Quick Contents

Go to any chapter by clicking on it in the list above. Or jump to the Contents or Index page by clicking a button to the right.

Start Here
Dveous/MX User Guide

Contents

Index

Abekas

Publishing and Copyright Information

Dveous/MX User Guide
Part Number 9100-0401-01

Publishing History

This Printing: February, 2006
Printed in U.S.A.

Copyright

FCC Compliance

This equipment complies with the requirements in Part 15 of the FCC rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

Important

Changes or modifications to this product not authorized by Abekas, Incorporated could void the FCC Compliance and negate your authority to operate the product.

This product was tested for FCC compliance under conditions that included the use of Abekas peripheral devices and Abekas shielded cables and connectors between system components. It is important that you use Abekas periperal devices and shielded cables and connectors between system components to reduce the possibility of causing interference to radios, television sets, and other electronic devices. You can obtain Abekas periperal devices and the proper shielded cables and connectors through an Abekas-authorized dealer.

Notice

Information contained in the User Guide is not guaranteed and is subject to change without notice or obligation.

Acknowledgments

Company Information

Abekas, Inc.
1430-D O'Brien Drive
Menlo Park, California 94025
United States of America

Voice: ++(650) 470-0900
Fax: ++(650) 470-0913
Web: www.abekas.com
email: info@abekas.com

Safety and First Aid

Abekas equipment is designed to the highest standards of quality and reliability. However, no matter how these systems are designed, operators and maintenance personnel can be exposed to electrical shock hazard when protective covers are removed for maintenance or the installation of options. With this caution in mind, each operator and engineer must observe all safety regulations, and have a clear understanding of first aid procedures related to electrical hazards.

Safety and Compliance Certifications

Conforms to UL STANDARD 1950
Certified to CAN/CSA STANDARD C22.2, No.950-95

中文	警告！	重要安全注意事项

本系统遵守安全标准 IEC/EN60950。为确保安全操作及防止电击或火灾危险，请遵守以下规定:

- 本系统能够自动调整以适应供电情况。请确保贵处的电源符合本系统所要求的正确电压和频率工作范围。
- 本系统中的每个机壳均必须接地，方法是将输入电源线连接到正确接线并接地的电源插座上。
- 对于随本系统提供的输入电源线，必须按如下方式接线:

载电线 = 棕色　　中性线 = 蓝色　　地线 = 绿色/黄色

在从机壳取下顶盖之前，必须从机壳完全断开所有的输入交流电源线。否则将会暴露于危险电流及电压之下。身体接触这些电流和电压非常危险，并可能导致严重的人身伤害或伤亡！只有合格的服务人员才可以取下机壳的顶盖。

对于带有此标记的组件，可以在系统运行（带电）时取下。在取下组件之后，请当心机壳内组件插孔连接器上暴露的危险电流及电压。当机壳接通输入交流电时，请勿用手指、工具和外部金属物体接触裸露的插孔连接器。身体接触这些电流和电压非常危险，并可能导致严重的人身伤害或伤亡！只有合格的服务人员才能取下这些组件。

ENGLISH	WARNING!	IMPORTANT SAFETY NOTICES

This system complies with safety standard IEC/EN60950. To ensure safe operation and to guard against potential shock hazard or risk of fire, the following must be fulfilled:

- This system features auto-ranging power supplies. Ensure that your power source is within the correct operating range of voltage and frequency, as required by the system.
- Each chassis in this system must be electrically grounded by connecting the input power cord(s) to a correctly wired and grounded power outlet.
- The input power cord(s) supplied with this system must be wired as follows:

Live = Brown　　Neutral = Blue　　Earth = Green/Yellow

Completely disconnect all input AC power cords from chassis before removing top cover from chassis. Failure to do so will expose dangerous electric currents and voltages. Physical contact with these electric currents and voltages is extremely dangerous and may result in severe physical injury or death! Only qualified service personnel should remove the top cover from the chassis.

Modules marked with this symbol may be removed while the system is operating (powered). After removing a module, beware of dangerous electric currents and voltages that are exposed on the module receptacle connector inside the chassis. Please keep fingers, tools, and foreign metal objects away from the exposed receptacle connector while the chassis has input AC power applied. Physical contact with these electric currents and voltages is extremely dangerous and may result in severe physical injury or death! Only qualified service personnel should remove these modules.

Dveous/MX User Guide

Introduction to Dveous/MX

Getting Started

Transforms

Channel Menus

Global Menus

Building & Running Effects

Motion Control

Saving & Recalling Effects

OrbitalFX

Quick Contents

Section 1:
Introduction to Dveous/MX

Abekas

Introduction

This manual is primarily a reference manual for the Dveous/MX user. However, Sections 2 through 9 contain various "how-to's" that may be used as a tutorial for less experienced users.

As an introduction to the Dveous/MX, Section 1 describes in general terms the function of each Control Panel element including the buttons, softkeys, soft-knobs, numeric keypad, LEDs, joystick and the user interface (menus).

In Section 2 you will learn how to start up on the Dveous/MX, select sources, delegate and configure channels, use the joystick effectively and how to create a simple effect.

Section 3 introduces DVE transforms. It explains the upstream/downstream hierarchy of the transform groups.

Section 4 contains explanations of the functions on all the menus displayed by the channel menu buttons. This includes 2D and 3D Transforms, Border/Crop, Color Corrector which includes Color Modify, Corner Pinning, Input, Key, Light Source, Multi, Motion Detect, Output, Texture and UltraWarp.

Section 5 describes the functions controlled through the Global Menu buttons, i.e. functions that are not specific to the local (1A, 1B, 2A, 2B) channels.

Section 6 discusses effect and timeline concepts. It details using the Timeline Control buttons and TimeFrame™ Effects Editor to create and run timeline effects.

Section 7 explains how Dveous/MX can be set up to make transitions from one keyframe to the next and thereby modify the look of an effect.

Section 8 discusses the saving and recalling of effects that have been created using Dveous/MX. It also contains information on Disk Menu functions.

Section 9 explains the use of OrbitalFX™, a Dveous/MX feature which provides a creative method for altering Dveous/MX parameters.

This manual assumes that you have a properly installed and configured system, and some basic knowledge of the purpose of a digital effects system in a production environment. See the Dveous/MX Technical Guide, P/N 9100-0402-01, for a detailed description of setup procedures and configurations.

Manual Conventions

- Control Panel keys are called “buttons” to avoid confusion with the video keying process.
- Names of Control Panel buttons appear in bold capital letters: the **3D TRANS** button, the **RUN** button, etc.
- Menu names are capitalized: the Warp menu, the Input menu, etc.
- Menu functions are noted in bold upper and lower case italicized letters: the ***Locate*** function, or simply ***Locate***.
- Names of function parameters are noted in bold upper and lower case letters: **H Loc**. or **Z Rot.** If a parameter can only be changed by turning its associated softknob, it is noted by the parameter name and the word “softknob”: the **Loop** softknob. Otherwise, softknobs appear in left to right order as softknob A, softknob B, softknob C, and softknob D.
- “Select” means to highlight a menu item for use by pressing or toggling its menu softkey.
- A sequence of button presses is noted by long dashes (—) separating the buttons: **MODIFY — ALL — ENTER**. Holding one button down and pressing another appears with a plus (+). For example, holding **CLEAR** and pressing the **3D TRANS** button appears as **CLEAR + 3D TRANS**.
- Depending on your input and channel configurations, a channel can process a video signal, a key signal or a drop shadow. This manual uses the word *image* generically to indicate the channel's source (video, key, or shadow).

Twin Channel Power

Historically, the term *channel* has been used to describe the input/output of the video processing path and the key processing path. Since the key signal only exists to identify where the active, manipulated video is located, its processing path is taken for granted. Therefore, the term *channel* in this kind of system only refers to the number of video images involved. So, for example, a two channel system or two channel effect would mean that two video images are involved.

Dveous/MX channels

Channels in Dveous/MX are not limited only to video, but can process video, key or drop shadow. This flexibility comes from Dveous/MX's *twin channel* processing ability that gives you the power of two DVEs in a single twin system.

A Dveous/MX system comes in three configurations depending on the number of HD channels present—dual twin, single twin system or one channel. All systems are dual twin in SD mode. In the one channel system, the only channel (1A) takes in a full bandwidth video signal; the second channel (1B) is not available. In the single twin system, the main channel (1A) takes in full bandwidth video. The second channel (1B), called the twin, can process one of three paths—a video signal, a key signal or a drop shadow.

The dual twin system contains an additional channel pair: one for video (2A), and the second (2B) for video, key or drop shadow processing. This configuration that gives you the power to rotate and warp a drop shadow, or fly it around, completely independent of its key signal and the main video.

Dveous/MX twin channel configurations

Whether you work in the single twin channel configuration or the dual twin configuration, the channel configuration remains the same. The A channel is the video channel, and B is the twin channel. You can use these channels in three different modes:

A = Video, B = Video The transform boards independently process two video sources. All transform, warp, and lighting effects are adjustable separately on each video channel. The DVE processor internally generates the key signals associated with these signals. The key signals are full screen "white" with adjustable opacity and edge softness.

A = Video, B = Key The transform boards independently process one video and one key source. All transforms are available to the key signal independently from the video. The key signal also has clip, gain, and phase controls.

A = Video & Key, B = Shadow In this mode, the transform boards derive a full bandwidth drop shadow from the key input. It processes the video and key (which are tied together) in one path, with independent control of the shadow in the other path.

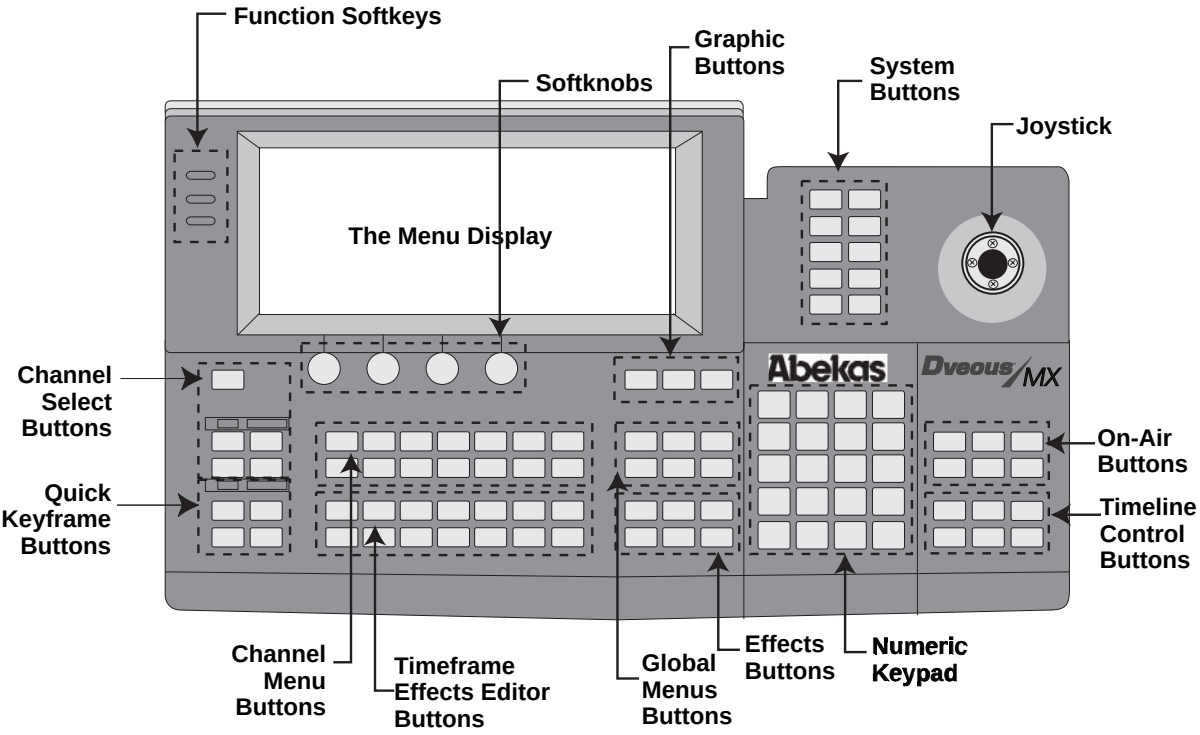
Dveous/MX Single channel configuration

In the single (1) channel configuration of the HD mode, only the A channel is active. There is no B or twin channel. Therefore, certain functionality is not available in this HD configuration and is so noted throughout this manual.

A=Video, B=not available The transform board processes a video source. All transforms, warps and lighting effects are adjustable for this video channel. the DVE processor internally generates the key signal associated with this signal. The key signal is full screen “white” with adjustable opacity and edge softness.

Control Panel Navigation

On the illustration below, you will see that the buttons on the Control Panel are grouped by functionality. The buttons are also color coded, to help you visually connect the button with its function. Generally speaking, green is for menus, blue for keyframes and timelines, and red for control functions. These buttons will be described in more detail later.



LED Lights

Each channel select button and menu button has an LED light to tell you what channel(s) are in use and in which menus you've adjusted values. Also, all the On-Air buttons have LEDs to tell you instantly what is in use.

Menu Buttons

By pressing the menu buttons you bring up the menus which make it possible to create effects: warps, rotations, sizing, borders, etc. There are two groups of menu buttons: the Channel Menu buttons and the Global Menu buttons.

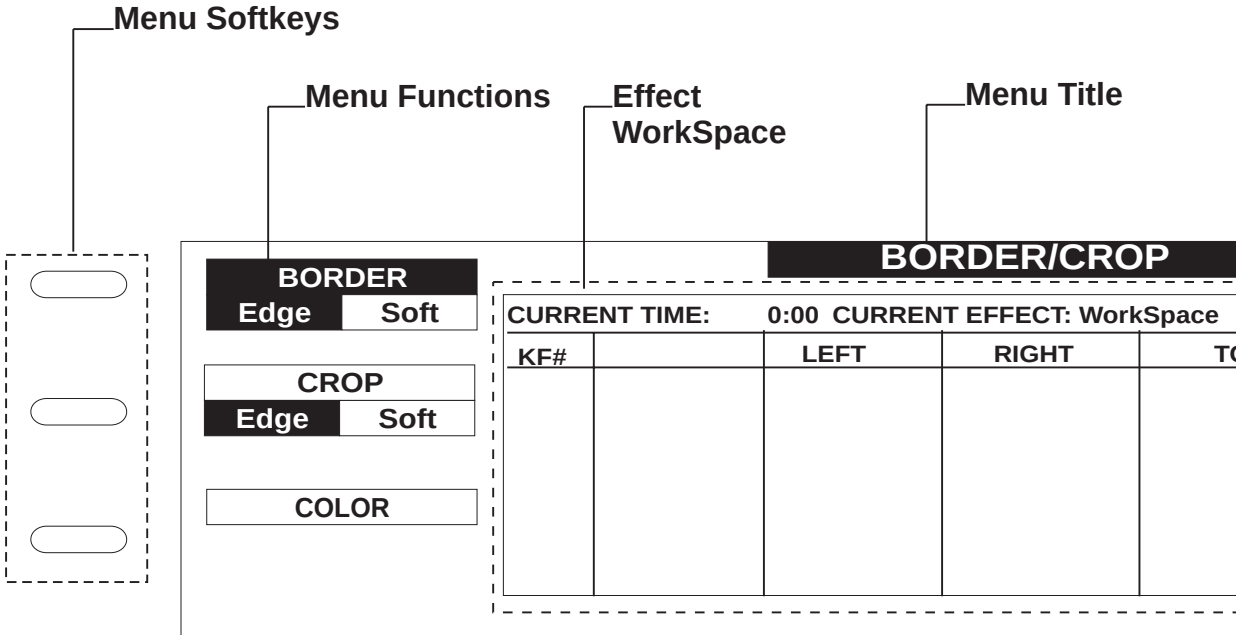
- Channel buttons let you transform your image in either the Source or Target plane.

- Global buttons let you transform the effect in Global space. We'll talk about three dimensional spaces later, because understanding nested 3D space is the key to making the effects you want.

Hint: You can adjust the menu to display in black on white (Normal) or white on black (Inverted). To do so, go to the Engineering menu. Toggle the ***Setup*** function to *Panel*. Then adjust the **Display** softknob to Normal or Inverted. This Engineering menu also contains the panel backlight and bias controls for adjusting display brightness and contrast.

Working In a Menu

Look at the *Menu Display Example* illustration below. Here, the Border/Crop menu is shown as a typical menu display. Each of the items called out in the illustration either lets you adjust menu values or tells you information about the status of Dveous/MX.



Menu Title

Tells you where you are (in which menu).

Menu Functions and Function Softkeys

Each menu function on the menu display has a button next to it called a *softkey*. Press the softkey to activate a function and/or to toggle through any function options related to it. In the Border/Crop illustration, the black highlight indicates that Border function is selected and its Edge option is activated.

Function Parameters and Parameter Softknobs

Determine the look of each function you select by adjusting the values in the Function Parameters at the bottom of the menu display. There are three ways to change values for the parameters:

- Using the Softknobs – Twist the Parameter Softknobs associated with the function. Use this method to interactively see how adjusting that parameter affects the image. Using the softknob adjusts the values slowly and with incremental control. You can twist the softknob until the image looks good to you and leave it.
- **Using the Joystick** – Twist the joystick and/or moving it horizontally or vertically, to change a parameter and thus modify an effect.
- **Entering Values into the Keypad** – Enter values in the numeric keypad, then press A, B, C or D to place those values into the associated parameter field. Use this method if you know specifically what values you need to use to create your effect.

Example: In the Border/Crop example, since the Border Edge is active, twisting one of the four softknobs would adjust values for either the left, right, top or bottom of the border edge. For example, you could twist the B softknob to adjust the Right border edge to .5000 or you could enter .5 in the keypad, then press B.

Note: In HD mode the numbering system is based on 16 x 9 and in SD it is based on 1 x .75. These different numbering systems can affect the softknob ranges differently.

Keypad Buffer

The keypad buffer information tells you what you have entered in the numeric keypad. It can display any of the following information:

- **Empty buffer** – this is the default state of the buffer. No information is waiting to be entered into any parameter.
- **A number** – this value is waiting to be entered into a parameter by pressing A,B,C or D.

- **The word *Clear*** – you pressed Clear in the keypad to erase, or clear, the value you had entered into the buffer. Or Clear has been used to reset default values for one or more parameters.
- **The word *Align* plus a value** – you pressed Align to set a parameter value.
- **The +/- symbol** – displays when inverting a value.
- **The message *Set Path* and a list of the motion path types** – you pressed Path. The motion path types that you can apply to keyframeable effects appear: JP (jump), LN (linear), SL (smooth linear), T1 (TCB1), T2 (TCB2) and SM (smooth).

The Workspace Display

The workspace display gives you information about the currently selected menu effect. Although the appearance of the display can vary from menu to menu, most are similar to the one in Border/Crop.

- **Current Time** – Gives the current position on the effect's timeline, noted in seconds:frames. Dveous/MX also transmits this timecode value to an edit controller if Offset (in the **Remote Setup** menu) is set to 0:00
- **Current Effect** – Shows the number of the effect that has been copied off the register and placed into the Workspace for viewing. When you power up or reboot Dveous/MX, the default effect, Workspace, will show as the current effect until you recall or save an effect.
- **Effect KFs** – Shows the number of remaining keyframes in use by the current effect. There is a maximum of 300 keyframes available per effect.
- **KF#** – Indicates the keyframe (KF) number in the effect timeline. Up to seven keyframes can be displayed at a time. Parameter values for each keyframe are listed in the columns to the right of the KF#. Column headings echo the Function Parameters in the current menu.
- **Editing Commands** – When you press one or more of the TimeFrame Effects Editor Buttons, you are giving Dveous/MX an editing command. Dveous/MX prints those commands as a string of text at the bottom of the Workspace display. If Dveous/MX recognizes the command string, it confirms by displaying ***OK*** at the end of the string after you press **ENTER**. If it does not, an error message appears after the unrecognized sequence.

The Master Channel

The available channels are determined by the Dveous/MX configuration and mode (SD or HD). In SD mode you will have four (1A, 1B, 2A and 2B) channels that are affected by menu settings. In HD mode you will have either one (1A) or two (1A and 1B) or four (1A, 1B, 2A and 2B) channels that are affected

by menu settings. Because it can get confusing moving around channels, the Master Channel tells you at a glance which channel's menu settings you are looking at. By default, Dveous/MX assigns 1A as the Master and in one channel HD mode, 1A is always the Master channel.

The Master Channel does not have any greater importance than any of the others, but exists for display purposes only. You can designate any channel as the Master, depending on whose menu settings you want to know. For example, if 2A is the Master Channel, any menu you press shows the settings for 2A.

However, whatever changes you make to the Master Channel affect all other delegated channels, with all offsets between channels being maintained when you enter the new value.

To make another channel the Master Channel, quickly double press that channel's button. Its number now appears in the menu display as the Master Channel and all menu setting will reflect it.

Note: The Master channel display does not appear when you are using the Global menus, since then all channels are being affected equally and the Global channel is, in effect, the Master channel.

Channel Delegation Status

This part of the menu display tells you which channels (including the **GLOBAL** button) you have delegated, or selected for activity. The delegated channel(s) are highlighted black.

Non-standard Mode Indicators

If one or more non-standard modes are in use, Dveous/MX tells you by displaying its mode in the menu display. The five non-standard modes are as follows.

- **Joystick Lock** – Locks the joystick to the controls of a menu. When you go another menu, after pressing **JOYSTICK LOCK**, the joystick adjusts parameters from the previous menu, giving you twice the control over affecting an image.
- **NoXpnt** – Tells Dveous/MX to ignore the inputs originally programmed for an effect and run it using the currently selected inputs.
- **Frozen** – One or more On-Air Freeze buttons is on. On-Air freezes override any timeline effect freeze. The channel input stays frozen no matter what effects you recall or run.

- **Dissolve** – The On-Air Dissolve mode is on. Transitions are from the current DVE setup to the first keyframe of the current effect.
- **Delegated** – Only delegated channels move when you run an effect. This mode is selected in the **PERSONALITY** menu (under Misc.) by adjusting ***Run Mode***.

The Joystick

The joystick gives you immediate visual feedback about how a menu's settings affect the image. By moving the stick you can instantly move or resize an image, or see what different border color or warp values will do, for example.

Joystick control directional controls are indicated in the menu display. Up/down arrows indicated vertical movement, left/right arrows indicated horizontal movement, while a circular arrows means twist the stick.

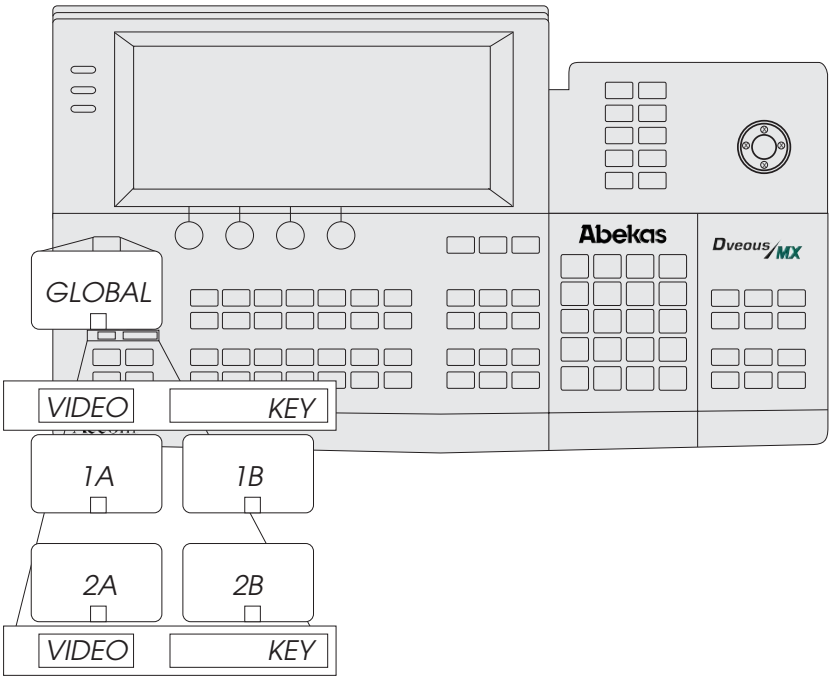
Channel Select Buttons

The five Channel Select buttons delegate, or select, channels for transforms. You can have more than one channel delegated at a time except, of course, in single (1) channel HD mode where 1A is the only channel used.

- **1A** and **1B** – delegate the single twin channel number pair.
- **2A** and **2B –** delegate the second dual twin channel pair.
- **GLOBAL –** delegates the Global channel, which affects every channel equally.

The LED displays above and below the “A” Channel Select buttons read ***VIDEO*** to indicate that these channels are video channels. The displays above and below the “B” Channel Select buttons read either ***VIDEO*** or ***KEY,*** to let you know how you have configured your channels in the KEY menu Setup mode.

For detailed information about delegating and configuring channels, see *Delegating Channels* and *Configuration* in Section 2 – Getting Started.

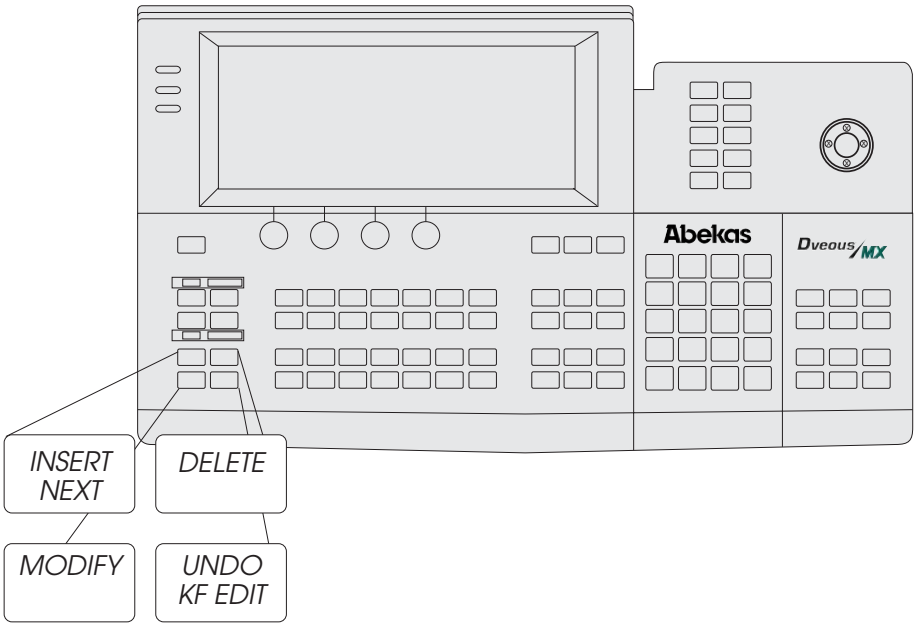


Quick Keyframe Buttons

The four Quick Keyframe buttons only affect the current keyframe (the one that the effect is currently on). These are "single press" buttons that need only to be pressed once to carry out a keyframe command. (Other command buttons allow multiple presses for different functions.)

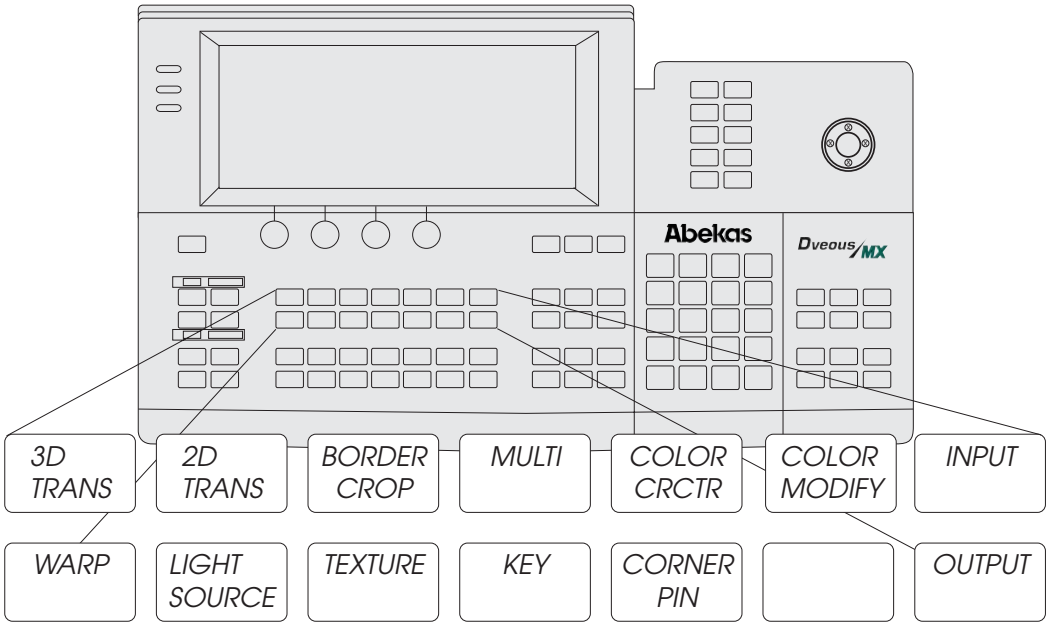
- **INSERT NEXT –** inserts a keyframe after the current keyframe.
- **DELETE** – removes the current keyframe, including its duration, from the timeline.
- **MODIFY** – changes the current keyframe to reflect any parameter changes.

- **UNDO KF EDIT** – "undoes" the last keyframe edit you made.



Channel Menu Buttons

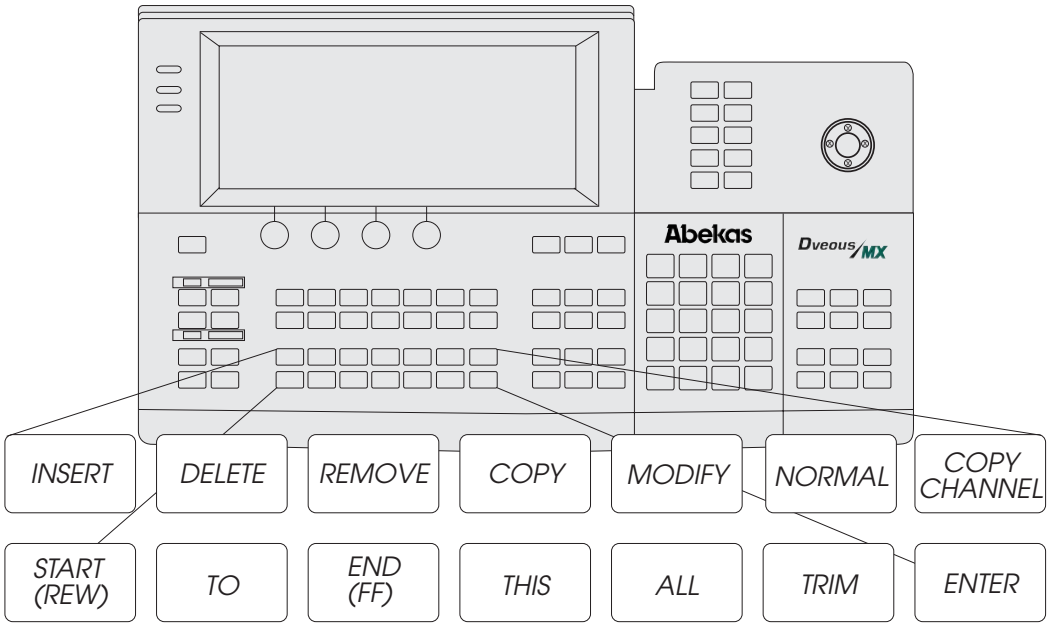
The 13 Channel Menu buttons access menus that affect the delegated channel images on the Local Source and Local Target planes.



- **3D TRANS** – affects the image in three dimensional space. Position the image in Source or Target space, then resize it, rotate it or moves its axis.
- **2D TRANS** – affects the image in two dimensional space. Use this menu to change horizontal and vertical size and to position the image upstream (Pre controls) or downstream (Post controls) of all 3D controls.
- **BORDER/CROP** – adds borders to the image and adjusts their color and size. Or, you can crop the image edges.
- **MULTI** – gives your images a mosaic quality or tiles them. Use this button for accessing motion detect.
- **COLOR CRCTR** – gives you independent color correction for RGB and YUV components. Includes adjustments for gain, gamma and knee.
- **COLOR MODIFY** – allows special effect coloring such as solarizing, luma tinting and chrominance and luminance inversion.
- **INPUT** – selects the video source for the delegated channel, chooses the videos placement on the near or far side of the channel and allows you to inverts freeze or blur the source.
- **WARP** – adds "Salvador Dali-like" effects: ripples, swirls, rings, page turns, etc.
- **LIGHT** SOURCE– adds realistic lighting effects to your image. Dual color lighting can be positioned in 3D space. Choose flood, bar or spotlight effects.
- **TEXTURE** – adds surface textures that combine beautifully with light sourcing and warps for realistic effects. Add textures from incoming video or from the internal texture framestore.
- **KEY** – Sets the configuration for the B (or twin) channel to process video, key or shadow. You can also adjust key and shadow clip and gain settings. **This is not applicable in the single (1) channel HD mode.**
- **CORNER PIN** – contains two functions. The Corner Pinning controls lets you pick up and tack any or all corners of the image into any four cornered position. Great for effects like placing video into a billboard. The AutoCube function prepares Dveous/MX to build any polygonal shape: cube, slab, etc.
- **OUTPUT** – selects the transparency and key priority of the A channel over the B channel.

TimeFrame Effects Editor Buttons

The 14 blue TimeFrame Effects Editor buttons perform editing commands. Pressed alone, or in sequence, they insert, delete, edit, and copy keyframes in effects.

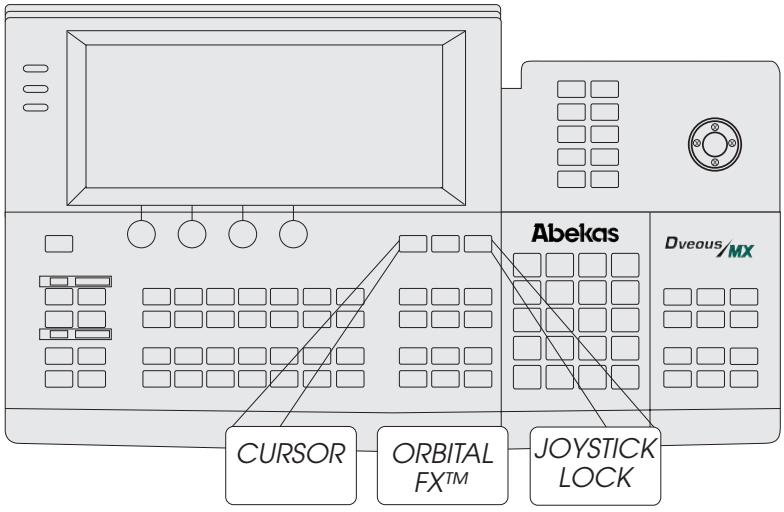


- **INSERT** – inserts a keyframe into the current time.
- **DELETE** – deletes a keyframe and moves the next keyframe to current time.
- **REMOVE** – removes a keyframe not effecting the timeline.
- **COPY** - copies specified keyframe to another location.
- **MODIFY** - replaces current keyframe with the contents of the Workspace.
- **NORMAL** – returns Dveous/MX to various default conditions through single or multiple presses. For detailed information about Normal settings, see *Getting Back to Default* in the Getting Started section.
- **COPY CHANNEL** – copies current attributes, specific keyframes and entire timelines from one channel to another.
- **START (REW)** – Moves current time to 0:00.
- **TO** – moves current time to the start of keyframe number (designated after the TO) in the master delegated timeline.
- **END (FF)** – moves current time to last keyframe (end of effect).
- **THIS** – moves current time to the beginning of the current keyframe in the master timeline.
- **ALL** – selects all
- **TRIM** – allows you to maintain the relative offset of parameter values between keyframes

- **ENTER** – tells Dveous/MX to perform the command(s) you just pressed. For example, to delete a keyframe, you press DELETE–ENTER. To copy all keyframes, press COPY–ALL–ENTER.

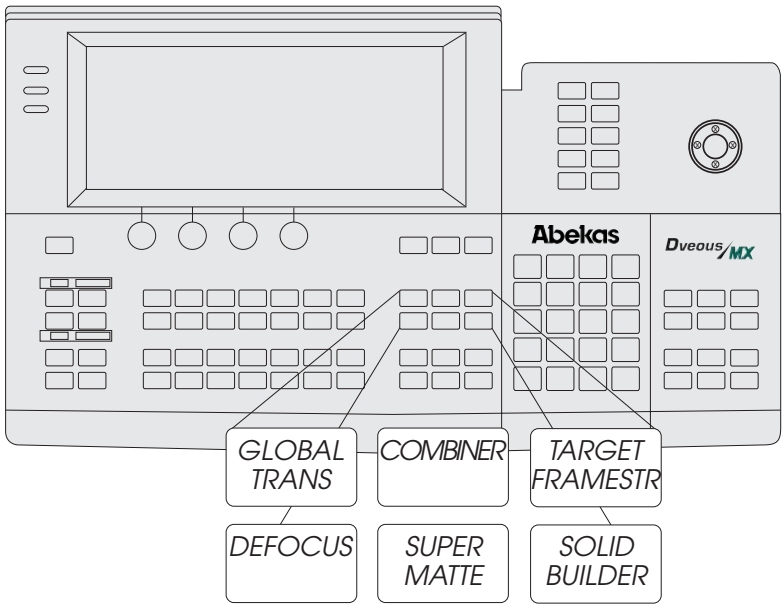
Graphics Buttons

- **CURSOR** – displays cursors and channel identifications on the Dveous/MX output so that you can see the center of rotation for the selected 3D space. There are separate cursors for Source and Target space, as well as for Global space. Each channel's cursors are a unique color for easy identification.
- **ORBITAL FX** – accesses the OrbitalFX menu. OrbitalFX provides a method to continuously alter selected Dveous/MX parameters. See the OrbitalFX section for details.
- **JOYSTICK LOCK** – dedicates, or locks, the joystick to the current menu control. This control is handy, for example, if you want to continue using the joystick for 3D positioning of the image while at the same time using the softknobs in the Warp menu.



Global Menu Buttons

The six Global Menu menus control functions that are not specific to the individual DVE channels 1A, 1B, 2A, 2B.



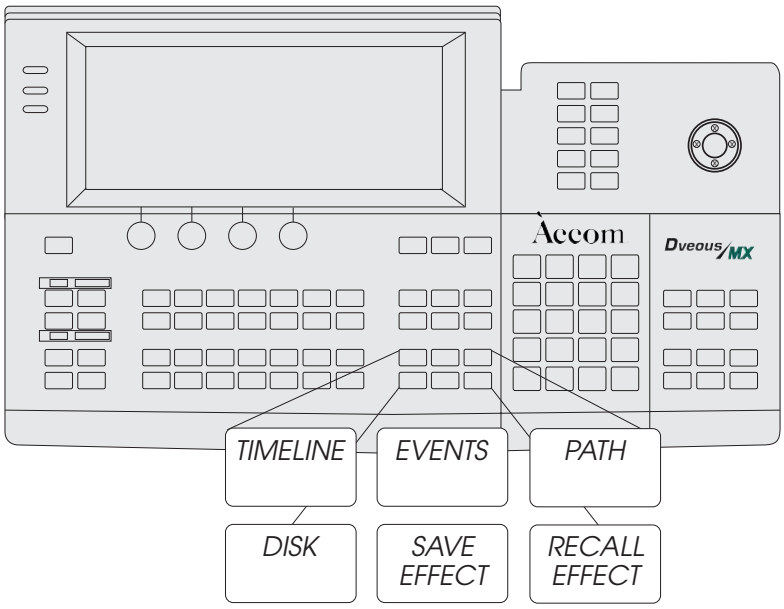
Note: In order to save effects created in these menus, you must delegate the GLOBAL channel.

- **GLOBAL TRANS** – locates, rotates and resizes all delegated channels as if they were tied together as one unit. Transformations applied here happen downstream of any Local Source or Local Target Transforms.
- **COMBINER** – sets a background source and adjusts its priority with the foreground video. Also sets the key priority between the Target Framestore and, if you have a dual twin system, between the two twin channel processors.
- **TARGET FRAMESTR** – used in the creation of effects such as decays, sparkles, smears and composite montages.
- **DEFOCUS** – lets you soften any input, which you can then route through the Color Corrector, background or directly into the channels.
- **SUPER MATTE** – creates two-color washes or backgrounds. The Super-Matte patterns can be used to generate a key signal that is fed to the B side of a twin channel, or used to simulate a wipe pattern. When multiplied, the patterns can also be used to create textures. Spiral FX parameters are accessed here.

- **SOLID BUILDER** – quickly builds a slab or cube. It uses 3 channels, 1A, 1B and 2A to create six-sided solids.

Effects Buttons

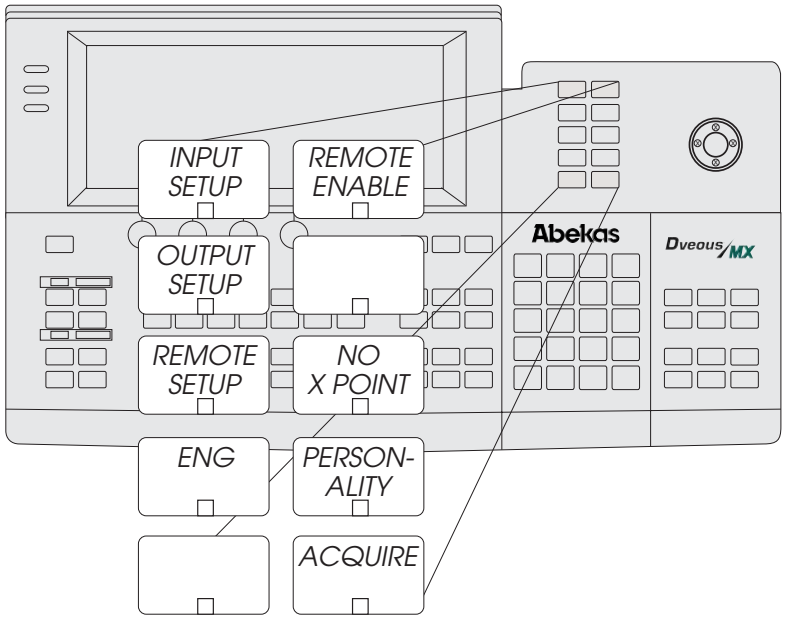
These six buttons access menus that set controls for the effect as a whole.



- **TIMELINE** – gives you a visual representation of the timeline and sets the duration of effects and keyframes.
- **EVENTS** – triggers one of the four GPI outputs.
- **PATH** – used to adjust the user path settings (TCB1, TCB2).
- **DISK** – saves to and copy from a floppy disk or hard drive.
- **SAVE EFFECT** – lets you quickly save an effect by number.
- **RECALL EFFECT** – lets you recall and browse existing effects, name or delete them. Set Loop and Protect flags here as well.

System Buttons

The System buttons access menus to setup the Dveous/MX inputs, outputs, remote setups, and enables.

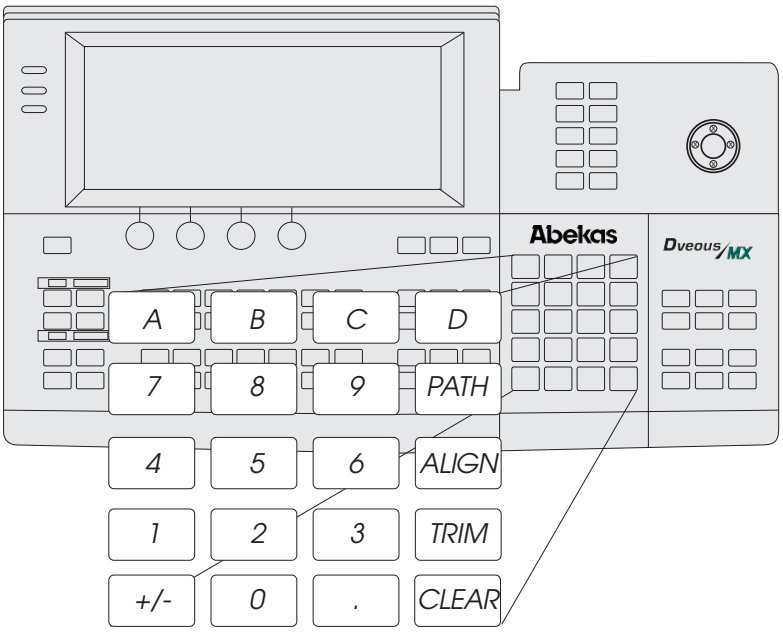


- **INPUT SETUP** - controls blanking adjustments for input video as well as Matte enables for each input.
- **REMOTE ENABLE** - controls 232/422 protocol and setup for each of the three remote ports.
- **OUTPUT SETUP** - controls output timing and blanking. Also configures SD/HD format, reference and video select to each of the six Dveous/MX outputs.
- **REMOTE SETUP** - sets up GPI input and output configurations.
- **NO XPOINT** – tells the system to ignore the inputs originally programmed for an effect and run it using the currently selected inputs.
- **ENG** – You can adjust the menu to display in black on white (Normal) or white on black (Inverted). To do so, press the **ENG** button to go to the Engineering menu. Toggle the ***Setup*** function to *Panel*. Then adjust the **Display** softknob to Normal or Inverted. You can also turn the *Bkgd* on or off. Also controls First Birthday (ram reset) as well as software install parameters.
- **PERSONALITY** - controls anamorphing, axis mode, run mode and field dominance settings.
- **ACQUIRE** - used in multiple control panel systems to delegate which panel is the "master" control panel.

Note: See Technical Guide for more information on all system buttons.

Numeric Keypad

Use the numeric keypad to enter effect numbers, keyframe numbers, parameter values, etc.

