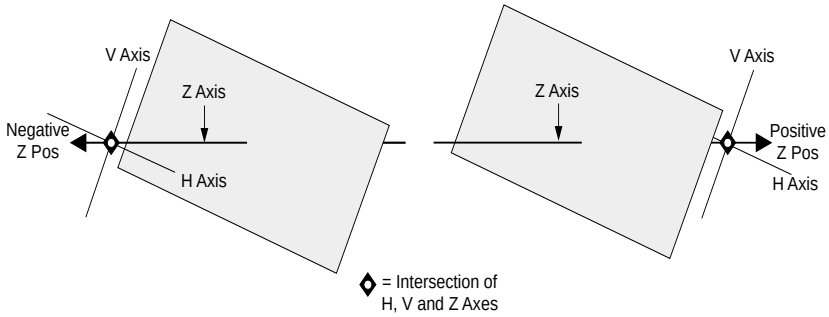
	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125



Z Pos

Moves the pivot point along the Z axis. Positive values move the pivot point behind the image; negative values move it in front of the image. Moving the pivot point along the Z axis causes horizontal and vertical rotations to move the image in an "orbit" about the pivot point.

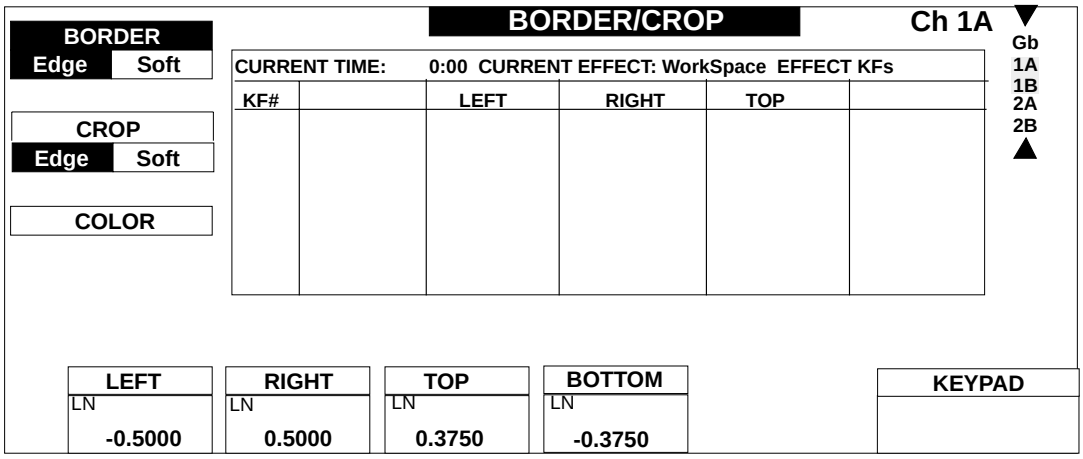
	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125



Border/Crop Menu

Pressing BORDER/CROP brings up the Border/Crop menu. Here you can add an internal border to the image and adjust the border's size and color. This menu also lets you crop all four sides of the picture independently or simultaneously. You can also adjust softness of the border and cropped image edges.

Borders and crops are upstream of all other image manipulations. This means that no matter what the image size, location, rotation, skew, etc., borders and crops always apply to the image edges; And, since crops are upstream of borders, borders always apply to cropped image edges.

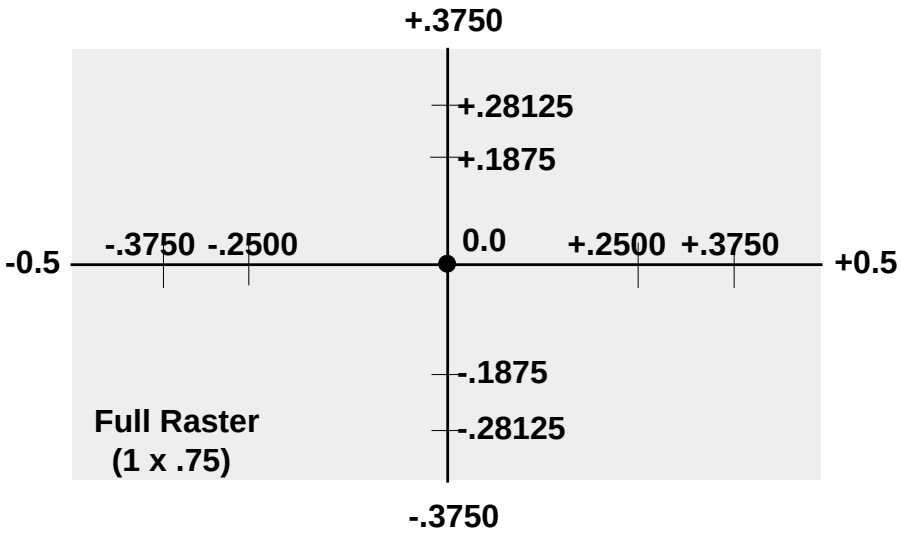


Border

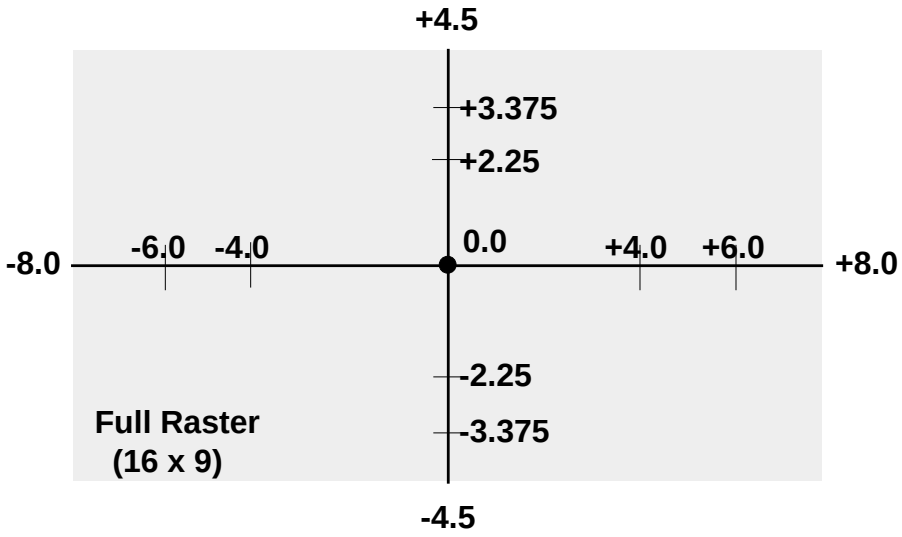
Think of the border as having two edges: the outside edge and the inside edge. The outside one is fixed to the crop edge. The inside edge moves to size the border. The default border values place the inside border edge in the same place as the outside border edge. This means the border is always "on," but with no width, it is not visible.

In Video+Video mode, you can set the crops outside the image edges. The border color appears in the gap between the image edges and the cropped edges. The result is an outside (of the image) border.

Values for borders and crops are relative to a full raster image. 0,0 is at the center of the raster. The following examples show 1 x .75 and 16 x 9 screen positions.



Screen Positions (1 x .75)



Screen Positions (16 x 9)

Because the border affects the video signal, you cannot independently add a border to, or use the Soft setting with, the key (B) channel in Video+Key mode.

Edge

To apply a border to one or more edges of the image, toggle the Border softkey to select Edge. Use the softknobs to adjust each side of the border independently, or apply the same border size equally to all four edges by twisting the joystick.

- Twist the joystick clockwise to increase the border width on all four sides. Twisting the joystick counter-clockwise to decrease the border width on all four sides.
- After adding width to the border, move the joystick vertically to move the top and bottom border edges at the same time. Move the joystick horizontally to move the right and left border edges at the same time.
- To adjust one border edge at a time, hold its keypad softkey (A, B, C or D) and use the joystick. Note that you can hold two softkeys at once and use the joystick to adjust a border corner.

Left

Moves the left border edge relative to the left edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	-0.5000	-8.0000
Range	+/- 99.999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125

Right

Moves the right border edge relative to the right edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.5000	8.0000
Range	+/- 99.999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125

Top

Moves the top border edge relative to the top edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.3750	4.5000
Range	+/- 99.999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125

Bottom

Moves the bottom border edge relative to the bottom edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	-0.3750	-4.5000
Range	+/- 99.999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125

Soft

Toggle the Border softkey to select Soft to adjust the border softness. This control affects only the inside border edge. Note that since the border is always "on," increasing softness makes it visible on the image, even if the border has no width.

Softness

Adjusts the softness of the border's inside edge. The default, 0, gives a hard edge.

	Both Modes
Default	0.00
Range	0 - 100.0
Align	Nearest multiple of 12.5

Crop

The Crop function lets you crop the edges of the border or soften the image edges, even if you have not cropped them.

Edge

To crop one or more edges of the image, toggle the Crop softkey to select Edge. You can use the softknobs to crop each side of the image independently, or crop all four edges equally by turning the joystick:

- Twist the joystick clockwise to crop inward on all four sides.Twist the joystick counter-clockwise crops outward on all four sides.
- After cropping the image, move the joystick vertically to move the top and bottom crops at the same time. Move the joystick horizontally to crop to move the right and left crops at the same time.
- To adjust one crop edge at a time, hold its keypad softkey (A, B, C or D) and use the joystick. Note that you can hold two softkeys at once and use the joystick to adjust a crop corner.

The default crop values define the normal raster edges. The total range of cropping is from the opposite raster edge to the full raster. Use crops to create any aspect ratio for the key signal for that channel. For example, you can create a 1:1 height to width ratio. Since twisting the joystick equally affects all the cropped edges, you can keep that aspect ratio while enlarging or decreasing the overall size of the hole cutter.

Left

Crops the left edge of the image.

	SD Mode (1 x .75)	**HD Mode (16 x 9)**
Default	-0.5000	-8.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125

Right
Crops the right edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.5000	8.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125

Top
Crops the top edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.3750	4.5000
Range	+/- 99.9999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125

Bottom
Crops the bottom edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	-0.3750	-4.5000
Range	+/- 99.9999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125

Note: This control does not crop the image itself; it affects the key signal. In Video+Video mode, you can set the crops outside the image edges. The border color appears in the gap between the image edges and the cropped edges. Because this control affects the key signal, you cannot independently crop or soften the edges of the video (A) channel in Video+Key mode.

Soft

To soften one or more edges of the image, toggle the Crop softkey to select Soft. You can soften edges whether or not they have been cropped. Use the softknobs to soften each side of the image independently, or soften all four edges equally by turning the joystick:

- Twist the joystick clockwise to increase the softness on all four sides. Twist the joystick counter-clockwise to decrease the softness on all four sides.
- Move the joystick vertically to adjust the softness on the image's top and bottom edges. Move the joystick horizontally to adjust the softness on the image's right and left edges.
- To adjust one edge at a time, hold its keypad softkey (A, B, C or D) and use the joystick. Note that you can also hold more than one softkey at a time and use the joystick.

Left

Softens the left edge of the image.

	Both Modes
Default	0.00
Range	- 1.00 to 100.00

Right

Softens the right edge of the image.

	Both Modes
Default	0.00
Range	- 1.00 to 100.00

Top

Softens the top edge of the image.

	Both Modes
Default	0.00
Range	- 1.00 to 100.00

Bottom

Softens the bottom edge of the image.

	Both Modes
Default	0.00
Range	- 1.00 to 100.00

Note: Because this control affects the key signal, you cannot independently soften the edges of the video (A) channel in Video+Key mode. Also, you cannot independently control the softness on each edge when in Video+Key mode. In this mode, there is a single softness control.

Color

Press the Color softkey to adjust the border color.

Lum

Sets the luminance for the border color. 0 is no luminance (black), 100 is full luminance (white).

	Both Modes
Default	0.00
Range	0 - 100.0
Align	Nearest multiple of 12.5

Sat

Sets the saturation for the border color. 0 is no saturation, 100 is fully saturated.

	Both Modes
Default	0.00
Range	0 - 100.0
Align	Nearest multiple of 12.5

Hue

Sets the color for the border, in degrees around the color wheel. 0 is blue, 45 is magenta, 90 is red, and so on.

	Both Modes
Default	0.00
Range	+/- 720.0
Align	Nearest multiple of 45

Opacity

Sets the border color opacity. 100 is fully opaque, 0 is fully transparent.

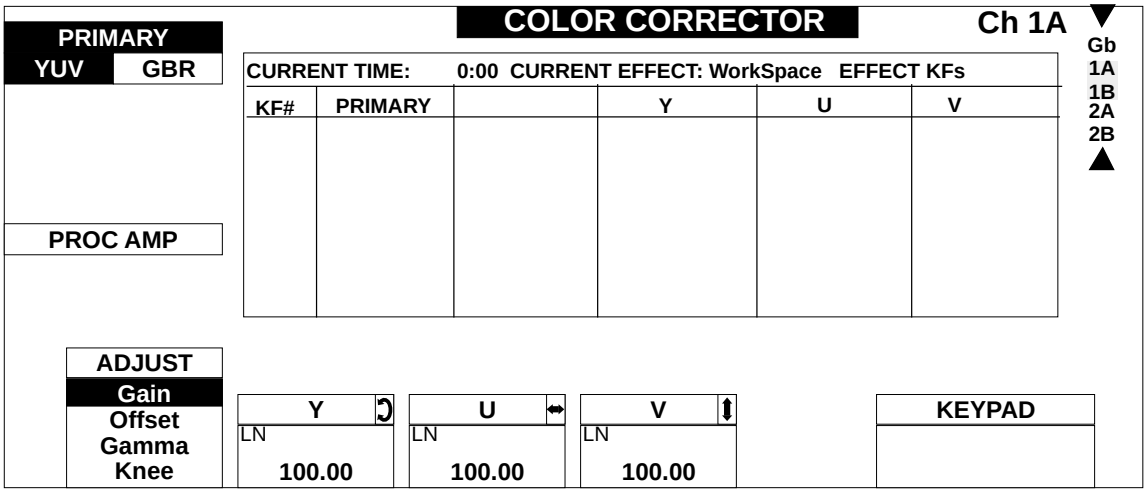
	Both Modes
Default	0.00
Range	0 - 100.0
Align	Nearest multiple of 12.5

Color Corrector Menu

The Dveous/MX reTouch Color Corrector gives you independent color correction for YUV or GBR (also known as RGB) components. The Color Corrector is the first of two menus for controlling the Color Corrector.

The Color Corrector menu is used to control gain, offset, gamma, knee and proc amp functions, while the Color Modify menu controls luminance and chrominance invert, luminance tinting and solarizing.

Press the **COLOR CRCTR** menu button to bring up the Color Corrector menu.



Overview of Color Correction

RGB Processing

Video in its simplest and purest form consists of three primary color components (red, green, and blue) that are combined to create a color image. Typically, video cameras, graphics and paint devices, and traditional analog color correctors have individual red, green, and blue adjustments. These controls are the most intuitive and easiest to understand.

YUV Processing

However, Dveous/MX is a component digital video device, and component digital video does not use red, green, and blue components directly. This format's components are noted in one of four ways: YUV; or Y, B-Y, R-Y; or Y, P_b, P_r; or Y, C_b, C_r. In all four cases, the Y is a luminance component, carrying the video

signal's brightness information. The remaining letters stand for the two color difference components. The two color difference components, combined, carry the video signal's color (chrominance) information. This format appears as YUV in the Color Corrector and Color Modify menus.

Color Corrector Menus are Pre Transform

There are four independent color correctors, one for each DVE channel. All color corrector adjustments are pre transform: they apply to the image before it enters a DVE channel for manipulation.

What Can Be Color Corrected

Any input source to the DVE can be color corrected: any of the 6 or 12 video inputs, the SuperMatte generator, a texture pattern or a defocused image. You can color correct the image in any channel using either GBR or YUV controls. You will probably find that the GBR mode is more intuitive than the YUV mode. However, since GBR color space is more restricted than YUV color space, there may be times when you need to work in the YUV mode.

RGB and YUV Transcoding

Dveous/MX's Color Corrector works in two stages. In the YUV mode, the first stage processes the video in this format without transcoding. In the GBR mode, the first stage up-samples normal 4:2:2 YUV to 4:4:4 YUV to double the chrominance resolution in preparation for GBR conversion. It then digitally transcodes this signal to 4:4:4 GBR, and uses this format for all processing including the gain, offset, gamma, knee, solarize and invert gain functions.

The second color corrector stage transcodes the modified 4:4:4 GBR signal back to 4:4:4 YUV and down-samples to 4:2:2 YUV, then processes the luma tinting and proc amp functions. The color corrected and/or modified image then passes to its DVE channel for transformation.

Note: Working in GBR (also known as RGB) color space may be more intuitive because you use the red, green and blue components of video much like you use camera white and black balance adjustments. Normally, you will use GBR mode, since the color corrector effectively limits the color-corrected video to legal GBR colors with a small outside margin.Working in YUV color space mode is less straightforward. "Y" is the brightness or luminance component, "U" is the B-Y or blue/yellow chrominance component (with no luminance), and "V" is the R-Y or red/cyan chrominance component (with no luminance). What this means is that adjustments in

GBR color space affect not only the color relationship, but also the luminance levels. YUV mode, on the other hand, keeps the luminance separate from the color components, so you can adjust them independently. YUV mode is most useful when you want to apply color correction based on luminance levels, or to create black and white negatives with the ***Invert YUV*** controls in the Color Modify menu.

Primary

Toggle the ***Primary*** softkey to select either ***GBR*** or ***YUV***.

YUV

Adjust

Turn this softknob to control individual components as follows:

Gain

Gain increases or decreases the component's overall level relative to the others.

	Both Modes
Default	100.00
Range	0.10 - 199.86

Offset

Offset provides a null offset for each component. It acts as a pedestal offset, which changes all brightness levels equally.