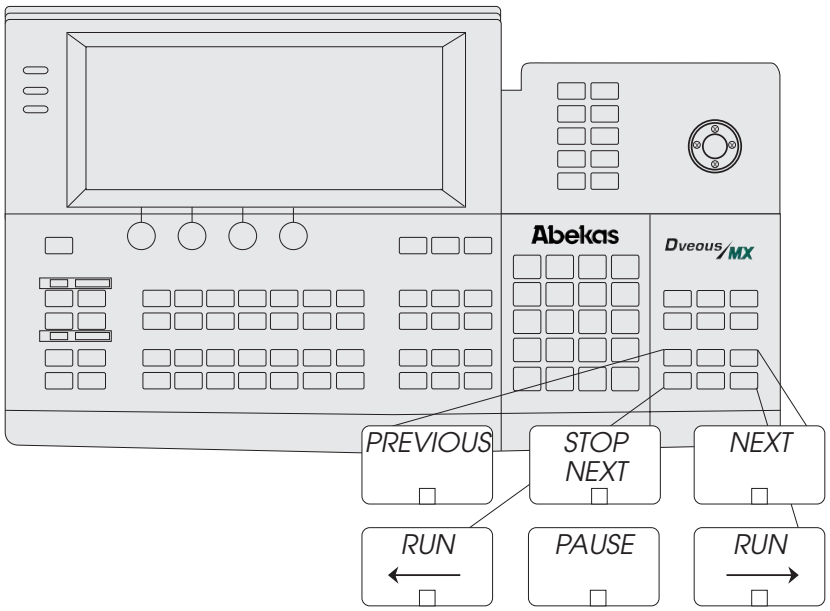


- **A, B, C,** and **D** – enters values into their corresponding softknob settings. For example, to enter the value 17 in softknob A, enter 17 on the keypad, then press **A**.
- **+/-** – inverts existing softknob values or lets you enter a negative number.
- **PATH** – toggles the available motion paths and lets you assign one to a function parameter. Also used to select individual files under Disk Menu.
- **ALIGN** – adjusts parameter values to their nearest one-eighth of the range for that parameter. Also used to select all files under Disk Menu.
- **TRIM** – trims parameter values by the amount entered in numeric keypad.
- **CLEAR** – erases the contents of the keypad buffer, the contents of the keyframe edit dialog, or resets entire softkeys or menus to default.

For complete details on entering values, see *The Numeric Keypad* in the Section 2: Getting Started.

Timeline Control Buttons

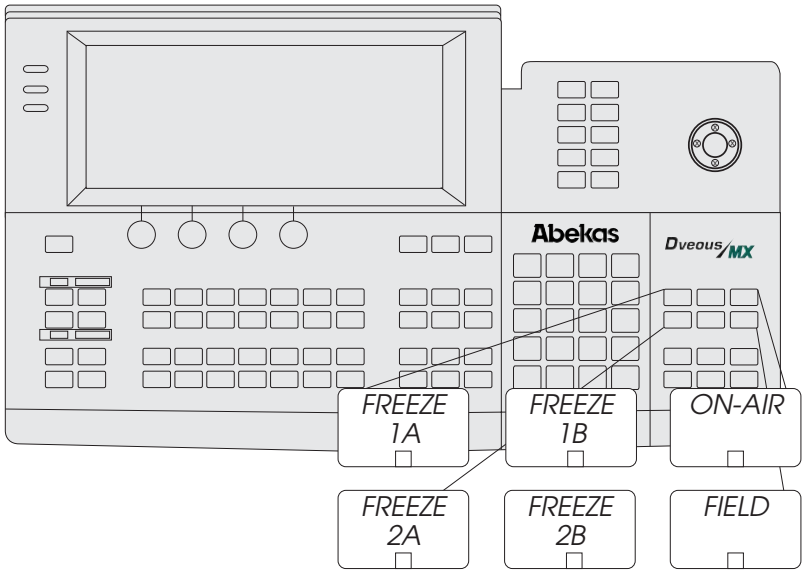
The six Timeline Control Buttons let you run through an effect.



- **PREVIOUS** and **NEXT** step through keyframes of the Master channel one at a time, either forward (NEXT) or back (PREVIOUS).
- **STOP NEXT** pauses the effect at the next keyframe.
- **RUN** ➔ runs the effect forward.
- ➔ **RUN** runs the effect backward.
- **PAUSE** pauses the effect when pressed. To continue running the effect, press **RUN** ➔ or ➔ **RUN**.

On-Air Buttons

Use these six On-Air buttons when operating Dveous/MX live. Press the **ON-AIR** button to bring up the On-Air menu and put the keypad in on-air mode. The four freeze buttons let you freeze the input to each channel independently. Once you have frozen an input, you can set up the freeze type for each input. Parameter softknobs for each channel appear when you press **FIELD**, allowing you to select the freeze type (field 1, field 2 or frame).



Note: On-air freezes override any timeline effect freeze: the channel input stays frozen no matter what effects you recall or run. This on-air freeze is different from the freeze setting in the Input menu, which lets you apply a freeze on a keyframe-by-keyframe basis.

Key Signal Paths

Understanding the video and key signal flow will help you better understand how Dveous/MX works. This discussion outlines your options for channel configurations and includes block diagrams that show the system video and key signal paths in more detail.

Configurations

Dveous/MX has three (3) configurations, all with SD and HD capabilities. In all configurations the SD mode works as dual twin channels. In HD mode you can have one channel, single twin or dual twin modes. In any twin configuration there exists both channel A and channel B. The A video transformation path is a full bandwidth video channel. The B path, or *twin channel*, is a full bandwidth video channel, however, it can also process key signals (luminance only). This B channel configuration gives Dveous/MX three modes of operation: video/video, video/key or video-key/shadow.

Video Only

This exists only in the one channel HD mode. The A channel processes full bandwidth video and the B channel is not accessible. The DVE processor internally generates the key signal associated with the one channel.

Video+Video - single or dual twin

This mode lets you use the B channel as a video channel. The channel has independent control of all keyframe parameters including motion paths, warps, light sources and textures. The DVE processor internally generates the key signals associated with these channels. The key signals are full screen “white” with adjustable opacity and edge softness.

Video+Key - single or dual twin

In this mode, you can manipulate the key signal with all keyframe parameters, including motion paths, warps, light sources and textures, independently of the video. This mode is useful for compositing operations.

Video-Key+Shadow - single or dual twin

This mode splits the B channel. The key portion is tied to the A video channel, and you can offset the key position with sub-pixel timing. You can manipulate the shadow portion of the B channel independently of the video+key channel, with all keyframe parameters, including motion paths, warps, light sources, and textures. This is a full bandwidth drop shadow.

Additional Channels

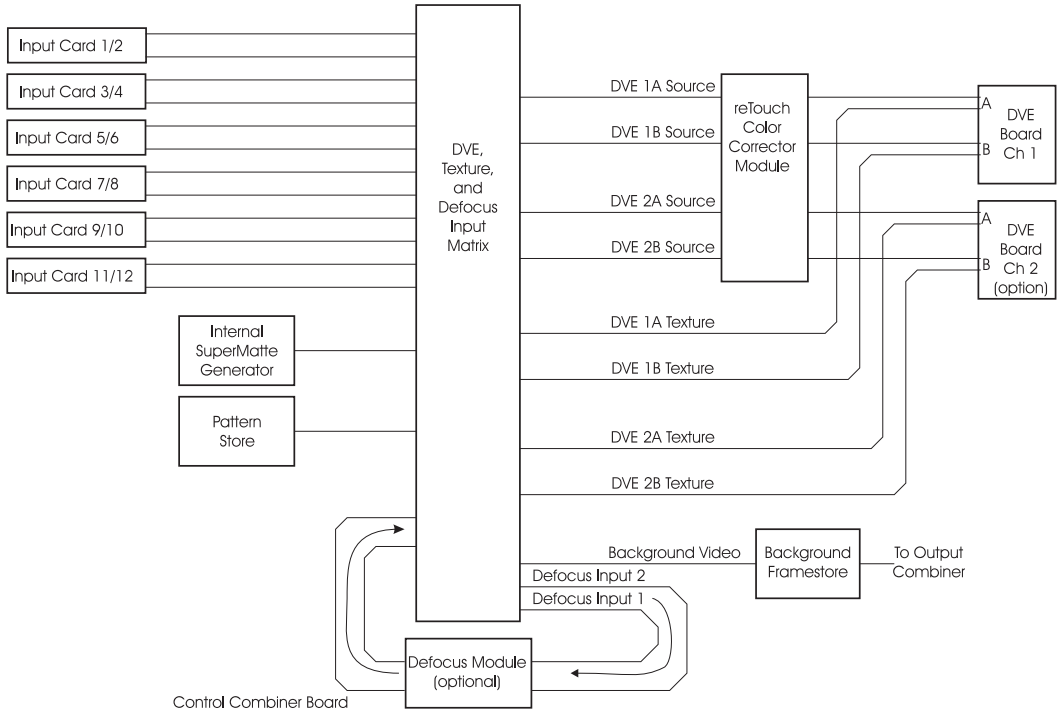
A dual twin system provides another set of A and B channels. The configurations' possibilities are the same as with the single twin system and are described above.

You also have the option of using one twin channel to process two video signals, and processing one video and one key signal on the other. Another configuration is four channels of video, each with independent control. This configuration lets you use Dveous/MX as a four channel, real-time video image processor.

Signal Paths

Inputs

Dveous/MX accepts up to twelve inputs. The twelve inputs (inputs 1-6 are standard, 7-12 optional), the internal SuperMatte generator, and the Pattern Framestore are all available as inputs to the Defocus function. The Defocus menu lets you select two input signals for defocusing. All inputs are SDI inputs conforming to SMPTE 292M or SMPTE 259M.



The twelve video signals, the SuperMatte generator, the Pattern Framestore, and the Defocus outputs are all available as DVE/texture matrix outputs. The nine matrix outputs feed two video/key sources (A and B) and two texture sources (A and B) to the transform boards, as well as to the background. Note that you can use any source anywhere, and in more than one place.

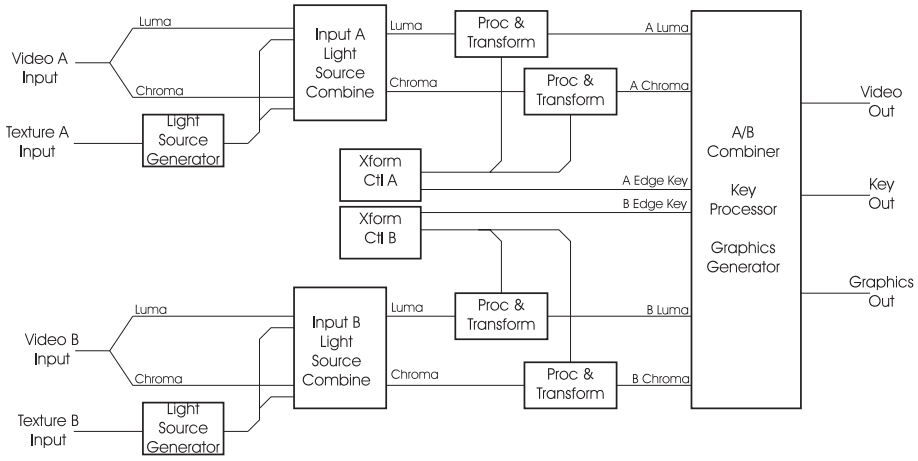
The DVE video/key sources feed the reTouch™ Color Corrector function. The Color Corrector output supplies the transform boards' input. The transform boards use the texture signals to modify the light source generator.

DVE Paths

As previously discussed, you can configure the DVE in three modes: Video+Video, Video+Key, and Video-Key+Shadow. This discussion includes a drawing for each mode.

Video+Video Mode In the Video+Video mode, the transform boards process the video in identical paths. It applies the texture input to the light source generator, then combines that output with the video input.

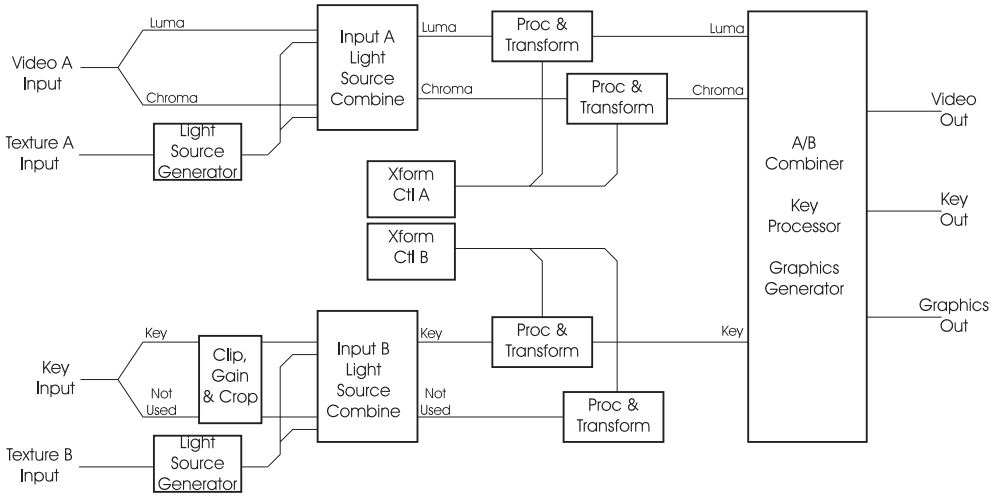
There are two transform controllers: one is dedicated to the A input, the other to the B input. Each transform controller generates an edge key signal that defines the transformed raster edges. The transformed outputs are then combined into a single video and key output and sent to the Combiner for output processing. The combining process uses either a fixed priority (A over B or B over A) or a Z based priority, where each image's position in 3D space determines the priority. The graphics output has axis cursors for the A and B channels.



Note: In one channel HD mode the processing is the same as above just without the Video B input.

Video+Key Mode The Video+Key mode differs from the Video+Video mode only in that the board processes the B input as the key signal, with additional clip, gain and H phase adjustments. Note that the "chroma" part of the B circuitry is not used since key signals are monochrome.

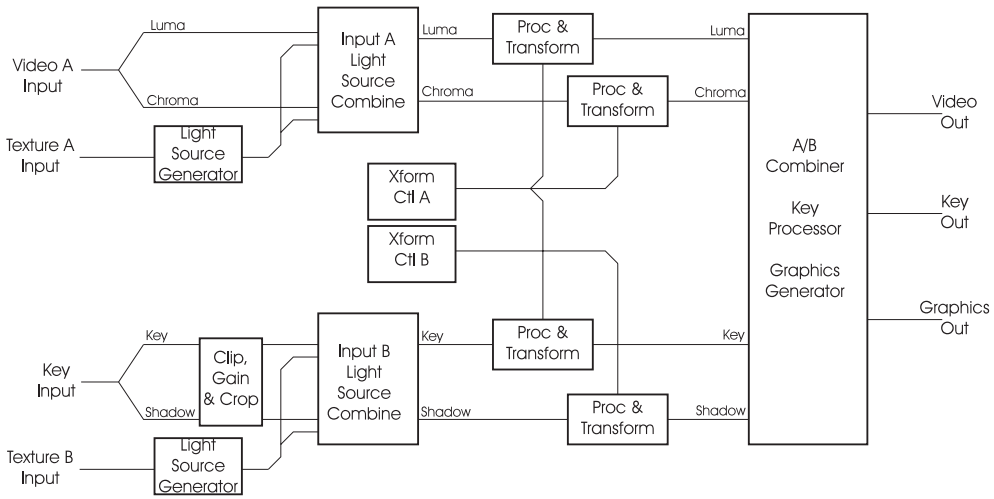
The A/B Combiner's key output is a transformed version of the input, and not the raster-based signal seen in the Video+Video mode. The B key transform is independent of the A video transform.



Note: This cannot be done in one channel HD mode.

Video-Key+Shadow Mode The Video+Key+Shadow mode is similar to the Video+Key mode, except the "chroma" part of the B circuitry is used to process a full bandwidth shadow signal.

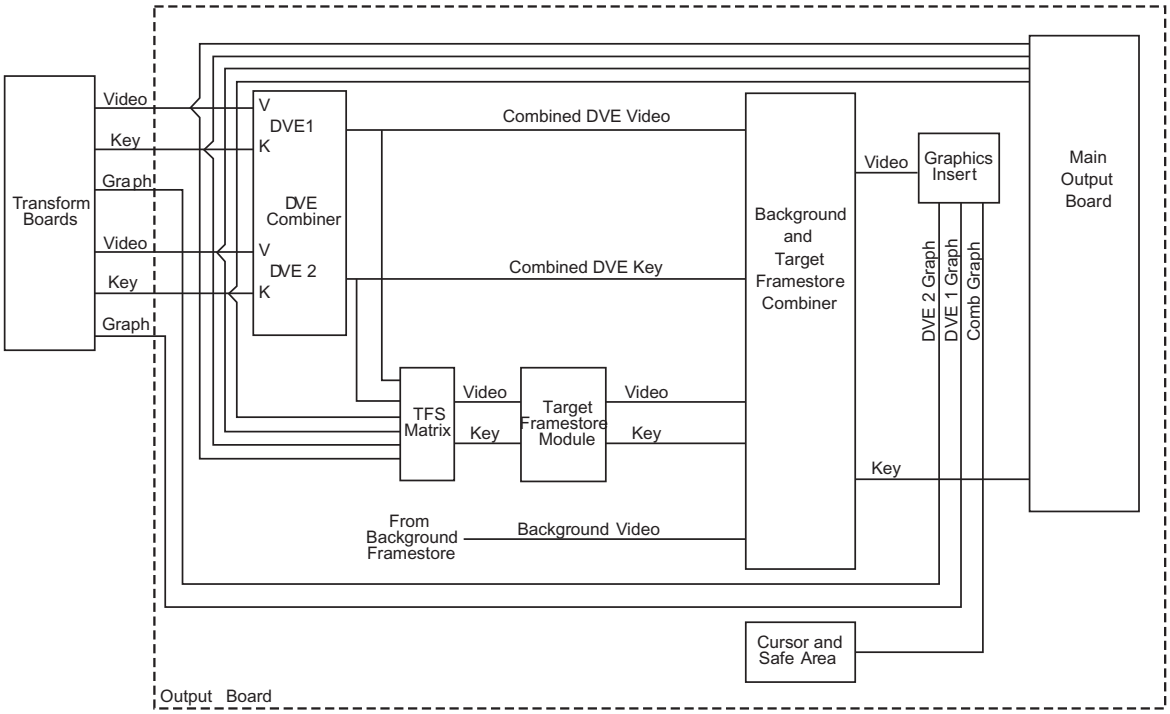
The transforms for the A channel also control the key path. The B channel transforms control the shadow signal, allowing completely independent control of the shadow. The A/B Combiner key output is a combined key/shadow signal.



Note: This cannot be done in one channel HD mode.

Outputs

The Transform boards supply three signals to the combiner: video, key, and graphics. The video signal is either a transformed version of the A input (Video+Key or Video-Key+Shadow modes) or of the A and B inputs combined (Video+Video mode). The key signal is either a transformed version of the B input (Video+Key or Video-Key+Shadow modes) or an internally generated edge key (Video+Video mode). The graphics signal contains the cursors and channel IDs. The video and key signals connect to both the DVE Combiner and the TFS matrix.



The DVE Combiner combines the two DVEs' video and key signals into a single set of video and key signals.

The TFS (Target Framestore) matrix lets you select the source for the TFS Dveous/MX. Choose either DVE, or the DVE Combiner output.

The Output Combiner combines the DVE Combiner output, the Target Framestore, and the background.

System Description

Dveous/MX is a Universal Format Digital Video Effects system available in three configurations that can work in SD or HD and is software configured in the user interface.

Dual Twin SD Configuration
SD Mode (1A/1B,2A/2B)—Two DVE channel pairs of SD with each pair capable of working as a Video +Video (V/V)pair, or as a Video +Key (V/K) pair, or as a Video +Key+Shadow (VK/S). All functionality is available in SD Mode.

HD Mode (1A)—One DVE channel (1/2 of a single twin) of HD capable of working in Video mode only. No Input Key available. Therefore, Video +Key (VK), Video +Key +Shadow (VK/S) and Solid Builder functionality is not available in HD Mode.

Single Twin HD Configuration
SD Mode (1A/1B,2A/2B)—Full functionality as described above.

HD Mode (1A/1B)—One DVE channel pair of HD capable of working as a Video +Video (V/V)pair, or as a Video +Key (V/K) pair, or as a Video +Key+ Shadow (VK/S). To create six sided cubes with Solid Builder will require two recording passes in HD Mode.

Dual Twin HD Configuration
SD Mode (1A/1B,2A/2B)—Full functionality as described above.

HD Mode (1A/1B,2A/2B)—Two DVE channel pairs of HD with each pair capable of working as a Video +Video (V/V) pair, or as a Video +Key (V/K) pair, or as a Video +Key+Shadow (VK/S). All functionality is available in HD Mode.

Standard Features

Dveous/MX's standard features include the following:

- Channel configurations. One of the features that makes Dveous/MX unique is its flexible channel configuration. Dveous/MX is available in three configurations that can work in SD or HD and is software configured in the user interface.
  - Dual Twin SD Configuration
  - Single Twin HD Configuration
  - Dual Twin HD Configuration

  Please refer to the Video and Key Signal Paths section for detailed information.

- The A video transformation path is a full-bandwidth video channel. The B channel can process key signals (luminance only), but is also a full bandwidth video channel. This lets Dveous/MX operate in four modes:
  - Video—you can control one video channel.
  - Video/Video—you can control the twin channels independently.
  - Video/Key—you can control the key channel independently.
  - Video-Key/Shadow—the key follows the main video channel, with independent control of the shadow.

  Please refer to the Video and Key Signal Paths section for detailed information.

- Dveous/MX supports twelve Standard Definition (SMPTE 259M)or High Definition (SMPTE 292M)10 bit serial inputs. Six inputs are standard and six are available as an option.
- The Dveous/MX chassis supports six Standard Definition (SMPTE 259M) or High Definition (SMPTE 292M)10 bit serial outputs. They are selectable as combined video, combined key, channel video or channel key outputs.
- Multiple Rates and Formats -Dveous/MX supports both 525 and 625 formats in SD mode. HD modes supported include 720,1035 and 1080 at both progressive and interlaced formats.
- SuperShadow—a full–bandwidth drop shadow.
- An internal Combiner that keys up to two DVE channel pairs and the Target Framestore over a background.
- A Background Framestore that can feed live or frozen images to the internal Combiner as a background.
- SurfaceFX, which combines the powerful texture and 3D light sourcing tools. There is an internal Pattern Framestore for generating video test patterns and textures. You can use any input to the routing matrix, including video and key inputs and the SuperMatte generator, as the source for a texture.
- SuperMatte color generator for creating dual color washes and patterns. The reTouch Color Corrector offers wide range color correction and modification in either RGB or YUV space for each DVE channel input independently.
- The Target Framestore lets you create trails with variable decay (with either video or a matte fill), sparkles with variable size and intensity, motion blur and montage (drop-ins) with selectable priority for live video over or under existing drop-ins. This feature also stores Z, or depth, information, letting you build solids easily and move live images in front of or behind the frozen images automatically.

- Four independent input freeze buffers (two for video, two for textures) per DVE channel pair.
- UltraWarp advanced image warping feature.
- The Defocus feature allows wide band defocusing of the luminance or chrominance in an image, or both. It is dual channel: you can use it on one or two video signals, or on one video and one key signal or the background. Defocus controls include independent horizontal and vertical defocus settings.
- The Dveous/MX Control Panel has a high resolution graphics display and a 3.5"high density (1.44MB)MS-DOS format floppy disk drive. You can use the floppy drive to store and recall effects and engineering setup files.
- Remote interfacing capabilities. Dveous/MX can control external switcher aux buses with frame accurate front/back switching. Three RS422 serial interfaces let external devices, such as a switcher or edit controller, control Dveous/MX. An additional RS422 port is used for connecting to the Dveous/MX Control Panel. There are also 12 GPI (General Purpose Interface) inputs and 12 GPI outputs.
- The included CPL Protocol interfaces Dveous/MX to switchers using GVG Control Protocol Language and is available on any of the 3 remote ports.
- Internal 16 X 11 crosspoint matrix for source routing.
- Non-volatile Hard Drive for storing effects.

Options

- Additional transform boards can be installed for extra HD channels.
- Another input card can be added to increase the total inputs from 6 to 12.
- An external floppy drive can be connected to the Dveous/MX control panel when console mounting blocks access to the on-board drive.
- Additional control panels can be connected to the Dveous/MX chassis to allow control from other users. Only one panel can be active at one time.

More Features

Hard Drive Storage The Dveous/MX comes with a hard drive for storing effects, JPEG files and engineering setup files.

Storage and Recall The Dveous/MX Control Panel has a high resolution graphics display and a 3.5" high density (1.44MB) MS-DOS format floppy disk

drive. You can use the floppy drive as well as the hard drive to store and recall effects, JPEG files and engineering setup files.

External Devices Dveous/MX can control external switcher aux buses with frame accurate on-edge switching. Serial interfaces let external devices, such as a switcher or edit controller, control Dveous/MX. There are also 12 user configurable GPI (General Purpose Interface) inputs and 12 GPI tally outputs.

Memory Battery backed up memory lets you store 100 effects on-line, using a pool of over 1700 keyframes. The maximum number of keyframes per effect is 300.

Picture Transforms Picture transform flexibility controls include 2D and 3D positioning and rotation, size, aspect, skew, and perspective in Source, Target, and Global space. There are six different motion path types that you can assign to parameters on a keyframe basis.

Creative Power Tools Dveous/MX comes standard with such powerful features like corner pinning, SuperMatte backgrounds, a full selection of warp shapes and realistic 3D lighting. The light source feature is a true 3D model that lets you add a light effect to either or both channels. Textures work with the light source feature: Dveous/MX can modify the light source based on the texture signal, making true shading and highlights possible throughout a transformation. Textures also work with some warps to let you create, for example, textured warps. You can use a live video source for the texture, a image from the Pattern Framestore, a stored JPEG file or the output of the Defocus module.

Target Framestore Target Framestore effects include trails with variable decay (with either video or a matte fill), sparkles with variable size and intensity, motion blur, and montage (drop-ins) with selectable priority for live video over or under existing drop-ins. This feature is based on Z, or depth information, letting you move live images in front of or behind the stored images automatically.

Quick Contents

Section 2: Getting Started

Abekas

Getting Started

This section outlines the basic steps for operating the Dveous/MX. You may also find it helpful to work through the examples in this section. By doing this you can familiarize yourself with the Control Panel and some basic operations. Unless otherwise noted the operation is the same in either SD or HD mode.

This section is divided into the following parts:

- Powering Up – how to turn your system on. How to deal with having several Control Panels plugged into your system.
- Selecting Formats – how to switch your Dveous/MX between SD and HD operations.
- Selecting Sources – how to select external and internal inputs, and assign Near/Far designation for the channel(s). Also, how to invert, freeze and soften the source video.
- Adjusting Input Sources – how to fine tune your inputs: inputs with different aspect ratios, blanking width compensation and motion detect.
- Delegating Channels – what is delegation and how to do it.
- Copying Channel Settings – copying information across channels.
- Channel Configuration – how to assign one of the three processing modes (video+video, video+key or video-key+shadow) to the twin (B) channel.
- Getting Back to Default – using the **CLEAR** and **NORMAL** buttons to reset the system.
- The Numbering System & Numeric Keypad – understanding how numeric values affect your image and how to use the numeric keypad functions.
- The Joystick – full details on operating the joystick, plus a few cool tricks.
- Creating a Simple Effect – step by step instructions. Plus how to read the LEDs on the menus buttons.
- Modifying an Effect – step by step instructions.
- Saving Effects – overwriting and recalling effects.
- The Effects Menu – using the **RECALL EFFECT** button to name and delete effects, browse the effects register and set Loop and Protect flags.

Powering Up

This section assumes that your Dveous/MX system is properly installed and configured. For details on installation and engineering configuration, see the Dveous/MX Technical Guide, P/N 9100-0402-01.

1. The main power switch is located in the back of the Chassis toward the center on the right side. Push the switch toward the "1" to turn it on.

   When you power up Dveous/MX, channel 1A appears full size at the video output, with input 1 as its source video. The key output is a full raster white field that duplicates the size of the transformed source video. You can change this default by reconfiguring the channels, as described later in this section.

2. If the cable connecting the Chassis to the Control Panel is less than 33 ft. (10 meters), the Control Panel can get its power from the Chassis, and boots up at the same time as the Chassis.

   If the Control Panel cable is more than 33 ft. (10 meters) long, you need an external power supply for proper operation. The external supply (Abekas® P/N 2800-0063) DIN connector plugs into the Control Panel connector labeled "POWER." The external supply AC cord then plugs into a standard AC Mains socket to power the Control Panel. (The external power supply is autoranging, accommodating 90 to 264 VAC at 47 to 63 Hz.)

3. When both the Chassis and Control Panel are powered up and running, the local 3D Trans menu appears in the Control Panel display.

Note: If the Chassis and Control Panel are not communicating, the menu display either remains blank or displays the message: "No chassis detected, check power and cable". If this is the case, check the cable connection at both the Control Panel and the Signal Chassis.

Note: Also be aware that the message: "No chassis detected, check power and cable" appears during bootup. This is normal.

4. If a single Control Panel is connected to the Chassis, its **ACQUIRE** button LED lights automatically.

Dveous/MX is now ready to use. See the discussions in this section for information on input and output setups, channel configurations, and creating simple effects.

Powering Up Multiple Control Panels

If there is more than one Control Panel connected to the Chassis, you must make one the dominant Control Panel. This procedure is performed by first un-acquiring all the Control Panels, then acquiring the dominant one and saving this configuration in the Engineering menu. This way, each time you boot up Dveous/MX, the dominant Control Panel always has control.

1. Press ENG to go to the Engineering menu.
2. Unacquire all the Control Panels: Press and hold **ACQUIRE** on each remaining Control Panel. The Chassis menu function appears in the menu display.
3. While holding **ACQUIRE**, toggle the ***Chassis*** softkey so that **Chassis** is not highlighted in black. All Control Panels are now unacquired.
4. Acquire the dominant one: Press and hold the **ACQUIRE** button on the Control Panel you want to be dominant. The Chassis menu function appears in the menu display.
5. While holding **ACQUIRE**, press the ***Chassis*** softkey so that **Chassis** is highlighted in black. The Control Panel is now acquired and its **ACQUIRE** button is lit.
6. Press *Setup* and toggle it to *Panel*. Ensuing unacquire and acquire commands will now be remembered for bootup.

Temporarily Changing Dominance of a Control Panel

If you temporarily want to make another Control Panel the dominant one, simply un-acquire the current dominant Control Panel and acquire the new one.

Selecting Formats

Dveous/MX can operate in either SD (Standard Definition) or HD (High Definition) Mode. Once the machine is configured it will remember the settings and always boot back to that mode unless changed.

Note: At factory shipment or after a First Birthday (see section 3 of Dveous/MX Technical Guide, P/N 9100-0402-00, for more information on First Birthday) the machine will boot up to SD Mode.

To change the format, go to the Output Setup Menu and using the config softkey select (highlight) either SD or HD. When you have changed the format you will be prompted with the following message: "chassis reboot required to change format from SD to HD". You must now power cycle the main power on the chassis.

After the power cycle, Dveous/MX will boot up to the selected format and automatically change the aspect ratio to 1 x .75 for SD or 16 x 9 for HD. You must now return to the Output Setup Menu, highlight the Config softkey and, using the D softknob (Format), select the particular format of SD (525/625) or HD (720, 1035, 1080).

You must also be sure that the reference and all inputs match the selected format and frame rate. Dveous/MX is now ready to operate in your selected SD or HD format.

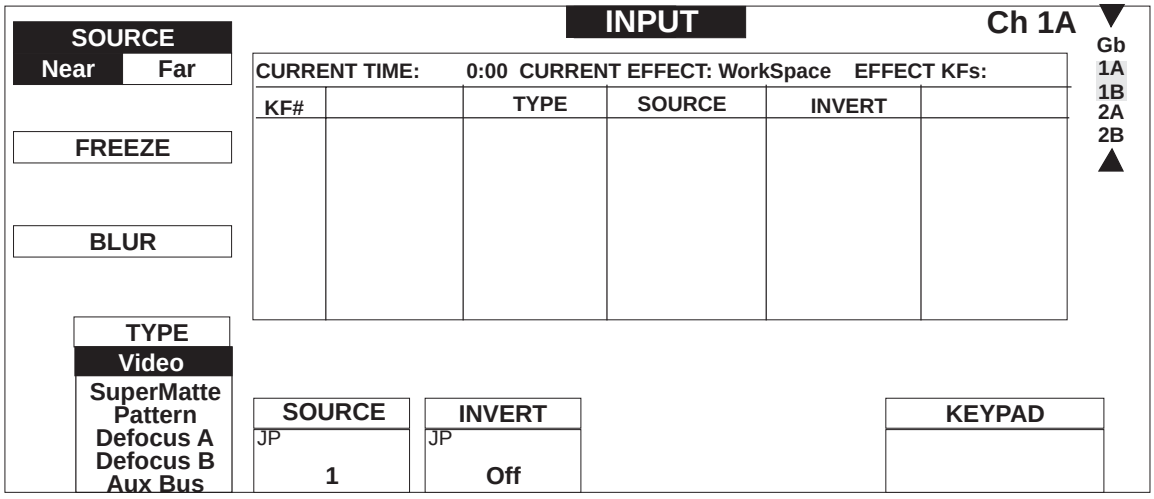
Selecting Sources

Dveous/MX has either 6 or 12 source inputs and up to four independent DVE channels in HD mode and always has four independent DVE channels in SD mode. An internal 16 input by 11 output crosspoint matrix lets you route all internal video, key, and texture signals.

External inputs are all available as DVE channel sources. Internally generated channel sources are the SuperMatte (color background) generator, the output of the Pattern Framestore, and the outputs of the wide range Defocus module. Since the Defocus module is dual channel, you have a total of 10 available sources in a Dveous/MX system (16 with the second input module option installed).

You can select any source as an input to any of these internal destinations: the four DVE channels (if dual twin system), the texture processors associated with each channel, the Background Framestore, and either input of the dual channel Defocus module.

Selecting a Channel Input Each DVE channel has a "near" and a "far" side. You can select a different source for each side, or you can send the same source to both. The near side is always the one 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 can be used to pre-select the next source to air.



1. Delegate the channel for the source input by double pressing a Channel Select button (1A, 1B, 2A or 2B.) Make sure only one channel is delegated (unless you want to route the same video to multiple DVE channels.)

2. Press **INPUT** in the Channel Menu buttons to bring up the Input menu.
3. Toggle the ***Source*** softkey to Near to select a source for the near side of the channel. The **Type**, **Source** and **Invert** softknobs appear.
4. Use the Type softknob to select one of six source modes: Video lets you select one of the 12 external inputs using the *Source* parameter. Pattern brings in the output of the Pattern Framestore. SuperMatte selects the SuperMatte generator. Defocus A and Defocus B input the corresponding output of the Defocus module. Aux Bus enables the XPNT parameter, which lets you select the crosspoint from an external switcher auxiliary bus.

   You have now performed the basic steps to select source video. If you wish, you can further define source characteristics. The steps below will tell you how to invert the video, freeze it and soften it.

Inverting, Freezing and Softening the Source Video

1. Invert the source image horizontally, vertically, or both. The Invert softknob is **Off** by default, giving the image normal orientation. H inverts the video horizontally, V inverts the video vertically, and H+V inverts the image in both directions.
2. Freeze or strobe a source in the channel, by pressing the ***Freeze*** softkey to bring up the Mode and Strobe softknobs.

   The Mode softknob selects the freeze mode: **Off** (no freeze, i.e., live video); Fld 1 (freezes field one of the input video); Fld 2 (freezes field two of the input video); or Frm (freezes the full frame of the input video).

   The Strobe softknob lets you freeze the image indefinitely (Infinity), or create a strobe effect. To create a strobe effect, select the freeze duration, between 0-254 frames, with the Strobe softknob. Dveous/MX holds the frozen image for that duration before grabbing the next freeze. For example, with a freeze set to strobe every 10 frames, Dveous/MX freezes and holds an image for 10 frames, grabs a new image and freezes it for 10 frames, and so on.

3. Without using the Defocus feature, you can soften the source image to a certain extent. Press the ***Blur*** softkey to adjust the horizontal and vertical blur settings. The default is 0 (no blur); 100 gives the maximum blur.
4. Toggle the ***Source*** softkey to *Far* and repeat steps 4 through 7 for the far of the channel.
5. Toggle the ***Source*** softkey again to highlight both ***Near*** and ***Far*** if you wish to have the same image on both sides.

Note: With a freeze enabled on a channel, you cannot see new sources as you select them. Also, with a freeze enabled, the same video appears on both the near and far sides of the channel.

Adjusting Input Sources

The following pages cover source adjustments concerning

- Different aspect ratios using Anamorph
- Blanking
- Motion detect

Inputs with Different Aspect Ratios

Normally, Dveous/MX expects input video to use the 16:9 aspect ratio if working in HD and the 1 x .75 (4 x 3) aspect ratio if working in SD. However, if you are using video with a different inherent aspect ratio, you can change the expected aspect ratio of Dveous/MX to allow internal transforms, warps, crops, etc. to match the specified aspect ratio.

To change the aspect ratio, go to the Personality menu. Press the ***Anamorph*** softkey and adjust the H and V softknob, then press ***Anamorph*** again to confirm. For example, with an aspect ratio of 4x3, change H = 4 and V = 3.

Be sure to pick numbers that match the inherent aspect ratio of the video you are processing. For High Definition television video one uses numbers such as 16x9 and 1 x .5625. For normal television video, numbers such as 1 x .75, 4x3 and 8x6 work fine. For film, 16x9 is common. Using numbers that do not match the aspect ratio of the video being processed results in distorted video when rotated.

The status of Anamorph changes to match any effect that you load. Note, however, that Anamorph values are not keyframe attributes and you cannot change them within an effect. You can apply new Anamorph values to an existing workspace effect. Dveous/MX re-scales all affected parameters as you enter Anamorph values. Simply re-save the effect to keep the Anamorph settings.

Blanking Width Compensation

Dveous/MX let you compensate for input video with overly wide blanking, which results in horizontal and/or vertical black edges on the input video. To adjust the blanking, go to the Input Setup menu and press the ***Channel*** softkey. Use Input to select the video source. Then select either **Normal** or **Crop** (A57) with the Blanking softknob. Adjust the horizontal and vertical edges with the H Blank and VBlank softknobs.

Note that these adjustments apply only to video routed to the DVE channels and not to video selected as a background source.

Normal Mode Allows you to set different blanking compensation for each input individually. Normal maintains a true aspect ratio for the image by stretching the aspect ratio of the input video so that the blanking edges are not visible. The advantage to this method is that each input can have its own blanking compensation. The disadvantage is that the video is now stretched slightly, preventing you from transitioning or match-framing back to the original, unstretched image, either in Dveous/MX or in some external device, without seeing a visible difference between the two images.

Crop (A57) Blanks all inputs by the same amount by simply cropping in the edges to remove the offending blanking areas. The advantage to this method is that all images maintain their original aspect ratios so there is no visible difference between the original and the cropped image, allowing match-framing between the two. A disadvantage to this method, however, is that blanking compensation applies to all external inputs equally, and not individually.

Note: If you will be using Solid Builder to construct slabs and need to match unity size, you must use Crop (A57) mode.

Motion Detect

Among powerful Dveous/MX features is the sensitivity of its motion detector. Motion Detect looks at the amount of motion in the input video and uses this information to produce a clean image in later manipulations of size, location or rotation. Usually, Motion Detect's default setting will suffice, but depending on the kind of video you are bringing in, you may want to adjust settings when configuring Dveous/MX.

Note: Due to the inherent technical nature of progressive (frame based) HD video formats, Motion Detection is not required. Therefore **Motion Detect** is only applicable when using interlaced HD video formats. If working in progressive HD formats, Motion Detection defaults to frame mode and the Mot Det menu has no effect on the video.

Note: Don't confuse the motion created by running an effect on Dveous/MX with motion in the input video. It is only the input video that the motion detectors are concerned with. An exception is that Dveous/MX border width changes are considered input video motion.

Frame Based Precision To understand the power of Motion Detect, it is important to note that Dveous/MX is a frame based digital effects system: it uses a full frame (as opposed to a single field) of information when transforming the video to the size and position you define with the transform controls.

Transferring a full frame of video requires using information from two consecutive fields. When motion exists in the video, the two fields can be different, since they are scanning at different time intervals. Trying to reconcile them into a single image can result in chaos. What you see on the screen is loss of picture quality or visible banding. Motion Detect eliminates these resolution problems by telling the system how much or how little motion to look for so that the fields combine into a clear image.

Accessing and Adjusting Motion Detect

To access Motion Detect, press the **MULTI** button on the Control Panel. The Multi menu appears. Press the ***Motion Detect*** function softkey to enable to **Mot Det** parameter.

Mot Det

The **Mot Det** softknob lets you select one of sixteen settings. These settings represent a range of sensitivity to motion from low (frame) to high (field), and ranging from 1-14 in between. 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.

Varying Amounts of Motion in the Same Video

With Motion Detect, you can also deal with varying amounts of motion within the video by defining settings between frame and field, For example, in video of a car driving past an otherwise stable shot, Dveous/MX would use the frame mode on the static parts of the video, and the field mode on the parts that contain motion, adapting the mode to the video.

Forcing frame mode

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.

Forcing Field Mode

Sometimes it is useful to force field mode. It is possible for motion in the video (particularly when using animated computer generated graphics that contain a lot of the same color) to fool the system into thinking no motion has occurred. Select field in these cases to eliminate any artifacts you may see.

The Motion Detect Settings

Motion Detect's 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.

Default:	9
Range:	Frame - 1 - 14 - Field
Align:	None

Note: The Personality menu's Film mode can override this setting. See the Film Mode text for details.

Film Modes

There are two different issues dealt with in the Personality menu's Film mode: How to handle motion detection of incoming video (*Mode)* and how to transition between keyframes when running an effect *(Motion)*. The two settings do not interact with each other, but are used in similar situations. Access these settings by pressing the **PERSONALITY** button then the ***Film*** softkey.

Note: Some film mode settings are not applicable on certain format selections of Dveous/MX.

Video Types

There are four types of video Dveous/MX may encounter:

- *Static Video* - No movement in the video at all.
- *Field Based Video* - Each field has the possibility of different video from the preceding and next field. This is the typical video produced by video cameras and such.
- *Frame Based Video* - This is video that has motion only at frame changes; there is a frame of two identical fields (with respect to motion) followed by another frame with two more identical fields, with the possibility of motion occurring between the two frames.
- *3:2 Pull-Down Video* - This is mostly a 525 function. The idea is to convert film's 24Hz frame rate to 525 video's 60 fields per second rate by alternately recording three or two fields for each film frame. The end result is a pattern of three identical fields followed by two, then three, etc.

Film Settings

Mode The Mode setting determines how Dveous/MX should treat incoming video. It acts as an override to the Multi menu Motion Detect setting.

Normal With Mode set to *Normal*, the Multi menu Motion Detect setting controls how Dveous/MX interpolates two fields of video when creating the manipulated video output.

Film With Mode set to *Film*, Dveous/MX takes advantage of the fact 50% of the time the current field was preceded by an identical field (with respect to motion), and forces the Motion Detect setting to Frame. The other 50% of the

time it uses the actual Motion Detect setting. Set *Phase* to match the field dominance of the video (1/2 frames or 2/1 frames).

3:2 With Mode set to *3:2*, the Multi menu Motion Detect setting is ignored, forcing Field motion.

Note: While the Mode setting does affect the Multi menu Motion Detect function, there is no indication that this is happening when looking at its setting.

Keep in mind that none of these settings have an affect on the picture until you compress or expand it; at unity size the interpolator is inactive. Leaving **Mode** set to *Film* with incorrect video results in a venetian blind or tearing look to the video that is hard to miss.

The other thing to remember is that whatever you set this for, it applies to all channels and all video signals that are passing through them. This setting (like the other Personality settings) is not remembered as part of an effect.

Motion The Motion setting controls how Dveous/MX creates the video in between keyframes when running an effect.

Normal With Motion set to *Normal*, Dveous/MX creates 60 positions per second (one per field) when running an effect.

Film *With Motion set to* Film, Dveous/MX creates 30 positions per second (one per frame). The idea is to use this with frame based video so that the effect does not create any motion between two fields that are the same. Selecting *Film* causes a stuttering frame-based look when running an effect. The *Phase* setting is to ensure that Dveous/MX jumps to the next frame at the same time the video does, matching its field dominance.

3:2 With Motion set to *3:2*, Dveous/MX creates 24 positions per second (one per film frame). This works the same as the *Film* setting, with the exception that the *Phase* setting has five values. Choose one to exactly match the effect's running with the video's position in the 3/2 (five field) pattern.

Delegating Channels

When you want to make changes to a channel, or to several channels, you have to delegate them first. You can have one, several or all channels delegated at once. Changes you make in a menu affect the delegated channel(s). Use the five red Channel Select buttons to delegate channels. Please refer to the graphic on the following page.

While not technically regarded as a channel, the **GLOBAL** button can also be delegated, since it has its own timeline. Delegate the **GLOBAL** "channel" when making changes in one of the Global menus.

One channel is always the Master channel. The channel you choose to be the Master will be one whose menu displays in the Control Panel. If you are only working on one channel, then that channel is automatically the Master and appears delegated as well. If you are working on more than one channel, one must be chosen as the Master. The Master does not have priority over the other delegated channels, but changes you make to the Master will affect other delegated channels, all offsets being maintained.

Offsets Between Delegated Channels All offsets between channels are maintained when entering changes to the Master channel. For example, let's say both channels 1A and 1B are delegated, with channel 1A designated as the Master. Channel 1B has a .25 Z rotate value, and Channel 1A has a .5 Z rotate value. Since 1A is the Master channel, the menu shows a .5 Z rotate value. Increasing the rotation value maintains the relationship of the two channels, and rotates them as a single unit. As a result, channel 1A always has .25 more rotation on it than 1B.