	Both Modes
Default	0.00
Range	+/- 50.00
Align	nearest multiple of 12.5

Gamma

Gamma is a contrast adjustment to bring out more detail in a component. A value of less than 1 “stretches” the darker portions and “compresses” the lighter portions of an image; a value of greater than 1 “stretches” the lighter portions and “compresses” the darker portions. Use the **Knee** control to set the dividing point that determines which portions are stretched and which compressed.

	Both Modes
Default	1.00
Range	0.10 - 2.50

Knee
Knee sets the dividing point that determines which portions the **Gamma** setting stretches and which it compresses. The best way to see **Gamma** and **Knee** adjustments is to input a ramp test signal and adjust each softknob. If you are not familiar with **Gamma** adjustments, checking the output on a waveform monitor can help you better understand how these controls affect the image.

	Both Modes
Default	25.00
Range	10.00 - 50.00
Align	Nearest multiple of 5

GBR

Adjust
Turn this softknob to control individual components as follows:

White
Increases or decreases the component's overall level relative to the others.

	Both Modes
Default	100.00
Range	.10 - 199.86

Note: At first, it may appear that the White adjustment operates backwards. However, this parameter adjusts white balance, not gain. The numbers are calibrated to the level of the incoming video. In other words, if the video component you are adjusting is at 90%, entering 90% is the level that is normalized to 100. Conversely, if incoming video is at 110%, entering 110 brings the level *down* to 100.

Black
Provides a black offset for each component. You can control the dark portion s of the image without affecting the bright portions.

	Both Modes
Default	0.00
Range	+/- 50.00
Align	Nearest multiple of 12.5

Gamma
Adjusts contrast to bring out more detail in a component. A value less than 1 "stretches" the darker portions and "compresses" the lighter portions of an image; a value greater than 1 "stretches" the lighter portions and "compresses" the darker portions. Use the **Knee** control to set the dividing point that determines which portions are stretched and which compressed.

	Both Modes
Default	1.00
Range	0.10 - 2.50

Knee
Sets the dividing point that determines which portions the **Gamma** setting stretches and which it compresses. The best way to see **Gamma** and **Knee** adjustments is to input a ramp test signal and adjust each softknob. If you are not familiar with **Gamma** adjustments, checking the output on a waveform monitor can help you better understand how these controls affect the image.

	Both Modes
Default	25.00
Range	10.00 - 50.00
Align	Nearest multiple of 5

Proc Amp

This function accesses controls that work much like a processing amplifier or VTR time-base corrector. All ***Proc Amp*** adjustments are downstream of the main color corrector settings.

Hue

This control adjusts the image's overall chroma phase or hue.

	Both Modes
Default	0.00
Range	+/- 720.0
Align	Nearest multiple of 45

Sat

This control adjusts the image's overall chrominance saturation.

	Both Modes
Default	100.00
Range	0.00 - 200.00
Align	Nearest multiple of 25

Gain

This control increases or decreases the image's overall luminance level.

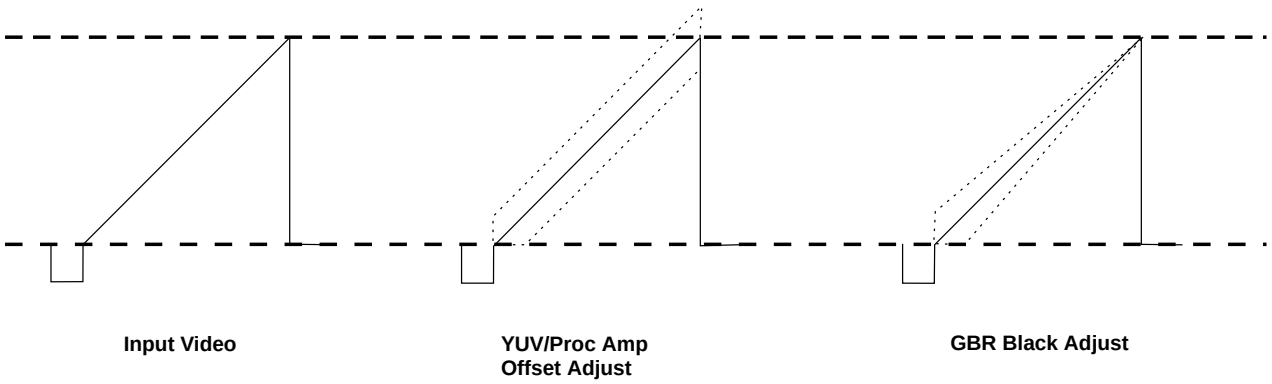
	Both Modes
Default	100.00
Range	0.00 - 199.86

Offset

This control provides a pedestal level or black offset for the image.

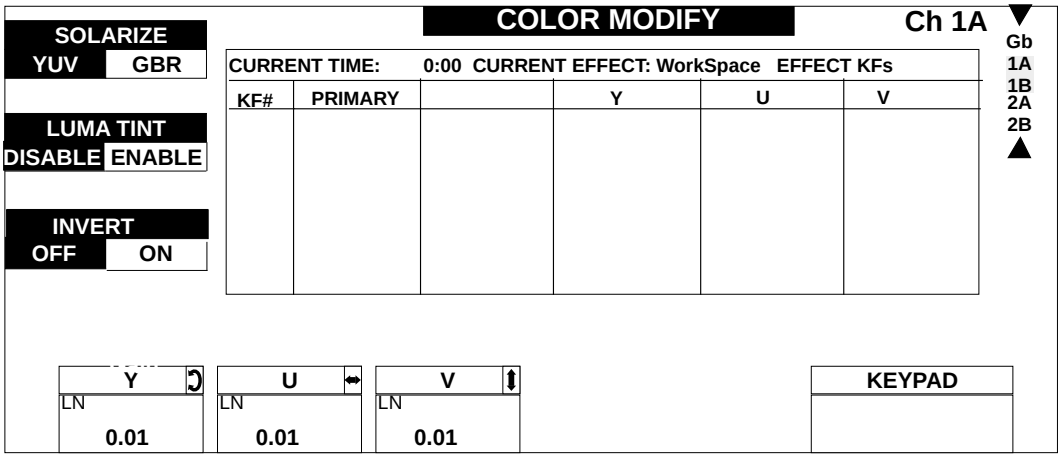
	Both Modes
Default	0.00
Range	+/- 50.0
Align	Nearest multiple of 12.5

Note: The GBR *Black* adjustment works like a real telecine color corrector: it adjusts the black level, but keeps the whites pinned at one point. The *Offset* control on the other hand, raises or lowers the entire active video area and affects both the blacks and whites equally (*see illustration below*).



Color Modify Menu

Press the **COLOR MODIFY** menu button to bring up the Color Modify menu. This menu lets you add special-effect type color correction: solarizing and chrominance and luminance inverting.



Solarize

The Solarize function adjusts the number of quantizing levels in the individual video components. In the ***YUV*** mode, you can solarize the individual **Y**, **U**, or **V** components with their softknobs. In the ***GBR*** mode, you can solarize the individual green, red, and blue components with the **G**, **B**, and **R** softknobs. Solarizing the B-Y or U, and R-Y or V, components (which together make up the chrominance signal) is also known as "posterizing."

	Both Modes
Default	0.01
Range	0.01 - 5.12

Luma Tint

Toggle the function softkey from ***Disable*** to ***Enable*** to apply a color tint based on the image's luminance value. You can apply tint to the black, gray or white areas of the image, or any combination. Each has independent **Sat** and **Hue** parameter softknobs. Like the Proc Amp adjustments, all Luma Tint settings are downstream of the main Color Corrector adjustments.

Adjust

Turn this softknob to control **All/Black/Mid/White**.

All applies the settings in the other softknobs to the entire image, regardless of different luminance levels. With the **Black** adjustments active, the controls apply to luminance levels below about 45 percent; the darker the level, the greater the effect. With the **Mid** adjustments active, the controls apply to luminance levels between about 20 percent and 85 percent, with the greatest effect at about 50 percent. With the **White** adjustments active, the controls apply to luminance levels above about 60 percent; the brighter the level, the greater the effect.

Sat

This control determines the saturation of the tint color added to the image.

	Both Modes
Default	0.00
Range	0 - 100.0
Align	Nearest multiple of 12.5

Hue

This control determines the hue of the tint color added to the image.

	Both Modes
Default	0.00
Range	+/- 720.0
Align	Nearest multiple of 45

Proc Sat

This control adjusts the saturation level of the original image before tinting. It is identical to the *Proc Amp* Sat control in the Color Corrector menu.

	Both Modes
Default	100.00
Range	0.00 - 200.00
Align	Nearest multiple of 25

Invert

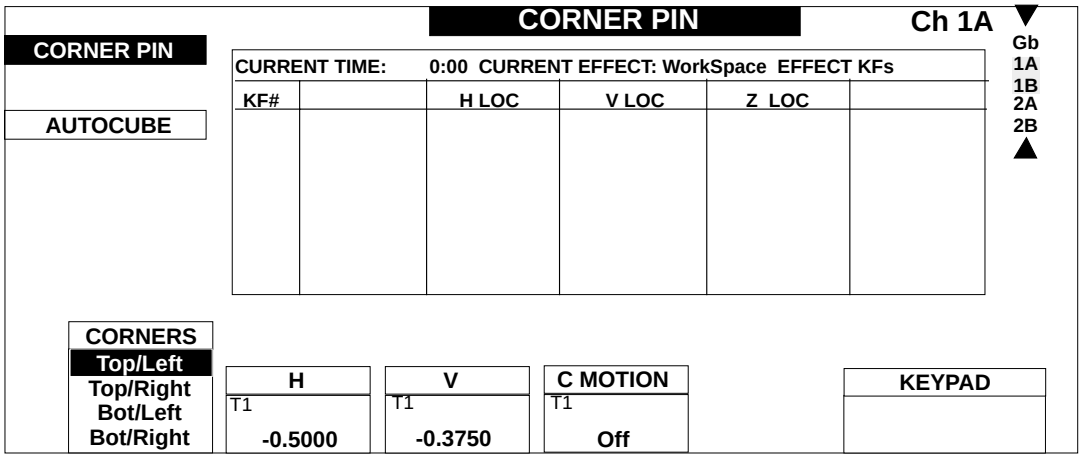
Toggle softkey from ***Off*** to ***On*** to use this functionality. This function adjusts the gain of the components, centered around the component's 50 percent level. **Invert** lets you create a negative of the original image by swapping dark areas for bright, and vice versa, for all three components, **Y**, **U**, or **V**. Positive values give a positive image, with reduced contrast below 100.00. Negative values give a negative image; -100.00 creates a full contrast negative. The softknobs let you invert the individual component's gain.

Note: Invert works in both RGB and YUV modes, but does not have a selector switch to access those modes. To choose RGB or YUV, use ***Solarize*** and toggle to the desired mode.

	Both Modes
Default	100.00
Range	+/- 100.00
Align	Nearest multiple of 25

Corner Pin Menu

Press **CORNER PIN** on the Control Panel to bring up the Corner Pin menu. Here you can control the corner pinning and autocube functions.



Overview of Corner Pinning

Corner pinning lets you pick up and paste any corner of an image without moving the other corners. This means you can "tack" a compressed image in a (four-cornered) position that does not conform to the high definition 16x9 television image.

For example, imagine a wide shot of a highway. On the side of the highway is a billboard. You want to put different video in the billboard. Because of the camera angle, the billboard is at an angle that is difficult for an effects system to match manually. You might use a paint system, filling the board with green, and do a chroma key. The new video's perspective probably does not match the billboard's perspective. Because it is a chroma key, the new video is cut in with a mask rather than compressed to fit, and some of the new video is cut away and lost.

With corner pinning, you can pick up each corner of the new video and place it on individual corners of the billboard. In just a few minutes, the new video is in place perfectly, the perspective is correct, and all the new video is in the shot.

Corner pinning changes the 2D Trans ***Aspect*** and ***Skew*** and 3D Trans ***Target Locate*** and ***Rotate*** settings as you manipulate the image. The advantage of using Target to do corner pinning is that you can then use the 3D Trans menu's ***Source Locate*** and ***Rotate*** softkeys to manipulate the image without disturbing

the shape as created. Because Target is downstream of Source, the Source parameters work as you expect them to. When you enable the ***Corner Pin*** softkey, the values in the softknobs reflect the corners' positions relative to the raster, as set in the 3D Trans and 2D Trans menus.

Note: Using Global transforms on a corner-pinned image is not supported, and may produce unexpected results.

Corner Pin

Press the ***Corner Pin*** softkey to enable the corner pinning controls.

Corners

Use this parameter softknob to select the corner you want to pin (**TopLeft, TopRight, BottomLeft or BottomRight**). Note that the **H** and **V** values reflect the corner's current position relative to the raster.

H

Moves the selected corner horizontally, relative to the center of the screen (0). Negative numbers move the corner left, positive numbers move it right.

V

Moves the selected corner vertically, relative to the center of the screen (0). Negative numbers move the corner down, positive numbers move it up.

C Motion

Corner pinning uses the 2D Trans *Aspect* and *Skew* and 3D Trans *Target Locate* and *Rotate* parameters. Set the C Motion softknob to On to force these parameters to track together between keyframes. Setting it to Off may cause unexpected image movement, such as a wobble, between keyframes, because the parameters involved may not necessarily track together.

Note: Corner pinning is most often used to create static shapes or effects that move without transformations. You can use frame-by-frame editing or transitions with the jump motion type selected for corner pinned material. For example, say you want to pin an image onto a moving background shape, such as a moving truck. In this example, you probably need to use frame-by-frame editing, unless someone did some clever work with truck/camera movement. The chances of an effects device exactly matching the motion of another image are very remote. Because the motions of the two moving images (the truck and the effect) are not identical, they look "disconnected" and the effect may not be realistic. The only way around this problem is frame-by-frame (or field-by-field) editing. Cue up the first frame of the truck, pin the image to it, record the frame, cue up the next frame, and so on. This way, each frame has the new video locked onto it, making the scene much more realistic.

Autocube

By automatically passing video onto the opposing side of a solid, ***Autocube*** allows you to build an apparently six sided cube or slab in a single pass (using a Dual Twin-Channel Dveous/MX system), or in two passes (with a Single Twin-Channel system). Press ***Autocube*** to enable the function. **This function is not available in one channel HD mode**.

Positioning Channels in Local and Global Spaces

When you create a solid, you need only determine one face of an opposing pair (e.g., the near/far pair). Autocube programs the opposite one automatically. Position the faces of the cube using the local channels, then move the cube with the Global channel. Normally, you will have only one keyframe in each of the local channels to set up the channel positions, and multiple keyframes in the Global channel for whatever positioning and movement you want on the slab or cube. However, extra local keyframes can be used for moving a light source across the cube, or to change the aspect ratio or thickness of the cube or slab.

Aspect vs. Crop to Determine the Size of the Solid

There are two ways to set up the size of the faces of the cube: using Aspect ratio or Crop. *Aspect* will "fit" the whole transform onto that particular side, but it will be "squished" to fit. *Crop* keeps the video at full size but crops out areas of the picture that are outside of the size of the cube.

Single and Dual Twin Channel Directions

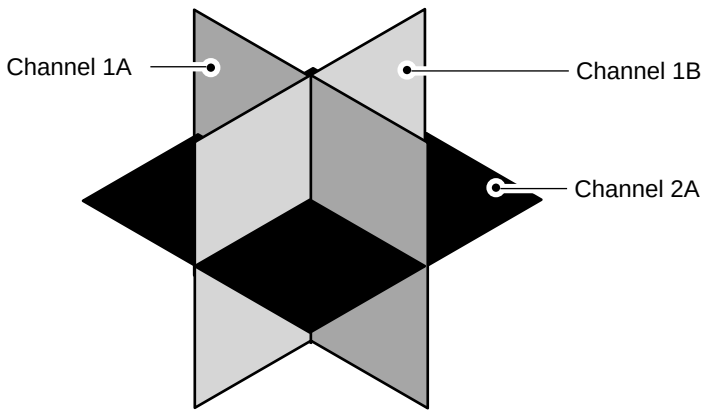
Follow these directions for a six-sided cube using a Dual Twin-Channel system. If you only have a single Twin-Channel system, follow the directions for Channel 1A and 1B for the first pass, and then use the directions for 2A and 2B for the second pass. Be sure to use the same Global keyframes in both passes (use the *Delegated* recall to copy only the Global keyframes from the first effect).

Building a Six-sided Cube Using Aspect

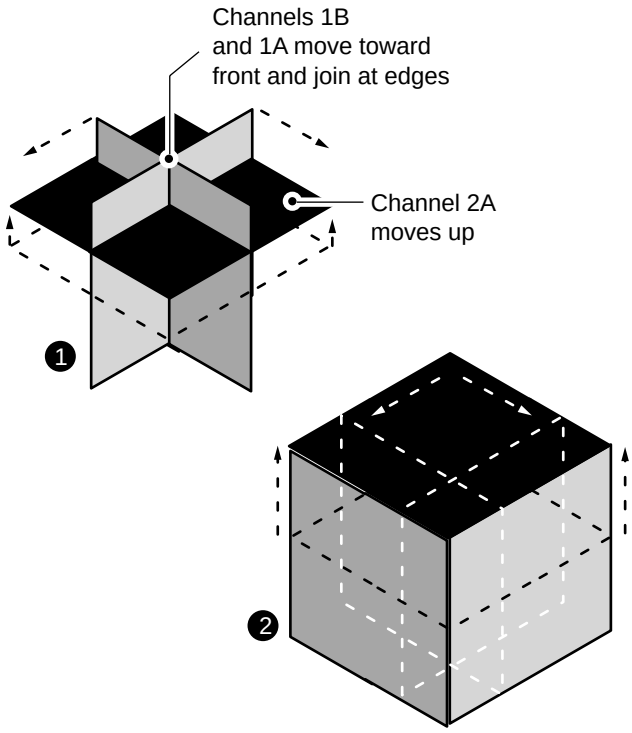
A square cube using Aspect is the easiest, so we'll start there. In the following examples the first value is used if working in 1 x .75 (SD mode) and the second value shown in parenthesis is used if working in 16 x 9 (HD mode).

1. Start with all channels full size and centered. Go to the Global Trans menu. Toggle ***Target*** to *Locate*. Enter **Z Loc** = 1.5 (18). This Z value lets you see the transforms better.
2. Delegate only channel 2B. Then go to the 2D Trans menu and select ***Aspect/Size.*** Enter **Size** = 0.0. Since 2B will not be used in the effect, we have now removed it by making its size zero.
3. Delegate channels 1A, 1B and 2A. Go to the Corner Pin menu and press ***Autocube*** to turn the function on. With the **Auto** softknob, choose *Cube/Key.*
4. Delegate 1A, 1B and 2A. Go to the 2D Trans menu. Select ***Aspect/Size*** and enter **H Aspect** = 1.5 (9) (you can copy this value from **V Aspect**, which should be at 1.5 (9), its default number). This aspect value is what makes the cube square.
5. Use channel 1A for the front/back, 1B for the sides, and 2A for the top/bottom. Channel 1A is already facing the right way, so it doesn't need to be rotated.

   Delegate 1B. Go to the 3D Trans menu. Press ***Rotate*** and toggle to *Target*. Enter **H Rot** = .25 (.25).
   Delegate 2A. Go to the 3D Trans menu. Press ***Rotate*** and toggle *Target*. Enter **V Rot** = .25 (.25). At this point, if Z Key priority was set in the Output menu and the Combiner menu, under ***DVE***, all three channels would be sitting in space like this (see illustration following):



6. Delegate 1A, 1B, and 2A. Go to the 3D Trans menu. Press ***Locate*** and toggle to *Source*. Enter **Z Loc** = -.375 (-4.5). Since you are moving the channels in *Source* space, they are all moving outwards relative to the center of the cube. *(See illustration below.)*



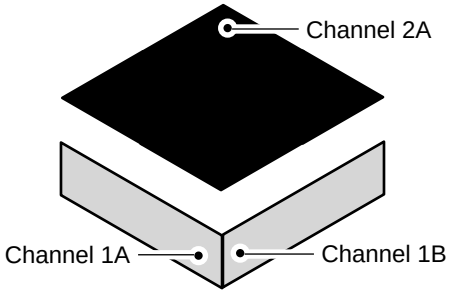
7. You can now spin the cube with the Global channel, by going to the Global Trans menu and using ***Rotate.***

Note: The anti-aliasing edge shaping in Dveous/MX makes the channel about 1/3 pixel smaller than what the numbers say it should be. This shaping may result in a small gap in-between the sides of the cube. To compensate, make each channel slightly bigger using **Size** in the 2D Trans menu. You may want to view the Key output on a monitor for best results.

Converting the Cube to a Slab

We will convert the cube to a slab by modifying the Aspect ratios

1. Build the cube described on the preceding pages.
2. Delegate 1A and 1B. Enter .2 (.2) for 2D Trans menu, select ***Aspect/Size*** and enter **V Aspect** = .2 (.2), or whatever value you want for the desired thickness of the slab.
3. Delegate 2A. Go to the 3D Trans menu. Press ***Locate*** and toggle *Source*. Enter **Z Loc** = -.1 (-.1), or the negative of half the value that you entered for the thickness of the slab. (Note that originally, the "thickness" was .15 (9), so we set the source locate to -.375 (-4.5)).
4. You can now spin the cube by going to the Global Trans menu and using ***Rotate.***



Building a Cube Using Crop To build the same effect using Crops instead of Aspect, you need to be sure that the Crop values are always symmetrical around zero. For example, if the right Crop is set to .375, the left Crop has to be set to -.375. The example below assumes you have built the cube and slab described on the preceding pages.

1. Start over with all channels full size and centered. Go to the Global Trans menu. Press ***Target*** and toggle to *Locate*. Enter **Z Loc** = 1.5 (18).
2. Remove channel 2B from the effect, since it will not be used, by making it zero size: Delegate 2B only. Go to the 2D Trans menu. Press ***Aspect/Size*** and set **Size** = 0 (0).
3. Delegate channels 1A, 1B, and 2A. Go to the Corner Pin menu. Press ***Autocube*** to turn the function on. With the **Auto** softknob, choose *Cube/Key.*

4. Now crop the channels: Delegate 1A, 1B and 2A. Go to the Border/Crop menu. Press ***Crop*** and toggle to *Edge*. Enter **Right** = .375 (4.5) and **Left** = -.375 (-4.5).
5. Use channel 1A for the front/back, 1B for the sides, and 2A for the top/bottom. Channel 1A is already facing the right way, so it doesn't need to be rotated.

   Delegate 1B. Go to the 3D Trans menu. Press ***Rotate*** and toggle to *Target*. Enter **H Rot** = .25 (.25).

   Delegate 2A. Go to the 3D Trans menu. Press ***Rotate*** and toggle to *Target*. Enter **V Rot** = .25 (.25).
6. Delegate 1A, 1B and 2A. Go to the 3D Trans menu. Press ***Locate*** and toggle to *Source*. Enter **Z Loc** = -.375 (-4.5). Since you are moving the channels in *Source* space, they are all moving outwards relative to the center of the cube.
7. You can now spin the cube by going to the Global Trans menu and using ***Rotate.***

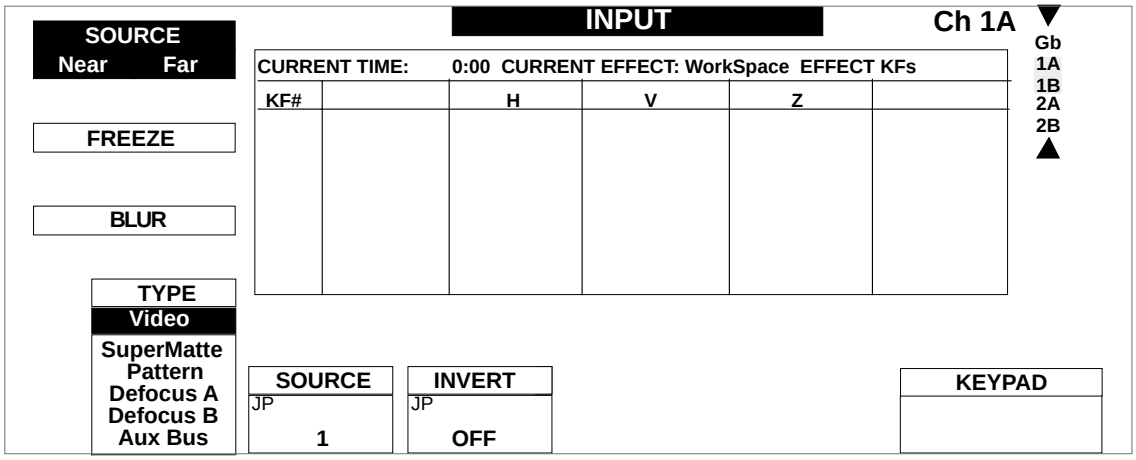
Converting the Cube to a Slab

We will convert the cube to a slab by modifying the crops.

1. Build the cube using crops, described on the preceding pages.
2. Delegate 1A and 1B. Go to the Border/Crop menu. Press ***Crop*** and toggle to *Edge*. Enter **Top** = 1 **Bottom** = -1, or whatever value you want for the desired thickness of the slab.
3. Delegate 2A. Go to the 3D Trans menu. Press ***Locate*** and toggle to *Source*. Enter **Z Loc** = -1, or whatever value you used for the crop thickness.

Input Menu

Press the **INPUT** button to bring up this menu. Here you can select the source for the active channel, and invert, freeze, and blur the source. Freezes have a variable strobe cycle.



Source

Toggle to either *Near* or *Far* to set the side of the active channel. You can also highlight both *Near* and *Far* to send the same source to both. The **Near** side is always the side that you can see; the **Far** side is always the one you cannot see. No matter how many times you rotate the DVE, you are always looking at the **Near** side. In live situations, the **Far** side selection is useful as a preset to select the next source to air.

Type

Use this softknob to select a source for the Near or Far side of the active channel. Choose from Video, SuperMatte, Pattern, Defocus A, Defocus B or Aux Bus.

Video – lets you select one of the 6 or 12 external video inputs.

SuperMatte - selects the output of the SuperMatte Generator, which incorporates two matte color generators and a dedicated wipe pattern generator. Use SuperMatte to create complex backgrounds, textures, etc.

Pattern – selects the output of the Pattern Framestore. Once you have selected input type Pattern, you must go the Texture menu to load the system-generated video test and texture patterns. See instructions later in this section for details on how to load these patterns.

Defocus A and **B** – sets the video to be defocused when in the Defocus menu. A and B represent the two outputs of the Defocus module. For more information, see Section 5 — Global menus under Defocus Menu.

Aux Bus - sets up control of switcher Aux Busses, if an external switcher is connected. Selecting this source type forces each DVE channel to dedicate itself to one external input. (See Technical Guide, P/N 9100-0402-00 for additional information.)

Source/XPNT

When *Video, Defocus A or Defocus B,* is selected as the type, this function reads **Source**; when *Aux Bus* is selected as the source type, this function reads **XPNT**. If *Supermatte* or *Pattern* is selected as type then this parameter doesn.t show.

Source lets you tell Dveous/MX which input to route to the delegated channel. You can scroll through 1 to 12 inputs.

XPNT lets you dial in the switcher Crosspoint number 0 through 127.

Invert

This reverses the source image left-to-right, top-to-bottom, or both. **Off** is the default: the source image is not inverted. **H** inverts the source image horizontally. **V** inverts the image vertically. **H+V** inverts the image both horizontally and vertically.

Note: Dveous/MX automatically inverts the far source horizontally to simulate the effect of viewing the source from behind. To reorient the far source, select **H** invert.

Freeze

Press the ***Freeze*** softkey to access the **Mode** parameter. With **Mode** you can choose to either freeze or strobe the source image.

Note: The freezes you program here are keyframe attributes, and you can use them as part of an effect. The **FREEZE** buttons in the Control Panel On-Air button group are not keyframe attributes, and their status is not saved as part of an effect.

Mode

Use this softknob to select whether the mode is **Off** (the source is live video), **Freeze** (freeze a field or a frame of the source image) or **Strobe**.

Off - the source is live video.

Freeze - In Freeze mode, the Output parameter is enabled. Select either **Frame**, **Field 1** or **Field 2**. For input video with motion, select **Field 1** or **Field 2** to eliminate inter-field flicker. To capture a still image with full vertical resolution, use the Frame setting.

Strobe - In Strobe mode, three additional parameters are enabled: **Rate**, **%Frozen** and **Output**.

The **Rate** value is indicated in time code and tells Dveous/MX to hold the frozen image for a specified duration before grabbing the next freeze. For example, with a Rate set to strobe every 10 frames, Dveous/MX grabs a freeze and holds it for 10 frames, then grabs a new freeze and holds it for another 10 frames, and so on.

The **% Frozen** value ranges from 0 - 100 and determines what portion of the time the strobe is live video and what portion is frozen video. For example, if the Rate is set at 10 frames, and % Frozen is at 50%, the strobe would be frozen for five frames, live for five frames.

Output operates identically to the **Output** parameter described in **Freeze**, above.

Blur

Use this function to slightly blur or soften the source video for the currently selected channel. This control uses the standard video bandwidth filtering to blur the image. It is a standard feature and is not a function of the wide range Defocus feature.

H

Blurs the image horizontally.

	Both Modes
Default	0.00
Range	0.00 - 100.00
Align	nearest multiple of 12.5

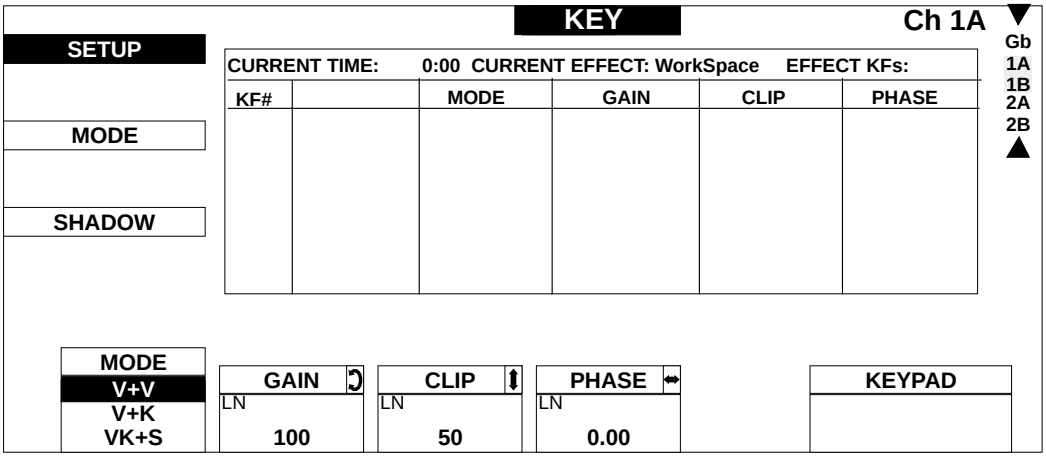
V

Blurs the image vertically.

	Both Modes
Default	0.00
Range	0.00 - 100.00
Align	nearest multiple of 12.5

Key Menu

The Key menu lets you configure Dveous/MX to process two independent video channels: one video channel with independent key channel processing, or one video/key channel with independent Super Shadow channel processing. You can also adjust the key channel and shadow settings in this menu. Press the **KEY** menu button to bring up this menu. **In the one channel HD configuration, this menu must be set to V+V. No other modes are applicable.**



Setup

Mode

Each twin channel (maximum two per system) has two processing channels: the A channel, which is dedicated to video only, and the B channel, which can independently process a video signal, a key signal or a drop shadow. The Mode softknob selects the mode for the channels. The A channel's keyframes retain the mode information for the B channel as a keyframe attribute.

The channel configurations are as follows:

V+V - Video+Video mode: the Transform boards process two video sources. You can separately adjust all transform, warp, and lighting effects on each video channel. The DVE processor internally generates the key signal associated with each channel, which is full image "white" with adjustable opacity and edge softness.

V+K - Video+Key mode: the Transform board independently processes one video and one key source. All transforms are available to the key signal independently from the video. You also have clip, gain, and horizontal phase controls for the key (B) channel.

VK+S - Video/Key+Shadow mode: the transform boards derive a full bandwidth drop shadow from the key input. They process the video and key together in the A channel, with independent control of the shadow in the B channel. You have clip, gain, and horizontal phase controls for the key portion of the A channel, and color and opacity adjustments for the shadow (B) channel.

Gain

Adjusts the key edge sharpness. The value indicates a percentage of 100, where 100(%) is a linear key. This parameter does not apply in Video+Video mode. Note that it does, however, affect the both the key and the shadow in Video/Key+Shadow mode.

	Both Modes
Default	100.00
Range	0 - 799

Clip

Adjusts the luminance level in the key signal above which the foreground or key fill video becomes visible over the background video. This parameter does not apply in Video+Video mode. Note that it does, however, affect the both the key and the shadow in Video/Key+Shadow mode.

	Both Modes
Default	50.00
Range	0 - 100
Align	Nearest multiple of 12.5

Phase

This parameter horizontally offsets the input key signal relative to the video, in 1/64 pixel increments. Phase does not apply in Video+Video mode. Note that it does, however, affect the both the key and the shadow in Video/Key+Shadow mode.

	Both Modes
Default	0.00
Range	+/- 8.00 pixels

Mode

The softknobs under the ***Mode*** function do not appear when you are in Video+Video mode, as both channels' key signals are forced to full-image white.

Key and Shadow parameters

These parameter softknobs select the source for the key and shadow channels. In Video+Key mode, the Key softknob controls the key (B) channel only. In Video/Key+Shadow mode, the Key softknob controls the key portion of the A channel, and the Shadow softknob controls for the shadow (B) channel. Note that the Shadow parameter does not apply in Video/Key mode.

White - a full image key signal (i.e., a white field) that matches the size of the transformed video.

Video - generates a key signal based on the luminance in the source selected for the B channel.

Inv Video - same as Video, except that it inverts the polarity of the generated key signal (i.e., black changes to white and white changes to black).

Use **Video** or **Inv Video** when you want to replace the rectangular key with a shape (for example, the key signal from a character generator). Normally, use **White** in the Video/Key+Shadow mode when you want to derive a shadow from the normal rectangular raster.

Shadow

The Shadow function lets you create a color and opacity for the drop shadow. This function only applies to Video-Key/Shadow mode, where Dveous/MX creates a drop shadow based on the input key signal shape. You must move the drop shadow (B) channel before you can see it, because its default position is directly beneath the A channel. Dveous/MX uses a dedicated color generator for the drop shadow.

Lum

Sets the luminance or brightness of the shadow color. 0 is no luminance (black), 100 is full luminance (white).

	Both Modes
Default	0.00
Range	0 -100
Align	Nearest multiple of 12.5

Sat

Sets the chrominance saturation of the shadow color. 0 is no saturation (monochrome), 100 is fully saturated.

	Both Modes
Default	0.00
Range	0 -100
Align	Nearest multiple of 12.5

Hue

Sets the hue (tint) of the shadow. The values represent the hue angles on a vectorscope: 0 is near blue, 90 is near magenta, 180 is near yellow, and 270 is near green.

	Both Modes
Default	0.00
Range	+/- 720.0 (two vector rotations)
Align	Nearest multiple of 45

B Opac

Sets the shadow opacity or transparency. 100 is fully opaque, 0 is fully transparent.