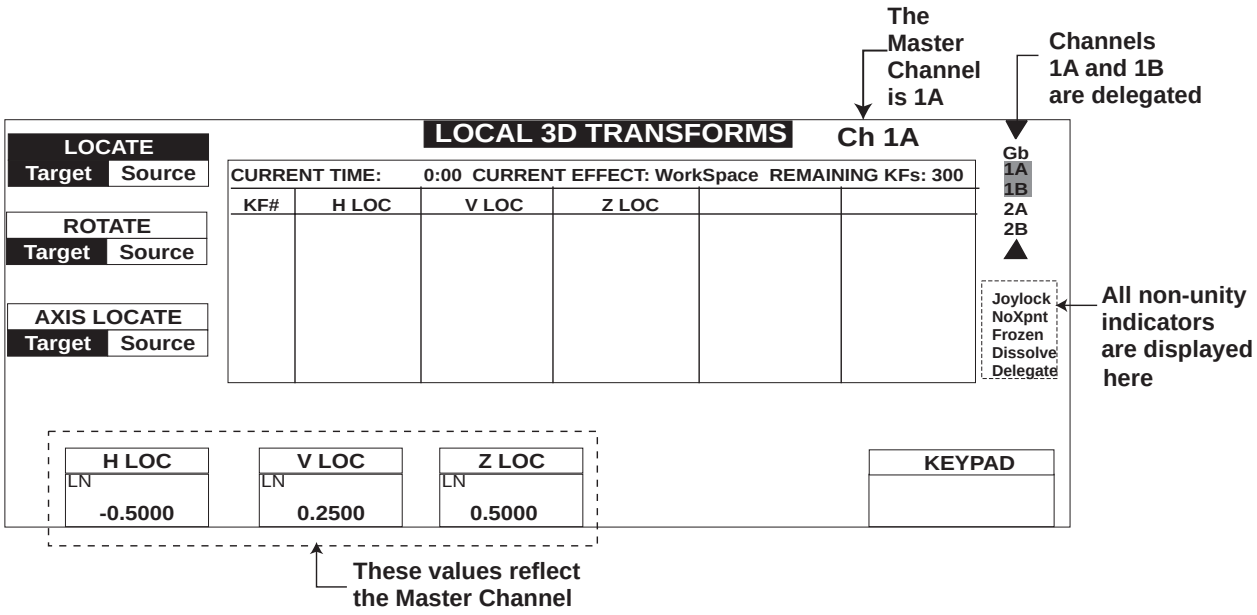
Note: Entering an absolute value with the keypad gives both channels identical rotations.

Note: If GLOBAL is the only delegated channel, you will not be able to make any changes in any of the Channel menus. The same is true if none of the channels are delegated.

How to Delegate Channels

You can toggle any channel on and off after designating the Master, including the Master itself. There are four different methods of delegating channels:

- Pressing a channel button once reverses the previous delegation status. So, a channel that was undelegated becomes delegated when pressed once. Conversely, a delegated channel becomes undelegated. By default, channel 1A is the Master channel.
- Pressing a channel button once and holding it assigns that channel to Master channel status without changing the delegation of any other channel. For example, if channels 1A, 1B and 2A were delegated, and 2A was the Master, pressing and holding 1A would now designate it as the Master while leaving 1B and 2A delegated.
- Pressing a channel button twice assigns that channel as the Master channel while undelegating all other channels.
- Pressing a channel button twice and holding it delegates all channels, including the Global channel and makes that channel the Master.



Note: If you are working with less than a dual twin system, the inaccessible channel buttons (1B, 2A or 2B) can be pressed but will appear as grayed out on the delegation menu. No functions can be performed on these channels.

Copying Channel Settings

You can easily copy the current setup of the Master channel to all other delegated channels. This method copies all menu settings for the Master channel to the delegated channels.

1. Select the Master channel by double-pressing one of the Channel Select buttons.
2. Press the Channel Select buttons of the channels into which you want to copy the Master channel settings.
3. Press **COPY CHANNEL**.
4. Press **ENTER**. The settings of the Master channel are now copied to the delegated channel(s).

Channel Copying for Specified Menus Instead of copying all menu settings for the Master channel, you can copy just those for specific menus (up to six at a time). After pressing **COPY CHANNEL**, press the menu button(s) whose Master channel settings you want to copy. Then press **ENTER**.

Channel Modes

As described in Section 1 – Introduction, each Dveous/MX twin channel can operate in three modes:

- Video+Video – two independent video channels.
- Video+Key – one video channel and an independent key channel.
- Video-Key+Shadow – also called SuperShadow; one video channel with a "slaved" key, and an independent shadow channel.

By definition, channel A is always video. The default configuration is two independent video channels. If your system is a dual twin system (channels 2A and 2B), you can configure one pair of channels differently from the other.

Note: If you have only one channel of HD, then the channel works in video only and the following configuration instructions are not applicable.

How to Configure Your Channels

1. Double press the 1A Channel Select button to configure the 1A/1B channel pair. Double press the 2A Channel Select button to configure the 2A/2B channel pair.
2. Press the **KEY** button to bring up the Key menu.
3. Press the ***Setup*** softkey to select it.
4. Use the Mode softknob to set the DVE board configuration:
   V+V (Video+Video mode) sets the transform boards to process two independent video channels.
   V+K (Video+Key mode) sets the transform boards to process one video channel (A) with an independent key channel (B).
   VK+S (Video-Key+Shadow mode) sets the transform boards to process a video channel plus a slaved key (A) and an independent shadow channel (B).

   In any configuration, you can select a near and far source for each channel, as described earlier in this section.

Note: The softknobs under the ***Mode*** softkey do not appear in Video+Video mode, as both channels are forced to a full white key signal.

Configuring Video+Key or Video-Key+Shadow

Continue with Step 5 if you have performed steps one through four on the preceding page and are choosing V+K or V-K+S modes.

5. Press the ***Mode*** softkey. For Video+Key mode, the Key softknob controls the key (B) channel only.

   In Video-Key+Shadow mode, the Key softknob is for the key portion of the A channel, and the Shadow softknob is for the shadow (B) channel.

   Both softknobs select the key mode for the channel:
   White – a full raster 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.

6. Press the ***Setup*** softkey to bring up the Gain, Clip, and Phase controls for the keyer. For a full linear key, use the default values (Gain = 100 and Clip = 50). Gain adjusts the key edge sharpness. Clip is a threshold adjustment that sets the luminance level at which the key turns on or off.

   Phase adjusts the horizontal position of the key signal relative to the original video. Use it to compensate for key timing errors that originate outside Dveous/MX. Normally, you can leave it at its default value (0.00).

Note: With White selected as the key source, the Gain, Clip, and Phase adjustments have no effect.

Configuring Video-Key+Shadow

Continue with Step 7 if you are using V-K+S mode.

7. Press the ***Shadow*** softkey to access the color and opacity controls for the shadow channel. The Lum, Sat, and Hue softknobs adjust the shadow brightness, color saturation, and hue, respectively. The B Opac softknob sets a transparency value for the shadow. The default values for Lum, Sat, and Hue (0) and a B Opac value of about 50 yield a realistic looking drop shadow. You can also use the Input menu ***Blur*** softkey settings to soften the drop shadow for an even more realistic look.

Getting Back to Default

There are two different default states you can reset: factory defined default values or your own, user-defined, default values.

- **NORMAL** (in the Timeline Effects Editor buttons) resets channel values the user defined settings.
- **CLEAR** (in the numeric keypad) resets factory-defined default settings.

Using NORMAL

User-defined NORMAL Settings

User-defined Normals let you put all, or just parts of, a menu's settings to your preferred default settings. Using **NORMAL** commands, you can quickly set to your defaults. This feature is useful, for example, if you always want to reset to certain inputs. Or maybe you always want channel 1B squeezed down when you go the 3D Transforms, etc.

Setting Up and Modifying NORMAL Defaults

First, set all menu parameters to your preferred settings. Then:

- To set Normals for only delegated channels, press **MODIFY — NORMAL – – ENTER**.
- To modify all channels, press **MODIFY — MODIFY — NORMAL — ENTER**.

Using NORMAL to Reset the Normal Defaults

- To reset all parameters of the delegated channel(s) back to their user-defined settings, press **NORMAL — ENTER**. The delegated channels are reset to the personal-preference defaults that you entered.
- To reset all channels to the user-defined settings, press **NORMAL — NORMAL — ENTER**. All channels are reset to any personal preference defaults that you entered.
- To reset all channels to factory default, press **NORMAL — NORMAL — NORMAL — ENTER**.

Using CLEAR

CLEAR resets to the factory default.

Before You Start

To reset values using **CLEAR**, the message <Clear> must first be displayed in the keypad buffer. Press **CLEAR** once to empty the keypad buffer of any pre-existing value. Once there is no value in the buffer, or if no value exists in the buffer, pressing **CLEAR** now inserts the message <Clear> into the buffer. Conditions are now set to do a reset to default value.

- To reset an entire menu to default, hold **CLEAR** and press the menu button. For example, to set all 3D Trans menu parameters to default, press **CLEAR** + **3D TRANS**. All values for each menu function (***3D Locate***, ***Rotate*** and ***Axis Locate***) are reset to factory default.
- To reset all of the parameters for a function, hold **CLEAR** then press the function softkey. For example, to clear the parameters associated with the *Locate* function in the 3D Trans menu, press **CLEAR**+***Locate***. All values for each parameters, **H Loc**, **V Loc** and **Z Loc**, are reset to default.
- To reset a single parameter, press **CLEAR** and the keypad softkey (**A**, **B**, **C** or **D**) for the softknob whose parameter and motion path type you want to reset. For example, to clear the **H Loc** parameter under ***Locate*** in the 3D Trans menu, press **CLEAR**+ the **A** button. You can clear one or more parameters using this method.
- Set the entire machine back to factory default
  You can also reset the entire machine to the factory default (as shipped from Abekas), regardless of channel delegation. Press **NORMAL** — **NORMAL** — **NORMAL** — **ENTER**. Even though you are using **NORMAL**, this command clears to factory default.

Note: Performing the **CLEAR** function **does not** affect the status of battery backed RAM. See "First Birthday" in Dveous/MX Technical Guide, P/N 9100-0402-01, for information on RAM reset.

The Numbering System

SD Mode

Dveous/MX in the SD mode uses a numbering system derived from the normal television aspect ratio of 4:3 – four units horizontally by three units vertically. Dividing both sides of this ratio by four yields 1:3/4, or 1:0.75. The SD mode uses this ratio as its numbering system. It indicates that the horizontal width of the screen, or the H axis, is one unit; the vertical height of the screen, or V axis, is three quarters of a unit, or 0.75 units. There is plenty of room for moving the image in both the Source and Target spaces (see Section 3 – Transforms for a discussion of Source and Target space); all planes have H and V dimensions of 200 units, or 200 times the height and width of the screen.

The third dimension, Z, is perpendicular to the H and V dimensions on each plane: it runs straight into and out of the plane at right angles to the horizontal and vertical directions. This value indicates depth, or distance from the next downstream plane.

The axis of each plane is defined as a point at which all three dimensions (H, V, and Z) have values of 0.0000. A point to the left of the axis on the plane has a negative H value; the left screen edge has an H value of -0.5000. A point to the right of the axis has a positive H value; the right screen edge has an H value of +0.5000. This gives a total width of 1.000.

Similar coordinates apply to the vertical dimension. A point above the axis has a positive V value; the top screen edge has a V value of +0.3750. A point below the axis has a negative V value; the bottom screen edge has a V value of -0.3750. The vertical range from screen edge to screen edge gives a total screen height of 0.7500.

The H and V position numbers may represent locations on the Source plane beyond the limits of the screen; the numbers always give you the exact location of the image on the plane, even if it is not visible in the video output.

In two dimensional transforms, the Z value represents picture size on the Source plane; it does not move the image in the Z (distance) direction. A value of 1.0000 gives a full size image. 0.5000 indicates that the horizontal and vertical dimensions of the image are reduced to one half of full size, and the image area is one quarter of full size (1/2H x 1/2V = 1/4).

In three dimensional transforms, the Z value represents the position of the image relative to the next downstream plane: its distance from it. At a value of 0.0000, the image's Z position image coincides with the plane; it is “sitting” on the plane. At values above 0.0000, the image is “behind” the plane, i.e., further away from the viewer. At negative values, the image is “in front of” the plane, i.e., closer to the viewer. At Z values equal to or less than -1.6667, the image dis-

appears; it has moved past the eye's viewing point and is actually "behind" the viewer in 3D space.

Moving the axis (for either the Source or Target plane) moves the rotational center of the plane relative to the image. You can move the image, including the axis, on the plane (using the locate controls) or move the axis only, leaving the image alone (using the axis locate controls), or move the image only, leaving the axis alone (using the 2D Trans Pre controls).

HD Mode

Dveous/MX in the HD mode uses a numbering system derived from the high definition television aspect ratio of 16:9 – sixteen units horizontally by nine units vertically. The HD mode uses this ratio as its numbering system. It indicates that the horizontal width of the screen, or the H axis, is sixteen units; the vertical height of the screen, or V axis, is nine units. There is plenty of room for moving the image in both the Source and Target spaces (see Section 3 – Transforms for a discussion of Source and Target space); all planes have H and V dimensions of 3200 and 1800 units, or 200 times the height and width of the screen.

The third dimension, Z, is perpendicular to the H and V dimensions on each plane: it runs straight into and out of the plane at right angles to the horizontal and vertical directions. This value indicates depth, or distance from the next downstream plane.

The axis of each plane is defined as a point at which all three dimensions (H, V, and Z) have values of 0.0000. A point to the left of the axis on the plane has a negative H value; the left screen edge has an H value of -8.0000. A point to the right of the axis has a positive H value; the right screen edge has an H value of +8.0000. This gives a total width of 16.000.

Similar coordinates apply to the vertical dimension. A point above the axis has a positive V value; the top screen edge has a V value of +4.5000. A point below the axis has a negative V value; the bottom screen edge has a V value of -4.5000. The vertical range from screen edge to screen edge gives a total screen height of 9.0000.

The H and V position numbers may represent locations on the Source plane beyond the limits of the screen; the numbers always give you the exact location of the image on the plane, even if it is not visible in the video output.

In two dimensional transforms, the Z value represents picture size on the Source plane; it does not move the image in the Z (distance) direction. A value of 1.0000 gives a full size image. 0.5000 indicates that the horizontal and vertical dimensions of the image are reduced to one half of full size, and the image area is one quarter of full size (1/2H x 1/2V = 1/4).

In three dimensional transforms, the Z value represents the position of the image relative to the next downstream plane: its distance from it. At a value of 0.0000, the image's Z position image coincides with the plane; it is "sitting" on the plane. At values above 0.0000, the image is "behind" the plane, i.e., further away from the viewer. At negative values, the image is "in front of" the plane, i.e., closer to the viewer. At Z values equal to or less than -26.6667, the image disappears; it has moved past the eye's viewing point and is actually "behind" the viewer in 3D space.

Moving the axis (for either the Source or Target plane) moves the rotational center of the plane relative to the image. You can move the image, including the axis, on the plane (using the locate controls) or move the axis only, leaving the image alone (using the axis locate controls), or move the image only, leaving the axis alone (using the 2D Trans Pre controls).

The Numeric Keypad

Use the numeric keypad to enter values for menu functions.

The Keypad Buffer

The keypad buffer always appears in the lower right corner of the menu display and shows the value or function ready to be applied to a menu setting. Entering a value in the keypad puts the number in the keypad buffer. The other buttons in the numeric keypad let you apply functions to settings. The list below shows the buttons and their functions.

Button	Function	Buffer Message
PATH	Selects the parameter motion path type. (Also used in disk menu to select or highlight more than one file)	<Set Path> JP LN SL T1 T2 SM
ALIGN	Sets the parameter to the closest 1/8th of full range. (Also used in disk menu to select or highlight all files)	<Align>
TRIM	Adds or subtracts the entered amount to/from the current value.	<Trim>
CLEAR	If a number or function is in the buffer, this erases it; If nothing is in the buffer, this resets the parameter to default. This button also clears entries in the Keyframe Edit Dialog area.	<Clear>
+/-	Inverts numeric values, and sets trims to subtract.	

Entering Values

This section tells you how to enter, clear, align, and trim, numeric values. It also covers copying values from one setting to another, and assigning motion path types to parameters.

Using the Keypad Softkeys (A,B,C,D)

Use the keypad softkeys (**A**, **B**, **C** and **D**) to enter values for one of the four function parameters. The keypad softkeys correspond to the parameters from left to right, **A** belonging to the leftmost softknob and so on. Simply enter a value for the parameter, then press its corresponding keypad softkey.

For example, look in the 2D Trans menu under the *Position/Pre* function. The Size setting is the right-most parameter, so its corresponding keypad softkey is **D**. To enter a value of .5 for Size, enter .5 in the numeric keypad, then press **D**. The image shrinks to one half full size, horizontally and vertically.

Copying Values

You can copy values from one parameter to another, or from a parameter in one menu to a parameter in another menu.

First, make sure the keypad buffer is empty (press **CLEAR** to clear any existing values). Then, press the parameter's keypad softkey (**A**, **B**, **C** or **D**) to copy its value and motion path type into the keypad buffer. You can then press another keypad softkey in the current menu or in another menu to enter this value and motion path type in another softknob.

Also, make sure that the keypad buffer does not display before pressing **A**,**B**,**C** or **D**. When displays and you enter a value then press **A**,**B**,**C** or **D**, you are clearing that parameter to default. You may need to press **CLEAR** twice to ensure that the keypad buffer is completely empty.

For example, the Size setting has a value of 0.5000. Pressing the **D** button loads 0.5000 into the keypad buffer. Now pressing **B** sets the H softknob to 0.5000.

Inverting Values +/-

Use the +/- button to invert the number in the keypad buffer. To enter a negative value, you can either enter the value followed by the +/- key, or press +/- followed by the number value. For example, if softknob A has a value of 5, pressing +/- then A changes the softknob value to -5. Conversely, if the value is -5, pressing +/- inverts the value to 5.

Maximizing or Minimizing a Setting

If you want to quickly set the highest or lowest allowable value for a parameter, enter a value that is outside its range, then press its keypad softkey. Dveous/MX automatically sets the value to its minimum or maximum setting. For example, entering 1000 in the Size softknob sets it to 99.9999.

Trimming Values

You can change an existing value, or "trim" it, by adding or subtracting a given amount to or from it. To trim a parameter value, press the **TRIM** button to

enter the message in the keypad buffer. Then, enter the trim amount in the numeric keypad and press a keypad softkey. For example, to add 1.5 to the value in softknob A press TRIM — 1.5 — A. To subtract 1.5 from the value in softknob A, enter TRIM — +/- — 1.5 — A or +/- — 1.5 — TRIM — A.

Note that there is always a trim amount in the keypad buffer. On bootup, the default trim amount is +1. After you trim a value, the keypad buffer remembers the trim amount. Now when you press TRIM, the keypad buffer recalls the last trim amount used. This feature makes it easy to trim multiple values by the same amount.

Aligning Values

You can use the **ALIGN** button to reset an existing parameter value to the nearest one-eighth of the full range of that parameter. This command is handy if you have used the softknob or the joystick to roughly position the image, then want to position it more accurately. For most settings, the typical value is a one eighth increment. With rotations, for example, one eighth of a complete rotation is 45 degrees or 0.1250. Aligning a rotation value of 1.1111 resets it to 1.1250, the nearest multiple of 0.1250. Locate settings use one eighth of a screen unit as the logical value. For example, aligning an H locate value of 3.4739 sets it to 3.5, which is the nearest multiple of 0.1250, or one eighth of a screen unit.

For other functions, where there is no typical value, the align function sets the value to the closest one eighth of the parameter's entire range. For example, in the Multi menu, the full range for mosaic tile size is 0 - 100. Since the typical value is a multiple of 12.5000, or one eighth of the entire range, aligning a tile size of 28.3267 changes it to 25.0000, a multiple of 12.5000.

Assigning Motion Path Types

Motion paths define how Dveous/MX interpolates from the settings in one keyframe to the settings in the next. Use the **PATH** button to assign motion paths to keyframeable parameters. See Section 7 – Motion Control for more details on each motion path type.

When you press the **PATH** button, this message appears in the keypad buffer:

<Set Path>
JP LN SL T1 T2 SM

The letters across the bottom indicate the available path types:

JP	Jump (Hold)
LN	Linear
SL	Smooth Linear
T1	TCB1 (Tension, Continuity, Bias preset 1)

T2 TCB2 (Tension, Continuity, Bias preset 2)
SM Smoothed Motion

Some parameters take only certain path types. If you try to assign an invalid path type to a parameter, the system assigns the highest "priority" path type available to it. The “priority” follows the list in the keypad buffer, left to right from lowest to highest. For example, if you try to assign SM to a parameter that takes only the JP, LN or SL path types, it assigns SL instead, because that is the highest priority path type allowed for that setting.

Methods of Assigning Path Type The highlight indicates the currently selected path type. Pressing the **PATH** button cycles the highlight through the list and selects a path type.

- To assign to a single parameter, select a path type, then press the keypad softkey (**A**,**B**,**C** or **D**) associated with the parameter. The path type abbreviation appears next to the parameter value.
- To assign the same path type to all the parameters related to a single menu function, select a path type and hold the **PATH** button, then press the menu softkey associated with that function.
- To assign a path type to all the parameters in a menu, select a path type and hold **PATH**, then press the menu button on the Control Panel.

Note: When assigning a path type to multiple settings, remember that the path “priority” rule applies to any setting that does not accept the path type you want to assign.

Remembering Last Used Path The keypad buffer “remembers” the last path type selected, making it easy to assign the same path type to many parameters. After you assign a different path, the next time you press PATH, the keypad buffer recalls the last path type used. When you boot up, the default path type is T1.

Note: When changing paths to an existing effect, you must first modify the effect before running the new **PATH** parameters.

The Joystick

The joystick lets you quickly adjust one or more of a menu's parameter settings. It gives you immediate visual feedback when positioning images, widening a border, playing with warps, etc.

If the joystick can be used in a menu you will see arrow icons in the function parameter display, next to the parameter's name. As you use the joystick to adjust the image, the values for that parameter change as well.

Move the joystick up or down to see that parameter change.

Move the joystick left or right to adjust that parameter.

Twist the joystick to see adjust that parameter.

Locking the Joystick to a Menu

You can tie, or lock, the joystick control to a menu's function parameters. After going into joystick lock mode in one menu, you can go into another menu and adjust its parameters by using the parameter softknob, while adjusting the locked parameters with the joystick. This feature is handy, for example, if you want to rotate the image using 3D Trans menu controls while playing with warp shapes in the Warp menu.

Press JOYSTICK LOCK on the Control Panel before leaving a menu. The joystick lock non-standard mode indicator status message displays.

Joystick Tricks

Applying Your Own Directional Arrows

In some menus, no directional menus appear, which indicates the joystick is not available for use. However, you can sneak around the system and temporarily tie the joystick to any unmarked parameters you wish. To do so, hold down the unmarked parameters corresponding keypad button (**A**, **B**, **C**, or **D**) while moving the joystick horizontally or vertically or by twisting it. Whichever way you first move the joystick determines the direction you tie to the parameter, and that directional arrow will appear in the parameter's menu display.

Joystick Lock Sneak Peek

When in joystick lock mode, you can easily find out what parameters you tied the joystick to in the other menu. Simply press and hold the **JOYSTICK LOCK** button. The menu display will change to show the menu, functions, and parameters that you were in when the joystick was locked. When you release the **JOYSTICK LOCK** button, the menu reverts to its previous display.

Creating a Simple Effect

Now that you know how to select a source and delegate channels, let's create a few simple effects. These effects are broken down as follows and become parts of one larger effect:

- Building an effect on Channel 1A
- Modifying the effect on 1A
- Creating an effect on Channel 1B
- Moving both channels in tandem
- Non-unity lights

Building an Effect on Channel 1A

In the following exercise, we will squeeze the picture down in size, move it around the screen, and rotate it 360 degrees.

1. Press **DELETE** — **DELETE** — **ALL** — **ENTER** in the TimeFrame Effects Editor to clear any existing keyframes from all channels, in the event an effect was hiding somewhere.
2. Press **NORMAL** — **NORMAL** — **NORMAL** — **ENTER** to clear all menu settings to the factory default. Default mode selects the Video+Video mode, and gives channel 1A keying priority over channel 1B.
3. Double press the 1A Channel Select button to delegate it and undelegate the other channels.
4. Press the **3D TRANS** menu button. The 3D Trans menu appears.
5. Press the ***Locate*** softkey and toggle it to *Source*.
6. Twist the joystick counterclockwise to make the image smaller. Or, you can turn the Z Loc softknob counterclockwise. The smaller channel 1A appears keyed over a full-size channel 1B.
7. Move the reduced image to the upper left corner of the screen with the joystick or with the **H Loc** and **V Loc** softknobs.
8. Press the **INSERT NEXT** button. The current parameters are now stored as keyframe 1.
9. Move the image to the upper right corner of the screen using the joystick or softknobs. Press **INSERT NEXT** again to store the new parameters as keyframe 2.
10. Move the image to the lower right corner of the screen. Press the Rotate softkey and toggle it to *Source*.
11. Rotate the image a full 360 degrees around its Z axis by entering the value 1 for Z Rot. To do this, enter 1 in the numeric keypad, then press the C keypad softkey. Press **INSERT NEXT** to store the current parameters as keyframe 3.

12. Press Locate and move the image to the lower left corner of the screen. Press Rotate and rotate the image horizontally by moving the joystick left or right. (You can also use the **H Rot** softknob.) To rotate the image exactly 180 degrees, enter .5 in the numeric keypad, then press the A keypad softkey. As the image rotates past "edge-on," the back source appears. Press **INSERT NEXT** to store the current parameters as keyframe 4. There is now a four keyframe effect in the workspace.
13. Press the **RUN→** button to run the effect. The image starts at the upper left corner, moves to the upper right corner, rotates about its center while moving to the lower right corner, and rotates to reveal the back side while moving to the lower left corner of the screen. Press **←RUN** to run the effect from the last keyframe to the first. Press **PAUSE** at any point to pause the effect, then press **RUN→** or **←RUN** to resume running the effect from that point. Press **START** to rewind the effect to the beginning.

Note: This effect is based on motion paths set to linear.

Modifying an Effect

To change the current effect, you can modify any parameter as follows:

1. Move to the keyframe you want to change by pressing **NEXT** (to step forward to the next keyframe) or **PREVIOUS** (to move back to the previous keyframe).
2. Change a parameter and press the Quick Keyframes **MODIFY** button. This modifies only the current keyframe. (For now, do not use the **MODIFY** button in the TimeFrame Effects Editor.)
3. Run the effect by pressing **RUN→**. The effect now runs with the modified keyframe.

Creating an Effect on 1B

So far, you have created and modified an effect for channel 1A only. To create an effect for channel 1B, double press the 1B button to delegate that channel and undelegate channel 1A. Then, using the above procedure as a guide, create a different effect for channel 1B.

When you create the effect for 1B, it will start running at the last keyframe you were on in the previous effect. So, if you run 1A to the end and don't rewind it, when you create 1B's effect, it will start after 1A runs its last keyframe. If you

rewind 1A, before starting to build 1B's effect, then 1B will start when 1A starts, and both channels will simultaneously run their own effects.

Moving Both Channels in Tandem

You can also create an effect with both channels moving in tandem. Remember that Dveous/MX looks at what channels are delegated when it determines which channels to affect. So, to move 1A and 1B in tandem, they must both be delegated. Also, remember that one channel must always be delegated at the Master Channel. The Master Channel has no greater importance than any other, but just tells Dveous/MX which timeline to look at and whose menus to display.

1. Double press the 1A channel select button to make it the Master and to delegate it.
2. Press the 1B channel select button to delegate it.
3. Adjust parameter settings in the 3D Trans menu. Both channels will be affect equally, with all offsets maintained.

Non-unity Lights

The LEDS on the menu buttons are called non-unity lights. When lit, they tell you that a menu's parameters have been changed. 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 what menus are affecting the image.

Saving Effects

The place where effects are saved is called the effects register. You can store up to 100 effects in the register. Effects are numbered 0 through 99. Each effect can have a maximum of 300 keyframes. The keyframes for each effect come from a collected pool of keyframes in battery backed up RAM (a semi permanent storage device). There are over 1700 keyframes in memory. When you create an effect, the system sets aside a portion of these keyframes for that effect.

Note: Each delegated channel's timeline uses a keyframe from the system pool. This means that when you create an effect by inserting four keyframes into five channels (1A, 1B, 2A, 2B and Global), you actually use 20 keyframes from the pool.

Saving an Effect

You can quickly save effects to the register without having to enter a menu.

1. Enter an effect register number (0 - 99) in the numeric keypad.
2. Press the **SAVE EFFECT** on the Control Panel. The effect is now saved at that number in the register and its number displays next to Current Effect.

Overwriting Existing Effects

Depending on whether you have enabled the protect flags, one of two things happen if you try to overwrite an existing effect:

Protect Flag Not Enabled If the existing effect does not have the protect flag enabled, the workspace effect overwrites the one in the register. You will not be prompted that you are overwriting an existing effect.

Protect Flag Enable If the existing effect does have protect enabled, Dveous/MX does not save the workspace effect, and does not overwrite the existing effect. A prompt tells you that the register is protected.

Recalling an Effect

There are two ways to recall effects: recall directly from the Control Panel, or recall from within the Effects menu.

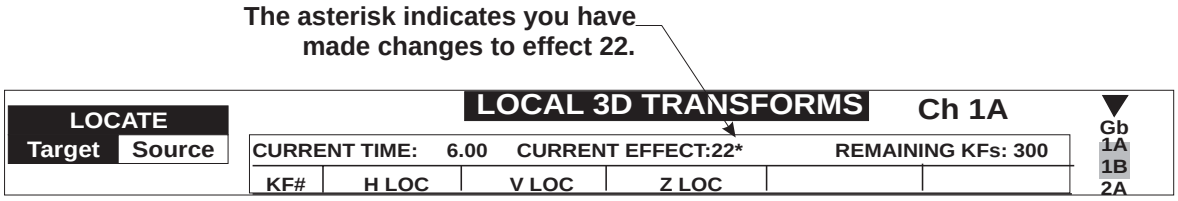
Recalling from the Control Panel

1. Enter an effect register number (0 - 99) in the numeric keypad.
2. Press the **RECALL EFFECT** button the Control Panel. The effect from that register loads and its number displays as the Current Effect in the menu's workspace display.

Recalling from the Effects Menu

1. Press **RECALL EFFECT**. The Effect menu appears.
2. Use the **REG#** parameter softknob to dial in the number of the effect you want to recall. Although the effect's number appears in the Workspace display as the Current Effect, the effect will not load until you press **RECALL EFFECT**.
3. Press **RECALL EFFECT**. The effect is now loaded in the workspace.

Modifying a Recalled Effect When you make changes to the currently loaded effect, an asterisk displays next to Current Effect in the menu display. The asterisk is a friendly reminder that you have changed the effect. The changes are not saved, however, unless and until you press **SAVE EFFECT**.



Workspace as the Current Effect When the word WorkSpace displays as the Current Effect, you are creating a brand new effect that has not been saved yet. Or, you have deleted all keyframes from all channels, in effect starting over again.

Note: See Section 8 – Saving and Recalling Effects for complete information about recalling effects and for information about using the disk drives to archive and recall effects.

The Effects Menu

Use the Effects menu to browse the effects registers, enable/disable the effect loop and protect flags, name effects, and delete effects. Access this menu by pressing the **RECALL EFFECT** button in the Effect area of the Control Panel.

Reading the Display For each effect register, the menu shows how many keyframes exist in each channel and the status of the Loop and Protect modes. Look at Remaining KFs to know the total remaining keyframes available in the system pool.

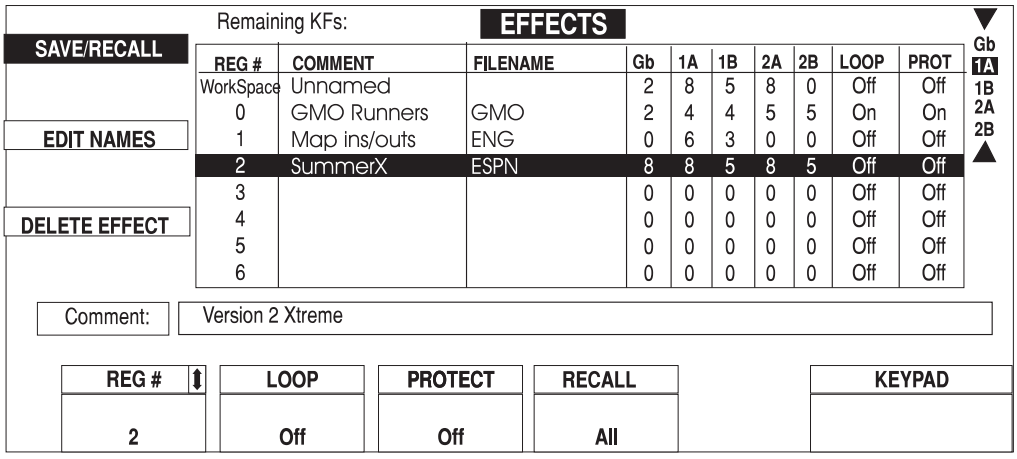
Reg # Use the Reg# softknob to scroll through the effect registers and view what numbers you have saved to. You can also use the joystick to move through the register, or go to an effect directly by entering its number in the keypad, then pressing A in the keypad register.

The Loop and Protect Flags

You can enable/disable the loop and protect flags for an effect in an on-line register as follows. Note that you can set the Workspace effect to loop, but you cannot enable the protect flag for it.

Enabling/Disabling Loop and Protect

1. Use the Reg# softknob or the joystick to highlight an effect register number. Or you can enter the number into the keypad and press A on the keypad register.
2. Turn the Loop and Protect softknobs to the desired status (on or off) for that effect register.



Deleting Effects

Only unprotected effects can be deleted. You can delete the current effect, or all effects, so long as they are unprotected, from the register(s) as follows. To delete an effect in a protected register, first use the Protect softknob to turn the register's flag off.

1. Use the Reg# softknob or the joystick to highlight the effect number to be deleted. Or you can enter the effect's number in the keypad and press A in the keypad register.
2. Press Delete Effect. Select is highlighted.
3. Press Delete Effect again to confirm the deletion. A message appears to indicate the effect register has been deleted, and all channels show 0 keyframes at that register.

Note: You cannot delete the workspace effect in this manner. To delete the workspace you must use the Timeframe Effects Buttons (**DELETE—ALL—ENTER**).

Note: For complete information about saving, naming and deleting effects, please see Section 8 – Saving and Recalling Effects.

Quick Contents

Section 3: Transforms

Abekas

Overview

The Dveous/MX digital effects system is used to manipulate video images, giving the appearance of motion in three-dimensional (3D) space. To achieve this, Dveous/MX can rotate the image and, as it rotates, maintain optically correct perspective. The processing preserves the geometric precision of 3D space on the two-dimensional (2D) plane of a television screen. The video being manipulated is called the *source image*.

Note: Depending on your input and channel configurations, a channel can process a video signal, a key signal or a drop shadow. This section uses the word *image* generically to indicate the channel's source (video, key, or shadow).

Dveous/MX has four separate sets of 3D controls. It helps to visualize them by thinking of each set as applying to a 2D plane. The controls move the 2D plane in 3D space. The four 3D control sets are as follows, in processing order from upstream to downstream (first to last):

- The Local Source plane, which moves in local source space and contains the source image and any 2D pre-transform modifications.
- The Local Target plane, which moves in Local Target space and contains the entire Local Source plane.
- The Global Source plane, which moves in Global Source space and contains the entire Local Target plane.
- The Global Target plane, which moves in Global Target space and contains the entire Global Source plane.

See page the illustration on 3-3 for the hierarchy of planes. This left to right ordering of planes shows the upstream (left) to downstream (right of anything upstream) effect of one source plane on another. Any manipulation of a plane affects that plane and the ones upstream of it, while all planes downstream are not affected.

When first building effects and manipulating planes, it is a good idea to start in the Local Source space so that you can always have a true source plane to work with. As you get more familiar with the interaction of planes and create more complex effects (cubes, for example), you will sometimes start in Target space.

Axis Point

Each plane has a horizontal (or H) axis, a vertical (or V) axis, and a perpendicular (or Z) axis around which the plane can rotate. The intersection of these axes is a single point known as the axis *point*, or simply *axis*. You can view this axis point by pressing the **CURSOR** button in the Graphics area of the Control Panel. This button enables cursors in the video output that indicate the current location of the axes for the active channels. See the discussion later in this section for more details on the axis cursors.

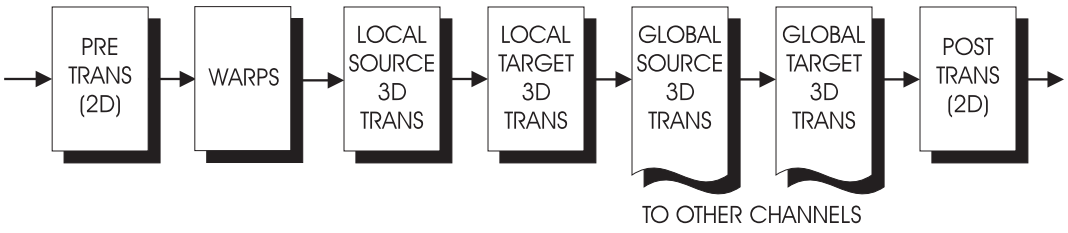
Using a plane's *Locate* control to position it in its space also moves its axis settings to maintain their relationship to the plane. Rotating the plane does not appear to force rotations on its axis settings, but more on this later.

Transform Groups

3D Transforms
Each set of 3D controls are identical in operation and power. The only thing that differentiates them is the order in which they are allowed to transform the image. The names of the 3D transform sets could just as easily been "First," "Second," "Third," and "Fourth." The two global 3D transforms ("Third" and "Fourth"), however, are special in that they apply to all Dveous/MX channels.

2D Transforms, Pre and Post
There are also ***Pre*** transform and ***Post*** transform 2D controls. The ***Pre*** controls change the H and V position and the size of the source image on the local source plane, without moving the source plane in 3D space. The ***Post*** controls change the H and V position and the size of the entire transformed image (i.e., the global target plane) on the screen, without moving the global target plane in 3D space.

The illustration below shows the upstream/downstream hierarchy of the transform groups. A detailed description of each the transforms appears later in this section, "Parameter Hierarchy Detail."



3D Transform Interaction Examples

Note: Dveous/MX is a mathematical processor that is based on the numbering system being used, i.e. 1 x .75, 4 x 3, 16 x 9. The following examples are based on SD mode (1 x .75) aspect ratios. The exact numbers being used will differ with the different aspect ratios. For instance to move an image half-way across the screen in a 1 x .75 aspect ratio would require an H loc value of .5. Whereas in the HD mode (16 x 9) the value would be 8.

For the following examples, first press **2D TRANS** to bring up its menu. Toggle the ***Position*** softkey to *Post*. Set the **Zoom** parameter softknob to reduce the image on the monitor so that you see more of the of 3D spaces. A **Zoom** value of 0.3000 works well.

Now, press **3D TRANS** to access the Local 3-D Trans menu. Controls in this menu manipulate the Local Source and Target planes. To perform a locate, rotate or axis locate in Source space, use the function softkey for that transform and then toggle to *Source*; To perform the transform in Target space, toggle the function softkey to *Target*.

Set the ***Locate*** function to *Source*. You are ready to move the location of the image on the Local Source plane. Use Local Source V locate (**V loc**) to move the image up a little. This location shift moves the Local Source plane (and its axes) independent of the other three planes (and their axes). To illustrate this, use the Local Source Z rotate (**Z rot**) to spin the image. It spins around its own center. Now use Local Target Z rotate to spin the image (toggle ***Locate*** to *Target*, then adjust **Z rot**). The Local Target plane spins on its center, which no longer matches the image's center because you have moved it with Source Locate.

In the above example, it would make no difference whether we used Local Target Z rotate, Global Source Z rotate, or Global Target Z rotate; the results would appear the same, since they are all downstream of the Local Source space.

Let's look at another example: First, press **CLEAR** + ***Locate*** to re-center the image. Now, use Local Target V locate (**V loc**) to move the image toward the top of the screen (instead of Local Source V locate used before). When you rotate the image, there is no apparent difference between Local Source Z rotate and Local Target Z rotate: they both spin the image about its own center. Using Global Z Rotates, however, spin about the center of the screen, since you have not moved the Global planes.

Here is another example of plane interaction: Start with a centered image (all locate values set to 0.0000). Set Local Source Z rotate (**Z rot**) to 0.1250 (45 degrees). Now use Local Source H locate (**H loc**) to move the image left and right. The image moves along a horizontal line straight across the screen. Using any other locate H controls gives the same results. As mentioned earlier, rotating a plane does not appear to affect its axes.

Now set the Local Source Z rotate back to 0.0000, and set the Local Target Z rotate to 0.1250. The Local Target and both Global H Locates still move the image straight across the screen. Using Local Source H Locate, however, moves the image diagonally, showing that the Local Source plane's Locate directions have indeed rotated.

The preceding example shows that rotating a plane does not affect its own Locate direction, but does affect the Locate directions of all upstream transform groups. So, rotating the Local Source plane affects only the 2D Adjust/PreTrans directions. Similarly, rotating the Local Target plane only affects the transform groups upstream of it (Local Source plane and 2D Adjust PreTrans). Since the Global Source and Target planes are downstream of the Local Target plane, they are not affected by anything you do with the Target plane.

Rotate Hierarchy

The previous examples showed that there is a hierarchy, or priority, of 3D controls. Using functions further down the list affects the controls above them. Furthermore, in the case of the Rotate function, you must take this hierarchy into account even within a single set of 3D controls.

For this example, you must tilt the image back vertically using ***Rotate/Source*** V locate (**V loc**), put the horizontal axis on the left image edge using ***Axis/Position/Source*** H locate (**H loc**), and horizontally rotate the image (as if opening the cover of a book) using ***Rotate/Source*** H locate (**H loc**). Using Local Source 3D, the effect does not look like you would expect. This attempt fails because it does not take into account the Rotate control hierarchy: first Z, then V, finally H. To rotate a plane's axes, you must rotate the plane further down in the hierarchy. See the illustrations below.

When you rotate a plane around its Z (perpendicular) axis, none of the plane's three rotation axes are affected. However, when you rotate a plane vertically (around its H axis), you also rotate the Z axis vertically, but the H and V axes remain unaffected.

Finally, when you rotate a plane horizontally (around its V axis), you rotate both the Z and H axes horizontally as well, still leaving the V axis unaffected. This transformation is graphically demonstrated in the Preview output when the cursors are turned on: you can see that a Z Rotate does not move the axis cursor at all; a V Rotate tilts the Z axis only; and an H Rotate pivots both the Z and H axes. Note that the V axis remains vertical at all times.

Let's return to the “book cover” example. This time, however, use ***Rotate/Target*** **V** to lay back the top of the image. The resulting image is the correct book cover effect: the Rotate parameter for each 3D space is using its own internal hierarchy: first Z rotate, then V Rotate and, finally, H Rotate.

Note that using Rotate/Target H to open the cover would have failed exactly as it did when using Source H and V Rotates in the previous case. In the first "book cover" example, the problem was that the Source H Rotate was pivoting around the still-vertical axis.

You can use Source and Target Z rotates to spin an image about opposing corners. This effect looks better with a square image, so instead of using ***2D Adjust/ Post Trans* Zoom** to reduce the image, enter 0.5000 in both **Aspect H** and **Aspect V** parameter softknobs. Start with an image that has no rotates or locates, and set the Local Target Z rotate to 0.1250 (45 degrees).

The local target vertical rotate still rotates the image about axes that are straight across and straight up and down. Set ***Rotate/Target* H** and **V** to 0.0000. Applying a Local Source V rotate shows that the local source plane's axes are Z rotated: the image rotates on H and V axes that are diagonal to the screen.

Now enter a Local Source Z rotate of -0.1250 (45 degrees in the opposite direction). This rotate reorients the image to straight up and down, but Local Source H and V axes are still diagonal to the image, causing it to spin about its corners. Again, the reason for this transform is Target Z rotate occurs downstream, rotating the Local Source plane and all three of its rotational axes.

2D Parameter Overview

Press **2D TRANS** in the Channel Menu buttons to bring up the Local 2D Transforms menu. There are two sets of 2D position and size controls: ***Pre*** transform 2D, which comes upstream of (before) the 3D transforms, and ***Post*** transform 2D, which comes downstream of (after) the 3D transforms.

The ***Pre*** transform 2D controls include position and skew, as well as a true image size control. The size control also has aspect controls, letting you independently size the image horizontally and vertically.

2D Pre/Position and Aspect

The 2D ***Pre/Position*** controls actually move the image on the Local Source plane. It is important to note this for two reasons: ***Pre/Position*** moves the image off the axis of rotation for all four 3D transforms (since the image moves, but each plane's axes do not), and Source plane rotations directly affect the path the image takes when moved with ***Pre/Position.***

For the following examples, it is helpful to use 2D ***Post*** **Zoom** to reduce the image on the monitor and let you see more of the 3D spaces. A **Zoom** value of 0.3000 works well.

With the H and V ***Pre/Position*** set to 0.0000, the Local Source rotates (and all other rotates) spin the image on axes that intersect in the middle of the image. Use the ***Pre/Position*** **H** control to move the image left so that it touches the edge of the screen. Now try the H and Z rotates. They all act on the axes' intersection, which has not moved. Think of the 3D transforms as acting on where the image use to be: their view of 3D space has not changed.

Now rotate the image H and Z about 45 degrees. Using the ***Pre/Position*** **H** control causes the image to slide along the rotated Source plane.

Using the 2D ***Pre*** **Size** softknob actually changes the image size. Using Z locate does not actually resize the image; it appears larger or smaller because it moves closer or further away. If you set a rotate axis on the left edge of the image, then change its size with 2D ***Pre*** **Size** or **Aspect**, the axis is no longer on the image edge.