	Both Modes
Default	100.00
Range	0 -100
Align	Nearest multiple of 12.5

Light Source Overview

Dveous/MX's light source modeling is part of the standard SurfaceFX feature. It simulates the effect of a light source shining on the image as it moves in 3D space. The light source itself is never visible, but it adds reflections and/or shadows to the transformed image to enhance the illusion of an object moving in 3D space.

There are two modes in which a light source can track an image: Global or Image mode. In either mode, the actual position of the light source in space can be adjusted with its own set of position controls. In Global mode, the light's position is relative to the screen coordinates, not the image's. The light source is static, casting reflections and shadows on the moving transform, much like the sun casts light on a moving object.

In Image mode, the light stays tied to the image, so that as you move the image, the light moves with it. You can position the light source as close or as far from the image as you want. In this way, the light source acts more like how a spot light might track the movement of an actor on stage.

Since each channel has its own light source, you can position the A channel's light source independently from the B channel's light source. Furthermore, you can take the light source from one channel and use it to provide two light sources on another channel.

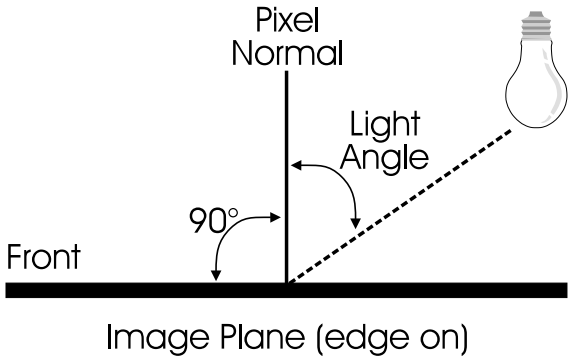
Positioning the Light Source

Like the Source and Target planes, you can locate the light source in three dimensions: H,V and Z. Values for H,V and Z are the same as those for the 3D Locate parameters. The light source position for each channel defaults to H=0, V=0 and Z=0, placing it in the exact center of the screen in all three dimensions.

Note that the light source itself is never visible -- only its reflected light or shadow reveals its location to the observer. To produce the effect of a real light source, Dveous/MX determines the location of the imaginary light source relative to the image, and then determines how each pixel in the image would appear, given a light source at that location. Dveous/MX does this by measuring the angle at which a ray of light from the light source strikes each pixel in the image and compares it to the image “normal' for each pixel location.

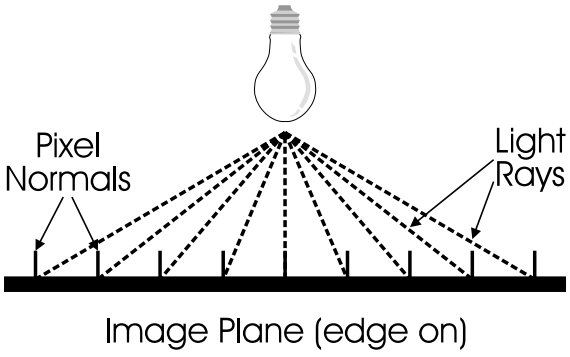
The normal is an imaginary line that intersects the plane of the image at a right angle (perpendicular to the image plane). Because the image is not always a flat plane (after applying a warp, for example), each pixel in the image must have its

own normal. In this way, Dveous/MX can compare the light source position to each pixel's normal and thus determine how much light or shadow should fall on each pixel independently.



To visualize this process, think of the light source as a single point of light, like a candle or light bulb. If the light source is close to the front of the image, its light rays are parallel to the normals of the pixels directly in front of it and it receives the maximum amount of light. However, the farther from the light source a pixel is, it receives less light since the angle of light striking its normal becomes more slanted.

Dveous/MX uses this angle to calculate how much of the light source is visible for each pixel in the image. An angle of zero degrees (light ray and normal parallel to each other) produces the greatest amount of light, while and angle of 90 degrees (light ray and normal perpendicular to each other) produces no light at all. An angle of greater than 90 degrees (light ray "behind" the pixel) begins to create a shadow on that pixel, and at 180 degrees (light ray directly "behind" the pixel) the shadow is darkest.



Enabling and Viewing the Light Source

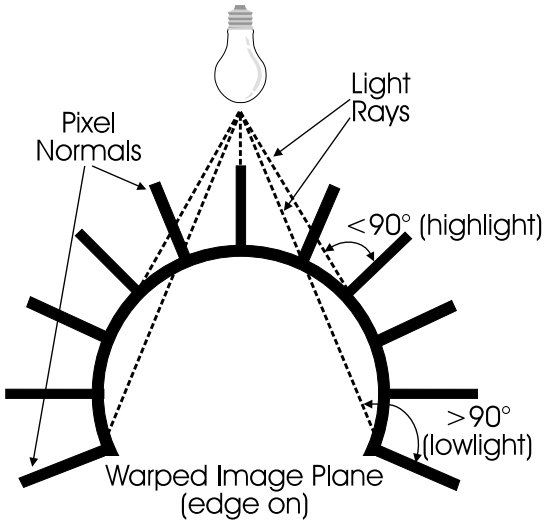
In the following example we will use channel 1A:

1. Press the **1A** button twice quickly to select channel 1A and deselect all other channels. Press **NORMAL — ENTER**, then **CLEAR+GLOBAL TRANS** to remove any transforms on channel 1A and the global channel.
2. Press the **3D TRANS** menu button and use the ***Locate*** softkey to highlight *Target*. Turn the joystick handle, or use the **Z Loc** softknob, to move the image back.
3. Press the **LIGHT SOURCE** menu button. Use the ***Lights*** softkey to highlight ***High***. The light source's reflection appears at the center of the image, since the default light source position is at center screen.
4. Press the **3D TRANS** menu button again. Enable the ***Rotate*** softkey (with ***Target*** still highlighted) and rotate the image on all three axes to see the effect of light source on the image.
5. Press and hold **CLEAR** and press the ***Rotate*** softkey to set all source rotate values back to zero. This clears the rotations, but does not affect the image's location.
6. Press the **LIGHT SOURCE** menu button again. Press the ***Position*** softkey once, leaving ***Spot*** highlighted, to access the position controls.
7. Use the joystick to move the light source in all three dimensions. Note how the light interacts with the image. The reflection is visible in the image when the light source's Z position value is less than the image's Z locate value, because the light source is in front of the image. When the light source's Z position value is greater than the image's Z locate value, the light source is not visible, because it is “behind” the image.

Highlights and Lowlights

At an angle of zero degrees, the light source shines directly on the pixels in that area of the image, and the reflection from the image is the strongest. This light source reflection is the highlight. As the angle increases, the reflection from the image becomes weaker, until, at an angle of 90 degrees, no light at all falls on the pixels in that area of the image, so there is no reflection.

With Dveous/MX, it is possible to have the difference between the angle of the light source and the pixel normals greater than 90 degrees. In the real world, an angle of greater than 90 degrees creates a shadow, and this happens with the lighting model also. If the normal is more than 90 degrees from the light source for a pixel, Dveous/MX creates a lowlight, or shadow, and adds it to that pixel. The lowlight applies to areas of the image that are hidden from the light source, and adds a shadow to the image where the angle between the light source and the pixel normals is greater than 90 degrees.



A pixel with a difference of 180 degrees has the most intense lowlight applied to it.

By moving the light source in the Z dimension (toward or away from the viewer), you can place the light source behind the image. In this case, the image's pixel normals point away from the light source, and are at an angle of more than 90 degrees from the light source. The result is that the lowlight appears in the image, since this area of the image is hidden from the light source and is in shadow.

Note that it is possible to place the light source directly on the image plane. In this case, because the pixel normals are all at exactly 90 degrees from the light source, the image shows neither highlight nor lowlight; the light source, in effect, does not exist.

You can use the highlight or the lowlight on the image, or both. You can also use any color for either light. The default colors are white for the highlight and black for the lowlight, to simulate natural reflections and shadows. In another mode, described in more detail later, you can increase or decrease the image's gain where the highlight or lowlight appears, instead of adding a color to the image, for a more subtle lighting effect.

The Effect of High and Low Lights on the Image

1. Use steps 1 and 2 in the previous example to position the image.
2. Press the **LIGHT SOURCE** menu button to access the Light Source menu. Toggle the ***Lights*** softkey to highlight ***Both***. The light source's reflection appears at the center of the image, since the default light source position is at center screen.
3. Press the ***Position*** softkey once, leaving ***Spot*** highlighted, to access the position controls. Use the joystick to change the light source's Z position and note how it interacts with the image. Again, the reflection is visible in the image when the light source's Z position value is less than the image's Z locate value, because the light source is in front of the image. This reflection is the highlight.

   When the light source's Z position value is greater than the image's Z locate value, the light source is "behind" the image, and the highlight disappears and the lowlight appears. The lowlight indicates the shadow created by the light source, because the light source is more than 90 degrees away from the image "normal."
4. Move the light source in front of the image again, but place it at one corner, very close to the image. The highlight is very small when the light source is close to the image.
5. Press the **3D TRANS** menu button and use the ***Rotate*** softkey to highlight *Target*. Rotate the image horizontally or vertically with the joystick. Note that, if the light source is close enough, the image actually passes through the light source, revealing the lowlight.
6. The highlight color defaults to white to simulate a reflection, and the lowlight color defaults to black to simulate a shadow. There are independent color settings for each light. Toggle the ***Color*** softkey to ***High*** to access the highlight's the color and opacity. Toggle ***Color*** to ***Low*** to adjust the lowlight's color and opacity.

Light Source Types

Each channel can use one of three light source types: spot, bar, or flood. Each type creates a reflection (the highlight) and a shadow (the lowlight, if used) on the image, based on its position in 3D space. As you move the image in space, the resulting highlights and lowlights simulate a realistic, fixed light source. The bar light type also has controls for horizontal, vertical, and Z rotation so you can orient the light source to match the image.

Spot

The spot light type simulates a single-point light source located near the image, as with a light bulb or flashlight. With a spot light source, the reflection is a single point of light that gradually falls off, or gets less bright, in areas of the image that are further away from the point of reflected light. You can position the spot source anywhere in 3D space.

Bar

The bar light type simulates a single-line light source located near the image, as with a fluorescent or neon tube. With a bar light source, the reflection is a single line of light that gradually falls off, or gets less bright, in areas of the image that are further away from the line of reflected light. Besides controlling the bar light position in 3D space, you can also rotate it about its center.

Flood

The flood light type simulates a large light source, much like the sun, where the rays are all parallel. With a flood light source, no single point on the image shows the reflected light source any more or less than any other point on the image; it is distributed equally across the entire image. Like the spot and bar light types, you can locate a flood light anywhere in 3D space. Its most effective use, however, involves moving it horizontally and vertically, if needed, but leaving its Z position at default (0), or using a slightly negative value to move it closer to the viewer.

Hint:When first positioning a light source, it is helpful to select the spot light source type. It is easier to visualize the position of a single point in 3D space than the position of an entire line or plane of light. Also, since the spot light source shows the center of rotation for the bar light, you can move the source first using spot, then change to the bar light type; all three light source types share the position values.

Focusing the Light Source

The **Focus** control limits the range of the light source by "focusing" it on an area of the image. A truly natural-looking point light source, such as a candle or light bulb, has a focus value of 1.0000. In the lighting model, however, this value lets light from the source shine equally on nearly the entire image unless the light source is very close to the image.

By artificially focusing the light source, Dveous/MX can simulate a spot light and a bar light more readily than would otherwise be possible. For this reason, the **Focus** setting has a 0.5000 default value. This lets you easily differentiate between a spot light, a bar light, and a flood light type. Values below 0.5000 tend to give unnaturally harsh edges. Values above 0.5000 give more natural lighting effects, though the location of the light source is less obvious.

You can also use **Focus** to give the image a glossy or shiny appearance. A low **Focus** value gives the reflection sharply defined edges, to simulate a very shiny, highly reflective surface. Higher **Focus** values spread out the highlight, simulating a less reflective surface.

Specular and Diffuse Light Modes

Two light modes define how the light source affects the image: specular and diffuse. Both modes modify the image's brightness and saturation, much like a true light source. **Specular** mode simulates the reflection from a glossy (highly reflective) surface, and **Diffuse** mode simulates the reflection from a dull (non reflective) surface.

Specular

Specular mode adds a highlight by superimposing a matte color onto the image in areas that reflect the light source. The same is true for the lowlight, but it applies only to areas that are hidden from the light source. Much like a glossy photograph, the image has "glare" where the light source is reflected from it. If you use the lowlight, the image is also darker in areas where the image is hidden from the light source. You can independently control the brightness, saturation, and hue of the highlight (glare) color and the lowlight (shadow) color.

Diffuse

Diffuse mode is visually more subtle than Specular mode. It increases or decreases the image's brightness and/or color saturation (by changing the luminance and/or chrominance gain) where the light source is reflected from it, without adding "glare." This simulates a flat, non reflective surface, such as a piece of colored paper or cloth. You can independently control the levels in the image, in both the area of reflection and the ambient light level of the area surrounding the reflection.

Maximum and Minimum Gain

In diffuse mode, there are two modes that determine the gain (brightness and saturation) of the area of the image that is lit by the light source and how it relates to the unlit area. The normal setting is *Diffuse Mx* (maximum gain), which lets you adjust the lit area of the image to be either lighter or darker than the surrounding, or ambient, area. It also makes both the lit and ambient areas brighter or darker than their original values. As you adjust the image's ambient (unlit) area, the brightness of the lit area tracks the brightness of the ambient area to maintain their contrast.

The other setting is *Diffuse Mn* (minimum gain), which limits the brightness of the lit and unlit areas. The brightness of the lit area can never exceed the brightness of the ambient area, and the brightness of the entire image cannot exceed its original brightness.

Multiple Light Sources on One Channel (not fully implemented)

Each DVE channel has its own independent light source. However, if you do not need the light source for one channel (for example, when the B channel is a key or shadow channel), you can "borrow" that light source and apply it to the other channel of the pair. This lets two light sources fall on one channel.

To acquire another channel's light source, its "own" channel must first release it. For example, to use channel 1B's light source on channel 1A, you must release it on channel 1B. When you do this, channel 1B no longer shows the light source effect, because it now applies to channel 1A. Any light source can only be applied to one channel at a time. Also, you can apply the light source from channel A to channel B, and at the same time apply the channel B light source to channel A. These modes are outlined more completely in the discussion of the Light Source menus later in this section.

To apply the same light source parameters to multiple channels, each channel must use its own light source. When you enable multiple channels, all light source adjustments apply to the active channels. The result looks like a common

light source for all the channels, even though they each use their own individual light sources for the effect.

Two Light Sources on One Image

This example shows the effect of two light sources on one image:

1. Use steps 1 and 2 in the previous example to position the image and turn on a light source.
2. Press the ***Position*** softkey once, leaving ***Spot*** highlighted, to access the position controls. Move the light source position to one corner of the image.
3. Press the ***Lights*** softkey and select **Both** with the **Source** softknob. Dveous/MX prompts that channel B is using its own light source. This warning lets you know that channel 1B's light source is now acquired, but is not visible until you release it from channel 1B.
4. Press the **1B** button twice quickly to access the Light Source menu for channel 1B and deselect channel 1A.
5. Press the ***Lights*** softkey and toggle it to ***Both***. This turns on the light source highlight and lowlight for channel 1B.
6. Use the **Source** softknob to select **None**. This releases channel 1B's light source, and makes it visible on channel 1A.

Note: If you select Ch B Light or Both on channel 1B, the light source reverts to channel 1B, and it disappears from the image on channel 1A. When you want to use two light sources on one image, be sure that the Source setting for the channel that is releasing its light source is None.

7. Press the ***Position*** softkey and move the 1B light source. Note that though the 1B light source is visible on channel 1A, the menu controls for it are still accessed by channel 1B. This means that to use another channel's light source for an effect, the channel's timeline must be included in the effect, even if the video from that channel is not otherwise used.
8. To simultaneously apply channel 1B's light source to channel 1A and apply 1A's light source to 1B, use the **Source** softknob to select **Ch B Light** on channel 1A and **Ch A Light** on channel 1B. This releases each channel's original light source and applies it to the other channel. Again, note that if either channel has its own light source or **Both** selected, the other channel cannot acquire the second light source.

Using a Light Source with Textures

As described under Texture menu later in this section, you must enable a light source to use textures. When you apply a texture to an image, it is not visible unless the image is lit by a light source.

The light model uses Z (depth) information derived from the image's position in 3D space. Modulating or changing the Z data slightly within the image gives the normally flat image surface depth and makes it appear three-dimensional. This is how textures work with light sources. Since a texture pattern is luminance (brightness) information used as Z (depth) data, Dveous/MX uses the texture source's luminance information to modulate the depth data for the textured image. When you apply a light source to the image, any changes to the image's depth made by the texture information appear as exaggerated highlights or lowlights in the image. The result is the appearance of a surface texture. See the section on the Texture menu for more information on this feature.

Using a Light Source with UltraWarp

Many of Dveous/MX's UltraWarp shapes let you add light sources (and/or textures) to give a realistic three-dimensional look. These shapes appear in the Warp menu with an asterisk (*), and include these categories:

- Page Turns (roll and flap, all views)
- Quad Page (roll and flap, all views)
- Spheres (transparent and opaque, both front and back views)
- Concentric shapes (swirl, 4-rings, and multi-rings)
- Ripples (circular and linear)
- Cylinders (vertical and horizontal)
- Fancy shapes (cylinders, page turns, and page rolls, both front and back views of each)
- Split shapes (mirrors and split)
- Miscellaneous shape (lens only)

Like textures, these warp shapes contain Z (depth) data that the lighting model uses to determine whether each pixel of the image is lit, in shadow, or unaffected. When you turn on a light source, Dveous/MX calculates the warp shape's position relative to the light source and applies a highlight or lowlight to the image accordingly.