2D Post/Position

The 2D ***Post/Position*** controls let you position the output of the 3D transforms on the monitor. They do not affect the 3D look of a rotated image. These controls are very useful for offsetting or sizing a solid or other object that you created with the 3D controls. The **Zoom** control does not actually change the image's size; it acts more like a zoom lens on a camera. Zooming out (making the image smaller) widens the field of view; zooming in reduces it. The actual image you are looking at is unaffected. As opposed to the 2D ***Pre*** transform controls, the ***Post*** transform controls do not affect the 3D axis settings or rotate functions.

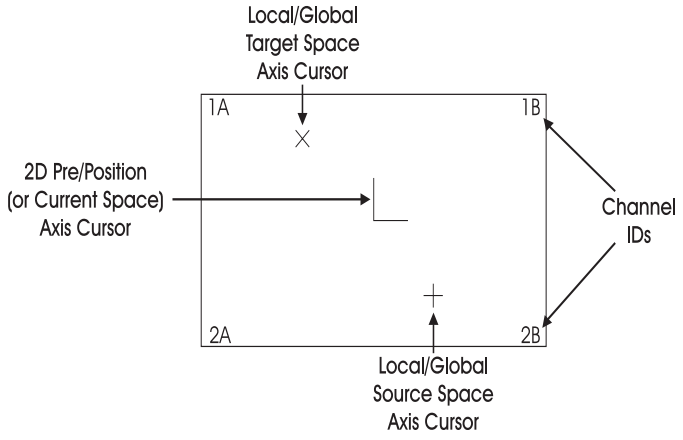
Axis Cursors

Pressing the **CURSOR** button to light its LED enables on-screen graphics to help you keep track of the channels and the locations of the Source and Target axes and the center of the source image. The channel IDs (1A, 1B, 2A, 2B) appear in the corners of the channel's image, as shown in the diagram below. Each channel, including Global, has its own set of cursors.

There are four axis cursors:

The L shaped cursor (2D Post and 3D) – In the 2D Pre Trans menu, it shows the center of the original source image. Once the image is rotated either horizontally or vertically, the third (Z axis) leg of the cursor appears (see illustration opposite page). In 3D space, the L cursor shows the center of rotation for either the Target or Source space, depending which is active.

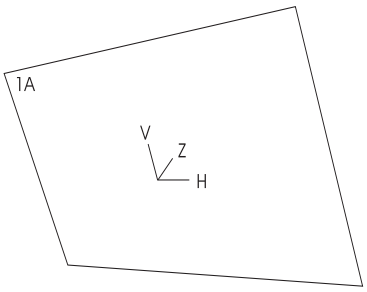
The L cursor (2D Post Trans) - indicates the center of the post trans image.



NOTE: This diagram shows all four channel IDs, but only one channel's axis cursors.

The X shaped cursor - indicates the axis for the Local Target space when Source is active.

The + shaped cursor - indicates the axis for the Local Source space when Target is active.



A rotated image that shows the third cursor axis. Axis labels are noted here for reference, and do not appear on the output.

Note that the only time all three cursors for a given channel appear on the screen at the same time is in the 2D Trans menu. In the 3D menus, L is always present, but only X or + appear with it.

The cursors and channel IDs only appear for the currently active channel(s). Since this can mean as many as 20 cursors on the screen at once, each channel has its own color for identification:

- Channel 1A: white
- Channel 1B: black
- Channel 2A: green
- Channel 2B: red
- Global Channel: grey (no channel ID)

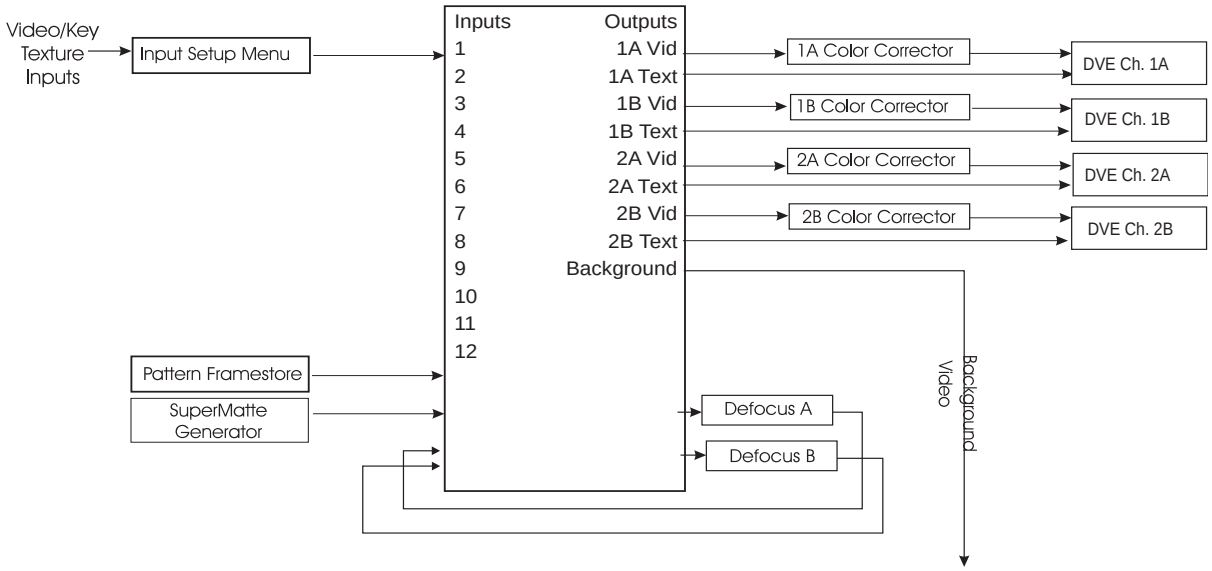
Note that the ID and cursor displays remain when you leave the 3D Trans menu. Also, running an effect automatically disables the **CURSOR** button, so the displays do not appear on the output.

Parameter Hierarchy Detail

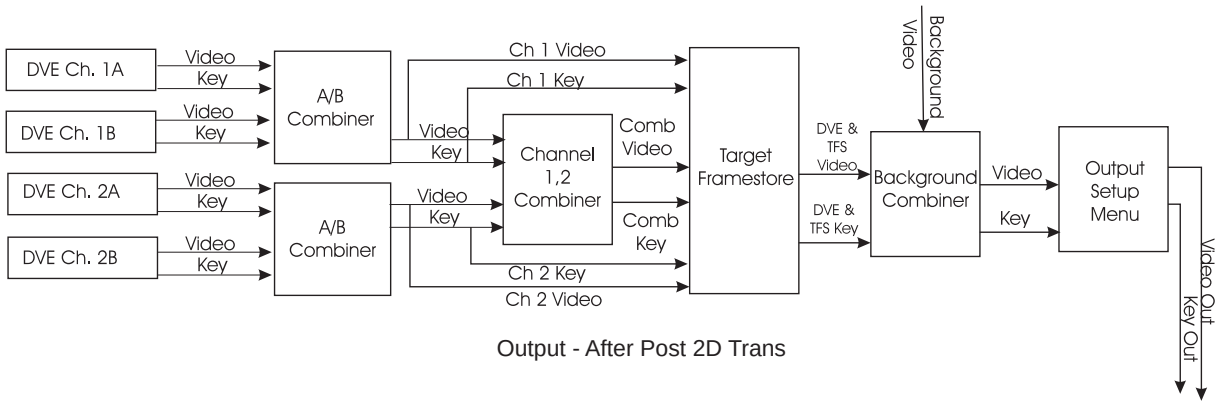
An effects system has many parameters (numeric values) and flags (switches) that alter the input video image. Dveous/MX offers many advanced features to let you create unique effects. While this power means virtually limitless possibilities, the array of controls can be daunting; therefore, it is important that you understand the image processing path and how the controls interact before you can expect to master Dveous/MX. This section describes the hierarchy of the system parameters.

The key to building effects is to design them from the most upstream parameter down (see illustration earlier). Note that although you can alter parameters at any point in the hierarchy, changing a parameter in the middle of the hierarchy reorients all upstream parameters and interacts with parameters downstream from it. Although in most effects this hierarchy is not important, you must consider it when building complex 3D tracking moves.

The following pages list the six transform groups (Pre 2D Trans, 3D Local Source, 3D Local Target, 3D Global Source, 3D Global Target, Post 2D Trans) in upstream to downstream order. Within each transform group, the hierarchy of parameters and flags is also ordered in upstream to downstream order. The menu for each parameter appears in parentheses. The following illustrations show the signal path through Dveous/MX.



Input - Before Pre 2D Trans



Output - After Post 2D Trans

Pre Trans 2D Parameters

The Source Image

The source image is, by default, a full raster image (either 1 x .75 or 16 x 9). It is placed in the center of the Source plane unless you move it with the ***Pre/Position*** controls.

Defocus (Defocus)

The wide range Defocus feature lets you select up to two video sources to be defocused or softened. It affects the source image before it is sent to the DVE channel inputs. There are independent controls for vertical and horizontal softening, and for the luminance or chrominance parts of the image.

Color Corrector (Color Crctr and Color Modify)

The ReTouch Color Corrector feature lets you work in either RGB or YUV space before it is sent to the DVE channel inputs.

Near/Far (Input)

The Near/Far flags select the video input source for the two sides of the source image. Any image manipulations apply simultaneously to the near and far source images.

Freeze (Input)

You can freeze the input video by setting flags to freeze a field or frame of video. Because ***Freeze*** is downstream of the near/far video switch, selecting a freeze causes the near video to appear frozen on both sides of the plane.

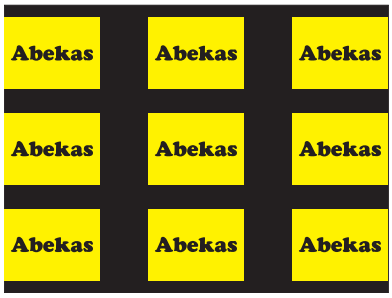
Invert (Input)

Inverts the input video for the near or far side of the DVE. You can invert horizontally, vertically or both. You can also select different settings for the near and far sides. Use Invert to reorient a source after rotating it.

Mosaic (Multi)

The Mosaic mode reduces the input video's resolution and breaks it into blocks. You can control the horizontal and vertical size of the blocks.

Multipic (Multi)



Multipic covers the Source plane with multiple copies of the source image. You can adjust the distance between the copies. The current border color fills the gaps between the copies.

You must uncrop the source image in order to see the multiple copies. Also, Multipic works differently with Video+Key and Video/Key+Shadow modes.

Border (Border/Crop)

Border crop lets you add a border inside the source image. Set the border width and move the border "window" with the joystick. A separate softkey lets you set the border color.

You can also adjust the width for each side independently, and set the border softness.

You can see that borders are downstream of crops when you apply a border to a cropped image. Border is only active in Video+Video mode, or Video/Key+Shadow, when the key is set to white.

Crop (Border/Crop)

Crop masks the size and shape of the key signal, so it gives the appearance that the source image is being cropped. By default, the system provides a key crop that is coincident with the video format in use (1 x .75 or 16 x 9).

In Dveous/MX's numbering system and in SD mode, the left edge of the raster is -.5000. the right is +.5000, the top is +.3750 and the bottom is -.3750. In the HD mode, the left edge of the raster is –8.0000, right is +8.0000, top is +4.5000, and bottom is –4.5000 screen units. Note that you can set the crops inside the image to mask part of it. In Video+Video mode, you can set the crops outside the image to reveal the border color and multipics (if enabled). In Video+Video mode, both A and B crops are active; in Video+Key and Video/Key+Shadow, only A crop is active.

Light Source (Image)

You can add lighting effects, such as spots, floods and bars, to effect for added realism. Light Source controls include position, color and rotation. When adjusting Position in Screen mode, however, Light Source effect on the image moves downstream. See later in this section under Light Source (Position).

Skew (2D Trans)

Skew distorts the image by letting you control the corner angles. A normal image has 90 degree corners. The default skew value is 0.0000. 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. You can skew the image horizontally, vertically, or both.

Pre/Position Size (2D Trans)

These controls adjust the image's size and position upstream of the 3D transforms. Repositioning the source image with Pre moves only the source image, not the Source plane or its axis of rotation.

Aspect (2D Trans)

Aspect lets you individually control the source image's horizontal and vertical size, making it other than the selected SD or HD format. This control resizes the image while keeping its center point at the center of the source plane.

Warp (Warp)

Warp controls let you distort the image. In actuality, Dveous/MX applies the warp shape to the Source plane and slides the image over that warp, thereby creating a distorted look.

To slide an image through a warp, you must go upstream to ***Pre/Position***. Moving a warped image, such as moving a circular shape around the screen, involves using one of the locate or ***Post/Position*** controls.

Local Source 3D Trans

Source Rotate (3D Trans)

Source Rotate rotates the Source plane in this order: Z, V, then H. As the image rotates, it has true perspective, with the angles and sizes needed to give the appearance of rotation in 3D space.

When the plane rotates past an edge-on point, the back image on the Source plane becomes visible. When you rotate the plane, you rotate the plane's numerical framework as well. For example, if you rotate the plane 180 degrees, then try to move the image with ***Pre/Position***, a left position entry moves the image right. With a slight rotation applied to the plane, moving the image with ***Pre/Position*** H or V (depending on the rotation) slides the image closer to or further from you.

Source Axis (3D Trans)

Source Axis lets you move the axes of rotation on the Source plane. By default (normal), the three axes (H, V, and Z) intersect at the center of the Source plane.

You can change the horizontal and vertical values to move the pivot point for the image. The Z axis is normally on the surface of the plane, relative to the H and V axes, but you can move it in front of or behind the plane. If you move the Z axis, you can make the image rotate toward or away from you in a barrel roll, or orbit.

Axis compensation

When you reposition the axis, Dveous/MX automatically corrects Locate values

for you. The compensatory values ensure the image stays still while you reposition the axis. However, you can choose to turn off this automatic feature with Axis Mode in the Personality menu. Axis Mode is *On* by default. Turning it *Off* defeats the automatic correction to Locate.

Source Locate (3D Trans)

Source Locate moves the Source plane in 3D space. You can locate the plane horizontally, vertically, and on the Z axis (toward or away from you, giving the impression of a size change). The effect of moving the image in space is that it maintains the viewing perspective as it moves.

If you rotate the image horizontally, then change the **H Loc** value, the image's angles change to maintain the perspective while the image moves. That is, the image edge that is closer appears to move further and faster than the image edge that is further away.

Moving the image away in space always seems to move the image toward the center of screen. This perspective is consistent with the rules of three dimensions: the further away you get, the more you see around the focal object.

Local Target 3D Trans

The Target parameters are a second set of 3D controls. In the analogy of multiple effects systems, the processed output of the Source 3D system feeds the Target 3D system. The numbering system is identical to the Source 3D parameters. You can use Target controls as additional tools to create complete rotations and hierarchical motion paths.

Rotation is an obvious application for additional 3D controls. If you use just one set of rotational parameters, you must use the predetermined order of plane rotation (Z, V, then H).

An identical set of rotations in Target lets you achieve a different order of plane rotation, such as Z, H, then V. This uses the Target vertical rotation, which is downstream from the Source vertical or horizontal rotation.

Target parameters also let you reposition a previously moved or rotated image, leaving Source 3D controls available to manipulate the image at a different location in space while maintaining correct perspective.

Target Rotate (3D Trans)

Target Rotate takes the three-dimensionally manipulated Source plane and rotates it about the second set of Z, V, and H axes, in that order.

Target Axis (3D Trans)

Target axis lets you move the rotation axes. By default (normal position), the three axes (H, V, and Z) intersect at the same place as the Source axes: the center of the Source plane.

You can change the horizontal and vertical values to move the pivot point for the image.

A simple application of Target axes, used with Source axes, is setting an axis of rotation on either side of the image. This setting lets you rotate the image off either edge without having to create an extra keyframe to move the axis.

Target Locate (Local 3D)

Target Locate moves the plane in 3D space. You can move the plane horizontally, vertically, and on the Z axis (toward or away from you, giving the impression of a size change). The effect of moving the image in space is that it maintains the perspective as it moves. If you use Target **H Rot**, then change the Target **H Loc** value, the image's angles change to maintain perspective as the image moves. That is, the image edge that is closer appears to move further and faster than the image edge that is further away.

Moving the image away in space always seems to move the image toward the center of screen. This is consistent with the rules of three dimensions: the further away you get, the more you see around the focal object. If you combine Target and Source parameters, note that applying a Target **H Rot**, then a Source locate, as described previously, results in the same apparent "slide" seen when moving a rotated image with 2D ***Pre/ Position***.

Global Source and Global Target

The Global Source and Target controls are a another set of 3D parameters that are downstream from, yet operate much like, their Local counterparts.

In the analogy of multiple effects systems, the processed output of the Local 3D system feeds the Global Source/Target 3D system. The numbering system is identical that in Local 3D parameters.

A primary function of globals is to move and rotate solids such as cubes and slabs, but you can also use these controls with single channel effects as well.

Light Source (Screen)

All Light Source parameters affect the image upstream, except for when adjusting *Position* in *Screen* mode. Here, when you move the image with ***Post/Position***, the light sources move with it.

Post 2D Parameters

Perspective (2D Trans)

Perspective exaggerates or reduces the amount of perspective on the processed image to adjust the look of rotated planes. The default value is .3000 for SD mode and 0.0188 for HD mode.

Post/Position Zoom (2D Trans)

In the multiple effects system analogy, you can consider ***Post/Position* Zoom** as a simple 2D image mover that gets its input from the global effects system.

Post/Position* Zoom** is the last level of controls in the system. Use it after building an effect to position the image on the screen. Because ***Post/Position is the final image manipulator, you can also use it to bring an image that is well off screen back into view.

Quick Contents

Section 4: Channel Menus

Abekas

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.

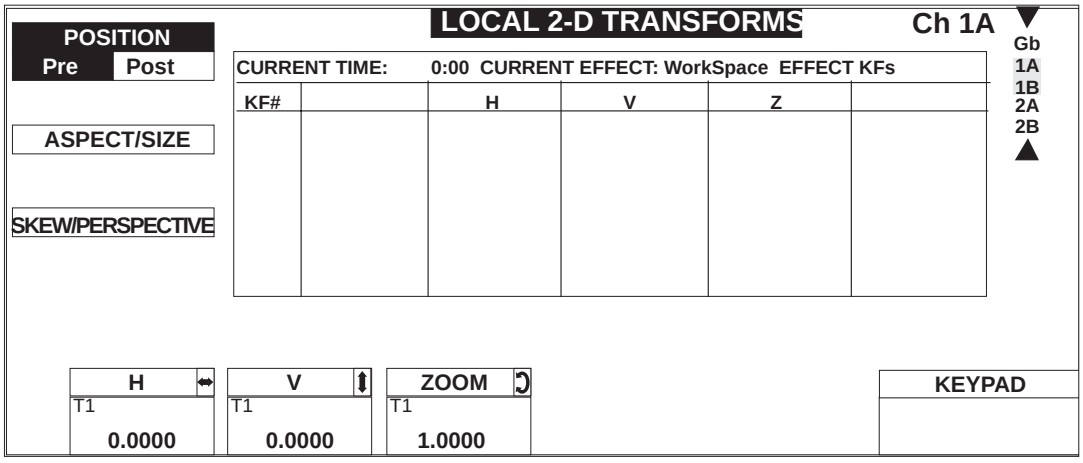
Note: All graphic representations of channel menus will be based on default SD mode parameters and settings.

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.

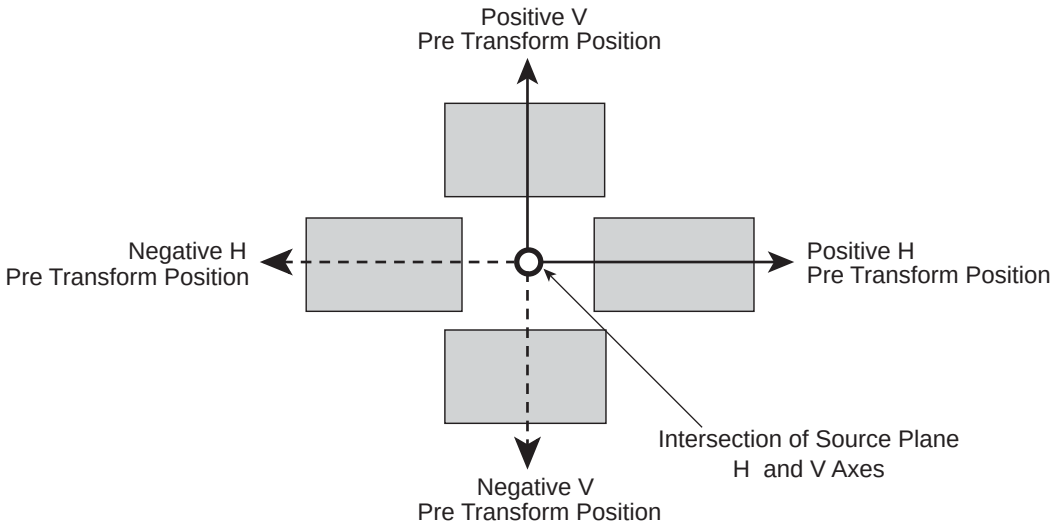


Pre

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

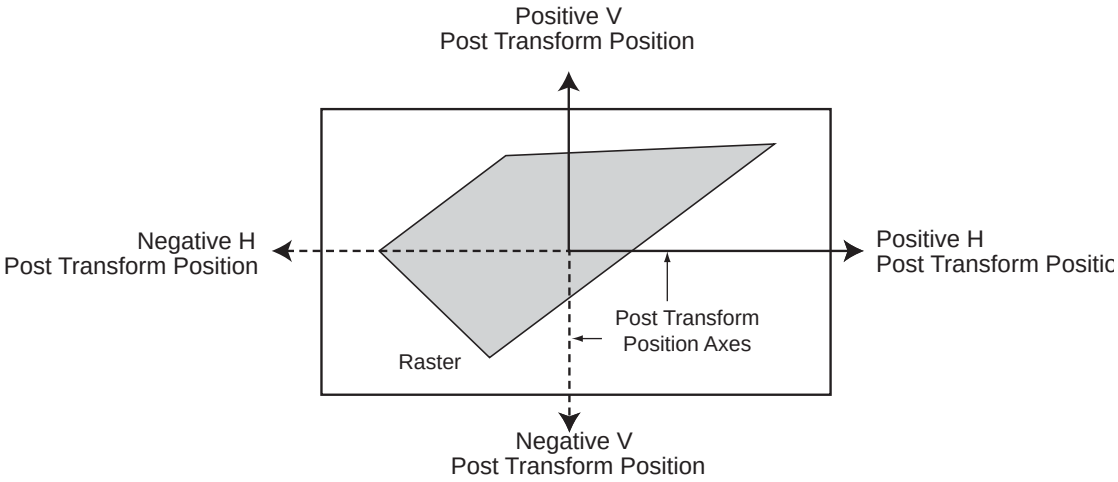
The Post controls position the image downstream of all the 3D transformation. Using the **Zoom** setting to move the image alters its apparent perspective. See the discussion of the ***Skew/Perspective*** softkey for more information on perspective.

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

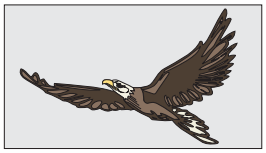
Aspect/Size

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.

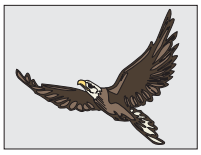
H Aspect Compresses or expands the image along its (Pre transform) horizontal axis. Smaller values compress the image; larger ones expand it.

	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



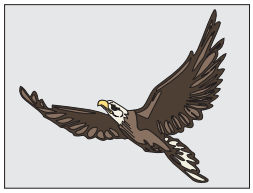
Normal HD (16 x 9) H Aspect Ratio



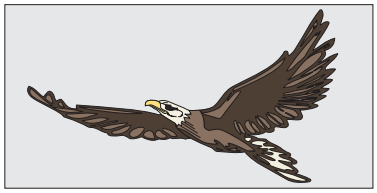
Compressed H Aspect Ratio

SD H Aspect Ratio Examples

Compressed SD



Normal SD (1 x .75)

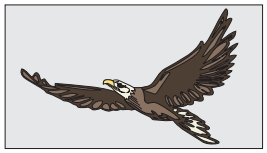


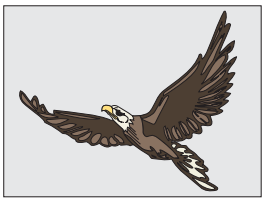
Expanded SD

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

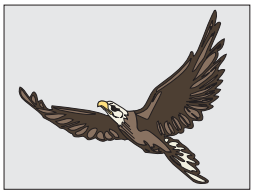
HD V Aspect Ratio Examples

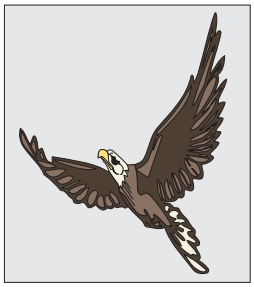




Normal HD V Aspect Ratio Expanded V Aspect Ratio

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

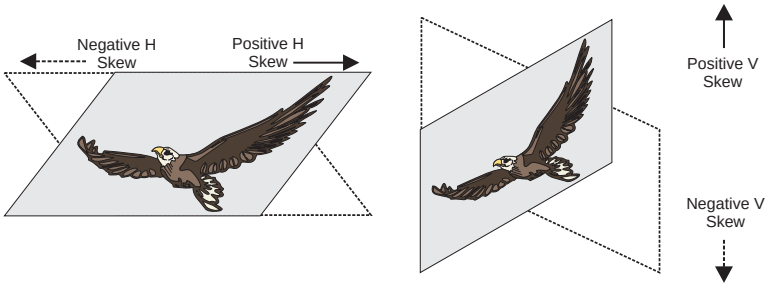
The normal video image is rectangle in shape. By definition, each corner is a 90 degree angle. Changing the corner angles by skewing them creates a parallelogram. You can think of skew as a type of rotation: a value of 0.2500 brings two adjacent corners one quarter of the way around the rectangle, where 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.

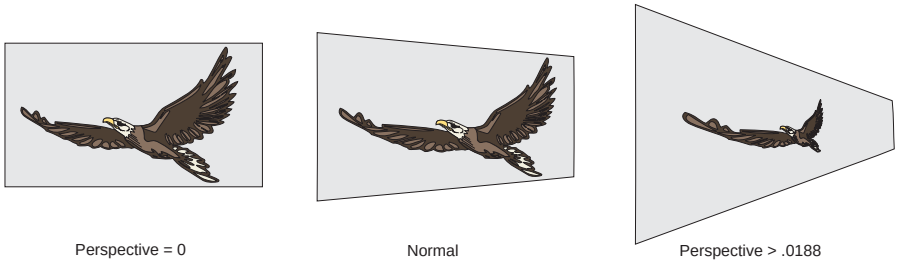
	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.3000	0.0188
Range	0-6.5000	0-0.4063
Align	Nearest multiple of .125	

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.

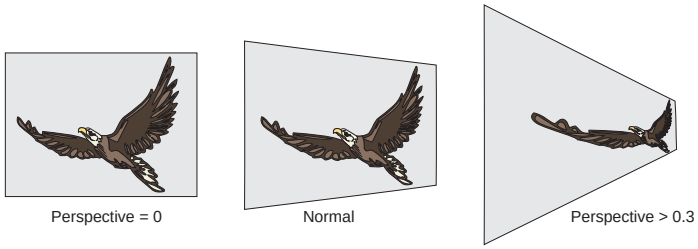
Note that the Post transform **Zoom** control affects the perspective of a rotated image, no matter which space you rotated it in. If you resize the transformed image with **Zoom**, you can multiply the default perspective value by the new **Zoom** value and enter the result in the **Perspcv** softknob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

HD Perspective Examples



Perspective on an image with the same H rotation

SD Perspective Examples

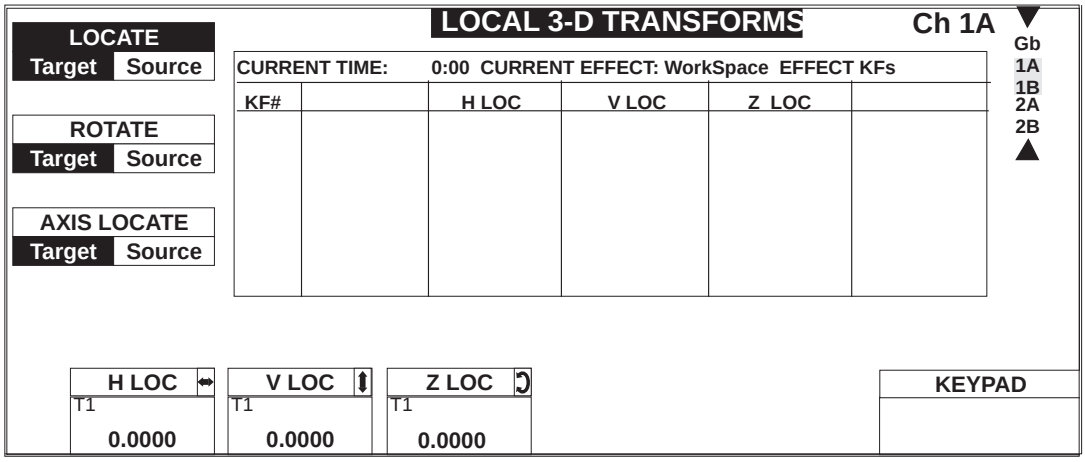


Perspective on an image with the same H rotation

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

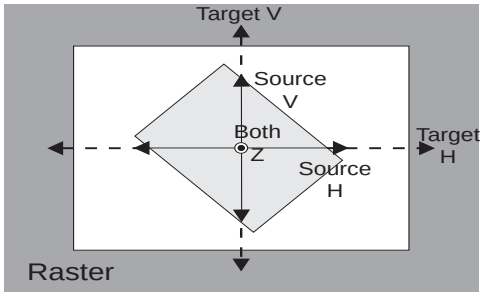
Dveous/MX lets you transform images in 3D space. You can rotate and locate images in both Source and Target space. All rotations use an axis point, which you can move in either space, and can view by pressing the **CURSOR** button.

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.

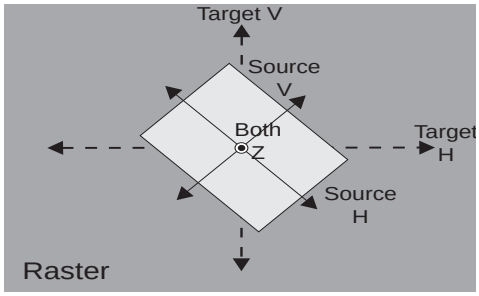
- **Source Space**

  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



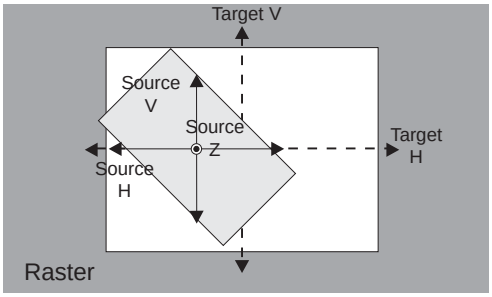
A 45 degree Z Axis rotate
In target space .

- **Target Space**

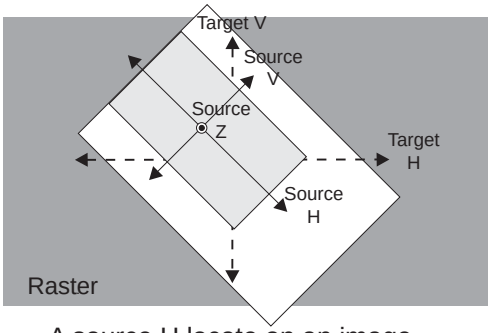
  Manipulations in Target space are relative to the Global Source axes. Any H, V or Z controls move the image relative to the Global settings. If the Global settings are at default, moves in Target space are relative to the raster.

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

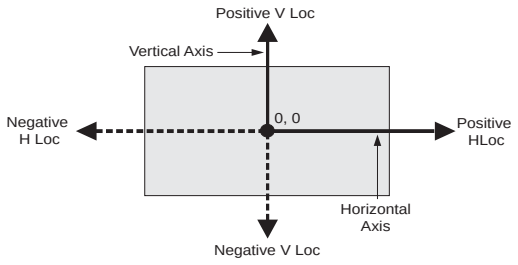
The ***Locate*** function lets you move the image along its axes in 3D space. Toggle the softkey to *Source* or *Target* to highlight the location in which you want to move the image. All Source locates move the Source plane. All Target locates move the Target plane.

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

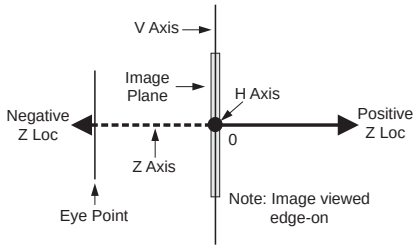
V Loc Moves the image along the vertical axis. Positive values move the image up; negative values move the image down.



	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.

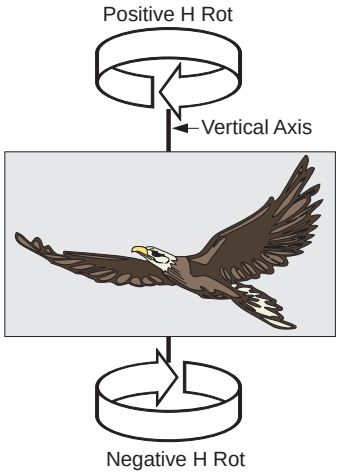
Toggle the ***Rotate*** softkey to highlight the space in which you want to perform the rotate: Source or Target. All Source rotates rotate the Source plane. All Target rotates rotate the Target plane.

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.

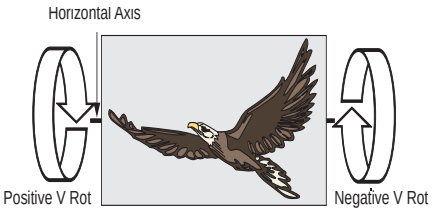
	Both Modes
Default	0.0000
Range	+/- 99.9999
Align	Nearest multiple of .1250 (45 degrees)



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

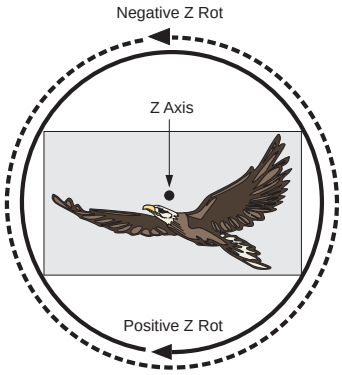
Positive values move the top edge away from you; negative values move the bottom edge away.

	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

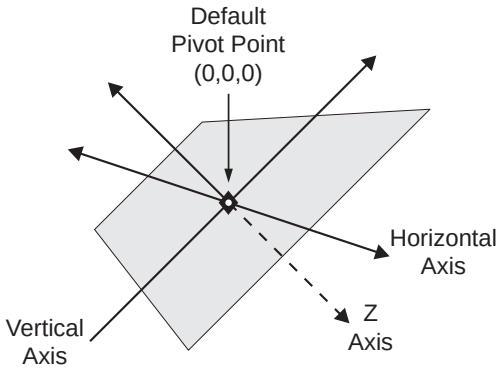
Target/Source

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.

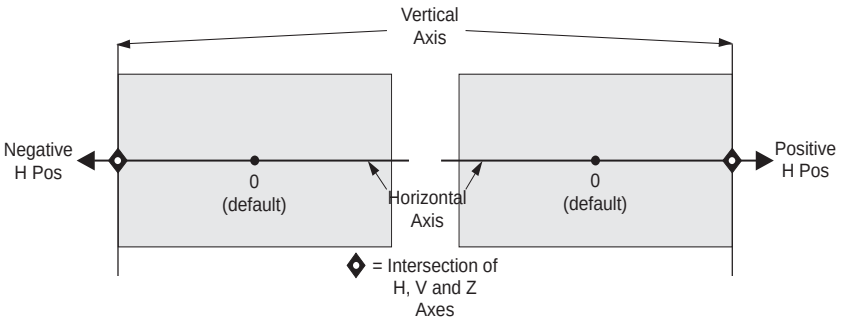
Moving the pivot point lets you rotate the image about its corner, or create swinging door effects, for example. Move the pivot point on the Z axis and use H and V rotates to make the image "orbit" the pivot point.

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.



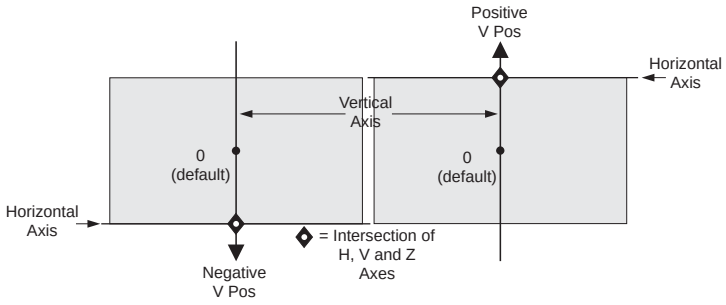
H Pos Moves the pivot point along the horizontal axis. Positive values move the pivot point right; negative values move it left.

	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



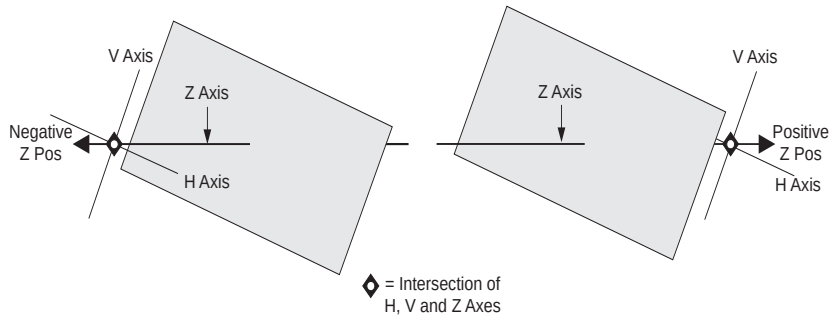
V Pos Moves the pivot point along the vertical axis. Positive values move the pivot point up; negative values move it down.

	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.

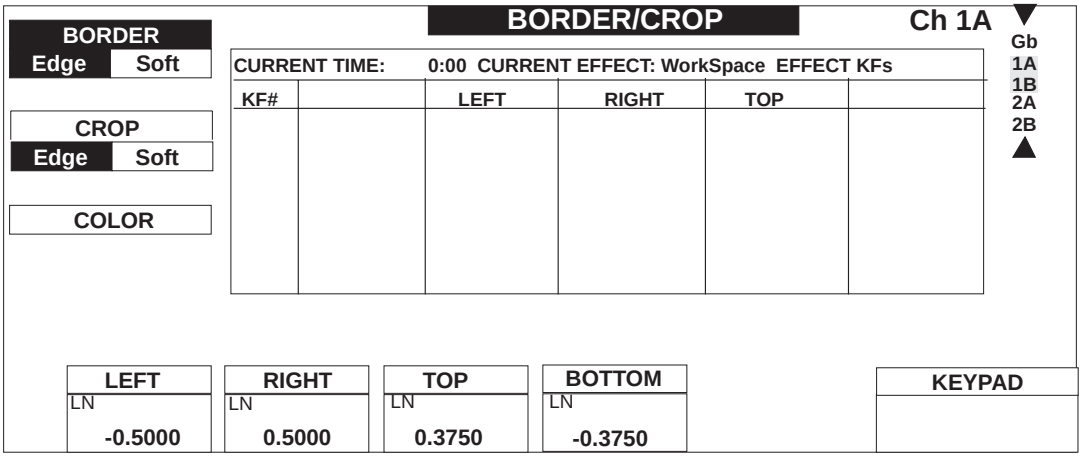
	SD Mode (1 x .75)	HD Mode (16 x 9)
Default	0.0000	0.0000
Range	+/- 99.9999	+/- 1599.9984
Align	Nearest multiple of .125	Nearest multiple of .125



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.

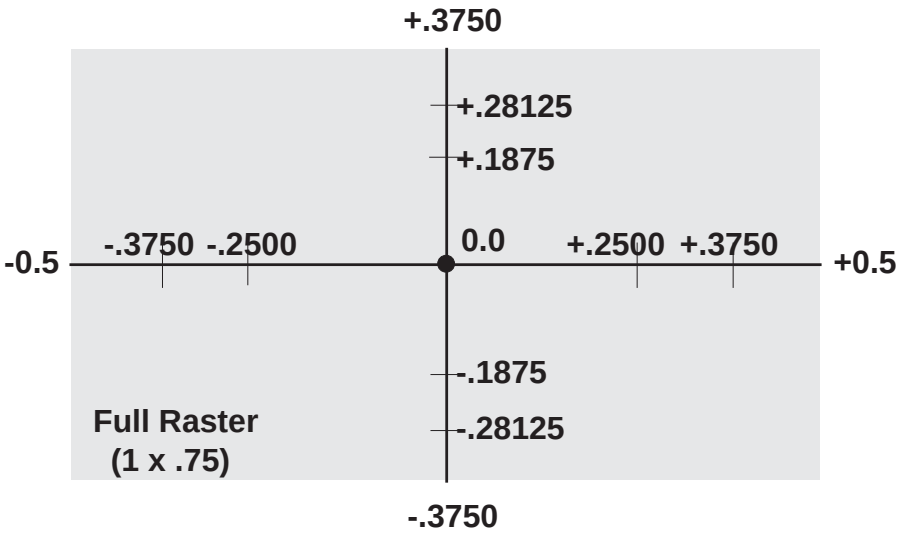


Border

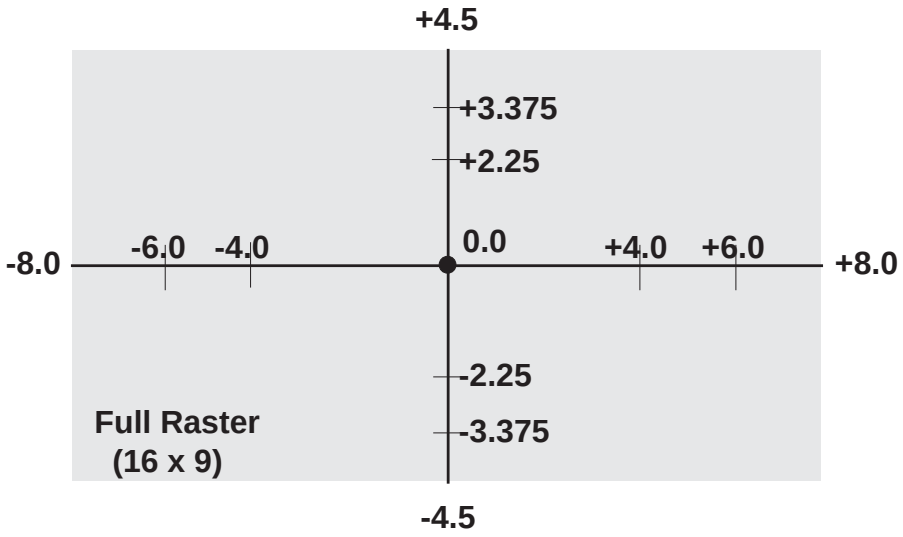
Think of the border as having two edges: the outside edge and the inside edge. The outside one is fixed to the crop edge. The inside edge moves to size the border. The default border values place the inside border edge in the same place as the outside border edge. This means the border is always "on," 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 indepen-

dently, 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.

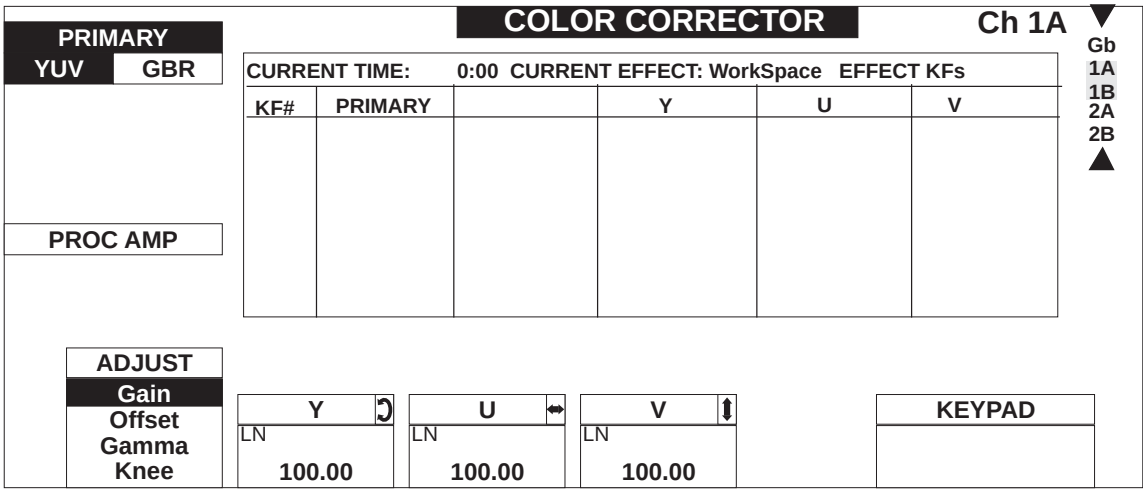
	Both Modes
Default	0.00
Range	0 - 100.0
Align	Nearest multiple of 12.5

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

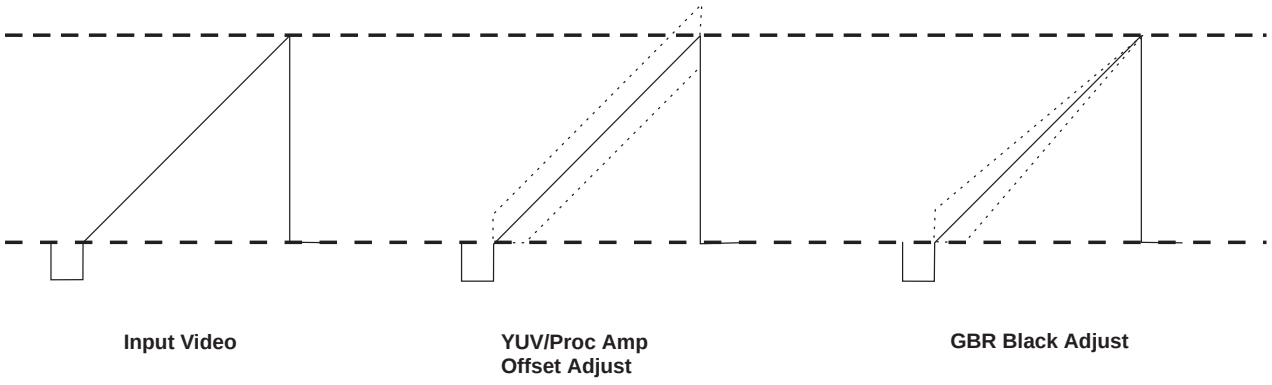
Gain This control increases or decreases the image's overall luminance level.