As described earlier, the highlight applies when the light source strikes a pixel at less than 90 degrees to its normal. The lowlight applies when a pixel's normal is more than 90 degrees from the light source. Since a warp shape can bend the image, each pixel's normal may be in a slightly different direction. With extreme bends, the normals in some areas of the image are less than 90 degrees, but normals in other areas may exceed 90 degrees from the light source angle. This difference creates highlights in some areas of the image and lowlights in others and so gives lighted UltraWarp shapes a realistic three-dimensional appearance.

Note: UltraWarp shapes are created two-dimensionally. The illusion of depth is destroyed if the image is rotated until it is edge-on. You should always use the warp rotate controls, where applicable, to rotate a warped image, not the 3D Trans menu Source or Target rotate controls.

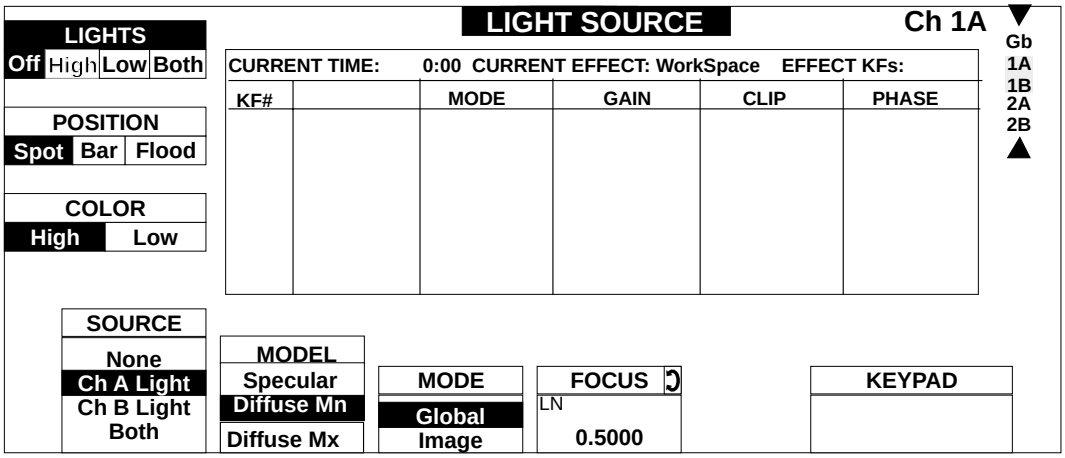
Apply a Light Source to a Warp

1. Select a DVE channel by double pressing its Channel Select button (for example, **1A**). Any other channels are now deselected.
2. Press the **WARP** menu button to access the Warp menu and press the ***Warp*** softkey. Do not toggle it ***On***.
3. Use the **Shape Category** softknob to select a category that has an asterisk (*) next to it. Depending on the category you select, different **Type** categories appear above softknob B.
4. Use the [**Name of Category**] **Type** softknob (softknob B) to select a shape type for that category. With some shapes, the [**Type**] **View** softknob (softknob C) becomes enabled. If applicable, use it to select a view.
5. Turn the **Demo** softknob **On**, then immediately **Off** again. This action applies preset warp parameters to the shape to make it visible, then returns other transform parameters to previous values. The selected warp shape appears.
6. Press the **LIGHT SOURCE** menu button to access the Light Source menu. Press the ***Lights*** softkey and toggle it to ***Both***. The default light source position and type appear in the warped image.
7. To view the light source effect on the warped image, either move the light source (press the ***Position*** softkey and move the joystick) or move the warped image (use the Warp menu to adjust the ***Modify*** and/or ***Position*** controls). Either way, the highlights and/or lowlights move on the image to simulate a light source shining on a three-dimensional surface.

   See the discussion on the Warp menu later in this section for more information on Warps.

Light Source Menu

Press the **LIGHT SOURCE** menu button to bring up the Light Source menu. Here you can add light source effects to an image.



Lights

Toggle this softkey to enable a highlight (***High)***, a lowlight (***Low***), or ***Both*** for the active channel(s). The ***Off*** setting disables the light source for the active channel(s).

Source

Use this to select which light source(s) apply to which channel(s).

None releases the light source for the active channel so that the other channel can acquire its light source.

Ch A Light selects channel 1A's light source for the active channel. This mode is the default when channel 1A is active (currently can only be used on Ch 1A or 2A.)

Ch B Light selects channel 1B's light source for the active channel. This mode is the default when channel 1B is active (currently can only be used on Ch 1B or 2B.)

Both (future implementation)

Model

Use this to select **Specular**, **Diffuse Mn** (Minimum) or **Diffuse Mx** (Maximum) lighting.

Specular lighting places a "glare" on the image, simulating a glossy or shiny image surface. The highlight and the lowlight each have their own color generator.

Diffuse Mx lets you set the brightness and saturation of the areas of the image where the highlight and/or lowlight appear.

Diffuse Mn limits the brightness and saturation of the highlight and/or lowlight in the image to be below the ambient (unlit) area of the image. It also limits the brightness and saturation of the ambient area of the image to below the original (unmodified) levels of the image.

Note: Diffuse lighting creates a more subtle effect. Instead of placing an extra "glare" on the image, it changes the image's luminance (brightness) and/or saturation (chrominance level) where the light source reflects from it. Diffuse lighting simulates a flat, non reflective surface

Note: To adjust the gain controls for **Diffuse Mn** and **Diffuse Mx,** press the ***Color*** function softkey. Four parameter softknobs appear: Y Gain, C Gain, Amb Y Gain and Amb C Gain. See information later in this section for details on adjusting the Color gain controls.

Mode

Toggles between two light movement modes, **Global** and **Image**.

Global fixes the light source in 3D space, so that whether you move the image with 2D Pre, 3D or Global transforms, the light source remains stationary.

Image ties the position of the light source to that of the image. When you move the image, the light source moves with it, whether you move the image with 2D, 3D or Global transform controls.

Note: The light source will not follow the image in 2D Pre with the Warp feature turned **On**. To move the image with the Warp feature **On**, use 3D, Global or 2D Post controls.

Note: If using 2D Post controls, the light source will move with the image. This rule is true whether in Global or Image mode because 2D Post is downstream of all other position controls, including the light source.

Focus

This controls the edge hardness for the reflection and/or shadow. The truly natural setting is a value of 1.0000. The default, however, is 0.5000. Values below 0.5000 tend to produce unnaturally harsh edges. Values above 0.5000 produce more natural lighting effects, though the location of the light source is less obvious. The higher the **Focus** value, the softer the edge of the reflected light on the image, and the greater the area of the image that is affected by the light source.

	Both Modes
Default	0.5000
Range	0.0000 to 10.0000
Align	Nearest multiple of 1.25

Position

The position function lets you pick the type of light (**Spot**, **Bar** or **Flood**) and lets you position that light source. You can move the light source in 3D space with either the softknobs or the joystick. Light position parameters use the same screen unit values as other 3D transform parameters.

H Pos

Moves the light source along the screen horizontal axis.

	SD Mode (1 x .75)	**HD Mode (16 x 9)**
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125

V Pos
Moves the light source along the screen vertical axis.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1199.9987
Align	Nearest multiple of .125	Nearest multiple of .125

Z Pos
Moves the light source along the screen Z axis.

	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .125

Adjust
This parameter only appears when the ***Bar*** light is selected. It lets you adjust either the **Position** or **Rotation** controls. When you choose **Position**, the **H**,**V** and **Z** parameters to the left change to reflect position values. The controls are identical to those for the spot and flood light types. When you choose **Rotation**, the **H**,**V** and **Z** parameters to the left change to reflect rotation values and let you rotate the bar light source. Note that the spot light location is also the center of rotation for the bar light source. Values for **H**,**V** and **Z** rotation appear below.

H Rot
Rotates the bar light horizontally around its center.

	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .125

V Rot

Rotates the bar light vertically around its center.

	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .125

Z Rot

Rotates the bar light around its center, about an axis that is perpendicular to the screen.

	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .125

Hint: When positioning a light source, it is helpful to select the spot light source type. It is easier to visualize the position of a single point in 3D space than the position of a line or plane of light. Also, since the spot light source shows the center of rotation for the bar light, you can move the source first using spot, then change to the bar light type; all three light source types share the position values.

Color

Toggle this softkey to access the controls for adjusting the highlight (**High**) and lowlight (**Low**) colors or gains.

Note: When in Specular light mode, parameter controls are enabled that set the brightness, saturation and hue of the highlight or lowlight color that is added to the image. In either of the Diffuse modes (Mn or Mx), four parameter controls are enabled. **Y Gain** and **C Gain** determine the brightness and saturation, respectively, of the light on the image. **Amb Y** and **Amb C** set the brightness and saturation, respectively, of the area outside the light source.

Lum

Adjusts the luminance (brightness) level of the highlight or lowlight color.

	Both Modes
Default	100.00 (highlight) or 0.00 (lowlight)
Range	0.00 to 100.00
Align	Nearest multiple of 12.5

Sat

Adjusts the chrominance (saturation) level of the highlight or lowlight color.

	Both Modes
Default	0.00 (both highlight and lowlight)
Range	0.00 to 100.00
Align	Nearest multiple of 12.5

Hue

Adjusts the hue (tint) of the highlight or lowlight color.

	Both Modes
Default	0.00 (highlight) or 180.00 (lowlight)
Range	+/-720.00
Align	Nearest multiple of 45

Opac

Adjusts the opacity (transparency) of the highlight or lowlight. At a value of 100, the highlight or lowlight is completely opaque; at a value of 0, the highlight or lowlight is fully transparent.

	Both Modes
Default	100.00
Range	0.00 to 100.00
Align	Nearest multiple of 12.5

Note: In Diffuse light mode, the following controls set the brightness and saturation of the areas of the image affected by the highlight or lowlight without actually adding a separate color. They also control the brightness and saturation of the unlit, or ambient, area of the image. There is one set of ambient controls that apply to both the highlight and the lowlight.

Y Gain

Adjusts the brightness of the image where the highlight or lowlight appears. The value indicates the amount of additional gain added to the highlight or lowlight. For example, a 0.00 setting is no additional gain, a 50.00 setting increases the gain by 50 percent, and a -50.00 setting reduces the gain by 50 percent. In Diffuse Mn mode, this level cannot exceed the Amb Y Gain setting.

	Both Modes
Default	50.00 (highlight) or -50.00 (lowlight)
Range	+/-100.00
Align	Nearest multiple of 25

C Gain

Adjusts the saturation of the image where the highlight or lowlight appears. In Diffuse Mn mode, this level cannot exceed the Amb C Gain setting.

	Both Modes
Default	50.00 (highlight) or -50.00 (lowlight)
Range	+/-100.00
Align	Nearest multiple of 25

AmbY Gain

Adjusts the image's brightness in areas not affected by the light source, i.e., the ambient brightness of the image. In Min Gain mode, this level cannot exceed the image's original luminance level.

	Both Modes
Default	0.00
Range	+/-100.00
Align	Nearest multiple of 25

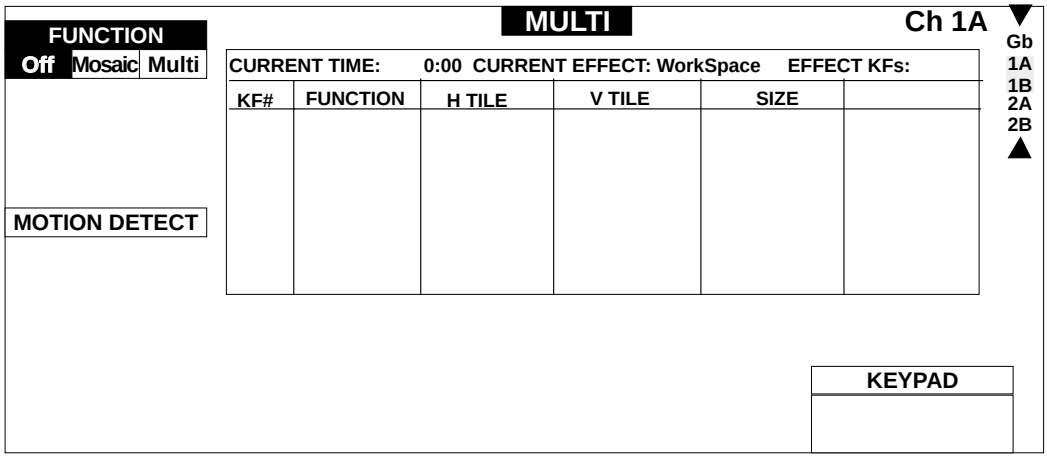
Amb C Gain

Adjusts the image's saturation in areas not affected by the light source, i.e., the ambient saturation of the image. In Min Gain mode, this level cannot exceed the image's original chrominance level.

	Both Modes
Default	0.00
Range	+/-100.00
Align	Nearest multiple of 25

Multi Menu

Pressing the **MULTI** button brings up the Multi menu. Use the Multi menu to add mosaic and multiple picture effects and to adjust the motion detection for the image.



Function

Toggle the softkey to enable either Mosaic or the multiple picture mode (Multi). Note that you cannot use both modes at the same time.

Off

For Off there are no parameters available.

Mosaic

Mosaic is a pixilation effect that modifies the image by repeating a pixel multiple times horizontally and/or vertically. The more a single pixel is repeated, the more input pixels are discarded, and the lower the image resolution. The result is a "tiled" image. The **H Tile** and **V Tile** parameters set the tile aspect ratio.

HTile

Sets the width of the mosaic tiles.

	Both Modes
Default	1.0000
Range	0 - 99.9999
Align	Nearest multiple of 12.5

V Tile
Sets the height of the mosaic tiles.

	Both Modes
Default	1.0000
Range	0 - 99.9999
Align	Nearest multiple of 12.5

Note: The **H Tile** and **V Tile** settings are relative to a standard television image, so setting them to the same values results in tiles that have a 16:9 aspect ratio. To use square tiles, for example, set **H Tile** to 0.5625, **V Tile** to 1.0000.

Size
Sets the overall tile size while maintaining the aspect ratio set with the H Tile and V Tile parameters. As you increase the Size setting, fewer tiles are visible in the image.

	Both Modes
Default	0.0000
Range	0 - 99.9999
Align	Nearest multiple of 12.5

Multi

This mode creates multiple, identical copies of the image on the source plane, letting you create filmstrip or video wall effects. In Video+Video mode, you can see parts of each copy inside the image edges with lower softknob values. With higher values, use the Border/Crop menu to set the crop values outside the image to see the copies. The current border color fills any gaps between the copies. In Video+Key or Video/Key+Shadow mode, you must apply the multi mode to both the A and B channels to see copies. This mode lets you use the key as a "cookie cutter" to reveal parts of the video (A) channel. Note that if the A channel has the same transforms as the B channel, the multiple pictures are identical copies. If the transforms on the channels do not match, the video part of the multiple pictures do not either.

H Mult

Copies the image along the horizontal axis. The copies begin on top of the original image, and move outward horizontally as you increase the H Mult value. The greater H Mult value, the farther apart the copies.

	Both Modes
Default	1.0000
Range	0 - 5.0000

V Mult

Copies the image along the vertical axis. The copies begin on top of the original image, and move outward vertically as you increase the V Mult value. The greater V Mult value, the farther apart the copies.

	Both Modes
Default	1.0000
Range	0 - 3.5000

Note: The multi effects is limited to the area defined by the crop size. To see the full multi effect, you must uncrop the image or extend the crop edges out.

Motion Detect

Press the ***Motion Detect*** softkey to enable the **Mot Det** parameter softknob. For a full discussion of this feature, please refer to *Motion Detect* in Section 2 — Getting Started.

Mot Det

Dveous/MX has a user adjustable threshold for the motion detection circuitry. The sixteen value settings represent a range of sensitivity to motion from low (frame) to high (field).

A low value causes Dveous/MX to treat the video as though it has less motion than is really present, and can cause banding artifacts in the motion portions of the video. A high value causes Dveous/MX to treat the video as though it has more motion than is really present, and can cause the picture to lose some detail.

Sometimes it is useful to force *frame* mode. For example, if the still input video has a lot of noise. Dveous/MX can interpret noise as motion and the result is a too soft image. Setting Motion Detect to *frame* would compensate for the noise and clarify the image.

The default setting is 9, which works well in almost all cases. Even with still video, this setting provides the best quality, since Dveous/MX automatically enables *frame* mode if the motion detector finds no motion.

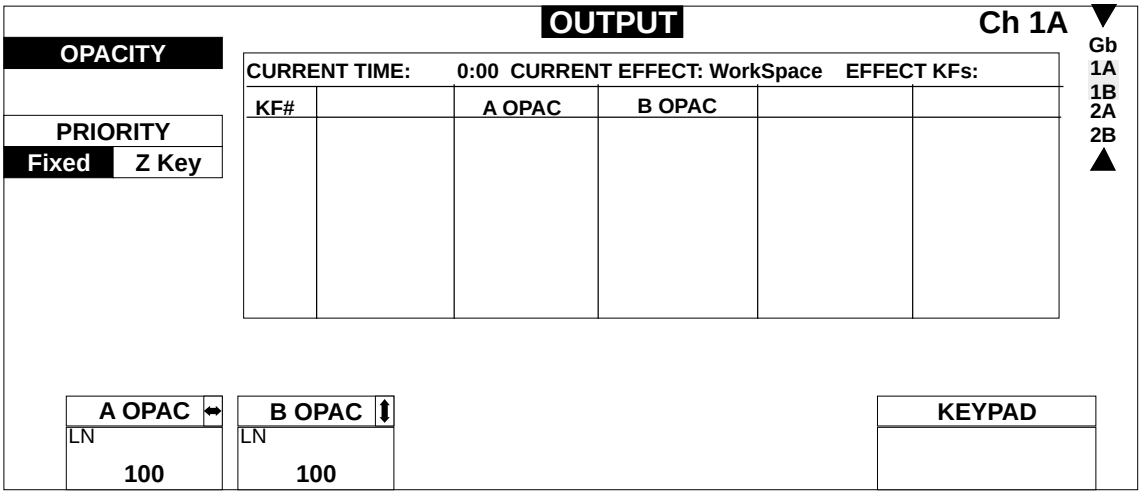
	Both Modes
Default	9
Range	Frame, 1 - 14, Field
Align	None

Note: If working in HD mode and using a progressive scan format, motion detection defaults to frame mode and these menu settings have no effect on the input video!

Output Menu

Press the **OUTPUT** button to bring up the Output menu. Here you can set the transparency and key priority of the A channel relative to its B channel. The A channel's keyframe memory retains these settings.

See the Combiner menu discussion in Section 5 – Global Menus for information on setting the priority and opacity of one DVE channel pair relative to the other pair (if installed), of the combined DVE channels relative to the Target Framestore and of the combined DVE and TFS relative to the background.



Opacity

The parameter softknobs associated with this function set the opacity for each channel. You can set one or both channels to be transparent or fade them in or out during an effect.

A Opac

Sets the opacity for the A channel of the active pair.

	Both Modes
Default	100
Range	0 (fully transparent) - 100 (fully opaque)
Align	nearest multiple of 12.5

B Opac (has no effect in one channel HD configuration)

Sets the opacity for the B channel of the active pair.

	Both Modes
Default	100
Range	0 (fully transparent) - 100 (fully opaque)
Align	nearest multiple of 12.5

Priority

This function sets the priority type and related parameters. **In HD mode a single twin or dual twin system is required for the following functionality.**

Fixed

Fixed always places one channel "over" or "in front of" the other channel, no matter what its location in 3D space. The A channel is, by default, over the B channel. You can change this priority with the **XFade** (crossfade) softknob.

XFade

Use XFade to exchange the priority of A and B channels by crossfading. By default (0), the A channel is over the B channel. At a setting of 100, the B channel is completely over the A channel. Intermediate settings mix the two channels where they overlap. Intermediate settings let you dissolve (or mix) one channel through the other as part of an effect.

Z Key

In Z key mode, Dveous/MX uses Z (depth) information to set the relative key priority of the two channels. The lower a channel's Z locate value, the closer it is to the viewer, and the higher its priority. The higher the channel's Z locate value, the further it is from the viewer, and the lower its priority. Also, if an image is rotated horizontally or vertically, part of the image is closer to the viewer, giving that part a higher priority. This means that if the two channels meet, overlap or intersect at any point, their relative Z locate values determine which channel is over, or in front of, the other.

A Offset

Increases the Z priority of the A channel from its normal value without changing its position with Z locate, which also affects its size. An zero offset uses the

normal Z locate priority. An increased offset value increases its priority, letting it appear over, or in front of, the B channel when it otherwise would not.

	Both Modes
Default	0.0000
Range	+/- 100.0000
Align	nearest multiple of 25

B Offset

Increases the Z priority of the B channel from its normal value without changing its position with Z locate, which also affects its size. A zero offset uses the normal Z locate priority. An increased offset value increases its priority, letting it to appear over, or in front of, the A channel when it otherwise would not.

	Both Modes
Default	0.0000
Range	+/- 100.0000
Align	nearest multiple of 25

Z Soft

Controls the softness or hardness with which one channel intersects the other.

	Both Modes
Default	0
Range	0 (soft edge) - 7 (hard edge)
Align	none

Texture Overview

Textures are a part of the SurfaceFX feature. They work with both flat (planar) images and warped images and are combined with a light source to add the appearance of a textured surface to the image in any DVE channel. For example, you can create a textured sphere that moves with realistic lighting effects.

Textures Sources

Any source available to Dveous/MX can create a texture for an image -- such a source is known as a *texture source*. Each DVE channel can have a different texture source.

You can pull textures off a variety of sources. Use live video for the texture source to get a moving texture pattern. Or, use the SuperMatte generator and customize your own texture. You can also use the Defocus module as a texture source, or the Pattern Framestore, which includes user stored JPEG files.

There is one Pattern Framestore for the entire system, but each DVE channel has its own input freeze buffer for the texture and video inputs. This way, you can load a pattern in the Pattern Framestore, freeze it on one DVE channel, then load another pattern and freeze it on another channel. (You cannot route live video to the Pattern Framestore, only to each DVE channel's input freeze buffer.)

How Textures Work

When you apply a texture to an image, Dveous/MX derives the texture information from the luminance in the texture source and translates it into Z (depth) data. Where the luminance level in the texture source increases (gets brighter), the texture is "raised" above the image's average surface level. The light source, in turn, sees this raise as a "peak" in the texture and applies a highlight to it, making it brighter relative to the surrounding image.

In the same way, where the luminance level in the texture source decreases (gets darker), the texture is "lower" than the image's average surface level. The light source sees this as a "dip" in the texture and applies a lowlight to it, darkening it relative to the surrounding image.

Note that the actual luminance level of the texture source is not as important as the contrast in the image. It is the change in luminance levels that gives the image its texture. Areas of the texture source that do not have contrasting luminance levels appear flat and two-dimensional when applied to the image, regardless of their absolute luminance level: completely black, completely white, or a shade of gray.

This is why surface textures are visible only when you apply a light source to the image. A light source uses pixel normals to generate highlights and lowlights in the image (see the Light Sources section for an explanation of "normals"). The texture information modifies the pixel normals in the image; it does not modify the image itself. This process lets the light source feature give the impression of surface texture by applying light and shadow to the image in a way that realistically imitates the lighting and shading you would see if the surface of the image were truly textured.

Like a warp shape, you lose the illusion of a texture if you rotate the image and view it edge-on. Textures are strictly a visual impression made possible with a light source, and create a powerful and realistic looking effect when used properly.

Applying a Texture

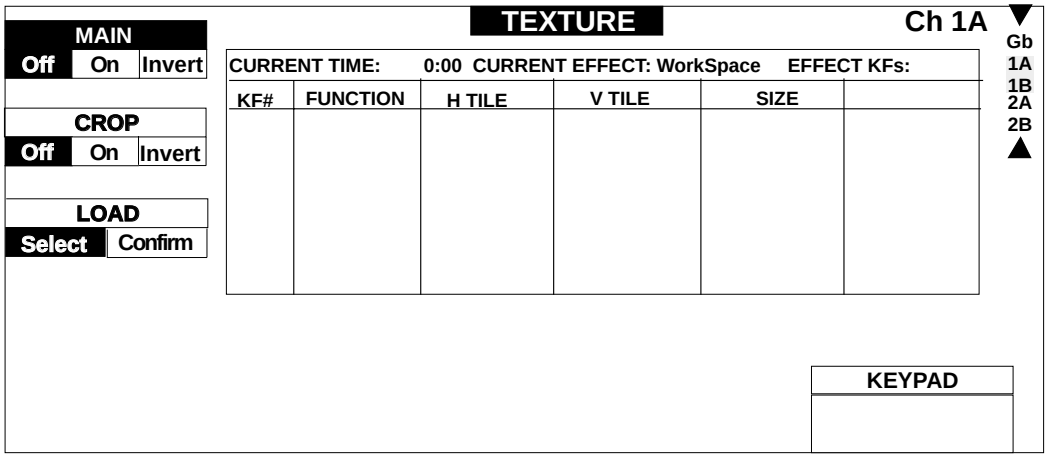
Add a texture to an image as follows:

1. Turn on the light source for a DVE channel. See the examples in the Light Sources section for more details on how to do this.
2. Press the **TEXTURE** menu button and toggle the ***Main*** softkey to ***On***. The controls for selecting a texture source, input buffer freeze functions, and texture offset and gain settings now appear. With a light source enabled and visible, the current texture source is visible in the image.
3. Use the **Source** parameter softknob to select any input installed in your system as the texture source, regardless of the main image source. (The texture source defaults to input 1.) Other available sources are the output of the Pattern Framestore (**Pattern**), the output of either Defocus module (**Defocus A** and **Defocus B**), and the **SuperMatte** generator.
4. To view a pattern from the Pattern Framestore, press the ***Load*** softkey. Use the **Pattern** softknob to select a texture pattern. (The last14 patterns are video test signals that do not produce a recognizable texture pattern.) After selecting a pattern name, press ***Load*** again. ***Confirm*** is briefly highlighted as the system loads the selected pattern into the framestore.
5. Press the ***Main*** softkey again. To use different texture patterns in multiple channels, you must use the channel's input freeze buffer to store the texture source before selecting a new source for another channel. The **Freeze** softknob lets you select a live source (**Off**), or freeze a moving source as a single field (**Fld 1** or **Fld 2**), or freeze a still image as a full frame for maximum vertical resolution (**Frm**). For best results, freeze a pattern from the Pattern Framestore as a full frame.

6. Use the **Offset** to control the balance between the height and depth of the texture. Positive **Offset** values raise the average height of the texture relative to the image. Negative **Offset** values decrease the average height of the texture relative to the image. At the ends of the **Offset** range, the highest or lowest points of the texture are clipped off, or flattened out.
7. Use **Gain** softknob to control the slope of the texture, much like the gain control in a keyer. The higher the **Gain** setting, the steeper, or sharper, the texture edges are, making the texture appear more exaggerated. Negative **Gain** settings invert the polarity of the texture, making former "high" spots in the texture "low," and vice versa. A **Gain** setting of zero "flattens out" the texture, effectively removing it from the image. Typically, a low **Gain** setting gives the most realistic-looking texture. Also, you can toggle the ***Main*** softkey to ***Invert*** to change the polarity of the texture source.
8. Toggle the ***Crop*** softkey to ***On*** to access the texture crop controls. Parameter softknobs for the **Left**, **Right**, **Top** and **Bottom** positions let you crop or mask the texture pattern inward from the outer edges of the image. You can use these parameters to limit the texture to just part of the image. Toggling ***Crop*** to ***Invert*** makes the texture appear outside the cropped or masked area, instead of inside it.

Texture Menu

Press the **TEXTURE** button to bring up the Texture menu.



Note: You must enable a light source in the Light Source menu before you can see a texture applied to the image.

Main

Toggle this softkey ***On*** to apply the selected texture to the active channel(s). Use ***Invert*** to invert the texture source's high/low polarity. Both modes have the same controls: ***Off*** is the default position for this function.

Source

Selects the source for the texture pattern. 1 - 12 are the external inputs. Super-Matte selects the internal two color SuperMatte generator. Pattern selects the output of the Pattern Framestore. Defocus A and Defocus B select the outputs of the Defocus module.

Freeze

Selects whether the freeze buffer for that DVE channel's texture input is Off (for a live input), or frozen as field 1 only, field 2 only, or a full frame. To freeze a moving texture source, select *Field 1* or *Field 2* to eliminate inter-field flicker. To capture a still texture source with full resolution, use the *Frame* setting.

Offset

Changes the average surface height of the texture relative to the surface of the image. Positive numbers make the texture appear higher than the image surface; negative values make the texture appear lower than the image surface. At the extreme ends of the offset range, the highest or lowest points of the texture are flattened, or clipped.

	Both Modes
Default	0
Range	-128 to +127

Gain

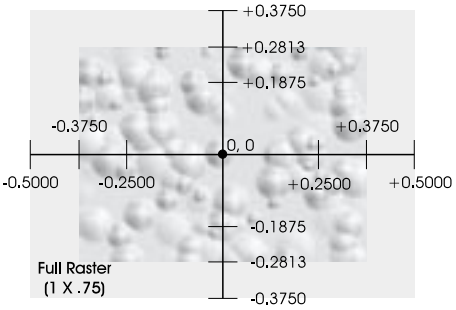
Increases or decreases the contrast between the highest and lowest points of the texture relief. Low positive values narrow the contrast range, and the result is a more subtle relief effect. Higher positive values increase the contrast range, and the result is a more exaggerated relief effect. A value of zero removes the texture by removing all relief; negative values invert the polarity of the texture source.

	Both Modes
Default	1
Range	-50 to +50
Align	Nearest multiple of 12.5

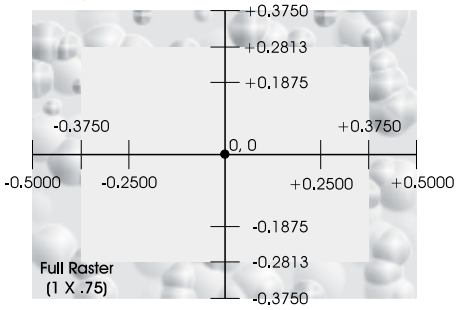
Crop

You can crop, or mask, the input texture source to apply the texture in only some areas of the image. Toggle ***Crop*** to ***On*** to enable texture crops. In this mode, you can crop the texture from the outside in, with independent controls for each edge. Or, use the joystick to move the crop edges simultaneously. In ***Invert*** mode, you can unmask the texture from each side independently, or use the joystick to move the crop edges simultaneously. The parameter softknobs for each mode are identical, and the default settings apply the texture across the full image in normal mode, or completely mask the texture in ***Invert*** mode. ***Off*** is the default position.

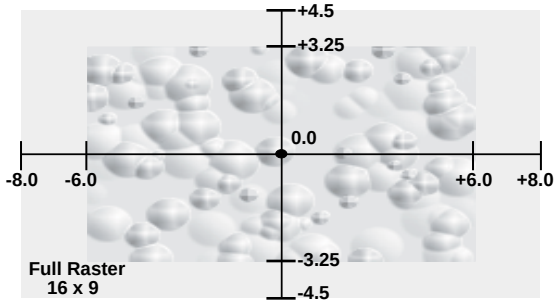
Crop settings for both modes: Left = -0.3750, Right = 0.3750,
Top = 0.2813, Bottom = -0.2813



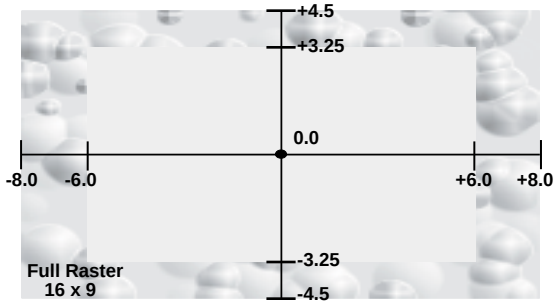
Crop On Mode



Crop Invert Mode



Crop On Mode



Crop Invert Mode

Left

Crops or masks the texture relative to the left edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	-0.5000	-8.0000
Range	+/- 0.5000	+/- 8.0000
Align	Nearest multiple of .125	Nearest multiple of .125

Right

Crops or masks the texture relative to the right edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.5000	8.0000
Range	+/- 0.5000	+/- 8.0000
Align	Nearest multiple of .125	Nearest multiple of .125

Top

Crops or masks the texture relative to the top edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.3750	4.5000
Range	+/- 0.3750	+/- 4.5000
Align	Nearest multiple of .125	Nearest multiple of .125

Bottom

Crops or masks the texture relative to the bottom edge of the image.

	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	-0.3750	-4.5000
Range	+/- 0.3750	+/- 4.5000
Align	Nearest multiple of .125	Nearest multiple of .125

Load

Press this softkey to access and load a JPEG texture or one of 25 internally generated patterns into the Pattern Framestore. This list of patterns starts with JPEG, followed by a combination of texture patterns and video test patterns (color bars, multiburst, etc.). Although you can use any of these 25 patterns for a texture, the JPEGs and the internally generated texture patterns are specifically for use as texture sources and will give you the best effect. To load a pattern:

1. Press ***Load*** once to enable the **Pattern** parameter softknob. ***Select*** is now highlighted.
2. Use the **Pattern** parameter softknob to dial in the desired pattern.

3. Press ***Load*** again. ***Confirm*** is briefly highlighted, indicating that Dveous/MX is loading the pattern into the Framestore. Once loaded, the pattern appears in the DVE, if Pattern is selected as Input type.

Using JPEGs for Textures and Images

Import up to 28 JPEG images from your computer into Dveous/MX to use as texture sources or as images. JPEGs are stored in flash memory for fast recall and can be up to 1.44 M in size. Once loaded into Dveous/MX, you can use your JPEGs like any other texture source. Or you can load the JPEG as an image into a channel.

Copying JPEGs from the Floppy Disk onto Dveous/MX

JPEGs are loaded like any effect file from floppy disk. If you are not familiar with this process, please see *Recalling Files from Disk* in Section 8 – Saving & Recalling Effects.

Note: You can abort the loading procedure while it is 0 to 50% complete. After 50%, the files is burnt into flash memory and you cannot abort. Note that the progress bar stops at 50% while the image is being stored in flash.

Previewing JPEGS Before Copying

You can preview any JPEG on your floppy before copying it into Dveous/MX. Go to the Disk menu and toggle *Recall* mode. Highlight the JPEG you want to preview. Turn the File Type softknob to *JPG*. Turn the Texture softknob to *FS* (this selection is the one before 1). The JPEG displays in the framestore (FS), unscaled.

You can also choose to preview all the JPEGs on your floppy. Dveous/MX automatically loads them into the framestore and gives you a slide show of the JPEGs. With **Texture** selected to *FS*, select all files using align and press ***Recall***. The JPEGs plays sequentially into the framestore.

Loading JPEG as Textures or Images

When you select JPEG as the Pattern source, two other parameters appears: Texture and Scaling. Once you have set Texture and Scaling, press ***Load*** to load the JPEG in as your texture or image. The time it takes to load the JPEG will vary depending on file size.

Texture dials in the JPEG file you want to load. If you know the numeric space the JPEG occupies, you can call it up instantly by entering its number in the numeric keypad and then pressing C.

Note: **Texture** is used when the JPEG will be used as a texture bump map for light sourcing. Because texture sources are bump maps, Dveous/MX converts the JPEG into an uncompressed bitmap acceptable for light sourcing.