	Both Modes
Default	100.00
Range	0.00 - 199.86

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

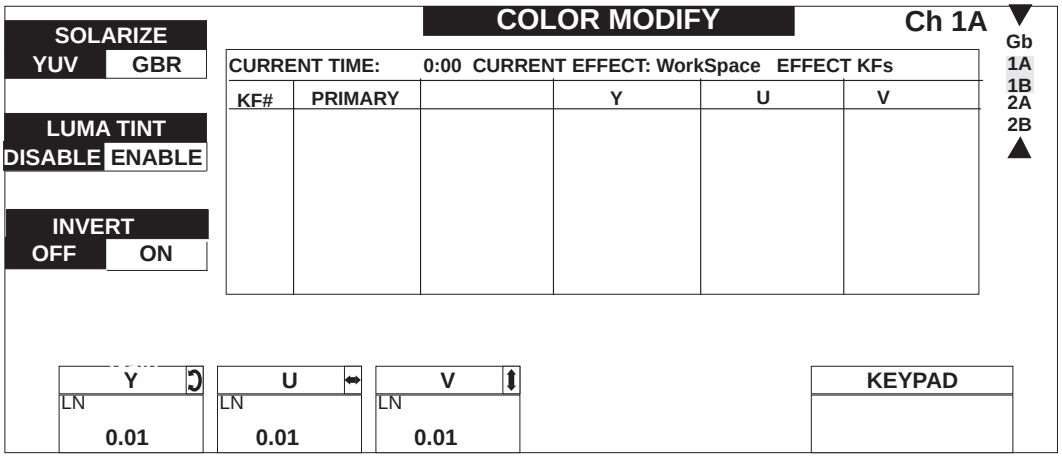
	Both Modes
Default	0.00
Range	+/- 50.0
Align	Nearest multiple of 12.5

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 neg-

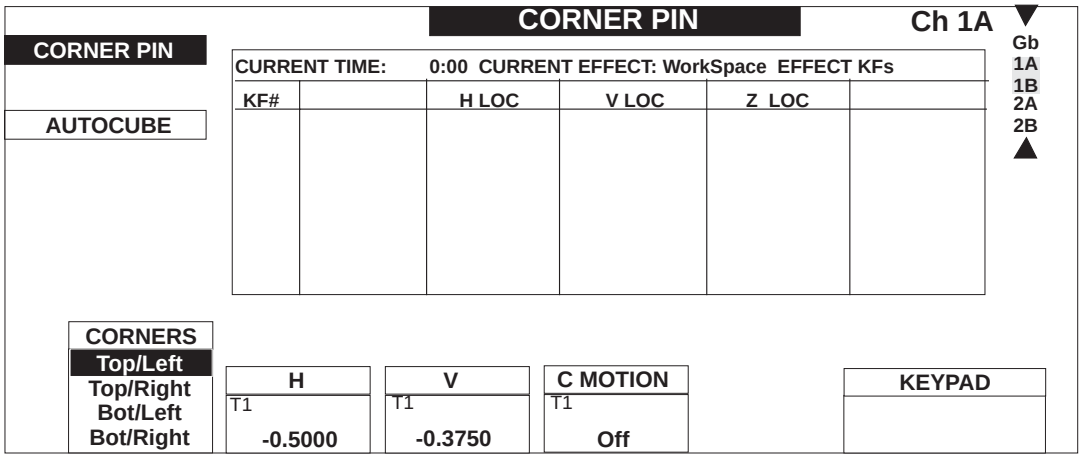
ative image; -100.00 creates a full contrast negative. The softknobs let you invert the individual component's gain.

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

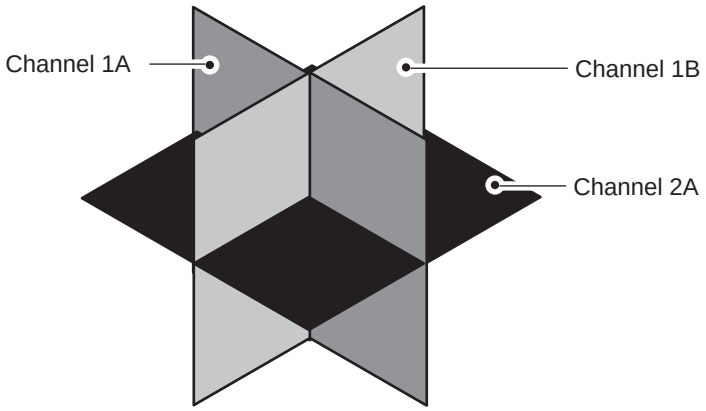
Follow these directions for a six-sided cube using a Dual Twin-Channel system. If you only have a single Twin-Channel system, follow the directions for Channel 1A and 1B for the first pass, and then use the directions for 2A and 2B for the second pass. Be sure to use the same Global keyframes in both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

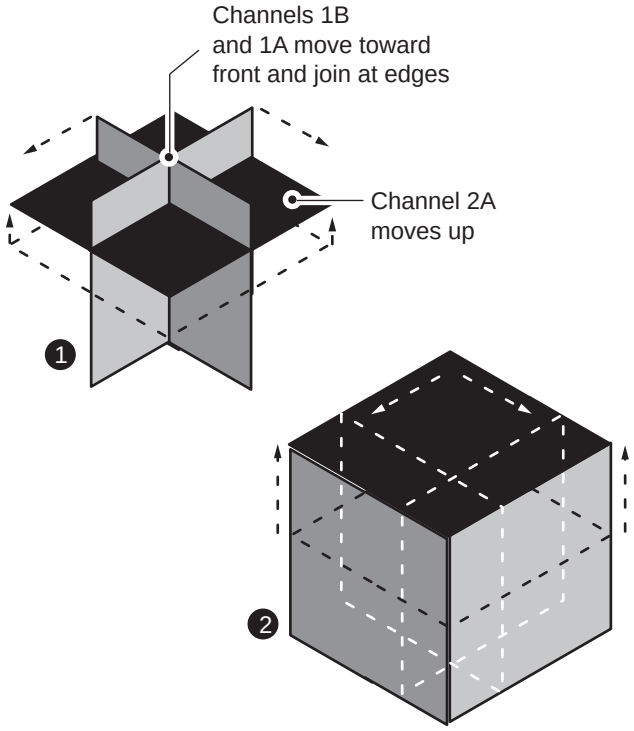
1. Start with all channels full size and centered. Go to the Global Trans menu. Toggle ***Target*** to *Locate*. Enter **Z Loc** = 1.5 (18). This Z value lets you see the transforms better.
2. Delegate only channel 2B. Then go to the 2D Trans menu and select ***Aspect/Size.*** Enter **Size** = 0.0. Since 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.)*

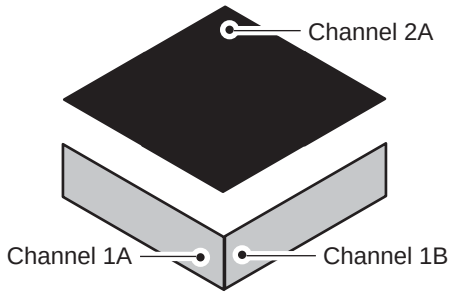


7. You can now spin the cube with the Global channel, by going to the Global Trans menu and using ***Rotate.***

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).

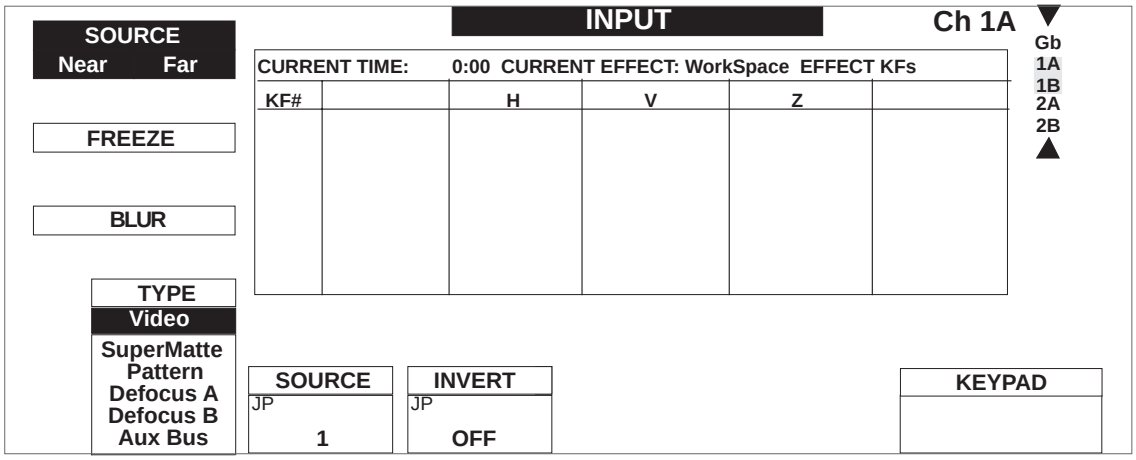
6. Delegate 1A, 1B and 2A. Go to the 3D Trans menu. Press ***Locate*** and toggle to *Source*. Enter **Z Loc** = -.375 (-4.5). Since you are moving the channels in *Source* space, they are all moving outwards relative to the center of the cube.
7. You can now spin the cube by going to the Global Trans 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 9100-0402-01 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.

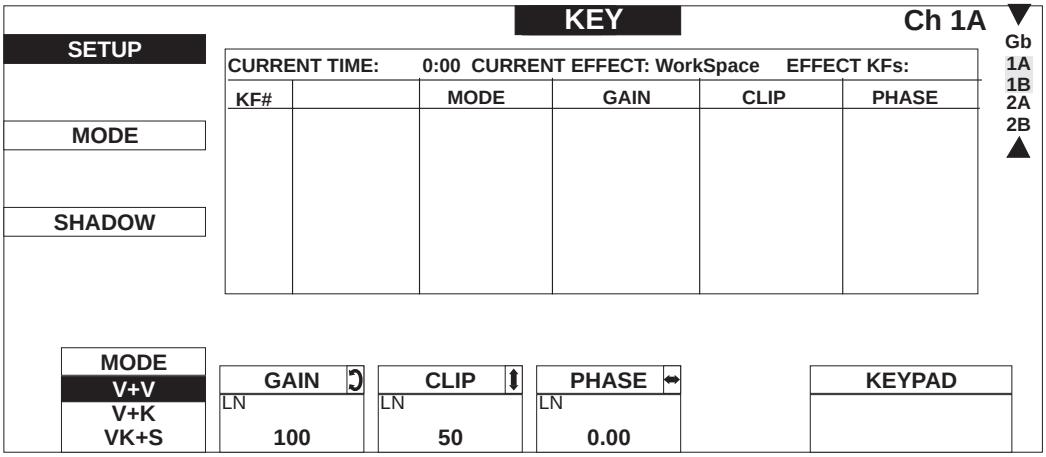
	Both Modes
Default	0.00
Range	0.00 - 100.00
Align	nearest multiple of 12.5

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 key-frames 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.

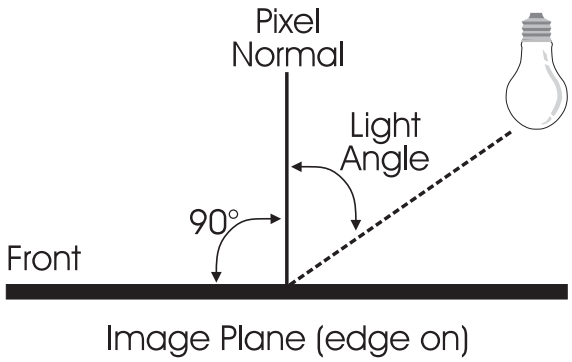
Positioning the Light Source

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.

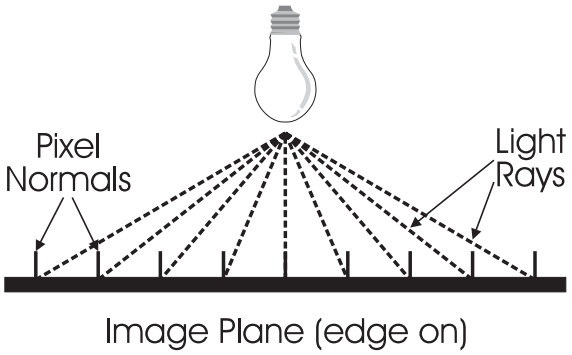
The normal is an imaginary line that intersects the plane of the image at a right angle (perpendicular to the image plane). Because the image is not always a flat plane (after applying a warp, for example), each pixel in the image must have its own normal. In this way, Dveous/MX can compare the light 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

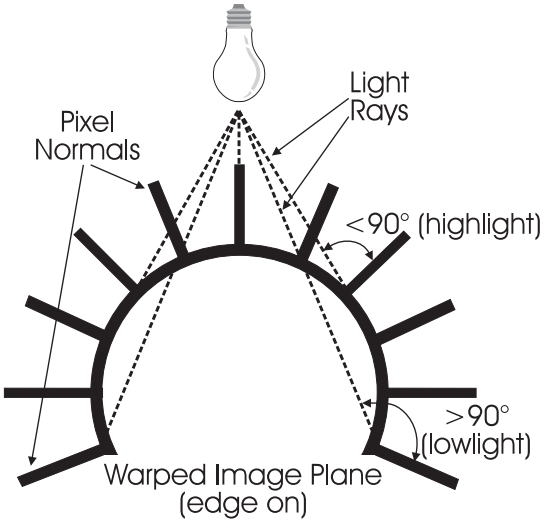
In the following example we will use channel 1A:

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 Ultra Warp

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 dif-

ference 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.

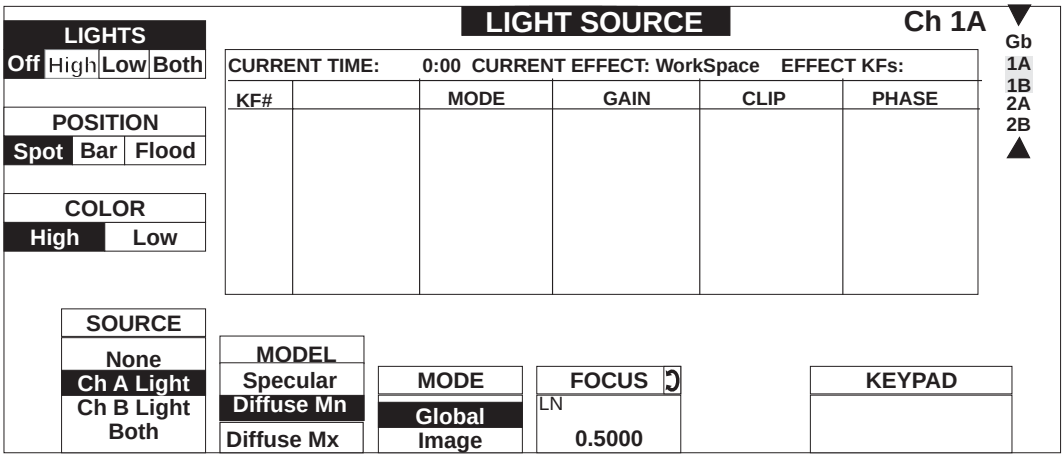
Apply a Light Source to a Warp

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

Amb Y 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.

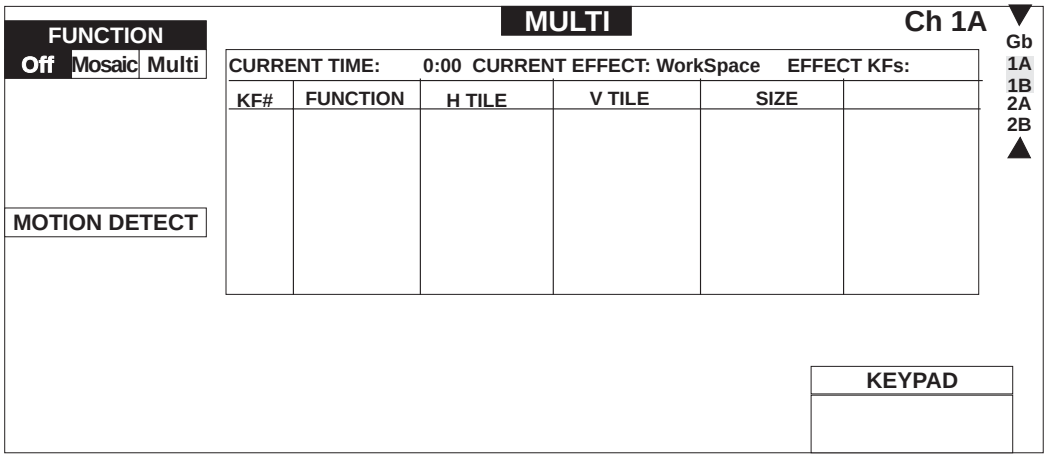
	Both Modes
Default	0.00
Range	+/-100.00
Align	Nearest multiple of 25

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.

H Tile 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.

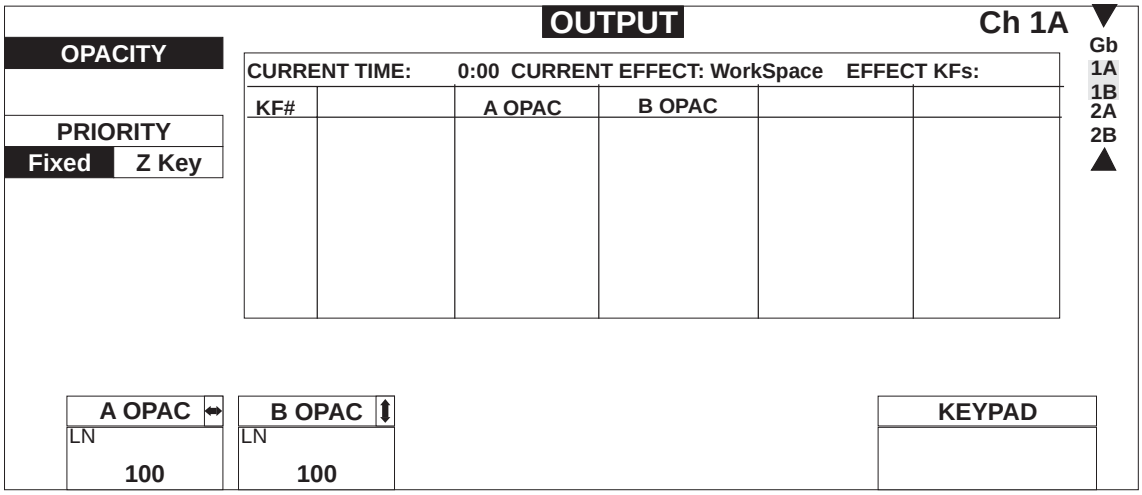
	Both Modes
Default	9
Range	Frame, 1 - 14, Field
Align	None

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:

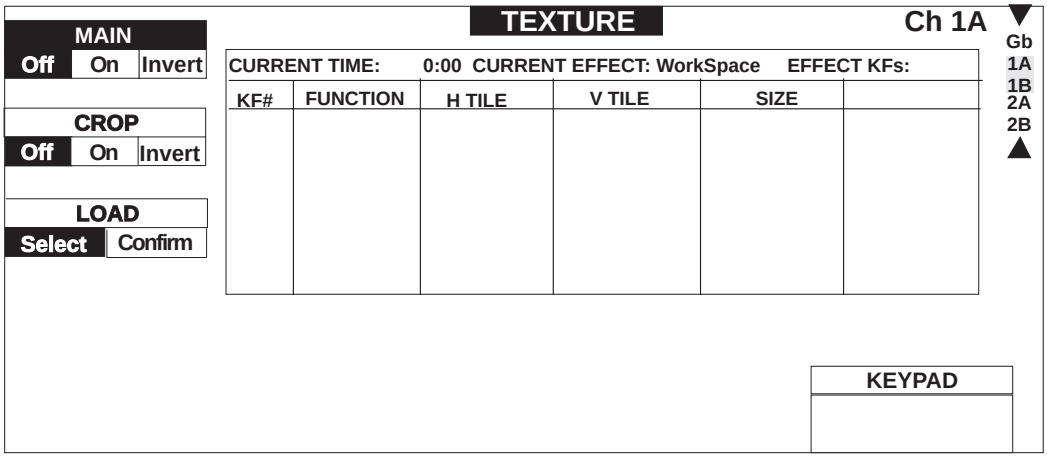
1. Turn on the light source for a DVE channel. See the examples in the Light Sources section for more details on how to do this.
2. Press the **TEXTURE** menu button and toggle the ***Main*** softkey to ***On***. The controls for selecting a texture source, input buffer freeze functions, and texture 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. SuperMatte 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.

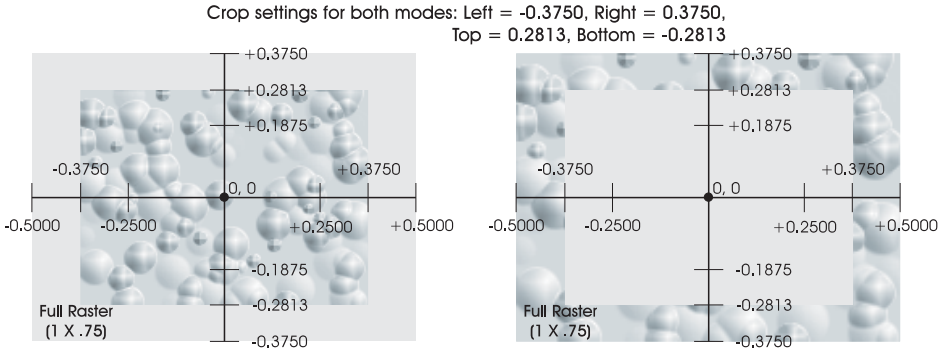
	Both Modes
Default	0
Range	-128 to +127

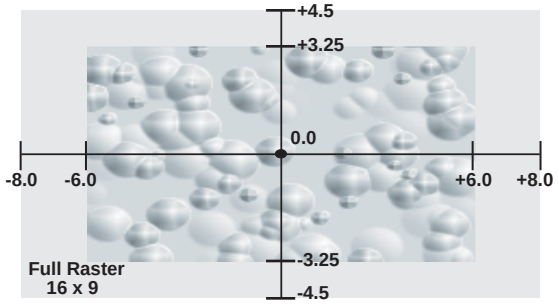
Gain Increases or decreases the contrast between the highest and lowest points of the texture relief. Low positive values narrow the contrast range, and the result is a more subtle relief effect. Higher positive values increase the contrast range, and the result is a more exaggerated relief effect. A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

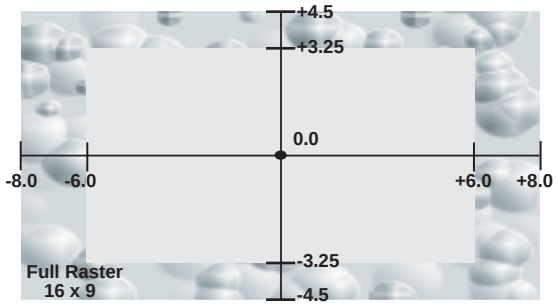
	Both Modes
Default	1
Range	-50 to +50
Align	Nearest multiple of 12.5

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.







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.

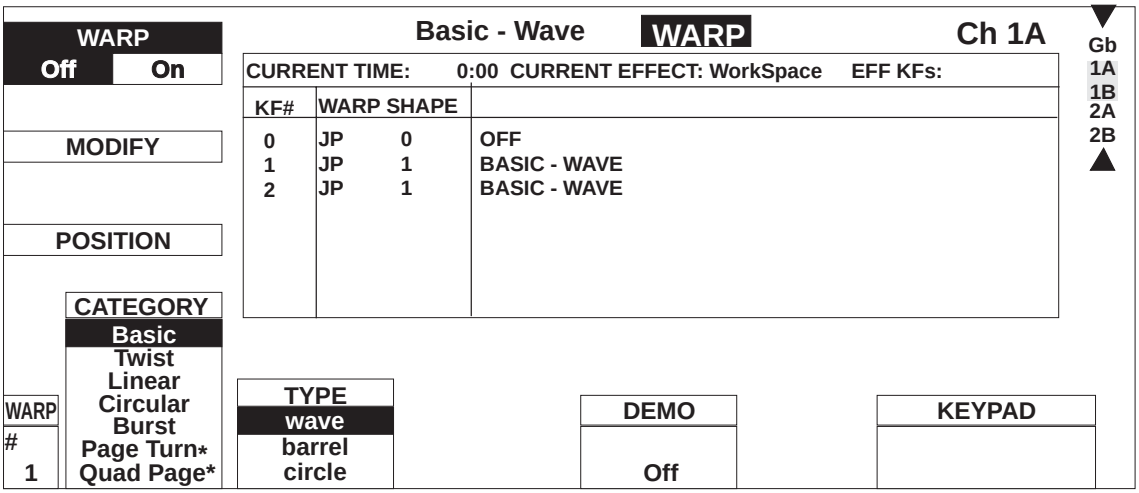
Applying a Warp Shape

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.

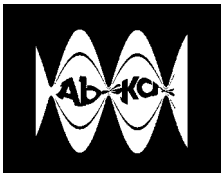
V Position Applies to the **Circular**, **Quad Page**, **Sphere**, **Ripple**, **Concentric** and **Split** categories, plus the **Misc** category **Lens** shape. (For the **Split** category **Split** shape, toggle the ***Position*** softkey to ***Offset*** to access this control.) Use **V Position**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

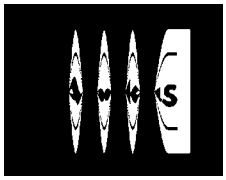
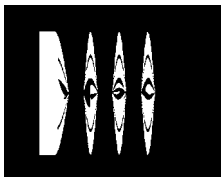
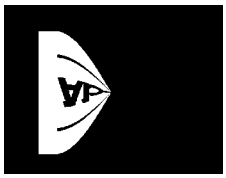
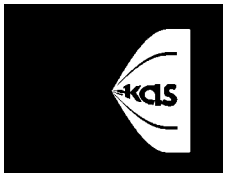
V Split Applies only to the **Split** category **Split** shape. Toggle the ***Position*** softkey to ***Normal*** to access this control. Use **V Split** to set the width of the vertical separation between the parts of the image.

Warp Shapes

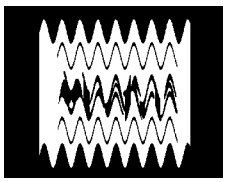
You can quickly view the available warp shapes by using the **Demo** softkey to enable the Demo mode as described at the beginning of this section. The following discussion describes each shape by category and includes an illustration that shows an example of the warp shape. The following examples are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

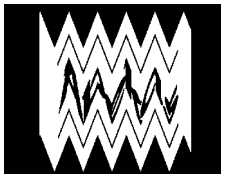
Warp #	Example	Category/Type/View with Description
1		**Basic/Wave** This shape imposes a sinusoidal waveform on the image. **Range** changes the waves' amplitude; **Spread** changes the number of waves visible in the image. A **Spread** value of 0.11 produces the maximum number of waves, which is 13. **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.

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

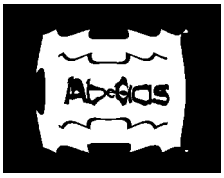
Warp #	Example	Category/Type/View with Description
9 & 10	 	**Twist/Helix/Front, Twist/Helix/Back** These shapes work with two DVE channels in Video+Video mode. Together, they produce the same results as **Helix Both**, but with different images twisting around each other. Video+Key and Video/Key+Shadow modes require two twin channels to create the effect.
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.

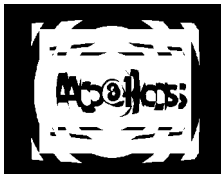
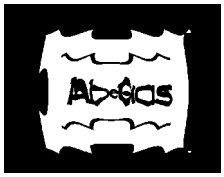
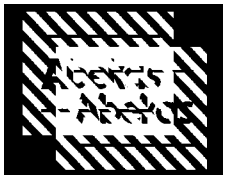
Note: Ripple, Zigzag, and Paper Fold warp shapes do not affect the image if the Range value is 0.00 (default). Use this value to keyframe from/to a non-warped image.

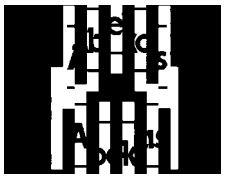
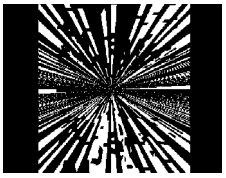
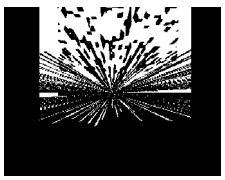
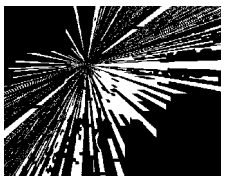
16		**Linear/Ripple** This shape is a variation of the sinusoidal waves used with the **Wave** shape. **Wave** is out of phase from top to bottom, but **Ripple** is in phase. **Amplitude** increases the amplitude of the ripples, **Frequency** squeezes or expands them across the picture, **Axis** rotates the ripple on the image, and **Position** moves the ripples on the image.

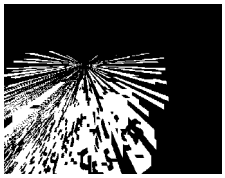
Warp #	Example	Category/Type/View with Description
17		**Linear/Zigzag** This shape is similar to **Ripple**, except that it produces a triangle wave instead of a sine wave. **Amplitude** increases the amplitude of the zigzags, **Frequency** squeezes or expands them across the picture, **Axis** rotates the shape on the image, and **Position** moves the shape along the axis.
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.

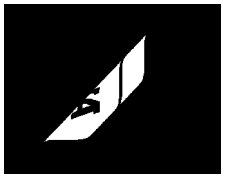
34		**Circular/Ripple** The circular ripple shapes give the effect of the ripples generated by dropping an object into a pool of liquid. **Amplitude** controls the ripples' "gain," and **H Frequency** and **V Frequency** control the number of ripples in each dimension. Use the **Position** control to 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.

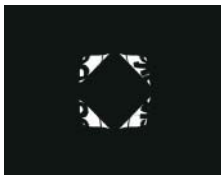
Warp #	Example	Category/Type/View with Description
36		**Circular/Sqr Pulse** This shape gives a pulsed ripple. **Pulse Width** controls a "duty cycle" that widens or narrows the ripples.
37		**Circular/Decay** This shape approximates a sine X/X mathematical function, where the wave ripple amplitude 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.

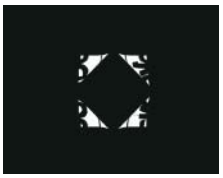
Warp #	Example	Category/Type/View with Description
23		**Burst/Shred** This shape is similar to **Split**, except it shreds the picture to many thin lines. Using certain values for **Axis** and **Spread** give a flickering effect, which you may or may not want. For best results, change both settings until you get the effect you want.
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.

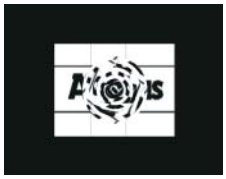
Warp #	Example	Category/Type/View with Description
28		**Burst/Half Flare** This shape is similar to **Flare**, except that increasing **Range** causes the rays to disappear in only one direction.
41		**Page Turn/Roll/Both** Used for One Channel Page Turns (same video front and back.) See below under 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.

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

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

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

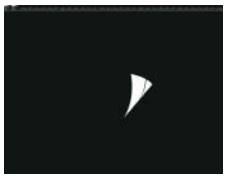
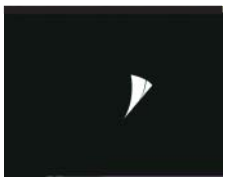
Warp #	Example	Category/Type/View with Description
49		**Concentric/Swirl** Swirls the image. **Position** places the swirl horizontally and vertically along the video. **Rotation** controls the direction and amount of the swirl. **Radius** controls the size of the swirl and determines how much of the 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.
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.

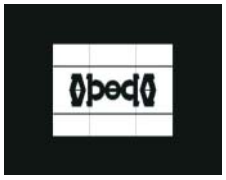
Warp #	Example	Category/Type/View with Description
50		**Cylinder/Vertical** Wraps the video into a vertical cylinder. **Radius** controls how loosely or tightly the cylinder is wrapped, ranging from -1 to +1, with 0 equaling a flat surface. **Position** places the cylinder left or right on the screen. **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.

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.

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

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

Quick Contents

Section 5: Global Menus

Abekas

Overview

The Global Menu buttons control functions that are not specific to the local (1A, 1B, 2A, 2B) channels.

Note: You must delegate the Global channel in order to save effects created with these menus. If the Global channel is not delegated, although you will be able to create effects, you will not be able to save them in keyframes.

There are six menu buttons in the Global area:

- Global Trans

  Global Trans button lets you manipulate an image's location, rotation and size in 3D Global space. Because Global space is downstream of all 3D transform spaces, it applies to all channels as though they were a single unit. You can think of Global space as another DVE that uses the combined output of the channels for its source. Also, Global space has its own timeline, independent of effects on other timelines, so you can offset its start time from those of effects on other channel's timelines.

- Combiner

  Use the Combiner menu to select a background source and to set the key priority between the DVE outputs, the Target Framestore, and the background. The background source can be external video, the internal SuperMatte generator, the Pattern Framestore, or the Defocus module (either live or frozen). With fixed priority, you can manually crossfade and control the opacity of the channels, background and Target Framestore. Z (depth) priority uses the Z locate value of each element to set its priority relative to the other elements in the combined output.

- Target Framestore

  The Target Framestore (TFS) provides recursive effects. These include several trail types (decays, sparkles, and smears) and composite montages that drop frozen images into the Target Framestore, either under (behind) or over (in front of) the combined DVE output.

- Defocus

  The Defocus menu controls the dual channel wide range Defocus module. With this feature, you can simultaneously or independently blur or soften any two Dveous/MX sources.

- SuperMatte

  The SuperMatte menu lets you create a two-color wash or background with dedicated color and pattern generators. The patterns can be used to generate a key signal that is fed to the B side of a twin channel, or used to simulate a wipe pattern. When multiplied, the patterns can also be used to create textures. Also includes SpiralFX for more complex patterns.

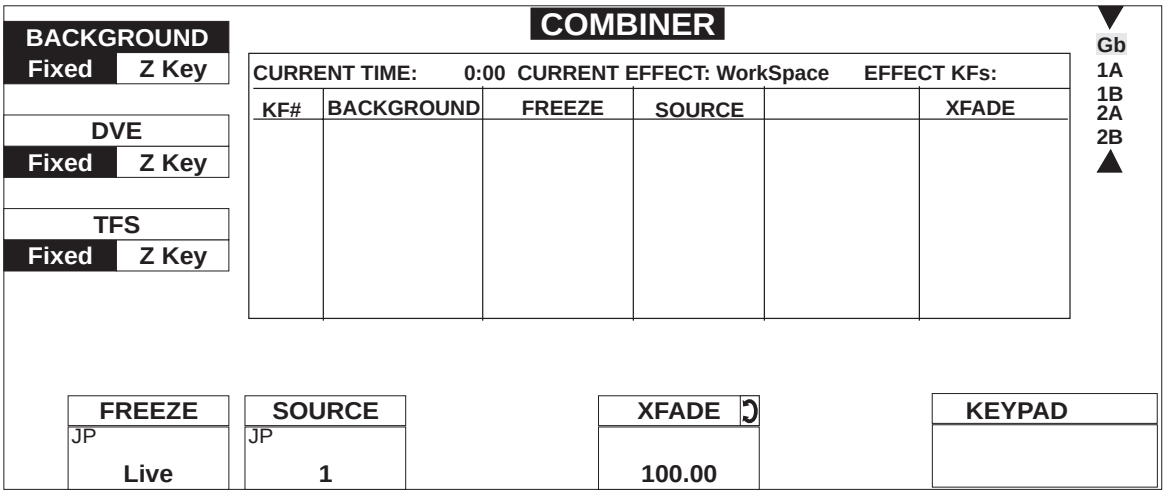
- Solid Builder

  Solid Builder lets you build a slab or cube with just the press of a button. Additional controls let you slide the image along the sides of the cube for perfect positioning, and instantly readjust the size of your solid.

Combiner Menu

The Combiner menu lets you select background sources and either manually (using Fixed mode) or automatically (using Z Key mode) set the key priority. Press **COMBINER** on the Control panel to bring up this menu.

The *Z Key* (automatic) sets keying priority on the relative location of each channel, the Target Framestore and the background in 3D space. With this priority setting, these elements intersect or otherwise interact with each other.



Note: The channel Output menu has controls for setting priority between the A and B channels of each pair. See the information on the Output menu in Section 4 – Channel Menus for more details.

Hint: You must delegate the Global channel in order to save combiner effects in keyframes.

Background

Use this function to select a source for the background, its freeze mode, and its key priority. Two of the softknobs, **Freeze** and **Source**, appear in both ***Fixed*** and ***Z Key*** modes and are discussed immediately below:

Freeze Selects the freeze mode for the background source: Live or Freeze. Note that a frozen background source is always a full frame of video.

Source Selects the source for the background. 1 - 12 are the external inputs. You may have fewer than 12 inputs if the second input module (option) is not installed; six inputs are standard. SuperMatte selects the internal two color SuperMatte generator. Pattern selects the output of the Pattern Framestore. Defocus A and Defocus B select the corresponding output of the Defocus module.

Fixed

The Fixed priority type, by default, places the background behind all other elements in the combined output (all DVE channels and the Target Framestore), no matter what their position in 3D space. You can change this positioning with the **XFade** (crossfade) softknob.

XFade In Fixed priority mode, use this softknob to exchange the key priority of the background relative to the combined DVE and Target Framestore. The default value, 100.00, places the background "behind" or "under" all other elements. A value of 0 places it "in front of" or "over" all other elements. Intermediate settings give a mix of the background and other elements. XFade lets you dissolve or mix the background through the other elements as part of an effect.

Z Key

In the Z Key mode, the priority of the background depends on its location in 3D space, which, by default, is infinitely far from the viewer.

Z Pos Z Pos has the same effect on key priority as the Z locate value for the DVE channels: the lower the value, the "closer" the background is to the viewer. Note, though, that the background does not actually change size or position: this softknob affects only key priority. The default value, 100.00, places the background behind all other elements. A value of 0.00 places it in front of all other elements. Intermediate settings place the background in front of, behind, or intersecting the DVE channels and Target Framestore, depending on their individual Z locate (depth) values.

Z Soft Z Soft controls the sharpness of the priority transition between the background and the other elements. It sets the softness of the edge where the background and DVE channels (and/or Target Framestore) intersect.

	Both Modes
Default	0
Range	0 (soft edge) - 7 (hard edge)

DVE

This function has no effect on a one channel HD mode. This function controls the key priority between the two combined twin channel outputs. Channel 1 is the standard DVE output (1A and 1B combined). Note that if you do not have the dual twin system, the only control that applies is the **CH1 Opac** softknob. These controls treat each combined channel pair (1A/1B and 2A/2B) as a single source.

Toggle the DVE softkey between ***Fixed*** and ***Z Key*** priority. The **Opac** (opacity) parameter softknobs appear for both modes and are discussed immediately below:

CH1 Opac Sets the opacity of the combined channel 1A/1B output.

	Both Modes
Default	100
Range	0 (fully transparent) - 100 (fully opaque)

CH2 Opac Sets the opacity of the combined channel 2A/2B output.

	Both Modes
Default	100
Range	0 (fully transparent) - 100 (fully opaque)

Fixed

Fixed mode, by default, places the combined 1A/1B output over the combined 2A/2B output, regardless of their relative locations in 3D space. You can change their relative priorities with the **XFade** (crossfade) softknob.

XFade In Fixed priority mode, use XFade to exchange the relative priority of the combined 1A/1B output and the combined 2A/2B output. The default value, 0, places 1A/1B over 2A/2B. A value of 100 places 2A/2B over 1A/1B. Intermediate settings give a mix of the two pairs where they overlap. XFade lets you dissolve or mix one channel pair through the other as part of an effect.

Z Key

The Z Key priority mode uses Z (depth) information to set key priority between channel pairs. A lower Z locate value places the channel pair closer to the viewer in 3D space and gives it higher priority. A higher Z locate value places the channel pair farther from the viewer and gives it lower priority. If a channel pair is rotated horizontally or vertically, part of the channel pair is closer, and so has

higher priority. This means that, where channel pairs meet, overlap, or intersect, their relative Z locate values determine which pair is over the other.

Z Soft Controls the sharpness of the priority transition between the channel pairs. It sets the softness of the edge where the channel pairs intersect.

	Both Modes
Default	0
Range	0 (soft edge) - 7 (hard edge)

TFS

The Output function treats the combined DVE channels (1A, 1B, 2A and 2B) as a single source and it controls the DVE opacity and key priority relative to the Target Framestore.

Toggle Output between ***Fixed*** and ***Z Key*** priority. The **Opac** (opacity) parameter softknobs appear in both priority modes and are described immediately below.

DVE Opac Sets the opacity of all combined DVE channels as a single source.

	Both Modes
Default	100
Range	0 (fully transparent) - 100 (fully opaque)

TFS Opac Sets the opacity of the Target Framestore option.

	Both Modes
Default	0
Range	0 (fully transparent) - 100 (fully opaque)

Note: The opacity settings are cumulative, and have a hierarchy that affects the channel's final opacity. For example, channel 1A has a 50 percent opacity setting in its Output menu. If you set the Combiner menu ***DVE*** **CH1 Opac** softknob to 50, it halves channel 1A's visible opacity to 25 percent. If you then set the ***Output*** **DVE Opac** softknob to 50, it halves channel 1A's visible opacity again, to 12.5.

Source Selects one of the three inputs for the Target Framestore. Combined uses the combined outputs of both twin channels (1A, 1B, 2A and 2B). CH1 uses the output of channel 1A/1B only. CH2 uses the output of channel 2A/2B only.

Fixed

The Fixed priority mode, by default, places the DVE over the Target Framestore, regardless of the DVE's location in 3D space. You can change the relative priorities of the DVE and TFS with the **XFade** (crossfade) softknob.

XFade In Fixed priority mode, use this parameter softknob to exchange the priorities of the DVE output and the Target Framestore. The default value, 0, places the DVE over the TFS. A value of 100 places the TFS over the DVE. Intermediate settings give a mix of the two where they overlap. XFade lets you dissolve or mix one element through the other as part of an effect.

Z Key

The Z Key priority mode uses Z (depth) information to set the relative key priority between the DVE and the Target Framestore. A lower Z locate value places the DVE closer to the viewer and gives it higher priority. A higher Z locate value places the DVE farther from the viewer and gives it lower priority. If the DVE is rotated horizontally or vertically, the closer part has higher priority. This means

that, where the DVE and TFS meet, overlap, or intersect, their relative Z locate values determine which is over the other.

If you freeze one or both DVE channels in the TFS, the current channel Z locate information is stored with the video. This gives the TFS its own Z priority, letting it appear over or under the DVE, depending on its Z locate values.

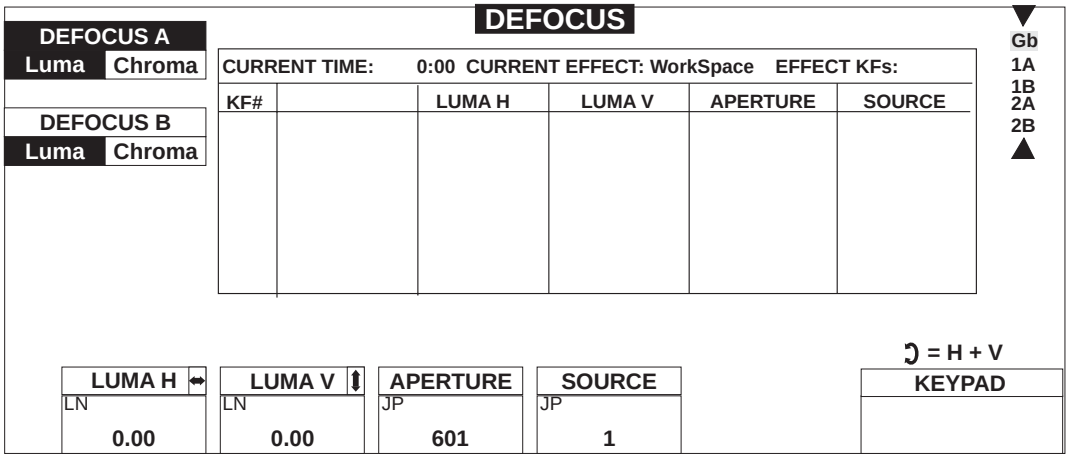
Z Soft Controls the sharpness of the priority transition between the DVE and the Target Framestore and sets edge softness where the DVE intersects the TFS.

	Both Modes
Default	0
Range	0 (soft edge) - 7 (hard edge)

Defocus Menu

The wide range Defocus lets you blur or soft-focus images. You can defocus up to two images, either simultaneously or independently. Use either of the Defocus channels' outputs (Defocus A and Defocus B) as input sources for the DVE channels (1A, 1B, 2A and 2B). You can also use the Defocus output for textures and backgrounds. Press the **DEFOCUS** button on the Control Panel to bring up the Defocus menu.

Hint: You must delegate the Global channel in order to save Defocus effects in keyframes.



Defocus A and Defocus B

There are two defocus channels, A and B. Note that these channels do *not* correspond to the DVE channels A and B; they simply assign one of two paths for routing an image into and out of the Defocus circuitry.

A function softkey exists for each channel, Defocus A and Defocus B. The softkeys operate identically for each channel and select one of three modes:

- The first press selects *Luma* defocus, which affects only the image's luminance (brightness).
- The second press selects *Chroma* defocus, which only affects the image's chrominance (color).
- The third press selects both *Luma* and *Chroma*, which lets you defocus the entire image.