Scaling lets you select from three file conversion choices: Unscaled, Scaled and Texture. **Scaled** and **Unscaled** determine the conversion process when the JPEG is going to be used as a picture.

Note: Use **Unscaled** if you built your JPEG for digital video, in which case no conversion is necessary. If you saved a regular 8-bit JPEG, then choose **Scale** to bring the image into the correct digital video range.

Recalling Effects with AutoLoad Enabled

AutoLoad is a step saving feature that automatically loads whichever pattern was saved with an effect. With AutoLoad enabled, you do not need to reload the pattern before running an effect. To enable AutoLoad:

1. Press the **PERSONALITY** button on the Control Panel. The Personality menu appears.
2. Press the Misc function softkey.
3. Toggle the **AutoLoad** softknob to *On*. Now, any pattern stored with a saved effect will automatically load upon recall of that effect.

Note: AutoLoad takes several seconds to load the pattern. If you operating live, you may wish to leave AutoLoad turned off and pre-load the pattern yourself.

Warp Overview

The term *warp* describes the nonlinear transformation of an image. If we define a linear transformation as a two dimensional image attached to a flat plane that moves in three dimensional space, a nonlinear transformation bends or curves the plane that the image is on. It can also slice the plane into small segments and move those segments individually in different directions or at different rates. In either case, modifying the plane directly affects the image on the plane, and this modification is called a warp.

Apply Light and Texture to Warps

Many of the new warp shapes work with the SurfaceFX package, which uses light sources to give these shapes a realistic three-dimensional look. These SurfaceFX warp shapes are indicated in the menu with an asterisk (*), and include page turns, ripples and concentric shapes like swirls and rings.

The Warp menu has all the controls you need to select and create a warp shape. You can combine other Dveous/MX parameters with warps when building effects.

Demo Mode

Warp settings, like other transform parameters, default to values that are the most linear. Because the default value is linear, and warps are by definition non-linear, when you first enable a warp, its may not be evident on the image. To let you see how the warp will affect the image, Dveous/MX provides a warp Demo mode with preset warp settings. Since each shape has its own values that result in the most visible effect, different preset values automatically apply to different shapes.

To demo the warp shapes, press the **WARP** button on the Control Panel to bring up the Warp menu. Set the **Demo** softknob to **On** to enable the Demo warp mode. Now, as you scroll through list of warp patterns, the image will demo the warp shape.

Demo mode is a special case, and there are some things you need to keep in mind when you use it:

- Turning Demo mode on automatically turns on warps.
- It is a good idea to turn Demo mode off before inserting or modifying keyframes. In Demo mode, Dveous/MX temporarily ignores the channel transforms and displays an image reduced to 75 percent, centered on screen, with no rotations. However, if you insert or modify a keyframe in Demo mode, the current parameter values in the transform menus apply to that keyframe, so that the keyframe does not save the way the image appears in the Demo mode.
- = Turning Demo mode off does not turn warp off. It applies the current (Demo) warp settings to the normal, transformed image. This is an easy way to start when adding a warp shape to an image. Leaving the Warp menu also turns demo mode off, with the same results.
- Selecting new shapes in Demo mode loads new presets into all warp settings. You can adjust these settings (under the **Modify** and **Position** softkeys) to experiment with the shape. There are three ways to return to the shape's preset Demo mode settings:
  - Turn Demo mode off, then back on.
  - Select another shape, then the original one.
  - Press **Align — A** in the Warp menu.

Selecting a Warp Shape

Use the **Shape Category** softknob to highlight a category, or group, of warp shapes. Then choose a particular shape with the **Type** softknob. Some shapes also let you select a front or back view, or both, with the **View** softknob. Remember that if you expected to see a warp affect the image and it doesn't, the default values may be too linear, and that you can view its effect by enabling Demo.

Note that the selected warp shape number always appears in the lower left corner of the Warp menu. If you know the number of the warp shape, you can enter it in the numeric keypad and press the A keypad button.

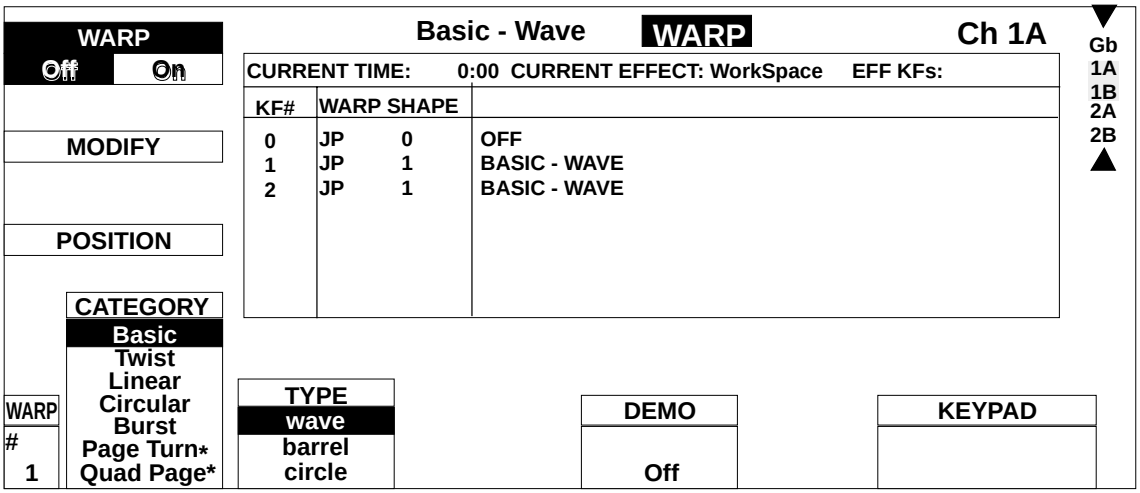
Applying a Warp Shape

Apply warp to an image as follows:

1. Use the Channel Select buttons to delegate the channels to which you want to apply the warp. Press the **WARP** menu button to bring up the Warp menu.
2. Toggle the ***Warp*** softkey ***On*** to enable the warp shape.
3. Select a warp shape by either entering its number in the keypad or by using the **Shape Category** softknob. Then select a shape name with the **Type** softknob.
4. If the **View** softknob appears, select the side of the warp shape you want to create: the **Front**, the **Back**, or **Both**.
5. Use the softknobs under the ***Modify*** and ***Position*** softkeys to manipulate the shape. You can use these controls alone or with other parameters to program the keyframes in your effect. Note that the ***Modify*** and ***Position*** parameters change depending on the currently selected shape.
6. After setting the warp controls, you can press the Quick Keyframes **INSERT NEXT** button to create a keyframe with these parameters.
7. Change a warp parameter, or a motion parameter, and press **INSERT NEXT** again to save another keyframe. When you press **RUN →**, the warp shape appears as you created it for the first keyframe, then interpolates to the next keyframe. This way, you can experiment with different warp shapes and their controls to create nonlinear transform effects.

Warp Menu

Press **WARP** on the Control Panel to bring up the Warp menu. The default setting is *Off*. The shape category and type of the current warp always appear at the top of the Warp menu next to the title. For example, in the illustration below, which displays the default menu status, the current warp shape is Basic with type Wave.



Each warp shape also has a number assigned to it. This number always appears in the lower left corner of the menu. In the above example, the warp shape number is 1. You can use these numbers to quickly recall a shape by entering the number in the keypad and then pressing A on the keypad.

Warp

Toggles the warp function *Off* and *On*.

Category

Use this softknob to select a shape category. The Category parameter is used to select the shape category (Basic, Twist, etc.). You can also select a shape by entering the shape number in the keypad and pressing the A keypad softkey. There are many shape categories, and as you scroll through the list, the Type parameter to the right will display different types, according to the category. There are at least two types per category. Depending on the shape category, a View parameter will also be enabled on the C softknob.

Type

Use this softknob to select a type from the selected category.

View

The *View* parameter shows the shape type selected (Cylinder, [Page] Turn, [Page] Roll, etc.). Use the softknob to select the view for two channel warp shapes. For most of these shapes, you can select the Front side, Back side, or Both. **This is not applicable in the one channel HD configuration.**

Demo

Turn this parameter softknob **On** to apply the selected shape to the image with preset warp settings. Turn it **Off** to create the shape manually. See the discussion on the warp Demo mode earlier in this section.

Hint: When create a warp, start in the Demo Mode to set up parameters for a warp. Then go to the Modify function to create the warp shape you desire.

Modify

This function accesses the warp modification controls. You can use the softknobs, the numeric keypad and, in most cases, the joystick, to adjust these settings.

There are many parameters under Modify, and because they can change depending on the warp shape being used, they are listed below in alphabetical order. For the shape categories noted, the ***Modify*** softkey toggles between ***Normal*** and ***Waveform***.

Alignment

Applies only to the Fancy category, which requires two DVE channels to complete the shape. Use Alignment to match up the edges of the shape halves to create a fully closed shape. **This is not applicable in the one channel HD configuration.**

Amplitude

Applies to the **Linear**, **Circular** and **Ripple** categories. Use **Amplitude** to set the "gain" for the selected shape; it affects the amount of warp nonlinearity applied to the image.

Axis
Applies to the **Basic**, **Burst**, **Linear**, **Circular**, **Page Turn**, **Quad Page** and **Ripple** categories, plus the **Misc** category **Meltdown** shape. Use **Axis** to Z rotate the warp shape without rotating the image itself.

Frequency
Applies to the **Linear** and **Ripple** categories. Use **Frequency** to change the "wavelength" of the warp effect; i.e. how many repetitions of the nonlinear waveform appear in the image.

Horizontal Frequency
Appears when you toggle ***Modify*** to ***Normal***, and applies to the **Circular** category. Use **Horizontal Frequency** to change the "wavelength" of the warp effect across the width of the image; it affects how many repetitions of the nonlinear waveform appear horizontally in the image.

Mag
Applies only to the **Misc** category **Lens** shape. Use **Mag** to set the image's apparent magnification through the lens.

Phase
Appears when you toggle ***Modify*** to ***Waveform***, and applies to the **Circular** and **Ripple** categories. Use **Phase** to change the position of the ripples relative to the center point of the shape without changing the size of the affected image area.

Pulse Width
Appears when you toggle ***Modify*** to ***Waveform***, and applies only to the **Circular** category **Square Pulse** and the **Concentric** category **Multi-Rings** shapes. Use **Pulse Width** to set the width of the square pulses or rings.

Radius
Applies to the **Page Turn**, **Quad Page**, **Sphere**, **Ripple**, **Concentric, Cylinder and Fancy** categories. Use **Radius** to set the radius (distance from the center to the outer edge) of the circular warp shapes.

Range
Applies to the **Basic** and **Burst** categories, plus the **Misc** category **Meltdown** shape. Use **Range** to set the "gain" of the selected shape; it affects the amount of warp nonlinearity applied to the image.

Rotation
Applies to the **Concentric, Cylinder and Fancy** categories. Use **Rotation** to Z rotate the warp shape without rotating the image itself.

Size
Applies only to the **Misc** category **Lens** shape. Use **Size** to set the diameter of the lens without changing the size of the image itself.

Spread
Applies to the **Basic** and **Burst** categories plus the **Misc** category **Meltdown** shape. Use **Spread** to set the width of the warp shape relative to the image. In general, the effect of the **Spread** setting on the image is not apparent unless you use a non-zero **Range** value.

Twist
Applies only to the **Concentric** category **Multi-Rings** shape. Use **Twist** to Z rotate the rings without rotating the image itself. Unlike **4-Rings**, this shape does not have individual rotation controls for each ring; each successive ring rotates proportionally more than the ring inside it.

Vertical Frequency
Appears when you toggle ***Modify*** to ***Normal***, and applies to the **Circular** shape category. Use **Vertical Frequency** to change the "wavelength" of the warp effect up and down the height of the image; it affects the number of repetitions of the nonlinear waveform that appear vertically in the image.

Position

This function accesses the warp position controls. You can use the softknobs, the numeric keypad and, in most cases, the joystick, to adjust these settings. There are many parameters under ***Position***, and because they can change depending on the warp shape being used, they are listed below in alphabetical order. For the shape categories noted, the ***Position*** softkey toggles between *Normal* and ***Offset***.

H Position
Applies to the **Circular**, **Quad Page**, **Sphere**, **Ripple**, **Concentric** and **Split** categories, plus the **Misc** category **Lens** shape. (For the **Split** category **Split** shape, toggle the ***Position*** softkey to ***Offset*** to access this control.) Use **H Position** to change the horizontal position of the warp shape on the image.

H Split
Applies only to the **Split** category **Split** shape. Toggle the ***Position*** softkey to ***Normal*** to access this control. Use **H Split** to set the width of the horizontal separation between the parts of the image.

Left / Right / Top / Bottom
These softknobs only apply to the **Split** category **Mirrors** shape. Toggle the ***Position*** softkey to ***Offset*** to access these controls. Use these softknobs to rotate each part of the image independently.

Position
Applies to the **Basic**, **Burst**, **Linear**, **Page Turn** and **Fancy** categories, the **Ripple** category **Linear** shape, and the **Misc** category **Meltdown** shape. Use **Position** to change the position of the warp shape on the image relative to its **Axis** and **Rotation** setting.

Quadrant
Applies only to the **Split** category **Split** shape. Toggle the ***Position*** softkey to ***Offset*** to access this control. Toggle **Quadrant** to select the part of the image (**Upper Left, Upper Right, Lower Left, Lower Right**) you want to move or rotate.

Ring 1 / 2 / 3 / 4
These softknobs apply only to the **Concentric** category **4-Rings** shape. Toggle the ***Position*** softkey to ***Offset*** to access these controls. Use these softknobs to rotate each ring independently.

Rotate
Applies only to the **Split** category **Split** shape. Toggle the ***Position*** softkey to ***Offset*** to access this control. Use **Rotate** to Z rotate the part of the image selected with the **Quadrant** softknob.

Top Left / Top Right / Bottom Left / Bottom Right
These softknobs apply only to the Quad Page Turn category. Toggle the *Position* softkey to *Offset* to access these controls. Use these softknobs to move the corners of the Quad Page Turn independently.

V Position
Applies to the **Circular**, **Quad Page**, **Sphere**, **Ripple**, **Concentric** and **Split** categories, plus the **Misc** category **Lens** shape. (For the **Split** category **Split** shape, toggle the ***Position*** softkey to ***Offset*** to access this control.) Use **V Position** to change the vertical position of the warp shape on the image.

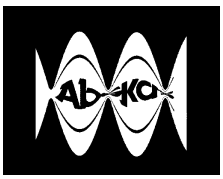
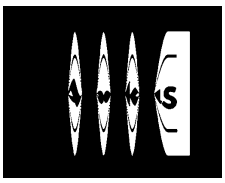
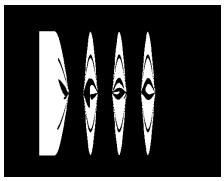
V Split

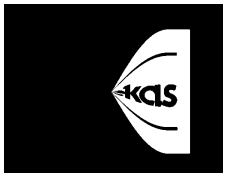
Applies only to the **Split** category **Split** shape. Toggle the ***Position*** softkey to *Normal* to access this control. Use **V Split** to set the width of the vertical separation between the parts of the image.

Warp Shapes

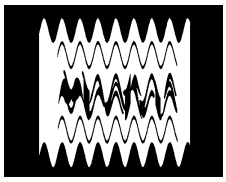
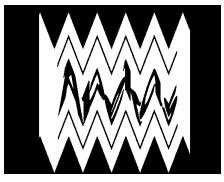
You can quickly view the available warp shapes by using the **Demo** softkey to enable the Demo mode as described at the beginning of this section. The following discussion describes each shape by category and includes an illustration that shows an example of the warp shape. The following examples are based on 16 x 9 numbering system. The warps may not look exactly alike when switching from SD to HD mode.

Warp #	Example	Category/Type/View with Description
1		**Basic/Wave** This shape imposes a sinusoidal waveform on the image. **Range** changes the waves' amplitude; **Spread** changes the number of waves visible in the image. A **Spread** value of 0.11 produces the maximum number of waves, which is 13. **Position** locates the waves on the image.
2		**Basic/Barrel** This shape creates a barrel or cylinder that is viewed straight on. Positive **Range** values give an inside (convex) view; negative values show the outside of the barrel (convex). **Spread** determines the radius of the base of the barrel, or the tightness of the curl. Setting **Spread** to 0 gives the image a flat, Cinemascope® appearance.
3		**Basic/Circle** Set **Range** to 1 and **Spread** to 0.25 to create a circle or pseudo globe. Note that this distorts the image in one dimension only (for example, horizontally but not vertically). Use **Axis** to rotate the axis of circular distortion. Setting it to 0 creates a globe with its pole running east/west. Greater **Spread** values give an ellipse shape. Smaller **Range** and **Spread** values give a shape that resembles a TV monitor with curved corners.

Warp #	Example	Category/Type/View with Description
19		**Basic/Cylinder** This shape generates a "tin can" cylinder. Positive **Range** values give an outside view; negative values give an inside view. **Spread** changes the tightness of the curl.
32		**Basic/Sphere** This shape distorts the image to create circular edges, like the **Circle** shape. Sphere, however, distorts the image in two dimensions, so that both the horizontal and vertical edges have a spherical appearance.
4		**Basic/Bowtie** This shape pushes part of the image "back" from the rest of the image, rather like an extrusion. Setting **Range** to .25 produces a shape similar to a bowtie, hence the name. Positive and negative **Spread** values affect the image identically.
5		**Twist/Helix/Both** This shape imposes multiple twists on the picture. Setting **Spread** to .05 gives the maximum number of twists, which is eight. **Spread** squeezes or stretches the twists. **Axis** rotates the shape on the image, and **Position** moves the shape (in one dimension) relative to the image.
9 & 10	 	**Twist/Helix/Front, Twist/Helix/Back** These shapes work with two DVE channels in Video+Video mode. Together, they produce the same results as **Helix Both**, but with different images twisting around each other. Video+Key and Video/Key+Shadow modes require two twin channels to create the effect.