Depending which mode you have selected, the parameter softknobs change accordingly. Descriptions of the parameter softknobs follow, with the three possible headings listed from left to right in order of the function mode selected: *Luma*, *Chroma* or *Chroma* and *Luma* together.

Luma H/Chroma H/Both H Controls the defocus in the horizontal direction. At 0.00, horizontal defocus is effectively off.

	Both Modes
Default	0.00
Range	0.00 - 100.00

Luma V/Chroma V/Both V Controls the defocus in the vertical direction. At 0.00, vertical defocus is effectively off.

	Both Modes
Default	0.00
Range	0.00 - 100.00

Note that you can use the joystick to control the defocus settings. Move the joystick right and left to adjust the horizontal defocus; move it up and down to adjust the vertical defocus. Twist the joystick handle to adjust defocus in both directions simultaneously.

Aperture This softknob lets you select the type of video blanking needed for the input video source. The 601 setting is for digitally generated video, which typically has narrow blanking. Use Analog for video, which has wider blanking. If an image contains black (or blanking) at the edges, passing it through the defocus module averages the black into the active image, resulting in a darkening of its edges. Since defocus applies to the video upstream of the engineering setups and crops, you cannot use them to remove the black edges. The Analog setting replaces the black with gray to keep the softened edges from darkening.

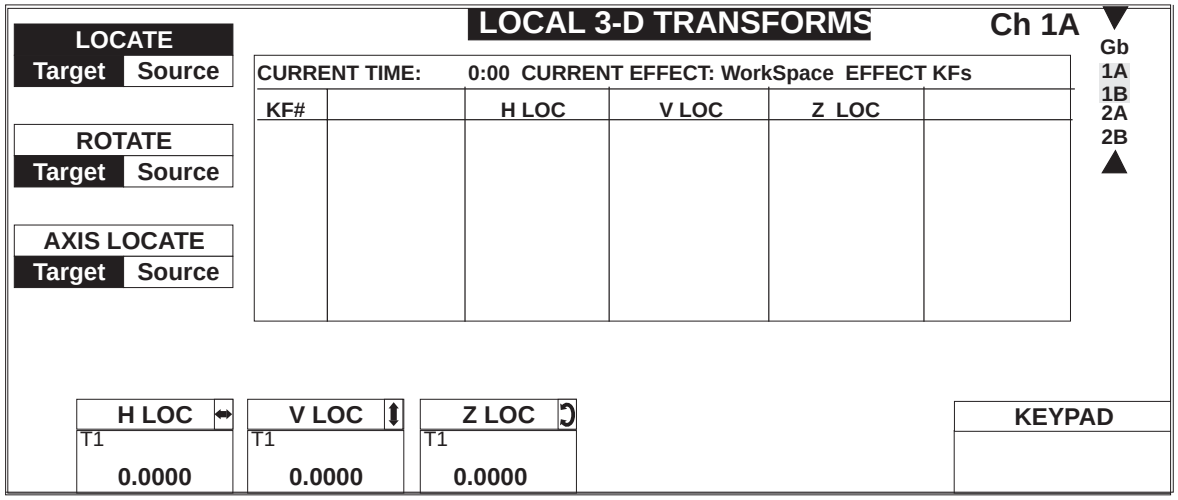
Source Use this softknob to select the source for the defocus channel. 1-12 are the external inputs. SuperMatte selects the internal two-color SuperMatte generator. Pattern selects the output of the Pattern Framestore.

Global 3D Transforms Menu

Press the GLOBAL TRANS button on the Control Panel to bring up the Global 3D Transforms menu. This menu lets you manipulate an image in either Target or Source Global Space. Global transforms are downstream of the 3D transform spaces. For a detailed explanation of the transform hierarchy, refer to Section 3 – Transforms.

Global Trans movement and rotation controls are similar to the ones in the Local 3D Trans menu, and they use the same screen units and rotation values. There are also separate Global Source and Target spaces. As with timeline effects, you can assign Global parameters their own motion path types, keyframe durations and pauses.

Global Space has its own timeline, so you can build effects on the Global timeline and offset their start times from those of effects on other channels' timelines. This separate timeline let you, for example, fly together pieces of an image (each on its own channel) then rotate of fly the entire image as a unit with the Global channel.



Hint: You must delegate the Global channel in order to save Global transforms in keyframes.

Locate

The Locate function lets you move the channels along the Global axes in 3D spaces. Press Locate to enable either Source or Target space as the location for the move. All Target locates move the channels relative to the screen.

All locates have true perspective, unless you alter the Perspcv setting in the 2D Trans menu (default = 0.0188). The perspective setting is downstream of the Global space.

H Loc Moves the channels along the Global horizontal axis. Positive value move the channels to the right; negative values move the channels 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 channels along the Global vertical axis. Positive values move the channels up; the negative values move the channels 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 channels relative to the eye's viewing point. The default value is 0.0000. Positive values move the channels away, making them appear smaller. Negative values move them closer, making the channels appear larger. With a value of - 26.600, the channels disappear because they have reached the maximum eye viewing point and are "behind" you in 3D space.

	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

The Rotate function spins the channels about the three Global axes. Toggle *Rotate* to either *Source* or *Target* to select the space for rotation. All Source rotates spin the Global Source plane. All Target rotates are relative to the screen.

The parameter values represent fractions of a 360 degree turn. For example, two and one quarter turns equals 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; 45 degrees is 45/360 = 0.1250, or one eighth of a complete rotation.

All rotates have true perspective, unless you alter the Perspcv setting in the 2D Trans menu. The perspective setting is downstream of the Global space.

H Rot Rotates the channels about the Global vertical axis. 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 .125

V Rot Rotates the channels about the Global horizontal axis. 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 .125

Z Rot Rotates the channels about the Global Z axis. Positive values rotate clockwise; negative values rotate counterclockwise.

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

Axis Locate

Axis Locate sets the center of rotation for the Global channel. The center of rotation is the point at the intersection of the Global H, V and Z axes. The H,V and X axes are perpendicular to each other and you can use them to move their intersection (the pivot point for the channels) in 3D space. You can move the pivot point on the Z axis and use the H and V rotates to make the channels orbit the pivot point.

Toggle the softkey to either *Source* or *Target* to select the space for the axis locate. All Source axis moves locate the pivot point in Global Source space. All Target axis moves locate the pivot point relative to the screen. Press the CURSOR button in the Graphics area of the Control Panel to enable the cursor that indicates the pivot point's current location. See Section 3 – Transforms for details on the cursor display.

H Pos Moves the pivot point along the Global 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 Global 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 Global Z axis. Positive values move the pivot point away from you; negative values move it closer. Moving the pivot point along the Z axis causes horizontal and vertical rotations to orbit the channels 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

Solid Builder

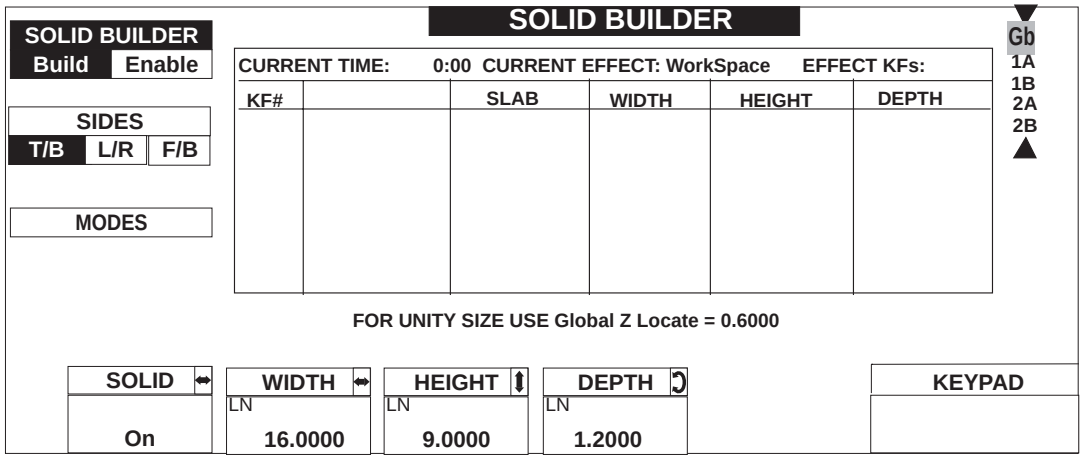
The Dveous/MX Solid Builder builds a slab that can then be enlarged to a cube. The slab is built on the Local Source plane, but the Solid Builder enters the parameters on the Global timeline. That means the Local channel timelines are free for other transforms and attribute changes. So you can change V, H or Z position, add lighting, do some color correction, grab or release freezes, etc.

With the preliminary setup on Local Source, You can perform rotations and changes of position in Local Target. Then tie it all together and do a transform in the Global plane.

Note: Although Solid Builder works in either 1 x .75 (SD) or 16 x 9 (HD), certain parameters do not translate correctly between different aspect ratios. Therefore, an effect using Solid Builder that was built in SD mode may not run correctly if run in HD mode. You may have to modify the effect or rebuild it if you want to do this.

Solid Builder Menu

The following discussion tells you how the menu works.



Solid Builder

Build

Toggle *Solid Builder* to *Build*. Then toggle Solid to *On* to turn the feature on and build a slab. As you adjust Height, Width and Depth values, Solid Builder automatically updates all the slab-essential parameters in other menus.

Enable

Enable lets you decide what channels are used to build the slab. When you toggle *Enable*, four parameters display: 1A, 1B, 2A and 2B. By default, all four channels are *On*, meaning they are being manipulated by Solid Builder. The default slab is built on channels 1A (F/B), 1B (T/B), and 2A (L/R), with channel 2B shrunk to zero size so that it is hidden. To take control of any channel away from Solid Builder, simply turn *Enable* to *Off* for that channel.

Even if you are running a single twin channel system, all four channel parameters display. This way, even though you have a single twin, you can build and copy an effect to a four channel machine.

Sides

The Sides parameters let you slide the video around in the front, top and sides of the slab so that you can position an image exactly where you want it. This feature is great for positioning logos and or featuring specific parts of an image. With the Sides function, you can also adjust the image aspect ratio.

Using the Sides function

Toggle *Sides* to adjust the image in one of the following slab sides: *TB* (Top and Bottom of the slab), *LR* (Left and Right sides of the slab) or *F/B* (Front and Back sides of the slab). For each side TB, LR or FB, you can adjust the vertical and horizontal position of the video and adjust its size, or aspect.

Pos H Repositions the image horizontally in the slab side.

Pos V Repositions the image vertically in the selected slab side.

Size H Adjusts the horizontal aspect of the image in the side.

Size V Adjusts the vertical aspect of the image in the selected side.

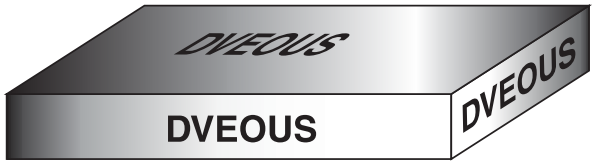
Modes

The Modes function lets you flip the slab side video horizontally or vertically. This feature is useful when the side video includes text. Also, if you are running a single twin channel configuration, Modes lets you place the video for channel 1B. Use the Preview function to easily position and place video for all sides of a unity size slab.

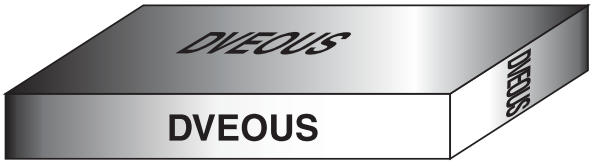
Side H – Horizontal orientation is the default mode. It takes the face video and rotates it 1/4 turn so that it maintains its horizontal orientation.

V – Vertical orientation places the video into the side in its original state, so that it runs vertically down the side.

Text placement using *H* Side mode



Text placement using *V* Side mode



CH1B If you are running a single twin channel system, use this parameter to tell Dveous/MX where to place the B channel video. Channel 1A is always designated as the face. Use the 1B parameter softknob to specify the location of

location. Note: With a single twin channel system, building an apparently six-sided slab requires two passes.

Roll Direction (Roll Dir) This feature allows the user to correctly invert the video when using 3D rotations in conjunction with Solid Builder.

Default – No inverts are possible other than side H and V described above. The invert function in the Input menu is disabled.

Forward – Allows correctly inverted video when the solid is rotated in a forward or backwards motion (top to bottom OR bottom to top). The invert function in the Input menu is disabled.

Sideways – Allows correctly inverted video when the solid is rotated in a side to side motion. The invert function in the Input menu is disabled.

Manual – In this mode the Invert function in the Input menu is enabled allowing the user to invert any side on a keyframe by keyframe basis for more complex rotations.

Note: Global channel must be delegated for any keyframe changes to be seen.

Preview Preview is useful if you will be building a full-size slab and want to be able to verify the placement and position of video in all sides of the slab at once. Turn Preview *On* to see a smaller-than-unity size, rotated slab. Then place and position your video. When you leave the Solid Builder menu, the *Unity Size* Global Z Locate value (displayed in the Solid Builder menu) is automatically entered. Your slab is still there, but at unity size, with all video in place and position as you previewed it.

On – Choose *On* to preview rotated slab. **Off –** Choose *Off* to turn off the preview.

Note: Preview mode assumes that all 3D and Global values are at Unity.

Keyframe Rules and Notes

- The GLOBAL channel must be delegated for all keyframes.
- It's also good idea to have a keyframe on every channel all the time. Having all channels delegated is especially important when creating your first keyframe. That way, you establish a keyframe that anchors you at the starting point and keeps your effect intact.

Building a Basic Slab

1. Clear out any existing keyframes or menu parameters by pressing NORMAL–NORMAL–NORMAL– ENTER. Then, go to the Global 3D Transforms menu and shrink the image down and rotate it just a bit. This step is not necessary to build a slab – you could just start from Step 2 – but it will let you see the effects of Solid Builder immediately. For this example, set Z Loc = .75 (SD) or 12 (HD) for the locate source. For the rotate source, set H Rot = -0.125 and V Rot = 0.125.

   It doesn't matter if you have channels delegated or not at this point. Once you start adding keyframes, however, the Global channel must be delegated.

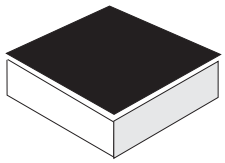
2. Go to the Solid Builder menu. Toggle *Solid Builder* to *Build*. Turn Solid to *On*. Instantly a slab appears.

Now twist the joystick and watch what happens. The Width, Height and Depth change instantly. You may insert keyframes at any time. (Remember to delegate the Global channel.) If you want to rotate the slab, use either Target or Source Rotate in the Global Trans menu.

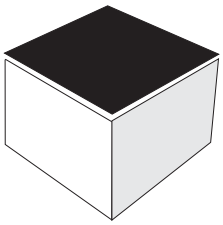
Solid Builder's Automation

Solid Builder goes behind the scenes and automatically adjusts various menu parameters that it considers essential to the building of a slab. You can adjust some of these parameters if you wish, without affecting the integrity of the slab. For example, you can adjust *3D Source* **Z Loc** to lift the face of the slab. How-

ever, some slab-essential parameters are not adjustable, and if you attempt to adjust them, Dveous/MX ignores your input.



The slab top is moved in Local 3D Trans.



Returning to the Solid Builder menu and changing slab Width, Height or Depth does not change the relationship of the top to the slab.

Unity Size

The Solid Builder menu display tells you what value to input for Global Z Source so that your keyframe will have the same 1 x .75 (SD) or 16 x 9 (HD) size and aspect as the original video at the input of the machine. Because Solid Builder pushes the image out to build the slab, adjusting this value will return the image to its correct unity size position. When building slabs, and in order to be able to match unity size, you must use the **Crop** (**A57**) function in the Input Setup menu to adjust for overly wide blanking. Do not use the **Normal** mode.

Building a Slab on the Source and Target Planes

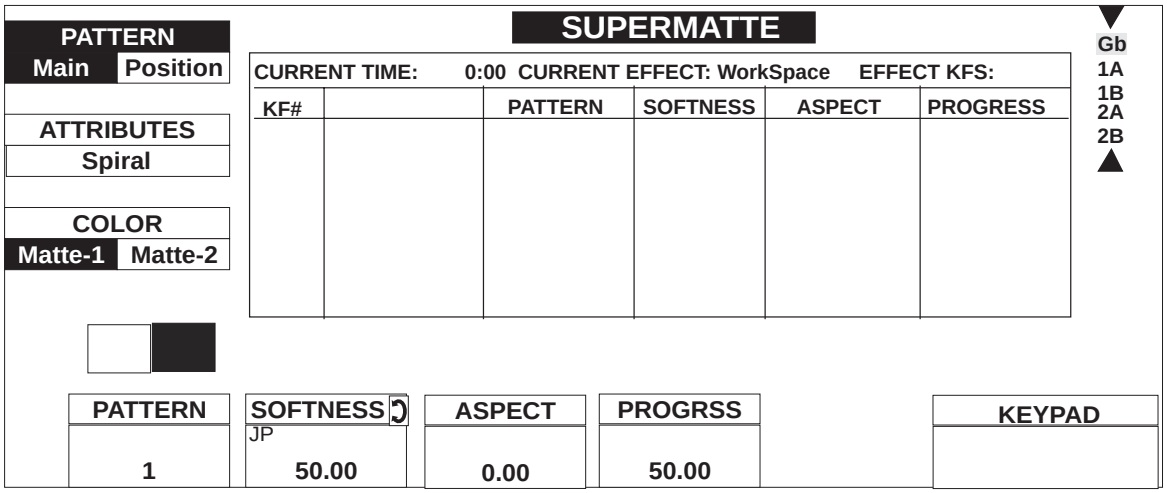
For those who believe it's a good idea to learn mathematical concepts before shooting straight to a calculator, see the directions in Section 4: Channel Menus for manually constructing a slab using the *Autocube* function in the Corner Pinning menu. This cube is built partially in Local Source and partially in Local Target, allowing for maneuvers such as an exploding cube.

SuperMatte Menu

Use the SuperMatte generator to create a two-color wash as a background, video, key or texture source. When used as a key source, the SuperMatte can be used as a wipe signal to wipe a channel on or off. Ninety-seven modifiable wipe patterns let you create a variety of different looks (not all of the patterns are currently active.)

The SuperMatte generator is available as a source, just like any input. Bring SuperMatte in as an input from one of four menus: The Input menu, the Texture menu, the Defocus menu or the Combiner menu.

Hint: You must delegate the Global channel in order to save SuperMatte effects in keyframes.



Pattern

Toggling *Pattern* to *Main* lets you select a pattern and adjust its attributes. Toggling it to *Position* gives you different movement controls.

Main

When you press *Main* the following parameters are enabled:

Pattern Dials in one of 97 patterns available (some are unavailable at this time) from the SuperMatte generator. As you scroll the list of patterns, an example of the pattern will display in the area just above the softknob display. If you know the number of the pattern you want, you can instantly call it up by enter-

ing its number in the numeric keypad and then pressing A on the keypad register.

Softness Adjusts the softness of the edge separating the two color washes. The range is 0 (hard edge) to 200 (softest edge). The default value is 50. A value of 100 gives a softness of 1 screen width.

Aspect Stretches the SuperMatte pattern by changing its aspect ratio. Positive numbers change the horizontal aspect ratio, negative numbers change the vertical aspect ratio.

Progress Changes the pattern size. Larger values increase the size, smaller ones decrease it. The range is 0 to 100, representing the transition from no size (pattern invisible) to full size (pattern full screen). The default value is 50.

The **Progress** value also indicates how far you have progressed through the wipe pattern. In this case, **Progress** is used like the transition bar on a switcher: values 0 and 100 represent the transition bar thrown from one end to the other. A middle value represents the bar in mid-transition. For example, a two keyframe effect with **Progress** set to 0 at the first keyframe and to 100 at the second keyframe would result in a fully transitioned wipe.

Progress works in conjunction with the Level parameter (located in this menu under *Attributes*) when adjusting the *Split* amount. See the discussion about *Level* at the end of the SuperMatte section for details.

Position

These parameters adjust an element of the pattern's rotation and/or location.

Mode Toggles between two modes: *Angle* or *Spin*. Depending on which mode you choose, the parameter softknob to the right will change accordingly. *Angle* tilts the pattern on its Z axis. *Spin* spins the pattern continuously.

Angle/Spin Depending on which mode you selected with softknob A, one of these modes will display:

- **Angle** adjusts the tilt angle of the pattern along its Z axis. The default is zero (0.00) tilt.
- **Spin** determines how fast or slow the pattern spins. Because the value represents the number of degrees the pattern rotates per field, it takes only small adjustments in value to see major results. Positive values spin the pattern clockwise; negative values spin it counterclockwise. The default is 0 (no spin), with a range of +/- 100.

H Pos Moves the horizontal position of the pattern on the screen. Values represent screen units.

V Pos Moves the vertical position of the pattern on the screen. Values represent screen units.

Attributes

Spiral

The new SpiralFX feature gives you control of two spiral generators used in conjunction with patterns 94 through 97. SpiralFX offers users a new creative tool for making complex patterns and backgrounds.

Pressing the **Spiral** softkey will bring up four new parameters: Rings 1, Arms 1, Rings 2 and Arms 2.

To use SpiralFX you must first choose a pattern (under the **Pattern/Main** menu) between 94 and 97. Then you may adjust and play with the Arms and Rings controls to create simple to complex spirals.

- Pattern 94 uses a circular wipe shape and is "additive" between the two spiral generators.
- Pattern 95 uses a circular wipe shape and is "multiplicative" between the two spiral generators.
- Pattern 96 uses a heart-shaped wipe shape and is "additive" between the two spiral generators.
- Pattern 97 uses a heart-shaped wipe shape and is "multiplicative" between the two spiral generators.

The controls for Spiral generator 1 are **Rings 1** and **Arms1**. The controls for Spiral generator 2 are **Rings 2** and **Arms 2**. Patterns 94 and 96 will add the values from the two spiral generators, while patterns 95 and 97 will multiply the values.

Rings controls the amount or tightness of the spiral pattern.

Arms controls the amount of radials (arms) used in the spiral pattern.

Note: The two generators can be used individually, as you will see in the following example, or together for more complexity.

Note: Both **Rings** and **Arms** can be negative numbers, which would reverse the colors of the SuperMatte within the spirals and the rotation of the spiral.

The SpiralFX feature of SuperMatte is a very creative tool. Therefore it will take some experimentation by the operator to create the looks he or she wants. The previous descriptions and the examples that follow are intended to give the operator a basic knowledge of the functions.

Example 1 - Additive

1. Set SuperMatte pattern to 94
2. Set **Softness** to 0
3. Press **Attributes** softkey to bring up Rings and Arms parameters
4. Set **Rings 2** and **Arms 2** to 0. This effectively sets the second spiral generator to 0, therefore you are not adding any values to the first spiral generator.
5. Slowly adjust **Rings 1** and notice the amount of circles increase as well as the tightness of the spiral.
6. Set **Rings 1** back to a low value (5 works well) and slowly adjust **Arms 1** noticing the amount of Arms (Radials) increasing within the Spiral.
7. Readjust **Rings 1** noticing the effect this has on the Spiral.
8. Finally start changing values for **Rings 2** and **Arms 2** thereby adding these values to the first Spiral generator and noticing the new complexity of the patterns.

Note: The range of the Spiral generators is so large that by using very high numbers you can create noisy (moire) patterns that may sometimes be useful.

Example 2 - Multiplicative

Follow the above example, replacing the following steps.

1. Set SuperMatte pattern to 95

4. Set either **Rings 2** or **Arms 2** to 1. This effectively sets the second spiral generator to 1, therefore you are not changing the value of the first spiral generator.

6. Finally start changing values for **Rings 2** and **Arms 2** thereby multiplying these values to the first Spiral generator and noticing the new complexity of the patterns.

Example 3 - Heart Patterns

Try the above examples with Heart Patterns (Patterns 96 or 97).

Note: Since SpiralFX is part of the SuperMatte functionality then all SuperMatte parameters will affect the spiral as they would any other pattern in SuperMatte.

Color

Adjusts the two colors from the SuperMatte generator. The two default colors appear as blue (Matte 1) and red (Matte2).

Matte 1/Matte2

Toggle between *Matte 1* and *Matte 2* to select which of the two colors you want to change. Then use the luminance (Lum), saturation (Sat) and hue (Hue) parameter softknobs to change the color and brightness.

Lum Adjusts the luminance, or brightness, of the matte color. The range is 0-100, with a default value of 100.

Sat Adjusts the saturation, or chrominance, of the matte color. The range is 0-100, with a default value of 50. Zero is monochrome (no saturation) and 100 is fully saturation.

Hue Adjusts the hue, or tint, of the matte color. The range is +/- 720, with a default of 0. The values represent the hue angles on a vectorscope: 0 is near blue, 50 near magenta, 170 near yellow, 230 near green and 290 near cyan. Although one pass through the color wheel is 360 degrees, Dveous/MX allows plus or minus 720 so that you can transition through the color wheel if desired.

Using SuperMatte As a Wipe Generator

You can use SuperMatte to simulate wipes by setting the matte colors to black and white and then keying in the video. You can wipe between a background and a video source or between two video sources (dual twin systems only).

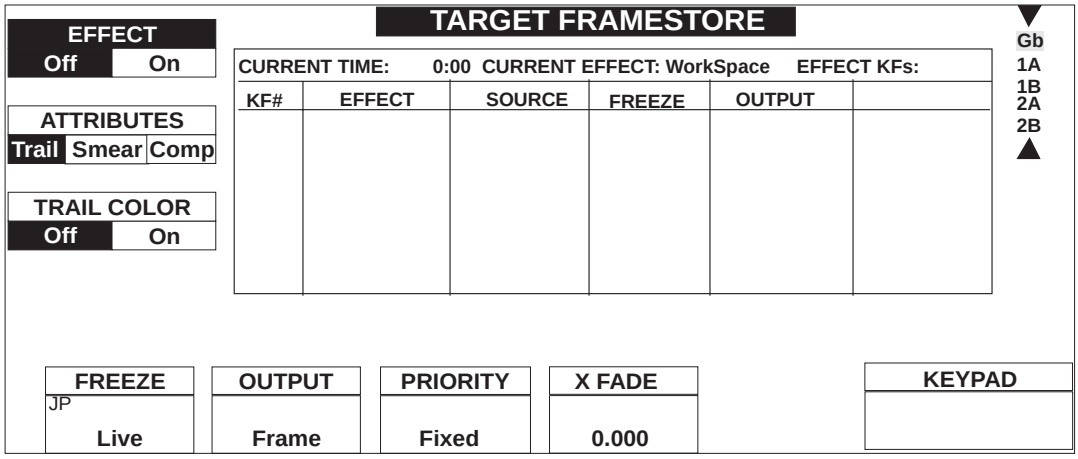
1. Go to the Input menu. Select the Source function. Use Type to choose video for the A channel and SuperMatte for the B channel.
2. Go to the Supermatte menu. Select the Color function. Set Matte 1 to white (Lum = 100, Sat to 0). Set Matte 2 to black (Lum to 0, Sat to 0).

3. Select Pattern and toggle to the Main function and choose a pattern, 1-93, to use as a wipe pattern. Set **Softness** to 0 to create a sharp contrast between the two matte colors and emulate a wipe pattern.
4. Go to the Key menu. Select the Setup function. Use the Mode parameter to select VK+S. Select the Shadow function. Set the B Opac value to 0 in order to eliminate the shadow.
5. Return to the SuperMatte menu. Select the Pattern Function. Use **Progress** to set the movement through the transition. To create a simple, fully transitioned, two-keyframe wipe, set **Progress** to 0 for the first keyframe and to 100 for the second.

Target Framestore Menu

The Target Framestore lets you add an extra dimension to effects, with trails, smears and sparkles. You can also use it to create composite drops, in which images lay on top of the other, as in a collage.

To use the Target Framestore, make sure to shrink down all channels. Any full-size channel will hide the Target Framestore, and its effects will not be visible. Press TARGET FRAMESTR to access the Target Framestore menu.



Hint: You must delegate the Global channel in order to save Target Framestores effects in key-frames.

Effect

Toggles ***On*** to enable the Target Framestore and ready the system for Target Framestore effects.

Freeze Freezes the Target Framestore when toggled to *Freeze*. The default mode is *Live*, which feeds live video into the Target Framestore.

Note: In order to see the Target Framestore in Freeze mode, make sure that the DVE Opacity value is low, and the TFS Opac value is high. These parameter settings are in the Combiner menu, under the Output function. See the *Combiner Menu* section earlier in Section 5 – Global Menus.

Output Selects one of three outputs modes for the Target Framestore: A full frame freeze (Frame), Field 1 only or Field 2 only. Use these controls to adjust or cancel image jitter. You can also select Frame to soften the effect's contours somewhat, and Field 1 or 2 to sharpen them.

Priority Toggles between *Fixed* and *ZKey*.

Fixed - Places each successive image behind (under) or in front of (over) the previous one. Adjust the XFade parameter to set whether the images show behind or in front of the current one.

ZKey - Lets you intersect successive images. In order to use *ZKey*, the images must have a rotation value so that they have an appearance of three dimensionality. When *ZKey* mode is selected, the ZSoft parameter become enabled, letting you set the level of interaction between images.

XFade/ZSoft *XFade* dissolves (mixes) one freeze with another. This parameter is enabled when *Fixed* priority is selected. To set the fixed priority behind, set XFade to 100. To set the fixed priority in front of, set XFade to 0. The default is 0, with a range of 0- 100. A mid-range XFade value dissolves one image into the other, with one having more priority than the other depending on the XFade value.

ZSoft sets the hardness or softness of the images' interaction. This parameter is enabled when ZKey mode is selected.

Attributes

Use the Attribute function to select the effect you want to create: *Trail*, *Smear* or *Composite* (Drop). It is important to note that how fast or slow you move the DVE interacts with values you set in the Trail and Smear modes, and hence affects the effect. Parameter names for Trail and Smear are identical and are listed together immediately following. Composite drop parameters are listed separately.

Trail and Smear

Select *Trail* to enable the Trail effect mode. As you move the video image in Trail mode, both the video and key signal follow it. The effect is an image being followed by a trail.

There are two ways to affect the trail: decay and sparkle. Decay makes the trail fade (or decay). Sparkle gives the trail a sparkling effect by having bits of the video disappear randomly. You can use Decay and Sparkle individually or together.

Select *Smear* to enable the Smear effect mode. As you move the video in Smear mode, only the video signal follows, while the key signal stays on screen, then fades to black. The effect is of having smudged, or smeared, the image across the screen. You can also smear motion inside the video to create a motion blur effect.

Note: In order for smears to be visible, you must set the priority of the Target Framestore to be over (on top of) the live video. To set the priority, go to the Combiner menu. Toggle the Output function softkey to Fixed.

Smear is also affected by the XFade value set in the Combiner menu. A XFade value of 0 (which places the DVE over the Target Framestore) is used for smearing the trail outside the video; a value of 100 (which places the Target Framestore over the DVE) is used to blur the motion inside the video.

Function Toggles either *Decay* or *Sparkle* modes. Depending on the mode you select, parameter softknobs C and D change accordingly. You must use the *Status* parameter softknob to turn either of these functions on. See below under Status.

Status Enables the *Decay* and/or *Sparkle* modes when turned *On*. Note that you can use *Decay* and *Sparkle* separately (one mode *On*, the other *Off*), or in conjunction with each other (both turned *On*).

Decay/Size *Decay* – this parameter appears when Decay is On. In Trail mode Decay affects the amount of time the trail is visible or, in other words, how long it takes the trail to fade. The default value is 100, with a range between 0 - 100. A value of 0 will eliminate any visible trail effect. The higher the value, the longer the trail follows the image.

In Smear mode, Decay controls the opacity of the smear. The higher the value, the more translucent the smear becomes; the lower the value, the more opaque.

Size – this parameter appears when Sparkle is On and it affects the size of the sparkles. The default value is 0, with a range between 0-15. The smaller the value, the more dot-like the sparkles; the larger the value, the more block-like the sparkles.

Slinky/Rate *Slinky* – this parameter appears when Decay is On. It inserts a cuts off point in the disappearance of the decaying trail. The default is 0, with a range between 0- 7. With Slinky set to 0 and a Decay value of 50, for example, the trail will gradually fade. With a Decay value of 50 and a Slinky value of 7, the trail follows the image closely and then abruptly disappears.

Rate – this parameter appears when Sparkle is On and it adjusts the duration of the sparkle effect. Depending on how fast the image moves across the screen, this parameter can be seen to effect the length of the trail. The default is 128, with a range 0-255. With a rate of 0, the sparkle trail is almost opaque and takes a while to dissolve. A rate of 255 will eliminate any visible sparkle effect.

Hint: **Creating Motion Blur**

You can use Smear to blur the motion inside the video. This effect is best observed with fast moving images. Stationary objects in the video will not be effected at all.

1. Go to the Input menu. Press the *Select* function and highlight *Near*. Use the Type softknob and select *Video*. Dial the Source softknob to the input video you want to blur.
2. Go to the Combiner menu. Toggle TFS to *Fixed*. Set the XFade softknob to 100.
3. Turn status on.
4. Go to the Target Framestore menu. Press the *Effects* function and highlight *On*. Press the *Attribute* function and select *Smear*. Select *Decay* under Function. Set the Decay rate to 90. The video now appears blurred.

Comp (Composite)

Composite mode lets you place (drop) successive frozen images into the Target Framestore. You can drop these images over or under images already existing in the framestore, with a result much like images layered in a collage.

Drop Toggles the composite mode *On* or *Off*. *On* drops a freeze of the current DVE output into the Target Framestore.

Priority Toggles between *Fixed* and *ZKey*. *Fixed* places each successive image behind (under) or in front of (over) the previous one. Adjust the XFade parameter to set whether the images show behind or in front of the current one.

ZKey Lets you intersect successive images. In order to use ZKey, the images must have a rotation value so that they have an appearance of three dimensionality. When ZKey mode is selected, the ZSoft parameter become enabled, letting you set the level of interaction between images.

XFade/ZSoft *XFade* dissolves (mixes) one freeze with another. This parameter is enabled when *Fixed* priority is selected. To set the fixed priority behind, set

XFade to 100. To set the fixed priority in front of, set XFade to 0. The default is 0, with a range of 0- 100. A mid-range XFade value dissolves one image into the other, with one having more priority than the other depending on the XFade value.

ZSoft sets the hardness or softness of the images' interaction. This parameter is enabled when ZKey mode is selected.

Trail Color

Toggle Trail Color *On* or *Off*. When *Off*, the trail is filled with video. When *On*, the trail is filled with matte color, whose attributes you can adjust with the Luminance, Saturation and Hue controls (below):

Lum Adjusts the luminance, or brightness of the trail colors. The default is 50, with a range between 0-100.

Sat Adjusts the saturation, or chrominance of the trail color. The default is 100, with a range between 0-100.

Hue Adjusts the hue, or tint, of the trail color. The range is +/- 720, with a default of 0. The values represent the hue angles on a vectorscope: 0 is near blue, 50 near magenta, 170 near yellow, 230 near green and 290 near cyan. Although one pass through the color wheel is 360 degrees, Dveous/MX allows plus or minus 720 so that you can transition through the color wheel if desired.

Quick Contents

Section 6:
Building & Running Effects

Abekas

Overview

This section discusses effect and timeline concepts. It details using the Timeline Control buttons and TimeFrame Effects Editor to create and run timeline effects.

Effects

An *effect* is one or more keyframes strung together to create a sequence. When you run an effect, Dveous/MX begins by configuring the channel(s) according to the first keyframe. It then looks ahead to the next keyframe to determine what the configuration needs to be at the time designated by that keyframe. Dveous/MX then interpolates smoothly from the first keyframe's settings to those in the next keyframe. This process continues, interpolating from current keyframe to the next, until the last keyframe in the effect is reached.

Each keyframe has its own location and duration in the effect. Keyframe durations default to one second, but you can set them to any length from one field to 1000 seconds long. You can vary the length of each keyframe independently and vary the start or end points of each keyframe relative to other keyframes. You can also vary the length of the entire effect, keeping the duration of each keyframe proportional to the others.

Timeline Effects

Each channel (1A, 1B, 2A, 2B) as well as the Global channel has its own timeline. When you build an effect (by inserting keyframes) on any delegated channel(s), you create a timeline for the delegated channel (s). With a fully configured system, you can use up to five timelines to create a timeline effect. With two or more timelines in an effect, each timeline runs simultaneously with, but independently of, the other timelines in the effect. You can offset the relative start and end time of each timeline, including the Global timeline, to create complex effects.

Timeline

A *timeline* is a set of keyframes connected sequentially in time, and a *timeline effect* is one or more timelines running together. You create a timeline effect with the buttons in the TimeFrame Effects Editor and Quick Keyframes areas of the Control Panel, and with the Timeline menu. You can save and recall entire timeline effects to and from on-line memory, and back up and restore them to and from floppy disk or hard drive. For complete information about saving and recalling effects, please see Section 8 – Saving & Recalling Effects.

Number of Keyframes In an Effect

There are 300 keyframes available per effect. Remember that more than one channel can be used to build an effect; therefore, the total number of keyframes available for the effect is the total of keyframes on all the channels. For example, building a four-keyframe effect on both channel 1A and 1B uses a total of eight keyframes. Look to the right of *EFFECT KFs* in the menu display to see how many keyframes are in use for an effect.

Total Keyframes in the System Pool

There are over 1700 keyframes available to the entire system. It is a good idea to periodically check the number of free keyframes to avoid running out at an inopportune moment. To know the total remaining keyframes in the entire system pool, look at the top of the Timeline menu next to *REMAINING KFs.*

Time Values

Time values are indicated in timecode (min:sec:frames). Any value is assumed to be in frames, except if a decimal point is used. The value is then interpreted as seconds and frames. A trailing decimal after the number means an extra field of duration.

For example, entering 100 means 100 frames. The time value displays on the menu as corresponding time code values depending on the HD video format currently selected. For example, 100 frames would display at 3:10 in 1080i 59.94 format.

Entering 10.15 means 10 seconds, 15 frames. The time displays as *10:15*.

Entering 10.15. means 10 seconds, 15 frames, 1 field. The display will read *10:15**. The asterisk represents the field. (For progressive and segmented video formats the trailing decimal would add one extra frame to the time code.)

Customizing Timeline Run Mode

You can choose to run each timeline simultaneously, or to run one or more timelines independently of the others. Controls for these modes are located in the Personality menu, accessible by pressing the **PERSONALITY** button.

Under the ***Misc*** function, use the **Run Mode** softknob to set which mode you prefer. *All Chnls* (All Channels) is the default mode, and runs each of the five timelines simultaneously. *Delegated* runs only delegated channels and provides a handy way to test each timeline individually. Note that when this mode is selected, the word “Delegated” appears on screen to indicate that you are operating in a non-standard mode.

Note: The Delegated run mode is only for viewing and troubleshooting purposes. It is not saved as part of an effect.

No X-Point (No Crosspoint) Mode

No X-Point mode tells the system to ignore the inputs originally programmed for an effect and run it using the currently selected inputs. This mode is designed for live applications, where there are last-minute changes to sources. For example, a different camera angle is requested than the one that is programmed into the effect.

No X- Point is strictly a recall mode, since the original crosspoint information is always stored with the effect when you create it. To activate this mode, press the **NO X POINT** button located at the top of the Control Panel in the System buttons.

1. Press **NO XPOINT** to light its LED. Note that "No Xpoint" shows in the menu display to indicate you are running a non-standard mode.
2. Go to the Input menu and select the desired inputs for each channel, including Near/Far assignment if applicable. Also select texture, background and defocus sources from their corresponding menus.
3. Recall and run the desired effect. The effect runs using the selected inputs, and not the ones originally programmed into the effect. Press **NO XPOINT** again to turn off its LED and disable the No Crosspoint mode.

No X-Point (No Crosspoint) and Aux Bus

No X-Point mode also works with the switcher Aux Bus control. With the No X-Point mode turned on, Dveous/MX will release control of the Aux Busses on the switcher, allowing the operator to select crosspoints live from the remote Aux panel.

For more information about setting up Aux Bus inputs, see Section 4 – Channel Menus under Input Menu. For more a detailed explanation look in the Dveous/MX Technical Guide, P/N 9100-0402-01.

Field Dominance on Run (Run Dom.)

This function lets you select a specific field for Dveous/MX to start on when you run an effect. In default mode, the effect starts running at whatever field the machine happens to be on when the RUN button is pressed. **Run Dom.** mode is helpful when using the Target Framestore, because you can select whether the drops will occur in Field 1 or Field 2.

To access the **Run Dom.** control, go to the Personality menu and press ***Misc.*** Use **Run Dom.** to toggle either **Field 1** or **Field 2** as the dominant start field. Or you can leave the machine in default mode, which is **Off**.

GPI Input Functions

Dveous/MX supports 12 GPI (General Purpose Interface) inputs. The GPI inputs are user configurable, with 27 different functions available for each GPI input. You can assign any function to any of the GPI inputs in the Remote Setup menu using the **GPI Funct** parameter softknob. The 27 functions are listed below.

Run Forward
Run Reverse
Pause
Jog 1 Frame Fwd
Jog 1 Frame Rev
Jog 1 Field Fwd
Jog 1 Field Rev
Freeze Channel 2B
Freeze All Channels
Unfreeze Channel 1A
Unfreeze Channel 1B
Unfreeze Channel 2A
Unfreeze Channel 2B
Unfreeze All Channels
Next Keyframe
Previous Keyframe
Rewind
Fast Fwd
Freeze Channel 1A
Freeze Channel 1B
Freeze Channel 2A
Toggle Freeze Ch 1A
Toggle Freeze Ch 1B
Toggle Freeze Ch 2A
Toggle Freeze Ch 2B
Toggle Freeze All Ch
Toggle Cursor On/Off

GPI Output Functions

Dveous/MX supports 12 GPI outputs, 4 of which are keyframeable.

Note: For further information about GPI inputs and outputs, please refer to the Technical Guide, P/N 9100-0402-01, under the Remote menu.

Timeline Control Buttons

The six Timeline Control buttons let you step through keyframes in an effect, run an effect either forward or reverse, and pause a running effect. These buttons affect all four channels, plus the Global channel, whether they are delegated or not (unless the *Delegated* run mode is turned on in the Personality menu. See ***Customizing Timeline Run Mode*** earlier in this section).

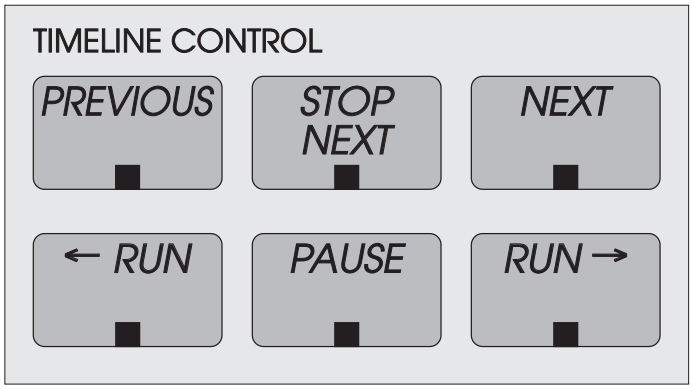
- **PREVIOUS** – performs two functions. You can use it to move to the keyframe before the current one on the master timeline, or you can use it as part of a keyframe editing command.

  As part of a keyframe editing command, for example, if the timeline is on keyframe 2 of a two keyframe effect, entering **COPY–PREVIOUS–TO–3** inserts a new keyframe 3 with the same parameters as keyframe 1. If there is currently an editing command in the keyframe edit dialog, pressing **PREVIOUS** makes it part of the command and does not move the timeline.

- **STOP NEXT** – puts the effect in a special pause mode when its LED is lit. In this mode, the effect runs until it reaches the next keyframe on the master timeline, then it pauses. You can press either **RUN** button to continue running the effect. As long as the LED in the **STOP NEXT** button is lit, the effect runs until it reaches the next keyframe on the master timeline, then pauses. If you use the **RUN** button to run the effect in reverse, it pauses when it reaches the previous keyframe.

- **NEXT** – performs two functions. Use it to step through the keyframes on the master timeline, starting with the current one. You can also use it as part of a keyframe editing command

  As part of an editing command, for example, if the timeline is on keyframe 2 of a three keyframe effect, entering **COPY — NEXT — TO — 1** modifies keyframe 1 to have the same parameters as keyframe 3. If there is currently an editing command in the keyframe edit dialog, pressing **NEXT** makes it part of the command and does not move the timeline.



- ← **RUN** – runs the effect in reverse. If the effect is not running, pressing ← **RUN** runs the effect from the last keyframe toward the first one. If the effect is paused, pressing ← **RUN** runs the effect backward from the current location on the timeline. If the effect is running forward, pressing ← **RUN** causes the effect to immediately begin running backward from the current point on the timeline. The button's LED lights to indicate that the effect is running backward. While running in reverse, a keyframe with a programmed pause causes the effect to pause when it reaches that keyframe, i.e., at the "end" of the keyframe when viewed from the true start of the effect.
- **PAUSE** – pauses a running effect. You can continue running a paused effect in either direction by pressing a **RUN** button. The LED in the **PAUSE** button flashes to indicate that the effect is paused. To stop a paused effect completely, press **PAUSE** again, extinguishing the LED.

  Pressing **PAUSE** with no effect running puts the master timeline in pause mode. This function is useful when you do not want to run the effect from the beginning. Position the effect's timeline on the keyframe you want to start with, and press **PAUSE**. Pressing the **RUN** button starts running the effect from its current position, instead of returning to the first keyframe in the effect and running from there. Pressing **PAUSE** two times quickly will stop a running timeline.
- **RUN** → – runs the effect forward. If the effect is not running, pressing **RUN** → runs the effect from the first keyframe toward the last one. If the effect is paused, pressing **RUN** → runs the effect forward from the current location on the timeline. If the effect is running backward, pressing **RUN** → causes the effect to immediately begin running forward from the current point on the timeline. The button's LED lights to indicate that the effect is running forward.

Using Other Buttons to Move Along the Timeline

Besides the Timeline Control buttons, you can use the **START (REW)**, **END (FF)**, and **THIS** buttons in the TimeFrame Effects Editor area of the Control Panel to move along the timeline. To use these buttons, the keyframe edit dialog must be empty (no keyframe edit command is begun). Press **START (REW)** to move to the first keyframe in the effect, **END (FF)** to move to the last keyframe in the effect. Pressing **THIS** moves the effect to the start of the current keyframe on the master timeline.

Looping an Effect

You can easily set an effect to loop endlessly. To do so, press **RECALL EFFECT** to access the Effects menu. Use the **Loop** parameter can be set *On* or *Off* for any effect.

By default, the last keyframe in an effect has a duration of 1:00 and determines the duration of the transition between the last keyframe and the first. Once running, a looped effect runs until you stop it by pressing the **START** (**REW**), **END** (**FF**), or **PAUSE** button.

There are two ways to set the Loop function:

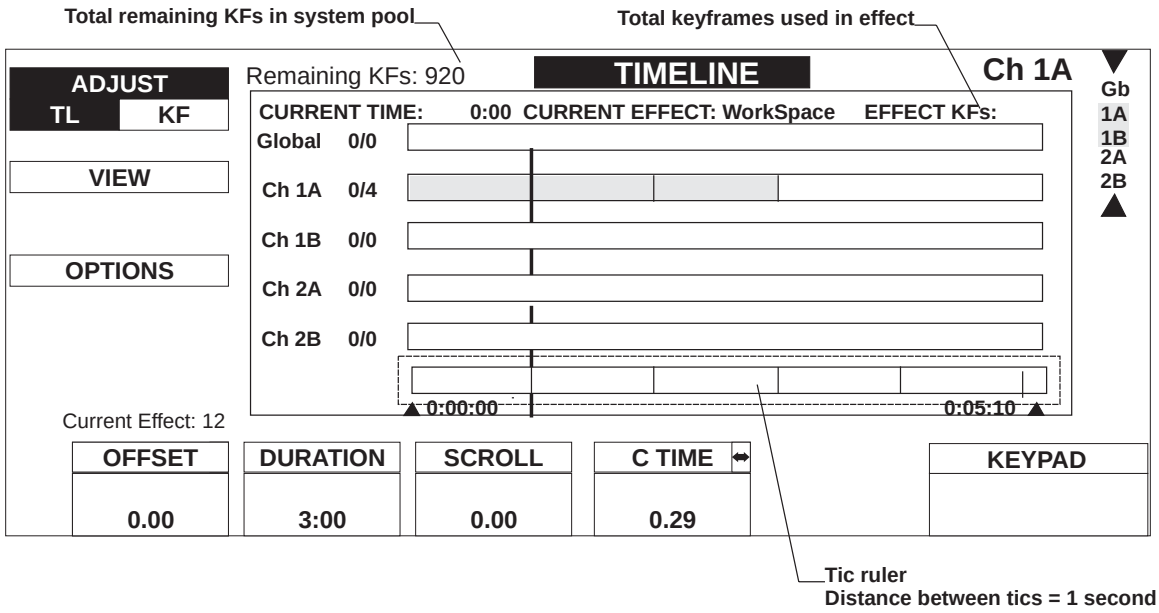
- **For the currently recalled effect—** You must go to the WorkSpace (dial WorkSpace with the Reg# softknob) to enable or disable Loop. When you save the effect again, the current Loop status will be saved into the register as well.

  Note that to disable Loop while running the effect, you must be in pause mode. Press **PAUSE** twice, then move to the Workspace to disable Loop.

- **For any effect other than the currently recalled effect—**You can go directly to the effect's register and turn the Loop parameter *On*. When you recall the effect, Loop will be enabled in its Workspace copy and in its register.

Timeline Menu

Use the Timeline menu to set the duration for an effect, to assign durations to each keyframe, and to view specific points along an effect's timeline.



Reading the Timeline Menu

Keyframes are indicated by small vertical bars (*tics*) along the effect's timeline(s). At the bottom of the timeline window is a time ruler whose tics are graduated in one-second increments. As you magnify the timeline display, you will see smaller graduations along the time ruler. Conversely as you decrease the amount of magnification, the larger the graduation. The tics always represent 1 second, no matter the value of magnification. The two time indicators on either side of the time ruler indicate, in timecode, how much of the timeline you are looking at. The default state of the time ruler is dependent on the SD or HD video format.

The Current Time (CTime) cursor is the thick vertical line that runs through all the timelines. It indicates the point in time of the running effect. The cursor moves as the effect runs.

Note: A keyframeable time line pause is available in the **PATH** menu.

Adjust

Toggling the *Adjust* softkey lets you modify either TL (timeline) or KF (keyframe) durations for the currently active timeline(s).

The parameters for both are identical, except for **Offset**, which appears for *TL* only and which is described immediately below.

Offset

Offset appears only when *Adjust TL* is selected. It offsets the timing of one timeline in relation to the others. As you enter new values, you will see the timeline shift in relation to the others on the menu display. Values are indicated in timecode.

Duration

Adjusting Durations in TL mode

Adjusts the durations of the individual keyframes proportionately to compensate for timeline duration change. You do not need to use any Quick Keyframes or TimeFrame Effects Editor buttons to apply the timeline duration changes; they apply to the effect immediately.

The minimum duration for a timeline is one frame. The maximum duration varies depending on the video format selected. For example, in 1080i 59.94 (HD mode) the maximum is 86,399:00 seconds or 24 hours.

Adjusting Durations in KF mode

Adjusts the duration of independent keyframes or of all the keyframes. Each keyframe has a default duration of one second, displayed as 1:00. The last keyframe on a timeline has a defined duration of 1:00. Usually, this value has no meaning, and does not count in the overall effect length because there is no next keyframe to which to interpolate or transition. However, if you run the effect in loop mode, this value is the duration between the last keyframe and keyframe 1.

After changing a keyframe duration, you must use **MODIFY** in the Quick Keyframes or TimeFrame Effects Editor buttons to apply it to the keyframe(s).

The minimum time for a keyframe duration is one field (:00*, entered using the softknob, joystick, or by pressing **0**, then the **A** keypad softkey). The maximum time is 1,000:00 seconds (16 minutes, 40 seconds).

Scroll

Lets you view other portions of the timeline display by scrolling forward or back. This parameter is for viewing purposes only and does not affect the running of the timeline; you will not see the effect move as you scroll the timeline. Also, see *Auto Scroll* below.

CTime

Lets you jog the effect timeline manually. Use either the softknob or the joystick to adjust the values. Pressing the JOYSTICK LOCK button while in this menu lets you manually jog the effect with the joystick while in other menus.

View

The View parameters adjust how much of the timeline you see on the menu display. These parameters are only for viewing purposes and do not affect the running of the timeline.

Magnify

Expands or shrinks the amount of time shown on the timeline. The value ranges from 0 (least magnification) to 10 (most magnification). To see how many seconds of the effect are displayed, refer to the timecode values beneath the tic ruler.

CTime and Scroll

The **Scroll** and **CTime** parameters operate the same those as for the Adjust Timeline and Adjust Keyframe functions.

Options

The Options function lets you further customize the Timeline menu view.

Auto Scroll

Determines what portion of the timeline remains in viewing range on the menu display. Toggle the mode on or off. The default mode is *On*.

Off – the timeline display does not scroll as the effect runs. The Current Time cursor may not appear in the display.

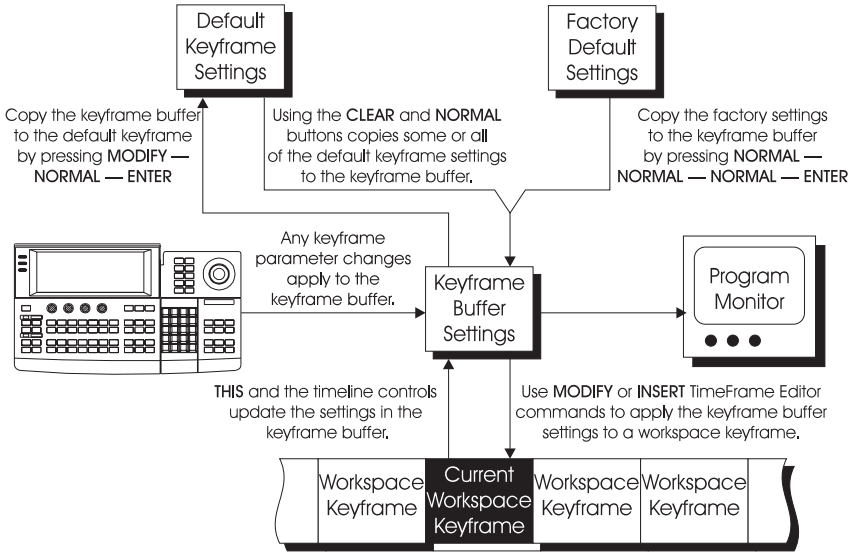
On – the timeline display automatically scrolls as the effect runs. The Current Time cursor remains visible in the display.

Frame Tics

Determines whether or not tic marks display in the ruler. The default condition is *On*. It is useful to turn Frame Tics *Off* if the value entered in **Magnify** inhibits the smooth performance of the **Scroll** feature. For example, as you zoom into the timeline, the distance between tics can be so small that the scroll bar seems to jump. With Frame Tics *Off,* you can scroll smoothly along a highly magnified timeline.

Creating Effects

You can use the Quick Keyframes or TimeFrame Effects Editor buttons to add keyframes to effects, and to modify, copy, delete, and remove existing keyframes. Before we discuss these editing buttons, it is important to understand how using them affects the system.



The Workspace

The Workspace is the part of memory that makes a copy of the most recently created keyframe or the most recently recalled or saved effect. You are never editing an actual effect, but rather a copy being shown from the Workspace. In this way, inadvertent overwrites and modifications are avoided. The only way to save changes you make in the Workspace is to use the **SAVE EFFECT** and **RECALL EFFECT** buttons.

Each channel (1A, 1B, 2A, 2B, and global) shares the Workspace. The total number of all keyframes in the channels cannot exceed 300 for a single effect. The Workspace is RAM protected, so that the effects are not lost if the system loses power, even for several days.

Workspace as the Current Effect When you start building a new effect on Dveous/MX, you will see the word *Workspace* displayed as the Current Effect. *Workspace* will remain as the Current Effect until you save it to the effect register. Then, the register number you assigned it will display next to the Current Effect (although you are still only editing a copy placed in Workspace memory). Additional modifications to the effect will require another save. For more information about the Workspace and saving and recalling effects, see Section 8 – Saving & Recalling Effects. An asterisk (*) next to an effect number notifies you that you have modified the effect.

The Keyframe Buffer

When you alter a keyframe with the position, size, or other settings, you control the contents of a keyframe buffer, and do not affect the Workspace contents. Using a TimeFrame Effects Editor command lets you place the keyframe buffer information into the Workspace, and therefore keep the change.

For example, suppose you are editing an existing effect. You want to alter the rotate setting on keyframe 3. You select keyframe 3, press the **3D TRANS** menu button, and start moving the joystick with ***Locate*** selected instead of ***Rotate***. The change you just accidentally made has only affected the keyframe buffer, not the Workspace effect. Press the **THIS** button on the Timeframe Effects Editor to reset the keyframe buffer to match the current Workspace keyframe.

When you select a Workspace keyframe with **START (REW)**, **END (FF)**, **PREVIOUS**, **NEXT**, or **THIS**, the keyframe buffer exactly equals the contents of that keyframe.

Quick Keyframe Buttons

The Quick Keyframe buttons, illustrated below, let you perform quick, single-press editing commands. They eliminate the need for multiple button press commands. Refer to the following table for commands you can enter with the Quick Keyframes buttons and their results. Keyframe is shortened to "KF" in the following table.

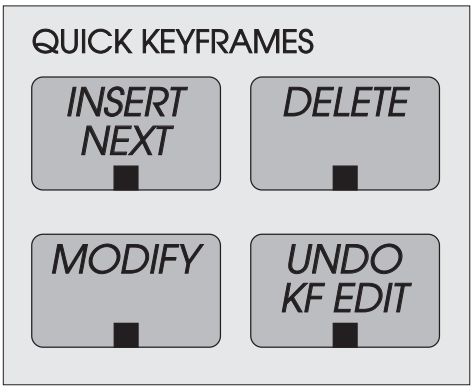


Table 1-1: Keyframe Commands

Command	Condition	Result
INSERT NEXT	NO KFs on any timeline	Inserts KF 1 at 0:00 time with default duration. Moves current time to start of KF 1
	No KFs on the delegated timeline, but KFs exist on other timelines	Inserts a KF at current time with default duration. Moves the current time to start of the new KF.
	Current time is on a KF location	Inserts a new KF after the current KF with the default duration. Moves the current time to the start of the new KF. Ripples KF numbers.
	Current time is between KFs	Inserts a new KF at the current time. Splits the time of the old current KF with new KF. Does not add time to the effect, nor move the current time. Ripples KF numbers.
	Current time is before KF1	Inserts a new KF1 at current time, with a duration that equals the difference between the current time and the old start time. Ripples KF numbers.
	Current time is after the end of the last KF	Inserts a new KF to fit from the end of last KF to the current time.

Table 1-1: Keyframe Commands

Command	Condition	Result
DELETE	Current time is on a KF location	Deletes the current KF, moves the next KF to the current time. Overall effect time shortened by the duration of the deleted KF.
	Current time is not on a KF location (between KFs, before start, or after end)	Error message: Must be on a KF to delete it.
MODIFY	Current time is on a KF location	Replaces the current KF with the Workspace.
	Current time is not on a KF location (between KFs, before start, or after end)	Error message: Must be on a KF to modify it.
UNDO KF EDIT	Any.	Undoes last keyframe edit performed and sets current time to start of effect.

The Undo KF Edit Button

Changing a parameter setting and modifying a keyframe with the Quick Keyframe or TimeFrame Effects Editor buttons changes the current Workspace. These actions also copy the existing Workspace (before you made the change) into temporary memory called the *undo buffer*. Think of the undo buffer as backup storage in case you make a mistake in the Workspace, or decide that the change is not what you want. Pressing the **UNDO KF EDIT** button exchanges the Workspace, which holds the effect with the unwanted change, with the undo buffer, which holds the effect before you made the change.

Also, when you recall an effect register, the system automatically copies the current contents of the Workspace to the undo buffer before recalling the effect register. This way, you can recover what was in the Workspace if you did not save it before recalling the new register. In this case, pressing **UNDO KF EDIT** exchanges the Workspace with the contents of the undo buffer.

Quick Keyframe MODIFY

Note the difference between using **MODIFY** as part of a TimeFrame Effects Editor button command and using the Quick Keyframe **MODIFY** button. Use the Quick Keyframe **MODIFY** button if you only want to change the current keyframe and do no not want to change any of the effect's other keyframes to match. Once you have used the Quick Keyframe **MODIFY** button, you cannot change the rest of an effect using a **MODIFY** command string, because there will be no difference between the setting in the keyframe buffer and the current effect keyframe.

TimeFrame Effects Editor

The 14 Time Frame Effects Editor buttons are illustrated below. Use these buttons individually or in sequence to either edit existing effects or to create new ones.

When you press any of these buttons, the keyframe edit dialog in the menu display shows your editing command sequences as you enter them. Use the numeric keypad **CLEAR** button to clear entries in the keyframe edit dialog.

Note: In most cases, the Effects Editor buttons only affect the currently delegated timeline(s). However, see the description of Double-Press Key Functions later in this section for examples of where this may not be the case.

The following tables list the command sequences you can create with the TimeFrame Effects Editor buttons, and their results. Keyframe is shortened to "KF" in the following tables.

Note: All INSERT operations end with the current time at the beginning of the new keyframe.

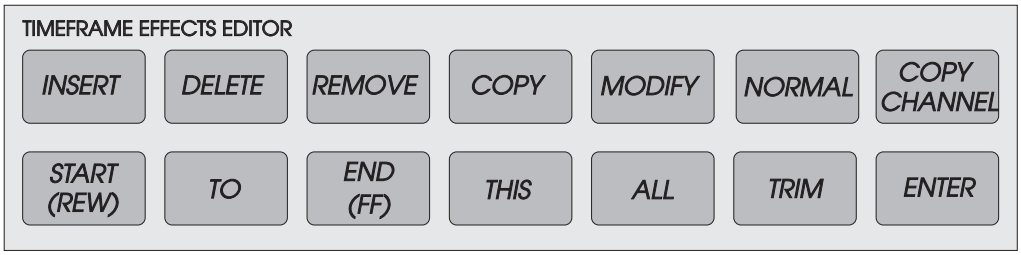


Table 1-2: Timeframe Effects Command Sequences

Command	Condition	Result
INSERT — ENTER	No KFs on timeline.	Inserts KF 1 with default duration. Moves the current time to 0:00.
	Current time is on a KF location.	Inserts KF with default duration before the current KF. Does not move the current time. Ripples KF numbers.
	Current time is between KFs.	Inserts a KF at the current time. The duration is split between the old current KF and the new KF (no time is added to the effect). Does not move current time. Ripples KF numbers.
	Current time is before KF 1.	Inserts a new KF 1 with default duration at current time. Ripples KF numbers. Does not move current time.
	Current time is after last KF.	Inserts a KF to fit from the end of last KF to current time.
INSERT — THIS — ENTER	Same as **INSERT — ENTER**.	Same as **INSERT — ENTER**.
INSERT — START — ENTER	No KFs on timeline.	Inserts KF 1 with default duration. Moves the current time to 0:00.
	Current time is on a KF location.	Inserts KF 1 with default duration at location of previous KF 1. Moves old KF 1 to end of the new KF 1 and ripples KF numbers. Moves the current time to 0:00.
	Current time is between KFs.	Same as on a KF location.
	Current time is before KF 1.	Inserts a new KF 1 at current time. Duration is from current time to old KF 1 start time. Does not move current time and ripples KF numbers.
	Current time is after last KF.	Same as on a KF location.
INSERT — END — ENTER	No KFs on timeline.	Inserts KF 1 with default duration. Moves the current time to 0:00.

Table 1-2: Timeframe Effects Command Sequences

Command	Condition	Result
	Current time is on a KF location.	Inserts KF after the last KF with default duration. Moves current time to end of timeline.
	Current time is between KFs.	Same as on a KF location.
	Current time is before KF 1.	Same as on a KF location.
	Current time is after last KF.	Inserts KF to fit from the end of the last KF to the current time.
INSERT — NEXT — ENTER	No KFs on timeline.	Inserts KF 1 with default duration. Moves current time to 0:00.
	Current time is on a KF location.	Inserts KF with default duration after the current KF. Moves current time to the start of the new KF and ripples KF numbers.
	Current time is between KFs.	Inserts KF at current time. Duration is split between old current KF and new KF (no time is added to the effect). Does not move current time. Ripples KF numbers.
	Current time is before KF 1.	Inserts a new KF 1 at current time. Duration is from current time to old KF 1 start time. Does not move current time. Ripples KF numbers.
	Current time is after last KF.	Inserts KF to fit from the end of the last KF to the current time.
INSERT — PREVIOUS — ENTER	No KFs on timeline.	Inserts KF 1 with default duration. Moves current time to 0:00.
	Current time is on a KF location.	Inserts KF with default duration before the current KF. Does not move current time. Ripples KF numbers.
	Current time is between KFs.	Inserts KF with default duration at the location of the current KF. Ripples KF numbers.

Table 1-2: Timeframe Effects Command Sequences

Command	Condition	Result
INSERT — 3 — ENTER	KF 3 exists.	Inserts new KF 3 before existing KF 3 and ripples KF numbers. Moves current time to KF 3.
	KF 3 does not exist.	Inserts multiple copies of KF to the current effect up to KF 3 all with default durations.
INSERT — 3 — TO — 12 —ENTER	KF 3 exists.	Inserts nine copies of KF with default duration before existing KF 3. Moves current time to KF 3.
	KF 3 does not exist.	Inserts multiple copies of KF to the current effect up to KF 12 all with default duration.
DELETE — ENTER	Current time is not on a KF location.	Error message: Must be on a KF to delete it.
	Current time is on a KF location.	Deletes current KF and moves the next KF to current time. Overall effect time is shortened by the duration of the deleted KF.
DELETE — THIS — ENTER	Same as **DELETE — ENTER**.	Same as **DELETE — ENTER**.
DELETE — START — ENTER	Any	Deletes KF 1 moves the old KF 2 to the old KF 1 position and ripples KF numbers. Overall effect time is shortened by the duration of the deleted KF. Moves current time to 0:00.
DELETE — END — ENTER	Any	Deletes last KF. Effect time is shortened by the duration of the deleted KF. Moves current time to end of keyframe.
DELETE — NEXT — ENTER	Any	Deletes KF after current KF. Effect time is shortened by duration of deleted KF.
DELETE — PREVIOUS — ENTER	Any	Deletes KF before current KF. Effect time is shortened by duration of deleted KF.

Table 1-2: Timeframe Effects Command Sequences

Command	Condition	Result
DELETE — 3 — ENTER	KF 3 exists.	Deletes KF 3. Effect time is shortened by KF 3's duration.
	KF 3 does not exist.	Error message: No keyframes.
DELETE — 3 — TO — 12 — ENTER	KF 3 - 12 exists.	Deletes KF 3 through 12. Effect time is shortened.
	KF 3 - 12 does not exist.	Error message: No keyframes.
DELETE — ALL — ENTER	Any	Deletes all KFs and their durations.
REMOVE — ENTER	Current time is not on a KF location.	Error message: Not on a keyframe.
	Current time is on a KF location.	If there is more than one KF in the effect deletes the current KF and adds its duration KF. Overall effect time does not change. If there is only one KF in the effect deletes the KF.
REMOVE — THIS — ENTER	Same as **REMOVE — ENTER.**	Same as **REMOVE — ENTER**.
REMOVE — START — ENTER	Any	If KF 1 is not at zero time or if KF 1 is at zero time and other timelines have a KF at zero time deletes KF 1. The old KF 2 becomes KF 1, the other KF numbers are rippled, and all the KFs keep their positions on the timeline. If KF 1 is at zero time and no other timelines have a KF at zero time, this deletes the KF. The old KF 2 becomes KF 1, the other KF numbers are rippled, all the KFs keep their positions on the timeline. Moves zero time to the KF 1 on the earliest timeline.
REMOVE — END — ENTER	Any	Deletes last KF. Effect time is shortened by duration of deleted KF.
REMOVE — NEXT — ENTER	Any	Deletes KF after current KF and adds its duration to the current KF. Overall effect time does not change.

Table 1-2: Timeframe Effects Command Sequences

Command	Condition	Result
REMOVE — PREVIOUS — ENTER	Any	Deletes KF before current KF and adds its duration to the new previous KF. Overall effect time does not change.
REMOVE — 3 — ENTER	KF 3 exists.	Deletes KF 3 and adds its duration to KF 2. Overall effect time does not change.
	KF 3 does not exist.	Error message: No keyframes.
REMOVE — 3 — TO — 12 — ENTER	KF 3 exists.	Deletes KF 3 through 12 and adds their total duration to KF 2. Overall effect time does not change.
	KF 3 does not exist.	Error message: No keyframes.
REMOVE — ALL — ENTER	Any	Deletes all KFs.
MODIFY — ENTER	Current time is not on a KF location.	Error message: Not on keyframe.
	Current time is on a KF location.	Replaces the current KF with the contents of the Workspace.
MODIFY — THIS — ENTER	Same as **MODIFY — ENTER.**	Same as **MODIFY — ENTER.**
MODIFY — START — ENTER	Any	Replaces KF 1 with the contents of the Workspace.
MODIFY — END — ENTER	Any	Replaces the last KF with the contents of the Workspace.
MODIFY — NEXT — ENTER	Any	Replaces the KF after the current KF with the contents of the Workspace.
MODIFY — PREVIOUS — ENTER	Any	Replaces the KF before the current KF with the contents of the Workspace.
MODIFY — 3 — ENTER	KF 3 exists.	Replaces KF 3 with the contents of the Workspace.
	KF 3 does not exist.	Error message: No keyframes

Table 1-2: Timeframe Effects Command Sequences

Command	Condition	Result
MODIFY — 3 — TO — 12 — ENTER	KF 3 to 12 exist.	Replaces KF 3 to KF 12 parameters with the Workspace parameters that are different.
	KF 3 or 12 does not exist.	Error message: No keyframes.
MODIFY — ALL — ENTER	Current time is not on a KF location.	Error message: No keyframes.
	Current time is on a KF location.	Replaces all KF parameters with the Workspace parameters that are different.
MODIFY — TRIM — (ALL 3 — TO — 12 3 — TO — END START — TO — 3) — ENTER	Current time is not on a KF location.	Error message: No keyframes.
	Current time is on a KF location.	Trims specified KF parameters by the difference between them and the Workspace parameters' values.
COPY — (START THIS 3 NEXT, PREVIOUS, END)— TO (START, 12, NEXT, etc.)— ENTER	Any	Copies specified KF to specified location, overwriting the parameters in the destination KF.
COPY — 3 — TO — 12 — TO — 13 — ENTER	Any	Copies KFs 3 - 12 to KF 13. A destination range is not needed. Overwrites and/or creates new KFs as needed.When you press the second **TO** the first **TO** changes to **THRU** in the KF Edit Dialog window.
COPY — (START THIS 3 NEXT, PREVIOUS, END)— TO—(START, 12, NEXT, etc.)— INSERT — ENTER	Any	Inserts specified KF at specified location. Ripples KF numbers.
TO — 3 — ENTER	Any	Moves current time to the start of KF 3 in the master delegated timeline.
START	Any	Moves current time to 0:00.

Table 1-2: Timeframe Effects Command Sequences

Command	Condition	Result
END	Any	Moves current time to the end of the effect.
THIS	Any	Moves current time to the beginning of the current KF in the master timeline.

Double-Press Key Functions

Six TimeFrame Effects Editor buttons allow you to perform an editing command without having to first delegate the channel. These buttons are: **INSERT**, **MODIFY**, **REMOVE**, **DELETE, COPY** and **NORMAL**.

Pressing one of these buttons once edits only the delegated channel(s). By double-pressing the button (pressing it twice) the function is carried out for all channels, delegated or not.

When you use a double-press command, the menu reads “Modify” (or whichever of the five buttons you pressed) after the first press and then adds “All Channels” when you press the button again.

It is often helpful to begin building an effect by pressing **INSERT–INSERT–ENTER**. This command anchors a keyframe for all channels at the beginning of an effect. This way, even if you are only working on one channel, all channels see the same starting point you do and you don't get unexpected results.

DELETE–DELETE–ALL–ENTER is a useful command that lets you delete keyframes for all channels, without having to delegate them first.

Reset Commands

There are many ways you can tell the system you want to start over or undo a change. For example, you can delete keyframes or quickly reset the machine to its user-defined Normal setting or undo the last change you made. The following pages describe the various reset commands.

The THIS Button

THIS is a powerful reset button. It immediately resets the current keyframe's parameters to their values before you made the undesired change(s). For example, if you inadvertently enter a Rotate value instead of a Locate value, pressing

THIS resets the original parameters for that keyframe. Use **THIS** even after pressing a multiple button editing command. For example, if you press **NORMAL–NORMAL–NORMAL–ENTER** to return to the factory normal and decide to undo that decision, **THIS** will return you to the current keyframe. **THIS** resets the keyframe buffer to match the current Workspace keyframe.

The DELETE Button

There are three ways to delete keyframes and set the parameters back to default simultaneously.

- To delete and reset for delegated channels only:
  Press **DELETE–NORMAL–ALL–ENTER**
- To delete and reset for *all* channels, delegated or not:
  Press **DELETE–DELETE–NORMAL–ALL–ENTER**.
- To clear the Workspace for the delegated channels only:
  Press **DELETE–ALL–ENTER.** Note that this method does not clear the keyframe buffer.
- To clear all keyframes from all channels in an effect:
  Press **DELETE–DELETE–ALL–ENTER**

The CLEAR Button

Use **CLEAR** to return to factory-defined default settings. You can reset an entire menu to its default value; reset all controls under a single function softkey; or reset a single parameter.

- To reset an entire menu to default, hold **CLEAR** and press the menu button. For example, to set all 3D Trans menu parameters to default, press **CLEAR + 3D TRANS**. This resets all 3D ***Locate***, ***Rotate*** and ***Axis Locate*** settings to default.
- To reset all of the parameters under a single function softkey, hold **CLEAR** then press the function softkey. For example, to clear the parameters associated with the *Locate* function in the 3D Trans menu, press **CLEAR+*Locate***. All parameters (H Loc, V Loc and Z Loc) are reset to default.
- To reset a single parameter, press **CLEAR** and its corresponding keypad softkey (**A**, **B**, **C** or **D**). For example, to clear the **H Loc** parameter under ***Locate*** in the 3D Trans menu, press **CLEAR+A.** You can clear one or more parameters using this method.

The NORMAL Button

Use **NORMAL** to set and reset your preferential default settings, called *normals*. For example, a normal state might be starting every effect with the DVE squeezed down to half size and with a border. Simply adjust the parameters in the applicable menu(s), then use a **NORMAL** command to set those conditions. These normals are saved even when you power down. You can leave the system in its factory default normal, which is a full screen picture with no transforms.

- To set the default normal for ***delegated*** channels, enter the parameters for the conditions you want in any menu. Then press **MODIFY–NORMAL–ENTER**. Those parameters are now stored as the normal state of the machine, and you can return to it at any time.
- To modify the normal for *all* channels, press **MODIFY– MODIFY–NORMAL–ENTER.**

Using NORMAL to Reset

- To reset all parameters of the ***delegated*** channel(s) back to their normal, press **NORMAL–ENTER**. This command resets any delegated channels to any personal-preference defaults that you entered.
- To reset ***all channels*** to the user-defined settings, press **NORMAL–NORMAL–ENTER.** This resets all channels to any personal preference defaults that you entered.
- To reset all menus to the ***factory-defined*** default (as shipped from Abekas), regardless of channel delegation, press **NORMAL– NORMAL – NORMAL–ENTER**.

Note: All of these reset functions will not disturb the video format you are working in or any of the setup functionality. See First Birthday in Dveous/MX Technical Guide, P/N 9100-0402-01, for clearing of these parameters.

Change Commands

The MODIFY Button

For the specified keyframes, a **MODIFY** command replaces the existing parameter(s) with the new value(s) that you enter. Use the **MODIFY** button of the Timeline Effects Editor to change more than one keyframe at the same time. This command is useful when you need to change the border color on a 25 keyframe effect, for example, because it means you do not have to modify each keyframe individually.

Use the other Timeline Effects Editor buttons to specify the range of keyframes to modify. For example, **MODIFY–ALL–ENTER** modifies all the keyframes for the delegated channel(s), while **MODIFY 1–TO–3** modifies keyframes 1 through 3.

A **MODIFY** command only takes effect once you change a keyframe's parameter(s). For example, if each keyframe has a different rotate value, simply pressing **MODIFY–ALL–ENTER** will not affect the rotate values. However, once you change a single rotate value, even by 0.0001, entering the **MODIFY** command now applies the new rotate value to all the keyframes.

To ensure that you do not accidentally change unintended parameters, it is a good idea to press **THIS** first, then carefully make the changes, then press **MODIFY–ALL–ENTER**.

The TRIM Button

When you use **MODIFY** to change a parameter, the same modified value is inserted for every keyframe with that parameter. On the other hand, **TRIM** lets you maintain the relative offset of the parameter values between keyframes.

For example, in a two keyframe effect, keyframe 1 has the image H rotated 0.2500, keyframe 2 has the image H rotated 0.5000. After pressing **START** to move to keyframe 1, you change the H rotate value to 0.5000. Pressing **MODIFY — TRIM — ALL — ENTER** gives keyframe 2 an H rotate value of 0.7500.

MODIFY vs. Quick Keyframe MODIFY

There are two **MODIFY** buttons on the Control Panel. One is located in the Time Effects Editor group of buttons, the other is part of the Quick Keyframes buttons.

Use the TimeFrame Effects **MODIFY** when you want to a range of keyframe parameters to match the current keyframe in an effect. Use the Quick Keyframe **MODIFY** when you want to change only the current keyframe's parameter(s). This **MODIFY** button changes the current keyframe buffer to match the keyframe buffer. If you try to use a TimeFrame Effects **MODIFY** command string after this Quick Keyframe command, it will have no effect because there will be no difference between the setting in the keyframe buffer and the current effect keyframe. For more information about the Quick Keyframes buttons, see pages the pages at the end of this section.

Using the COPY CHANNEL Button

Use **COPY CHANNEL** to either copy keyframes or to copy the current state of the machine. The direction of the copy is always *from* the Master Channel *to* the delegated channel(s).

Copying the Current State

This method is useful if you want to establish a similarity in the look between channels, but do not want the exact same keyframes. For example, if you want the same border from one channel to appear on another channel, using a **COPY CHANNEL** command instantly sets the other channel with those border parameters, but leaves you free to set different keyframes.

You can either copy the entire state of the machine or specific menus only (up to six).

1. Double-press the Channel Select button of the channel you want to copy *from*. This action makes that channel the Master channel.
2. Press the Channel Select button(s) for the channel(s) you want to copy *to*. This action delegates those channels. Their channel numbers are highlighted on the menu display.
3. Press COPY CHANNEL–ENTER. All current attributes of the Master Channel are now copied to the delegated channels.

   Alternatively, you can specify which of up to six menus you wish to copy. Press the desired menu button(s) after you press **COPY CHANNEL**. The command looks like this: **COPY CHANNEL–[menu button(s)]–ENTER.**

Copying Keyframes

You can copy an entire timeline or just specific keyframes on the timeline. You can copy them exactly to the same position on another channel's timeline, or to different positions.

Use the buttons in the TimeFrame Effects Editor to specify their range. For example, to copy the entire timeline for the Master Channel, press **START–TO–END** as part of the copy command.

Use the numeric keypad to indicate specific keyframes. For example to copy only keyframe 3, press **COPY CHANNEL–3–ENTER**.

Indicate a range of keyframes, for example 3 through 5, by pressing **3–TO–5–TO–3** as part of the command. When Dveous/MX moves the keyframes to the new channel(s), it will overwrite any existing keyframes it finds at that position, starting at keyframe 3. If no destination keyframe is specified, the copied keyframes will be appended to the end.

Note: Specifying a single keyframe like COPY CHANNEL–3–TO–5–ENTER will copy the range of keyframes 3 through 5 to the end of the destination timeline(s). To copy keyframe location 3 of the master timeline to keyframe location 5 of the destination timeline, press *TO* twice: COPY CHANNEL–3–TO–TO–5–ENTER.

Using INSERT in the Copy Command Use **INSERT** if you want to insert copied keyframes to the new timeline(s) without overwriting the existing keyframes. For example, the command **COPY CHANNEL–3–TO–5–ENTER**, copies 3 through 5 to the delegated channel(s) and overwrites any existing keyframes that exist from 3 through 5. **COPY CHANNEL–3–TO–5–INSERT–ENTER**, on the other hand, inserts the range 3 through 5 into the new timeline while rippling down the existing keyframes. The keyframe order is automatically renumbered. See Section 4 – Channel Menus for other uses of **COPY CHANNEL**.

Quick Contents

Section 7: Motion Control

Abekas

Overview

The look of an effect depends a lot on how the transition occurs from one keyframe to the next. The motion path settings covered in this section let you control how Dveous/MX makes that transition.

Motion path types can be assigned to any parameter that is changeable on keyframe-by-keyframe basis. Some parameters take only certain path types, while others accept all path types. If you try to assign an invalid path type to a parameter, the system assigns the highest priority path type available to it.

The PATH Button (Numeric Key Pad)

The **PATH** button accesses and sets one of six available motion path types. When you press **PATH**, this message appears in the keypad buffer:

<<Set Path>>.
JP LN SL T1 T2 SM

The path types are displayed in abbreviated form from lowest to highest. Reading from left to right they are: Jump, Linear, Smooth Linear, Tension Continuity Bias 1 (TCB1), TCB 2 and Smoothed Motion. Press **PATH** to cycle through the path types and select one.

Dveous/MX only uses path type to interpolate between settings in keyframes. It does not interpolate from one path type to another. For example, say an effect has jump (JP) motion set on a parameter for keyframe 1, then smooth motion (SM) on keyframes 2 and 3. When you run the effect, Dveous/MX uses jump motion between keyframes 1 and 2, then switches to smooth motion for the rest of the effect.

Assigning a Motion Path Type

You can assign a path type to either a single parameter, to the parameters associated with a function softkey, or to all the parameters in an entire menu.

- **To assign a motion path to a single parameter:**

  Toggle the **PATH** button to highlight the desired path. Press the keypad softkey (**A**, **B**, **C**, or **D**) associated with the parameter. The path type abbreviation appears next to the parameter value.

- **To assign the same path type to all the parameters for a softkey**:

  Toggle the **PATH** button to highlight the desired path. Then hold the **PATH** button down and press the function softkey. The path types appears next to all parameter values for that function.

- **To assign a path type to an entire menu:**

  Toggle the **PATH** button to highlight the desired path. then hold the **PATH** button down and press the menu button.

  Remember that if you try to assign an invalid path type to a parameter, the system assigns the highest priority path type available to it. For example, if you try to assign ***Smooth*** to a parameter that only uses ***JP***, ***LN*** or ***SL***, the system will assign *SL* instead.

Path Types

The path types are listed below in order of priority from lowest to highest.

JP (Jump)

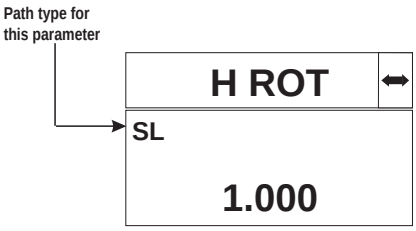
Jump is similar to "Hold" in other DVEs. It holds the parameter value through the duration of the keyframe; there is no interpolation between keyframes. At the first field of the next keyframe, the parameter "jumps" to the setting for that keyframe. Note that even if you run an effect backward, Dveous/MX looks ahead for hold flags, so the effect runs properly in reverse.

LN (Linear)

This motion type interpolates in a straight line (in both motion and time) between the parameters of the current keyframe and those in the next keyframe.

SL (Smoothed Linear)

Smoothed Linear gives the parameter a linear motion path between keyframes, but adds acceleration at the start of the current keyframe and deceleration into the next. This path creates a natural motion effect between keyframes, especially on border and crop settings.



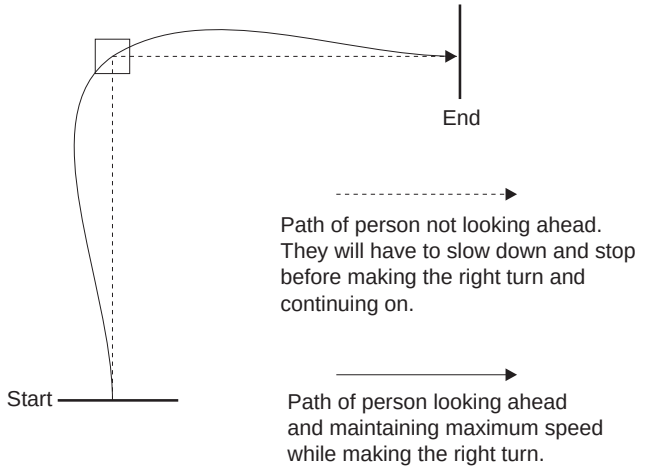
Smoothed (SM)

The smoothed path mode uses a look ahead over the entire effect to calculate the motion path, and creates the smoothest path possible for both motion and time.

For example, when using TCB, a Z rotate in keyframe 3 of a six keyframe effect affects the path from keyframes 2 through 5 (the four keyframe window). In smooth mode, the rotate affects the paths of all six keyframes, with less impact on the keyframes further from the actual rotate.

TCB 1 and TCB 2

TCB is an abbreviation for Tension, Continuity, and Bias. The premise behind TCB motion is that the source image moving in 3D space has mass, which prevents it from changing direction or speed instantly. Dveous/MX must "look ahead" to the next keyframe, and "look behind" to the previous keyframe, to determine how best to pass the image through the keyframes and maintain realistic looking speeds and paths.

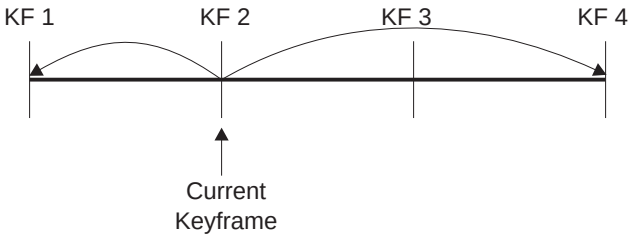


There are two independent sets of tension, continuity, and bias values per keyframe for each channel timeline. Transitions between keyframes with different *TCB* settings have a linear path to prevent "popping" when changing from one

value to another. The motion algorithms are based on matrix math that includes vector calculations and keyframe look aheads. It may be more intuitive to use a physical model to demonstrate the effect of ***TCB*** motion. Although the internal calculations do not work exactly as the model suggests, the results are the same.

For this example, imagine a person running from one place to another, then turning right and heading to a third position. He must first accelerate to his maximum speed while heading to the position where he will make the right turn. The shortest distance between two points is a straight line, but if the person is going to make a right turn, he would have to stop forward motion at the second position, change directions, then move forward again. To maintain maximum speed and avoid stopping, the person can veer a little to the left and then back to the right as he approaches the second position; in this way he is already making the right turn and does not need to slow down as much.

Four Keyframe TCB Window Example

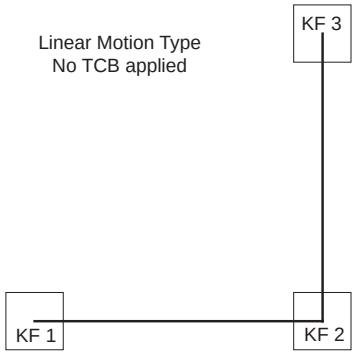


All of this means that the person must look ahead and anticipate the change in direction. In the TCB modes, Dveous/MX looks past the keyframe immediately ahead to the one after it, and uses that information to determine the needed path. Also, what happened between the current keyframe and the previous one also affects the current path. This is similar to the person making the right turn not being able to follow a straight path to the third position: the right turn is not complete until sometime after he passes the second position.

Note: TCB1 and TCB2 are user set parameters. These adjustments can be made under the **PATH** button in the Effects part of the Control Panel. (Notice there are two **PATH** buttons; one green key cap in the Effects section for adjusting TCB1 and TCB2 parameters and one gray key cap in the Numeric Key Pad section used for selecting the path type desired.)

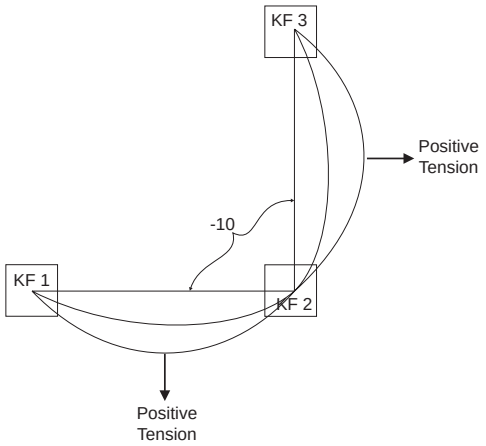
Dveous/MX uses a four keyframe window in the TCB modes. This is commonly known as a two keyframe "look ahead," but there is also a one keyframe "look behind." In a two keyframe effect, there is nothing to look ahead to; changing the TCB settings has no effect. Acceleration and deceleration do apply, however.

For the purposes of this discussion, we will use a simple effect with three keyframes. The image has been sized and moved as illustrated in the figure below. The TCB values are active on all keyframes. For our physical model, think of the keyframes as blocks of wood, and the path they follow as a flexible cord, such as a garden hose. The first figure shows a linear path for the keyframes.



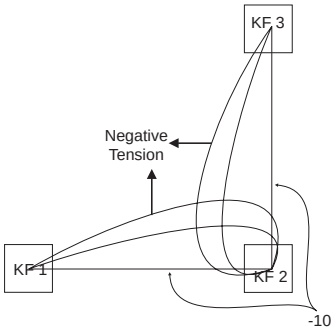
Tension

Adding tension acts like attaching strings to the hose on either side of keyframe 2. We then ask two people to each take a string and pull on it. The default tension value, 7, provides a natural looking path. Increasing the tension value exaggerates the path, and it overreacts to the look ahead. The maximum value is 100.



A value of -10 produces the same effect as the smooth-linear motion type. There is acceleration and deceleration into and out of keyframes, but the path is straight (linear). This is the equivalent of no look ahead. Note that the motion actually stops at each keyframe: with no look ahead, Dveous/MX treats each keyframe as if it is the last one. A use for TCB with tension set to -10, instead of the SL mode, is that you can interpolate to this setting from a different tension value. This is very useful when you want to stop the look ahead smoothly, such as on a keyframe with a pause.

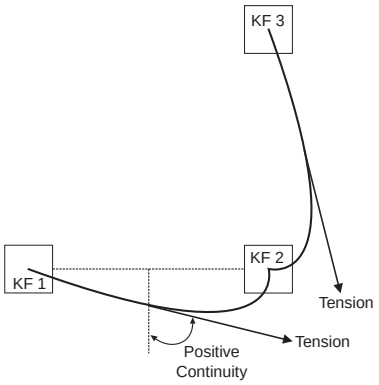
As the values increase in the negative direction, they produce a path that enters and leaves each keyframe in opposite directions than with values above -10. The end of the negative range is -100.

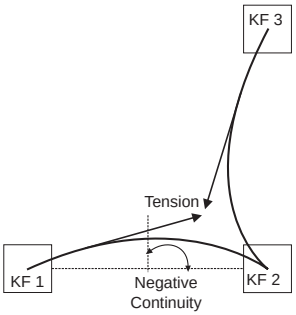


Continuity

Continuity describes the angle at which we exert tension on the hose with the string. With a zero continuity setting, the string pulls the hose at right angles to the linear path, producing a symmetrical arc. For this example, only keyframe 2's continuity setting is changed. Positive continuity values angle the pulling force toward the outside of keyframe 2. Negative continuity settings angle the pulling force toward the inside of keyframe 2.