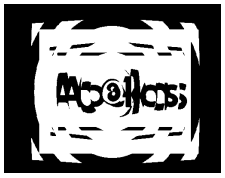
Warp #	Example	Category/Type/View with Description
6		**Twist/Twist/Both** This shape twists the picture once when you set **Range** to 1. You can use the twist to create a pseudo page turn. Note that page turns created with this shape, while realistic looking, process only one side of the image.
7 & 8	 	**Twist/Twist/Front, Twist/Twist/Back** These shapes work with two DVE channels in Video/Video mode to produce twist effects with different images on each side. Apply one shape to channel A and the other shape to channel B, then activate both channels to move the combined shape. Video+Key and Video/Key+Shadow mode involve using one shape at a time and making two record passes.

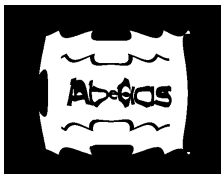
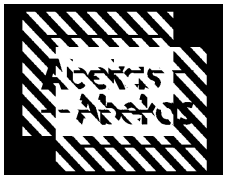
Note: Ripple, Zigzag, and Paper Fold warp shapes do not affect the image if the Range value is 0.00 (default). Use this value to keyframe from/to a non-warped image.

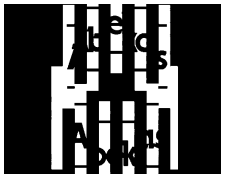
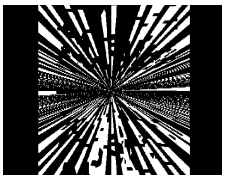
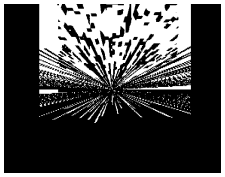
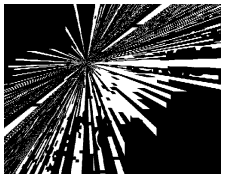
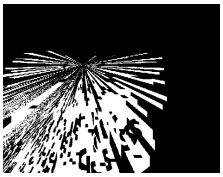
16		**Linear/Ripple** This shape is a variation of the sinusoidal waves used with the **Wave** shape. **Wave** is out of phase from top to bottom, but **Ripple** is in phase. **Amplitude** increases the amplitude of the ripples, **Frequency** squeezes or expands them across the picture, **Axis** rotates the ripple on the image, and **Position** moves the ripples on the image.
17		**Linear/Zigzag** This shape is similar to **Ripple**, except that it produces a triangle wave instead of a sine wave. **Amplitude** increases the amplitude of the zigzags, **Frequency** squeezes or expands them across the picture, **Axis** rotates the shape on the image, and **Position** moves the shape along the axis.

Warp #	Example	Category/Type/View with Description
18		**Linear/Paper Fold** This shape is similar to **Bowtie**, except the bottom edge is "in phase" with, or displaced in the same direction, as the top edge. Increasing **Amplitude** and **Frequency** imposes what looks like a paper fold or a partition on the image. Setting **Axis** to 0.345, **Amplitude** to 1, and **Frequency** to 0.06 produces a rocket shape.

Note: The Circular patterns have a dual setting for **Modify**, ***Normal*** and ***Waveform***. This allows further modification parameters.

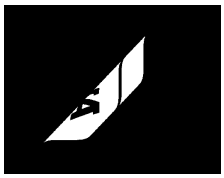
34		**Circular/Ripple** The circular ripple shapes give the effect of the ripples generated by dropping an object into a pool of liquid. **Amplitude** controls the ripples' "gain," and **H Frequency** and **V Frequency** control the number of ripples in each dimension. Use the **Position** control to move the origin for each ripple the horizontal and vertical directions. Use **Axis** to rotate the axis of H and V wave origination. Use **Phase Adj** to change the waveform phase relative to the center convergence point.
35		**Circular/Zigzag** This shape is similar to the circular ripple, except that the ripples are linear and have the shape of a triangle wave.
36		**Circular/Sqr Pulse** This shape gives a pulsed ripple. **Pulse Width** controls a "duty cycle" that widens or narrows the ripples.

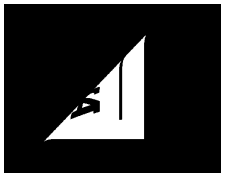
Warp #	Example	Category/Type/View with Description
37		**Circular/Decay** This shape approximates a sine X/X mathematical function, where the wave ripple amplitude lessens as the ripple moves away from the origin.
38		**Circular/Rectified** This shape has ripples that are similar to a full wave rectified sine wave: positive half peaks repeat throughout the shape. There are no negative half peaks.
20		**Burst/Lace** This shape splits the image into a maximum of 32 slices. Changing **Range** forms the slices and slides them over each other. **Spread** controls the width of the slices. Try rotating the warp **Axis** while changing **Range** values.
21		**Burst/Interlace** This shape is similar to **Lace**, but generates many more slices. You can use **Spread** to reduce the slices to single line widths. Vary **Range** to produce an interlacing effect.
22		**Burst/Split** This shape splits the picture into 32 slices. Varying **Range** forms the slices and slides them away from each other, instead of over each other, as with **Lace**. Decreasing **Range** brings the two sets of slices back together.
23		**Burst/Shred** This shape is similar to **Split**, except it shreds the picture to many thin lines. Using certain values for **Axis** and **Spread** give a flickering effect, which you may or may not want. For best results, change both settings until you get the effect you want.

Warp #	Example	Category/Type/View with Description
24		**Burst/Pipe Organ** This shape splits the picture into up to 16 slices. To see the pipe organ shape, increase **Range** to form the slices and pull the two sets away from each other, then change **Axis** to a 45 degree angle. The slices near the center of the picture travel faster and are further apart; the slices near the edge of the picture travel more slowly and are closer together.
25		**Burst/Burst** This shape gives the image an explosion effect. Increasing **Range** splits the image into rays that converge in the center of the image. As **Range** increases, the rays disappear in all directions. At a 0.25 **Range** value, all the rays disappear. Changing **Spread** increases the area affected by the warp shape. **Axis** rotates the axis about which the explosion forms. **Position** moves the point of convergence on the warp axis.
27		**Burst/Half Burst** This shape looks like **Burst** at first glance. Varying **Range** splits the picture into converging rays. As you continue to increase **Range**, however, the rays disappear in only one direction.
26		**Burst/Flare** Increase **Range** to apply vertical shredding in the center of the picture. You can then change **Axis** to form converging rays. Set **Range** to 0.01, **Axis** to 0.13, and **Spread** to any value. You should see two converging points on the screen. Varying **Position** moves the convergence point along the warp axis, which you can control with the **Axis** softknob.
28		**Burst/Half Flare** This shape is similar to **Flare**, except that increasing **Range** causes the rays to disappear in only one direction.

Warp #	Example	Category/Type/View with Description
41		**Page Turn/Roll/Both** Used for One Channel Page Turns (same video front and back.) See below under Page Turn/Roll/Back and Page Turn/Roll/Front for further details.
54		**Page Turn/Roll/Front** This shape works with **Page Turn/Roll/Back** to give a complete page turn. You need two twin channels for the complete effect in Video+Key or Video/Key+Shadow mode. To perform a live page roll or flap, use the Video+Video mode. As with **Roll**, **Axis** determines the starting point of the curl, **Radius** controls its tightness, and **Position** peels the page off the screen.

Note: As with all other warp shapes, you can use other Dveous/MX parameters to build an effect. **Aspect Ratio** is, however, the exception. Certain combinations of **Aspect Ratio** and warp **Position** result in page turns with misaligned front and back sides. Also, do not use this shape with a corner pinned image.

55		**Page Turn/Roll/Back** This shape works with **Roll Front** to give the effect of rolling a page. The complete effect requires two twin channels in Video+Key or Video/ Key+Shadow mode. Use Video/Video mode for live page rolls. When you first select this shape, the image disappears from the screen, because in the finished effect, this shape is the back side of the page. Vary **Radius** to form the roll. Increasing **Radius** tightens the curl. Change **Axis** to start the roll from a corner or side. Change **Position** to roll the page off, or unwrap it on, the screen. When you adjust the settings, note that you only see the back side of the page. To see the front side, keep the same settings, but change the shape number to 52. In Video+Video mode, select shape 55 on channel A and shape 52 on channel B. Activate both channels and manipulate the settings to build the effect. Be sure channel A has higher priority.

Warp #	Example	Category/Type/View with Description
40		**Page Turn/Flap/Both** Flap Both creates a single video channel version shapes 52 and 53. After you load the warp shape, the bottom of the page curls up. Use **Axis** to select the corner or side for the start of the page turn. This is the first keyframe. You can change the axis, then use **Position** to curl the page off and use this as the second keyframe. Since this shape uses a single transform engine, the Front and Back video is always the same source.
52		**Page Turn/Flap/Front** This shape works with **Page Turn/Flap/Back** to give a complete page turn. You need two twin channels for the complete effect in Video+Key or Video/Key+Shadow mode. To perform a live page roll or flap, use the Video+Video mode. As with **Roll**, **Axis** determines the starting point of the curl, **Radius** controls its tightness, and **Position** peels the page off the screen.
53		**Page Turn/Flap/Back** This shape works with **Flap Front** to produce a complete page turn with different images on each side. See **Flap Front** for information about using this shape. If you use this shape in the low priority channel, the page turn peels away from you. Normally, use this shape in the high priority channel.
43		**Quad Page/Roll/Both** Splits the image into four quadrants and rolls each from the inside outward. The video is the same on the front and the back, but appears reversed on the backside. Position **Normal** moves the point where the split originates and rolls each quadrant at the same time. Position **Offset** lets you move each quadrant separately. Change **Axis** to start the roll from a corner or side.
58		**Quad Page/Roll/Front** Splits the image into four quadrants. The front of the image rolls from the inside outward. The back side is not visible. The parameters operate the same as in #43 above.

Warp #	Example	Category/Type/View with Description
59		**Quad Page/Roll/Back** Splits the image into four quadrants. The back side of the image rolls from the inside outward. The front side is not visible. The parameters operate the same as in #43 above.
42		**Quad Page/Flap/Both** Splits the image into four quadrants and lifts the page edges outward. The video is the same on the front and the back, but appears reversed on the backside. Position **Normal** moves the point where the split originates and rolls each quadrant at the same time. Position **Offset** lets you move each quadrant separately. Change **Axis** to start the roll from a corner or side.
56		**Quad Page/Flap/Front** Splits the image into four quadrants. The front of the image peels outward. The back side is not visible. The parameters operate identically to those in #42.
57		**Quad Page/Flap/Back** Splits the image into four quadrants and peels the back image edges outward. The front side is not visible. The parameters operate identically to those in #42.
44		**Sphere/Transparent/Front** Wraps the video into an apparently three dimensional sphere. In Front mode the video appears in its normal orientation. **Radius** controls the size of the sphere by determining how tightly the video wraps around it. The **H** and **V Position** controls reposition the sphere along the video, so that it simulates up/down and side to side movement.
45		**Sphere/Transparent/Back** Wraps the video into an apparently three dimensional sphere. In Back mode the video appears in reversed orientation. The parameter controls are identical to those in #44.

Warp #	Example	Category/Type/View with Description
62		**Sphere/Opaque/Front** Wraps the video into a spherical shape of varying size. Takes the area outside the raster and fills it in with black. The video appears in its normal orientation. The parameter controls are identical to those in #44.
63		**Sphere/Opaque/Back** Wraps the video into a spherical shape of varying size. Takes the area outside the raster and fills it in with black. Video displays in reverse orientation. The parameter controls are identical to those in #44.
49		**Concentric/Swirl** Swirls the image. **Position** places the swirl horizontally and vertically along the video. **Rotation** controls the direction and amount of the swirl. **Radius** controls the size of the swirl and determines how much of the image is affected.
64		**Concentric/4-Rings** Places four concentric circles in the image. Normal **Position** lets you position the rings horizontally and vertically. Position **Offset** lets you rotate the rings individually as Ring 1, Ring 2, Ring3, Ring 4. **Rotation** simultaneously spins the circles in opposite directions. **Radius** controls the size of the circles and determines how much of the image is affected.
65		**Concentric/Multi-Rings** Places concentric circles on screen, the number of which you can determine. Unlike the 4-Rings warp, however, you cannot rotate the circles in opposing directions. **Position H** and **V** lets you position the rings in the image. Use ***Modify*** **Pulse Width** to determine the width of rings. The lower the value the greater the rings, so that at 0 the rings almost look like a swirl. **Rotation** turns each circle equally. **Twist** looks at the values in **Radius** and **Pulse Width** and uses them to offset the circles in a twisting motion.

Warp #	Example	Category/Type/View with Description
46		**Ripple/Circular** Creates circular ripples like those of a stone dropped into a pool of water. This warp interacts with Light Sourcing. **Frequency** controls how many ripples appear in image, while **Amplitude** affects the size of the ripples' appearance. **Phase** changes the position of the ripples relative to the center point of the image.
47		**Ripple/Linear** Simulates ripples like those of a flag waving in the wind. This warp interacts with Light Sourcing. ***Waveform*** **Phase** moves the ripples across the image, while **Axis** determines the direction the ripple travels across the image. **Frequency** and **Amplitude** act the same as in #46 above.
50		**Cylinder/Vertical** Wraps the video into a vertical cylinder. **Radius** controls how loosely or tightly the cylinder is wrapped, ranging from -1 to +1, with 0 equaling a flat surface. **Position** places the cylinder left or right on the screen. **Rotation** spins the cylinder around the horizontal axis. When rotating a closed cylinder, the effect is like looking down a tube.
51		**Cylinder/Horizontal** Wraps the video into a horizontal cylinder. **Radius** controls how loosely or tightly the cylinder is wrapped, ranging from -1 to +1, with 0 equaling a flat surface. **Position** places the cylinder up or down along the screen. Rotation spins the cylinder around the vertical axis. When rotating a closed cylinder, the effect is like looking down a tube.

Warp # **Example** **Category/Type/View with Description**

Note: The following fancy warps interact with Light Sourcing and provide better three dimensional effects. A full twin channel configuration is normally used to build the Fancy warp shapes. Activate both channels and manipulate the settings to build the effect. Because channel A normally has priority over channel B, channel A is used for the back and channel B is used for the front.

Note: For fancy warps in HD mode, when using demo mode, turn demo on and then off to see results.

60 

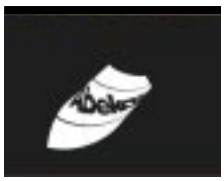
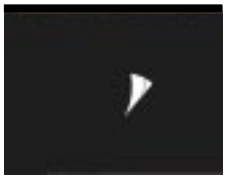
Fancy/Cylinder/Front
Creates the front half of a cylinder. The video displays in normal orientation. The back side is not visible. **Alignment** changes the horizontal and vertical orientation of the cylinder. **Rotation** rotates the cylinder along the axis determined by its **Alignment** value. **Radius** controls how loosely or tightly the cylinder is wrapped, ranging from -1 to +1. With **Radius** at 0, the cylindrical image is on edge, off screen, so that it is not visible.

61 

Fancy/Cylinder/Back
Creates the back half of the cylinder. The video displays, in reverse orientation. The front side is not visible. The front, or inside, is not visible. Control are identical to those in #60.

66 

Fancy/Page Turn/Front
Creates the front half of a page turn. The video displays in normal orientation. The back side is not visible. **Radius** determines how much of the page is in view. **Align** controls where along the image the page turn commences. **Rotation** sets the angle of the turned page to the screen, while **Position** move the warp along the video.

Warp #	Example	Category/Type/View with Description
67		**Fancy/Page Turn/Back** Lifts the edge of the back side the page and peels it outward. **Radius** controls how much of the page back is turned into view. **Align** controls where along the imaginary page you want the turn to commence. Rotation determines the angle of the turned edge. Position turns the page on and off screen. The front side of the image is not visible.
68		**Fancy/Page Roll/Front** Creates the front half of a page roll. The video displays in normal orientation. The back side is not visible. **Radius** determines how much of the page is in view. **Align** controls where along the image the page turn commences. **Rotation** sets the angle of the turned page to the screen.
69		**Fancy/Page Roll/Back** Rolls back the edge of the page back side. **Radius** controls how much of the page back is rolled into view. **Align** controls where along the imaginary page you want the roll to commence. **Rotation** determines the angle of the rolled edge. **Position** turns the page on and off screen. The front side of the image is not visible.
72		**Split/Mirrors** Duplicates the image in a mirror-like fashion. The ***Position*** **Normal** controls let you determine how close or far apart the mirroring occurs in the image. ***Position*** **Offset** stretches or compresses the image in different quadrants of the image. Individual controls for left, right, top and bottom control the mirroring from normal to funhouse in effect.
71		**Split/Split** Splits the image into four separate quadrants. Use ***Position*** *Normal* to determine where the split occurs. The quadrants can be equal in size or not, depending on the **Normal** position. Moving any of the four split images across the quadrant center point crops the image. ***Position*** *Offset* provides individual controls to position and rotate each quadrant.

Warp #	Example	Category/Type/View with Description
70		**Misc/Melt Down** The video appears to melt off the screen. Spread control how dense or loose the melt looks. Range performs the melting process. Axis determines the direction of the melt down, so that you can melt left/right or up/down. Position places the melt warp along the video.
48		**Misc/Lens** Places a circular lens on a portion of the video so that it appears magnified. Place the lens over any portion of the image using the **Position** control. **Size** modifies the size of the lens over the image. You can control how magnified the image under the lens appears using the **Magnification control.**

Note: Warp #'s 11-15, 29-31, 33, 39 are currently not used.