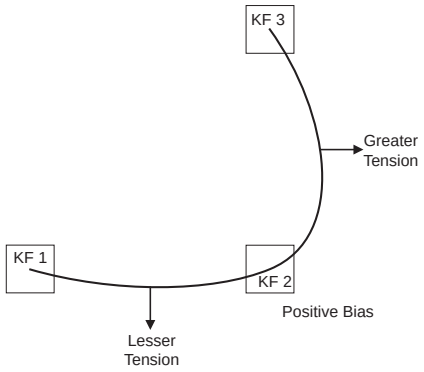
The tension setting also affects the continuity changes. Setting tension to -10 causes the continuity settings to have no effect.



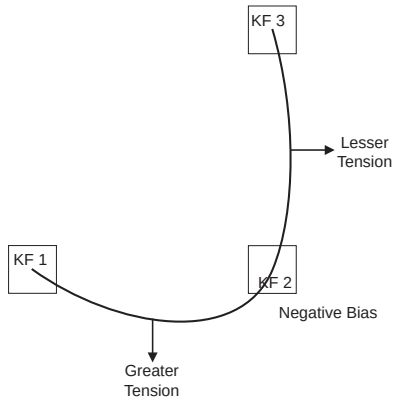


Bias

The bias setting determines how much tension (pulling force) applies to each hose, as though the people pulling the strings had unequal strengths. A zero bias setting distributes the pulling force equally between both hoses. Positive bias settings increase the pulling force after keyframe 2, with a corresponding decrease before the keyframe. Negative bias settings increase the pulling force before keyframe 2, with a corresponding decrease after the keyframe.



In the example of the person running through a right turn, bias settings effectively determine how much of the turn is complete by the second point. With bias at 0, half the turn is complete. With a positive bias, less than half the turn is complete at the second point. With a negative bias, more than half the turn is complete.



The tension setting also affects bias changes. Setting tension to -10 causes the bias settings to have no effect. You can use bias and continuity independently of each other.

Using TCB 1 and TCB 2

The previous discussions dealt with a very simple effect that used position changes only. In building effects that use position, rotate, and size changes at the same time, you will find achieving the exact motion path you need is a little more complex.

Rotate parameters are notorious for causing unwanted movement in an effect. Setting tension to -10 removes the unwanted motion, but also affects position and size changes. Normally, only the rotate look ahead is incorrect, and is the only parameter that needs the -10 tension setting.

All parameters that can use the TCB 1 mode have it enabled by default. TCB 2 lets you use two TCB settings in an effect at the same time: one TCB setting on some parameters, the other TCB setting on others. In the above example, setting the tension on TCB 2 to -10 and assigning it to the rotate parameters eliminates the rotate look aheads, but lets the position and size operate in the normal TCB 1 tension, 7.

Quick Contents

Section 8:
Saving & Recalling Effects

Abekas

Overview

You can store effects in Dveous/MX's on-line memory, as well as save and restore effects to and from floppy disk or hard drive. You can save or recall an effect from any menu. Dveous/MX has a built-in 3.5" floppy disk, located on the right side of the Control Panel. The floppy drive supports 1.44MB and 720KB MS-DOS floppy disks. The system comes standard with a 2 gigabyte hard drive.

You can also add an optional external floppy drive, which is useful if your Control Panel is mounted in a console that covers the internal disk drive. You can store effects and engineering setup files to floppy disk.

Saving and Recalling Effects

On-Line Memory

After you create an effect, you can save it to on-line memory for later use. When you create an effect, Dveous/MX sets aside part of the system keyframe pool for that effect. You can save up to 100 effects in on-line effect registers, with a maximum of 300 keyframes per effect.

Note: Each keyframe in each channel uses a keyframe from the system pool. This means, for example, that when you create an effect by inserting four keyframes into five channels (1A, 1B, 2A, 2B and Global), you actually use 20 keyframes from the pool.

Saving an Effect

You can save an effect while in any menu. Once the effect is saved, the original effect is still present in the Workspace and you can continue adding to it or you can start another effect. The register number you just saved to displays next to Current Effect so that you know what effect the Workspace copy originated from. There are two ways to save an effect:

- Enter an effect register number (0 - 99) in the numeric keypad. (Make sure the keypad buffer is clear of any previous values. If it is not, press **CLEAR** before entering the register number.)

  Press **SAVE EFFECT**. The number you just entered now displays next to Current Effect in the menu display.

- Press the decimal point on the numeric keypad followed by **SAVE EFFECT**. The effect is saved to the first free (empty) effect register. That register number now appears next to Current Effect.

Hint: Any time you edit an effect, those changes affect only the Workspace copy. They are not saved to the effect register until you use the SAVE EFFECT command.

Overwriting an Existing Effect

If you enter an effect register number that already contains an effect, one of two things happens:

- If the existing effect does *not* have the protect flag enabled, the Workspace effect overwrites the one in the register. For this reason, it is important to make sure there is no previous value already in the keypad buffer, because that effect will be overwritten once **SAVE EFFECT** is pressed unless the Protect flag is enabled.
- If the existing effect does have the protect flag enabled, Dveous/MX does not save the workspace effect, and does not overwrite the existing effect. A prompt tells you that the register is protected.

See *Loop and Protect* later in this section under Effect Menu for more information on protecting an effect.

Recalling an Effect

Recall an effect from on-line memory to the Workspace as follows. You can perform these steps from any menu:

1. Enter an effect register number (0 - 99) in the numeric keypad. Then press **RECALL EFFECT**. The effect is now loaded into the Workspace and shows as the Current Effect.
2. Press **RECALL EFFECT** again to access the Effect menu.

   The recalled effect register number is highlighted and its number also appears in the **Reg#** parameter. At the top of effect register list, next to *WorkSpace*, you will see the identical keyframe setup as the effect you just recalled, indicating that a copy of the effect is now in the Workspace, where you can run and edit it.

   Return to any menu to start editing, or press the Timeline Control buttons to run the effect. If you return to a menu, the recalled effect register number will display next to Current Effect. Remember that you are working on a Workspace copy of the effect, not the actual effect. See notes under *Saving an Effect.*

The Recall Parameter in the Effects Menu You can choose how many timelines to recall from an effect. **Recall** toggles between *All Chnls* and *Delegated*. *All Chnls* is the default state, and recalls the entire effect. Delegated recalls only the delegated timelines. When you leave the Effects menu, **Recall** mode reverts to *All Chnls*.

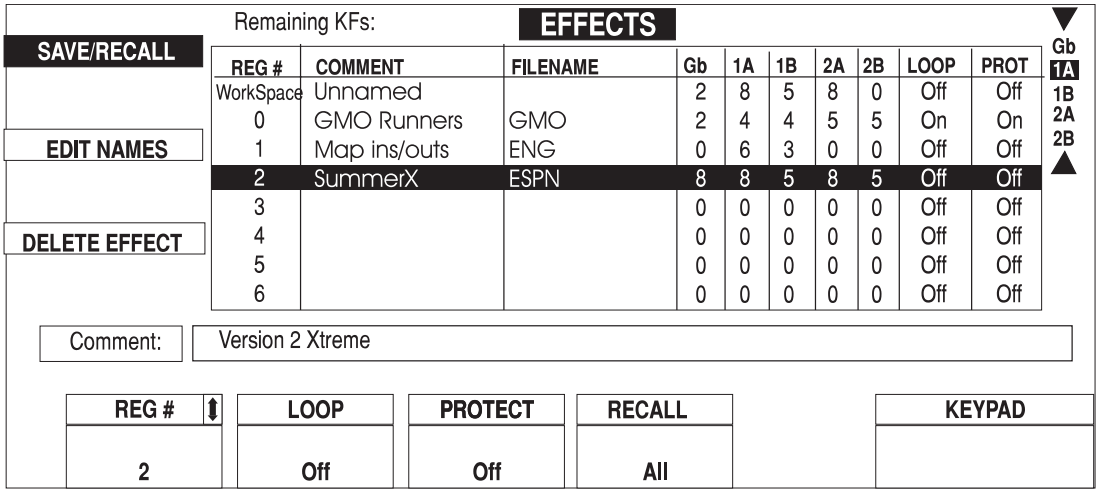
The Effects Menu

Press **RECALL EFFECT** to access the Effects menu. Use the Effects menu to browse the on-line effects registers, delete effects, enable/disable the loop and protect flags, and add filename and comments to effects.

For each effect register, the menu shows how many keyframes exist in each channel and the status of the Loop and Protect modes. Look at Remaining KFs to know the total remaining keyframes available in the system pool.

Save/Recall

This function softkey highlights by default when you access the Effects menu, but does not perform any function when pressed. It indicates that you are in the Save/Recall portion of the menu and that the **Reg#**, **Loop**, **Protect** and **Recall** parameters are accessible.



Reg# Use the Reg# softknob to scroll through the effect registers and view what numbers you have saved to. You can also scroll to *Workspace*. Note that when you recall an effect, its number shows into the Reg# display.

There are three ways of moving through the effect registers:

- Twist the **Reg #** softknob.
- Use the joystick to move up and down the list and move the highlight.

- Move directly to an effect register by entering its number in the numeric keypad and pressing the **A** keypad button. **Note: For effect numbers 0 through 9 you must press 00, 01, 02, etc. and then A. For workspace, pressing 0 then A will work.**

Loop and Protect Toggle these parameters either *On* or *Off* to enable or disable the loop and protect flags for an effect in an on-line register. Set loop mode on to put the effect in an infinite loop. With protect mode on, you cannot overwrite or delete the effect.

Loop and Protect in a Recalled Effect 1.Press RECALL EFFECT to access the Effects menu, if you are not already in it.

2. Use the **Reg#** softknob to move the highlight to *Workspace*. Or, you can press **0** then **A** in the keypad to select the Workspace. When flagging a recalled effect, you must do so in the Workspace copy.
3. Use the **Loop** and **Protect** to change the flag settings.

Note: The protect flag is not enabled while in Workspace.

Loop and Protect for a Saved Effect 1.Press RECALL EFFECT to bring up the Effects menu.

2. Move the highlight to the desired effect register using one of the three methods described under *Reg#*, above.
3. Use the **Loop** and **Protect** softknobs to change the flag settings. Both toggle ***On*** and ***Off***. The status you choose is reflected in the register's menu display. When you recall the effect, the mode(s) you toggled will reflect in the Workspace copy as well.

Note: Recalling a protected effect will automatically disable the protect flag in the workspace. However the original effect register will still be protected.

Recall Recall lets you choose how many timelines to recall from an effect. Use it to toggle between *All Chnls* and *Delegated*. *All Chnls* is the default state, and recalls the entire effect. *Delegated* recalls only the delegated timelines. When you leave the Effects menu, Recall mode reverts to *All Chnls*. Note that this Recall parameter does not display if you used SAVE EFFECT to access the Effects menu.

Edit Name

Dveous/MX lets you assign file names to effect registers and type in a comment to make identifying them easier. Because Dveous/MX automatically advances you between comment and file fields, entering information for numerous effects is as quick and easy.

File names are limited to eight characters. Comments may be up to 80 characters long. Either can use any combination of numbers or letters and include dashes, underscores or spaces. The file name and comment show display next to their associated register number in the menu display.

Auto Advance Feature for Quick Text Entry When in *Edit Name* mode, the Field parameter appears. Use it to select the text field you want to update, either *Filename* or *Comment*. If, however, you want to enter names and comments sequentially, leave Field set to *Comment*. This way, Dveous/MX lets you quickly type in the information you need, by using *Confirm* (or the Return key on a keyboard) to advance you between fields and register numbers.

Control Panel vs. Keyboard There a two ways to enter text information, either via the Control Panel or using a QWERTY keyboard attached to the jack marked "KEYBD" on the back of the Control Panel.

Both the following examples assume *Comment* is chosen in the **Field** parameter (see *Auto advance feature*...on previous page).

- Using the Control Panel to type a filename/comment

1. Use **Reg#** to select the number of the effect register you want to name. If you want to name a consecutive series of registers, select the first register of the series.
2. Press ***Edit Name***. *Edit* is highlighted and the Comment text box appears in the menu display for the comment.
3. Use the **Letter** softknob to choose the first letter you want. You can dial in A through Z, a dash (-), an underscore (_) or a blank for inserting spaces between letters. You can also include numbers in a name. To enter numbers, simply enter them on the keypad when in naming mode.Use the *Backspace* selection at the beginning of the **Letter** list erase as many characters as needed.
4. Press **D** on the numeric keypad. The highlight is cleared from the text box and the character you chose appears in it.
5. Repeat steps 3 through 5 until you have entered the desired name. If you make a mistake, dial the **Letter** softknob to *Backspace* and the press the **D** keypad button for as many times as you need to delete the desired character(s). You can include numbers anywhere in the name.

6. Press ***Confirm*** to enter the name. The new name appears under Comment in the menu display and Dveous/MX automatically advances you to the next text field, *Filename*, whose text box now appears in the menu.
7. Now you are ready to type in the file name. Follow steps 3 through 5. Now when you press *Confirm*, you are moved to the file name text box for the next register number. Continue with this process until all comments and file names have been entered.

- Using a keyboard to enter file name/comment

1. Use **Reg#** to select the register number to be named. If you want to name a consecutive series of registers, select the first register of the series.
2. Press ***Edit Name***. *Edit* is highlighted and the Comment text box appears.
3. Type in a comment. The highlight is cleared from the text box when you enter the first letter.
4. Press the Return key to enter the comment. The comment appears in the menu display and Dveous/MX automatically advances you to the next text field, *Filename*, whose text box appears in the menu.
5. Now you are ready to type in the file name. Follow steps 3 through 5. Now when you press *Confirm*, you are moved to the file name text box for the next register number. Continue with this process until all comments and file names have been entered.

Notes about Edit Name

- The name and comment for an effect only display in the Effects menu and exist only to help you identify your work. The system always refers to the register number to call up an effect and that is the number displayed next to Current Effect.
- Naming an effect does not recall the effect. To recall the effect after naming it, use **RECALL EFFECT**.
- If you modify a named effect and save the changes as a new effect, the system assigns the previous name to the new effect. If you want the modified effect to have a new name, you must rename the new effect once you have saved it.

Notes about Using a Keyboard

- The directional arrows move you through text.
- The Home and End keys move you to the beginning or end, respectively, of the text field.
- Insert mode toggles overwrite mode.

Delete Effect

Delete effects to free up keyframes and perform general housekeeping on your system. You can only delete unprotected effects. If you try to delete a protected effect, an error message displays telling you the register is protected. To delete a protected effect, you must first recall the effect and then turn Protect *Off*.

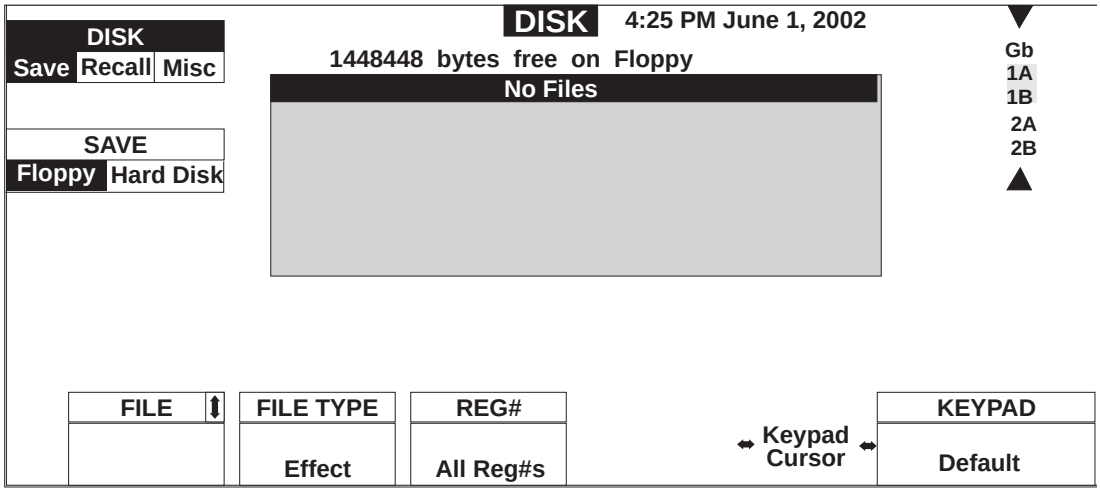
1. Highlight the effect register number to be deleted.
2. Press ***Delete Effect***. "Select" is highlighted.
3. Press ***Delete Effect*** again to confirm the deletion. A temporary message appears to indicate the effect register has been deleted and all channels show 0 keyframes at that register.

The Disk Menu

The Disk menu controls all floppy disk and hard disk functions, including naming, saving, recalling, copying and deleting files, and formatting disks. Press **DISK** to call up the menu illustrated below.

Because you can save engineering setups and effects to disk, you can easily recreate Dveous/MX setups. You should always backup setup and effect files to disk before performing a system update.

Note: In SAVE or RECALL, you must toggle between floppy or hard drive to select the drive on which to perform function.



Save Softkey

Use this to toggle between working with the built in hard drive or the 1.44M floppy drive.

Formatting a Floppy Disk

If you have a new or unformatted floppy disk, you must format it before Dveous/MX can save files to it. You can use a DOS compatible PC or the Dveous/MX Control Panel to format disks.

Formatting Using the Control Panel or External Floppy

1. Insert the unformatted floppy disk into the Control Panel or (optional) external floppy drive.
2. Toggle to ***Save*** softkey to Floppy.
3. Press the **DISK** button, then toggle the ***Disk*** softkey to select ***Misc***. New softkey labels now appear.
4. Toggle the ***Action*** softkey to select ***Frmt***.
5. Use the **Drive** softknob to select the drive with the floppy. (It defaults to *Internal* unless there is an external drive connected, in which case it defaults to *External*.)

Note: Formatting a disk erases any information stored on it. Be sure the floppy does not contain files you want to keep, and that you have selected the correct drive, before formatting a floppy disk.

6. Press the ***Confirm Format*** softkey. Dveous/MX formats the floppy disk, and a meter indicates the progress. Use the ***Abort*** softkey if you want to stop the formatting before it is complete. When it is finished, Dveous/MX prompts "***Successfully Formatted Disk***."

Note: You will not be prompted with a second message. Hitting the Confirm Update will start the formatting process. There is an abort softkey if needed.

Saving Files to Disk

You can save effects and setup files to floppy or hard disk. You can save one, several or all effect registers. When you save files, Dveous/MX copies the eight-character file name plus the two-digit register number associated with that name, making it easy to recognize your files.

For example, an effect at Reg# 3 whose name is Example will appear as *EXAMPLE E03*. The last two places of the file extension give the register number.

Also, Dveous/MX stamps disk files with the current time and date. If your Dveous/MX is new, you may want to set the time and date before saving files to disk. See the discussion on setting the time and date at the end of this section.

File Types The File Type softknob lets you assign what kind of file you would like to save to disk: *Effect*, *Setup*, *JPG* or *All*.

- *Effect*: Saves effects from on-line memory to the floppy or hard disk.
- *Setup*: Saves the current setup parameters of the following menus to floppy or hard disk: Input Setup, Output Setup, Remote Setup, Engineering, Remote Enable and Anamorph settings from the Personality menu. The only exception is panel setups in the Engineering menu; these are saved to a flash EEPROM in the Control Panel itself.
- *JPG*: Saves JPG files to disk.
- *All:* Views all effects, setups and JPGs. You cannot save or recall with this file type selected.

Saving a Single Effect to Disk This example shows how to save an effect register to a formatted floppy disk, although the same procedure is used to save system setups, or JPEG files.

1. Insert a formatted floppy disk in the drive.
2. Press the **DISK** menu button, then toggle the ***Disk*** softkey to ***Save***.
3. Toggle the ***Save*** softkey to ***Floppy***.
4. If you are saving to an external floppy drive, you must toggle ***Disk*** to ***Recall*** then adjust the floppy softknob accordingly.
5. Use the **File Type** softknob to select *Effect.*
6. Use the **Reg#** softknob to select the effect register number you want to save to disk. You can save the Workspace effect, by choosing *WorkSpace*.

   Note if the file type is JPG then the **Reg#** softknob is replaced with **Texture**.
7. Press the ***Save*** softkey. Dveous/MX prompts "Enter File Name into KEYPAD."
8. The filename will be displayed in the keypad buffer. If you do not wish to change the file name from what is already displayed, proceed to the next step. If you want to give the effect a new file name, then enter the new name into the keypad buffer (either using a PC keyboard or using the Letter softknob).
9. Press the ***Confirm Save*** softkey. Dveous/MX saves the file to the floppy disk, and a meter indicates the progress. Use the ***Abort*** softkey if you need to stop the save before it is complete. When it is finished, Dveous/MX prompts "***Successfully Saved File***."

Saving a Range of Files to Disk You can save a sequential range of files. Substitute STEP 6, 7 and 8 of the preceding example with the following instructions:

6. Type the range of files you want to save into the numeric keypad. The range is indicated by a period (.) between the numbers in the range. For example, to save effect number 0 through 12, type *0.12* in the numeric keypad. Then, press the **C** button to enter the range into the **Reg#** parameter.
7. Press the ***Save*** softkey. Dveous/MX prompts "Enter File Name into KEYPAD."
8. Assign files names for the range. You can either let Dveous/MX pick the existing file names from the registers or assign a single new file name for the range. To let Dveous/MX pick the existing file names, type the word *default* into the keypad buffer.

Saving All Files to Disk You can save all register effects to disk. Substitute STEP 6, 7, and 8 of the preceding example with the following instructions:

6. Use the **Reg#** softknob to select *All Reg #s*. The word Default appears in the keypad buffer.
7. Press the ***Save*** softkey. Dveous/MX prompts "Enter File Name into KEYPAD."
8. Assign file names to the registers. If you want Dveous/MX to pick the existing file names from the registers, then leave Default in the keypad buffer. If you want to assign a a single, new file name for all the registers, type it into the keypad buffer.

About Saving Files to Disk

- To name a file using the Control Panel, use the **Letter** softknob to dial in the characters and press **D** in the numeric keypad to enter them into the buffer.
- To name a file, you can also use a PC/AT compatible keyboard connected to the Control Panel.
- Do not enter extensions in file names. Dveous/MX automatically adds the extensions and only recognizes files with those extensions. For effects files, the format is E##, where ## stands for the two digit register number for that effect. The WorkSpace is saved as EWS. Setup files are saved as ENG and JPEGs as JPG.
- When Dveous/MX is in file naming mode, the **PATH**, **ALIGN**, and **TRIM** buttons have no function. Dveous/MX prompts you to clear the keypad buffer if you try to name a file with one of these functions in the buffer.

Recalling Files from Disk

After saving effects and/or setups to disk, you can recall them. Dveous/MX lets you mark specific effect files or all effect files for recall.

Marking Effect Files The File softknob becomes enabled when you select *Recall* with the *Disk* softkey. Use it in conjunction with the PATH button on the numeric keypad to select how many files you recall. Alternatively, you can select sequential files for recall by using the PATH or ALIGN button.

Marking Specific Files Use File to highlight a file you want to restore, then press the PATH button in the numeric keypad. The file name becomes highlighted, indicating that it is selected for recall. Repeat this process for as many files as needed. Unmark a file by selecting the marked file and pressing PATH again.

Marking Sequential Files Hold PATH while scrolling File to highlight sequential files in the list. Unmark all files by pressing ALIGN.

Marking All Files Press ALIGN. All files are highlighted. Unmark the files by pressing ALIGN again.

Recalling Effects from Disk to the Register 1.Press the DISK menu button, then toggle the ***Disk*** softkey to select ***Recall***. New softkey labels appear.

2. Toggle ***Recall*** softkey to select the disk drive to be used. A list of the files on the disk appears in the menu.
3. Use the **File Type** softknob to select which type of file you want to recall. In *Effect* mode, the display only lists effect files on the disk (those with the E## extension, or if created with software prior to Version 5, those with EFF). Selecting *Setup* lists only the setup files on the disk (those with the ENG extension). JPG lists only JPEG files on the disk. To view all the files on the disk, select *All* with the **File Type** softknob.
4. Mark the files you wish to recall.
5. Assign the files a location in the register. You can restore the effect to its original register number (as indicated by the last two numbers of the file extension, E##) or you can assign it to a user defined position.

   Set **Reg#** to *Original* to restore effects to their original positions. To restore a single effect to a new register number, set **Reg#** to that number. To restore a range of effects to new sequentially ordered register numbers, use **Reg#** to select the first number in the sequence and Dveous/MX will load the effects in order starting with that number. For example, to restore five effects to registers 12 through 16, set **Reg#** to 12.

Note: When recalling JPEG files, the **Reg#** softknob is replaced with **Texture**. This tells the Dveous/MX to which of the 28 internal JPEG registers to load the file. For more information see Section 4 under "Loading JPEG".

Note: If you select a register with a protected effect, Dveous/MX does not restore the file, and prompts you that the register is protected. If two or more files used the same original effect register, Dveous/MX overwrites the register each time it finds a new file that originated from that register.

6. Press the ***Recall*** softkey, then the ***Confirm Recall*** softkey. Dveous/MX recalls the file to the selected register, and a meter indicates the progress. There is an ***Abort*** softkey you can use to stop the recall before it is complete. When it is finished, Dveous/MX prompts "***Successfully Recalled File***."

Recalling Setup Files Use the above procedure for saving setup files but notice a new softknob called ***Emem Recall***.

Under Periph and CPL remote control, Dveous/MX effects can be learned to switcher control called Emems. The mapping of Dveous/MX effect number and Emem effect number is saved as part of Dveous/MX setup file.

The ***Emem Recall*** softknob allows the user to recall this mapping without the rest of the Dveous/MX setup (ONLY) or recall the Dveous/MX setup without the EMEM mapping (NO) or to recall both together (YES). YES is the default setting.

Note: The default mapping is 1 to 1.

Copying and Moving Files

You can use Dveous/MX to copy or move effect and setup files between drives. Because Dveous/MX writes files in the DOS format, you can also use a personal computer for managing files.

The following example shows how to copy a file on the floppy disk. The difference between copying and moving a file is that copying makes a copy of the

source file, and moving it simply renames the source file. Also, you can copy files between two drives, but moves work only on a single drive.

1. Insert the floppy disk with the file you want to copy into the Control Panel or (optional) external floppy drive.
2. Press the **DISK** menu button, then toggle the ***Disk*** softkey to select *Misc.* New softkey labels appear.
3. Toggle the ***Action*** softkey to select *Copy.*
4. Use the **File Type** softknob to select the type of file list. Setting it to **Effect** lists only the effect files on the floppy (those with the E## extension). Setting it to **Setup** lists only the setup files on the floppy (those with the ENG extension). JPG lists only JPEG files. Set the softknob to **All** to list all the files on the floppy, regardless of their extension.
5. Use the **File** softknob to move the highlight to the file you want to copy. The eight-character file name, plus its E## extension, appear under **File**.
6. Use the **Dest Drive** softknob to select the target drive for the copy. (With ***Move*** highlighted, this softknob does not appear; moves rename the file on the same floppy disk.)
7. If you want to give the new file a different name, use an external keyboard or the Dveous/MX menu method, as outlined under Naming Effects earlier in this section.
8. Press the ***Confirm Copy*** softkey. Dveous/MX copies the file from the source to the target drive, and confirms when it is finished.

   Note that if you use ***Move*** instead of ***Copy***, Dveous/MX prompts for the new file name.

Deleting Files From Disk

This example shows how to delete a file from a disk using the Dveous/MX Control Panel.

1. Select the drive with the file you want to delete.
2. Press the **DISK** menu button, then toggle the ***Disk*** softkey to select ***Misc***. New softkey labels appear.
3. Toggle the ***Action*** softkey to select ***Del.***
4. If needed, use the **Drive** softknob to select the drive with the floppy. A list of the files on the disk appears in the menu.
5. Use the **File Type** softknob to select the type of file list. Setting it to **Effect** lists only the effect files on the floppy (those with the E## extension). JPG lists only JPEGs. Setting it to **Setup** lists only the setup files on the floppy (those with the ENG extension). Set the softknob to **All** to list all the files on the floppy, regardless of their extension.

6. Use the **File** softknob to move the highlight and select the file you want to delete. The softknob label also indicates the currently selected file name.
7. Press the ***Confirm Delete*** softkey. Dveous/MX deletes the file, and a meter indicates the progress. Use the ***Abort*** softkey if you want to stop the deletion before it is complete. When it is finished, Dveous/MX prompts "***Successfully Deleted File***."

Setting the Date and Time

Dveous/MX uses an internal clock to stamp files when you save them to floppy disk, and to set the default comments for on-line effects registers. If your unit is new, it is a good idea to check that the system clock is set to the current date and time. Set the system clock as follows:

1. Press the **DISK** menu button, then toggle the ***Disk*** softkey to select *Misc*. New softkey labels appear. Press the Set Clock.
2. Press the Set Clock softkey. Toggle the ***Set Clock*** softkey to select *Time.* The **Hour**, **Minute**, and **AM_PM** softknobs appear.
3. Use the softknobs or the numeric keypad to set the current time. Hours are set 1-12; use the **AM_PM** softknob to indicate morning or evening.
4. Toggle the ***Set Clock*** softkey to select *Date*. The **Month**, **Day**, and **Year softknobs appear.**
5. Use the softknobs to set the current date. Note that you can set any year from 1980 to 2079. Once you set the system clock, Dveous/MX automatically keeps time from that point on.

Viewing File Comments on Your PC

You can view effect names on a DOS compatible PC by inserting the disk in the PC floppy disk drive and entering the command

```
type filename.ext
```

at the prompt. Be sure to use the actual file name and extension when entering this command, which displays the comment saved with the file.

Quick Contents

Section 9: OrbitalFX

Abekas

Introduction

Dveous/MX achieves its video effects via a collection of parameters, e.g. Locate H and Rotate V, that when altered, modifies the video passing through it. Traditionally, these parameters are altered either manually (using the joystick, keyboard, or softknobs) or as part of keyframe based splining while running an effect.

OrbitalFX™ provides a method for altering Dveous/MX parameters. OrbitalFX uses automatic value generators, called oscillators, which are "patched" to system parameters. Once patched, the parameter is under the oscillator's continuous control; the user controls the oscillator. This can be done in real time while the system is running.

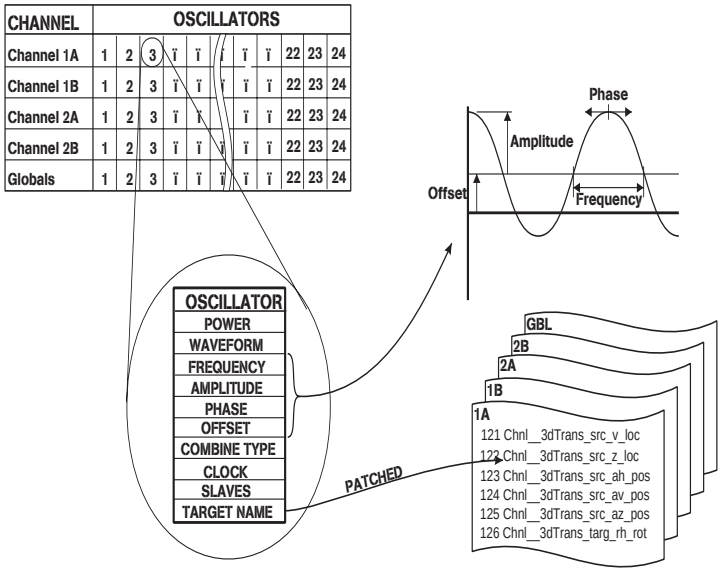
Applying OrbitalFX to multiple parameters (or multiple oscillators to a single parameter) allows you to create complex effects that would have been very difficult or impossible using the traditional keyframe approach. In addition, OrbitalFX is partially integrated into the keyframe based timeline system, allowing you to turn oscillators on and off on a keyframe basis, making it easy to add to keyframe based effects. An example would be to add a subtle but rapid shake to a video compression. Ordinarily this would require many keyframes (depending on the amount of shaking desired); with OrbitalFX it becomes much easier to setup and modify, providing a better chance of getting the look you are after.

Note: State of OrbitalFX can be changed in the Personality menu. See the Technical Guide, P/N 9100-0402-01, or General Operational Notes later in this section for more information.

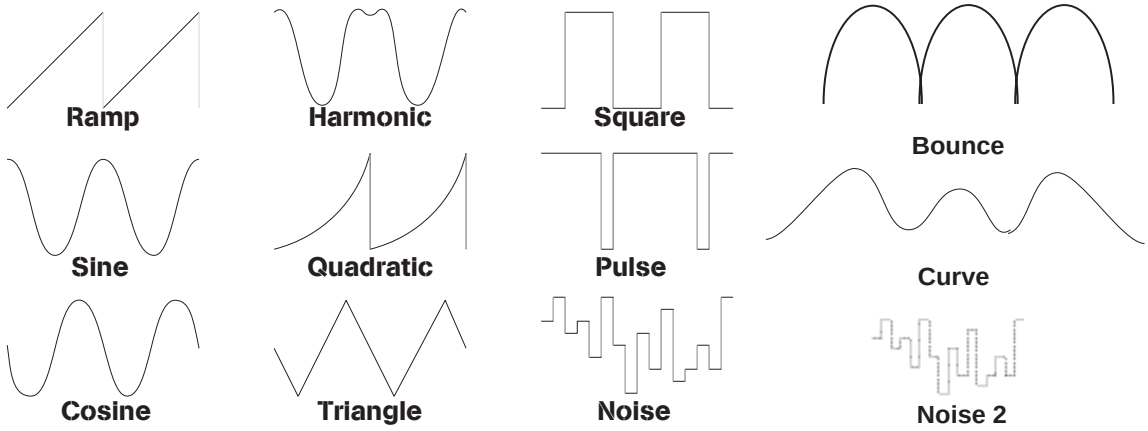
Oscillators

OrbitalFX relies on the use of *oscillators* to generate the values used to modify the various parameters within Dveous/MX. An oscillator is simply an automatic number generator that you control. You set up its amplitude, frequency, the waveform, and its relationship to the other oscillators used.

There are 24 oscillators per channel (1A, 1B, 2A, 2B, and Global) in Dveous/MX. Each comes pre-assigned (patched) to a parameter. You can patch each oscillator to any parameter you like; you can even patch multiple oscillators to the same parameter.



Power turns each oscillator's power on and off. *This field is the only keyframeable parameter*, allowing you to turn on and off individual oscillators within a traditional keyframe timeline.

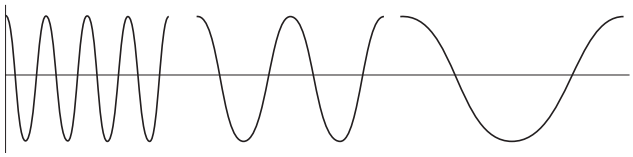


Note: The above waveforms show the output values over time. By following the progression of a waveform, you can see how it controls number generation over time.

- *WAVEFORM* selects the "shape" that the oscillator generates.
  - Ramp: Counts linearly to the maximum amplitude then resets and goes again.
  - Sine: Counts up to the maximum amplitude then counts down to the minimum, following a sine wave shaped curved path. Depending on the usage, this generally gives the appearance of acceleration and deceleration to the movement (when patched to parameters that cause movement) as the limits are reached.
  - Cosine: Operates exactly as with Sine, but 90 degrees out of phase.
  - Harmonic: Counts in a modified sine fashion, but adds a special little harmonic wiggle in the middle.
  - Quadratic: Counts like Ramp, but in a non-linear exponential fashion.
  - Triangle: Counts up to the maximum amplitude then counts down to the minimum (similar to Sine and Cosine) following a linear path.
  - Square: Simply jumps between the maximum and minimum values, spending an equal amount of time at each.
  - Pulse: Same as Square, except it spends more time at the maximum value (90%) than at the minimum (10%).

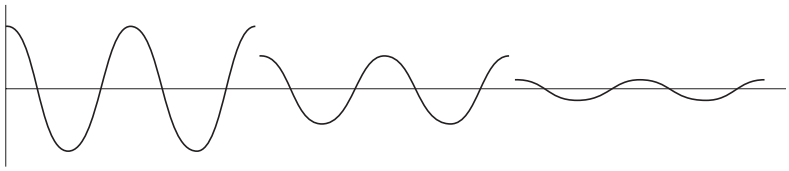
- Noise**:** Randomly generates numbers (within the maximum/minimum range). Note that for this waveform, *smaller* numbers in the ***Frequency*** setting causes random numbers to be generated at a quicker pace.
- Noise 2: Shares a single random number between all oscillators using the NOISE2 wave form for the whole field.
- Bounce: Approximates the acceleration of a bouncing ball.
- Curves: Random but smooth curves.

■ ***Frequency*** determines the speed of the oscillator's counting. Its range is from 0 (stopped) to 99,999 (ridiculously fast). The frequency value represents how much the clock advances per field in the ***Clock*** field. An exception is with the **Noise** waveform, where smaller values produce faster changes.



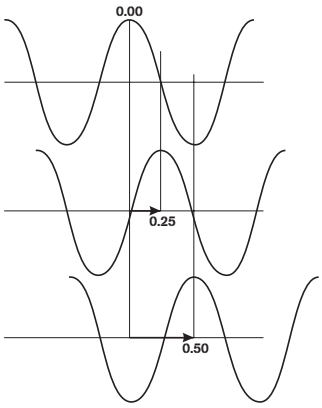
■ ***Amp*** controls the amplitude of the oscillator. It is the distance from the baseline to the maximum and minimum values; the total distance covered is actually twice the ***Amp*** setting. Its range is from –999.9999 to +999.9999. The actual values you use depend on the oscillator's patched parameter. The default ***Amp*** values assigned to each oscillator give a good starting point.

A value of 2.0000 indicates that the oscillator will run from –2.0000 through 0.0000 to +2.0000, an overall range of 4.0000.

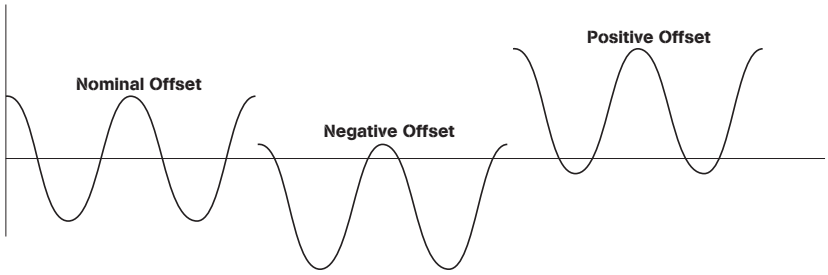


Note: Setting Amp to –2.0000 produces the same results, but the action will be backwards compared to when using a positive number.

- ***Phase*** adds an offset to an oscillator's clock, and can be used to create special relationships between waveforms in related oscillators. For example, two oscillators patched to H Locate on two different channels will appear to follow each other if one is given a small phase adjustment. The ***Phase*** range is from 0.0000 to 1.0000.



- ***Offset*** changes the center point about which the ***Amp*** setting works. In other words, use it to offset the maximum and minimum values from the default position. The range is from –999.9999 to +999.9999, but is dependent on the parameter it is patched to. If ***Amp*** is set to 0, then adjusting ***Offset*** is just like adjusting the parameter itself.



- ***Comb Type*** (Combine Type) selects between *Set*, *Add*, and *Multiply*. When patching multiple oscillators to a single parameter, it is important to know that Dveous/MX applies the oscillators in the order they appear in the center screen display. See Oscillator Combining later for more details.

  Set replaces the parameter's existing values with those its oscillator generates. In this case, you cannot adjust a parameter, manually or with a timeline effect. An oscillator using *Set* overrides any previous ones patched to the same parameter.

  Add trims the parameters values. Use *Add* to apply oscillator generated values to an existing value, whether from a timeline effect or previous oscillators patched to the same parameter.

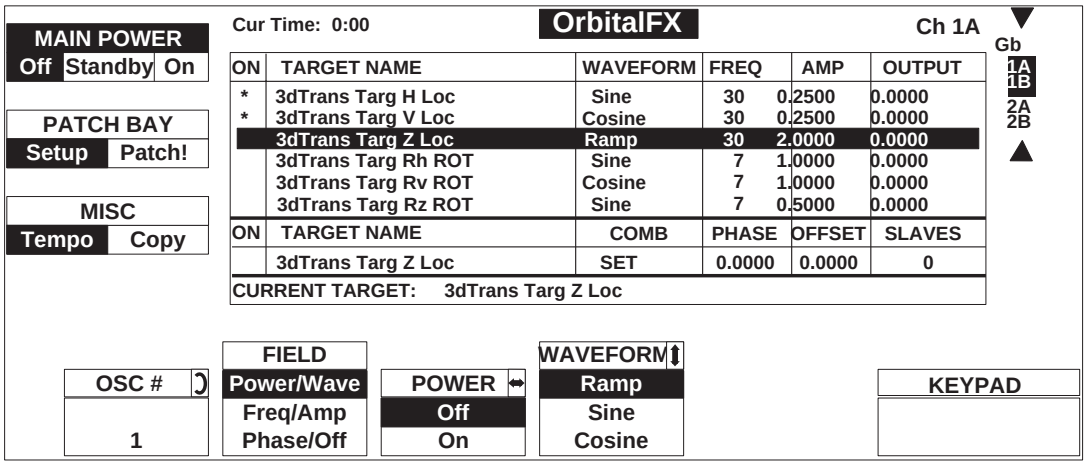
  Multiply can be used to provide a scaling or “volume control” of previous oscillators patched to the same parameter. Using *Multiply* on the first oscillator of a group or when a single oscillator is patched to a parameter causes the parameter's value to go to zero.

- ***Clock*** shows the oscillator's clock. It counts from 0.0000 to 1.0000 at a rate determined by the frequency setting. (The frequency value represents how much the clock advances per field.)
- ***Slaves*** selects the number of oscillators, immediately following the current one (the master), which will respond to changes in the master oscillator. The range is from 0 (no slaves) to 23. For example, if you set ***Slaves*** to 4 on oscillator 6, then oscillators 7 through 10 will all be powered on when oscillator 6 is powered on, and any changes made to 6 will ripple down to the slaves. Once enabled, you can go back and change the settings on any of the slaved oscillators, although any changes made to the master will once again force the slaves to match its settings. The default oscillator patches include slave settings based on parameters. For example, oscillator 1 by default is patched to "3dTrans Targ H Loc", and the following two oscillators (V and Z Loc) slaved to it. Set ***Slaves*** on oscillator 1 to 0 before enabling power on it if you do not want the slaved oscillators to follow.

  The ***Slaves*** setting also affects the Patch Bay mode. Patching an oscillator to a parameter causes any slaved oscillators to be automatically patched to consecutive parameters.

OrbitalFX Menu

Press the **ORBITAL FX** button to see the OrbitalFX menu. (Note: this is the button next to **JOYSTICK LOCK** in the Graphics section of the panel.)



The center of the menu display shows six of the oscillators and their settings, with the currently selected oscillator highlighted.

The *ON* column indicates currently enabled oscillators. *TARGET NAME* shows the functions assigned to each oscillator. A line below the group of six shows more details about the currently selected oscillator. The bottom line shows the currently patched parameter, or in the Patch Bay menu, the parameter to be patched. There are three softkeys along the left side of the display as follows:

- **Main Power**: This allows you to turn the entire OrbitalFX engine on or off, or to place it in a standby mode. It also allows access to the primary oscillator controls, making it the primary menu.
- **Patch Bay**: This allows you to patch (assign) oscillators to the parameters.
- **Misc**: This contains a master tempo adjustment and oscillator copy functions.

Main Power

Toggling **Main Power** *Off* completely disables the OrbitalFX system.

Toggling to *Standby* allows all oscillators set on to connect with their parameters. If you manually adjust their clocks, their output, and thus the parameter value, changes. This is useful when cueing an oscillator to start at a specific point, for example when you first want to control a parameter by timeline control, then switch to oscillator control. To make the transition seamless, note the parameter's ending value on the timeline, then cue the oscillator to that value by

manually adjusting the clock while in Standby mode. When the keyframe is modified or inserted, the clock value sets its starting point.

Toggling **Main Power** *On* engages the OrbitalFX system.

Note: The above settings are not stored as part of the effect.

The softknob settings are as follows:

Osc # Use this to select the oscillator you want to configure. Its number range is from 1 to 24.

Field This actually selects which pairs of oscillator fields the C and D softknobs allow you to modify. See the previous text regarding oscillators for details on the *Field* settings.

- Power/Wave
- Freq/Amp
- Phase/Off
- Comb
- Clock/Slave

Patch Bay

Use this softkey to assign oscillators to the parameters. Softknob A (***Osc #***) selects which oscillator to change, and softknob D (***Var***) selects the parameter you would like to patch to it. ***Var***'s range is from 0 to 300, with 0 to 184 actually used to select parameters (0 to 124 with globals). The end of this document contains a list of the parameters and their numbers.

Once you have selected the desired parameter, press the **Patch Bay** softkey again to confirm the patch and assign it.

As mentioned previously, the ***Slaves*** setting also affects the Patch Bay mode. Patching an oscillator to a parameter causes any slaved oscillators to be automatically patched to consecutive parameters.

Misc

The **Misc** Softkey toggles between two modes: Tempo and Copy.

Tempo *Tempo* provides a master clock control, allowing you to speed up or slow down all of the oscillators simultaneously. None of the oscillator values are directly changed by this setting though.

Copy The copy function is useful to rearrange the order of oscillator patches, without having to actually repatch them. This is useful when you need to alter the parameter hierarchy for an effect.

- Store Osc—***Store Osc*** copies the current oscillator to another. Type the destination's number at the numeric keypad and press the **A** button.
- Recall—***Recall*** copies an oscillator into the current location. Type the source's number at the numeric keypad and press the **B** button.

Note: The A and B softknobs do not function in this mode; the values of "–1" have no meaning.

OrbitalFX and the Keyframe System

Power (on/off control) for each oscillator is the only OrbitalFX parameter changeable on a keyframe basis within an effect. The status of the other parameters is remembered, but cannot be splined (changed) within an effect.

Beware of having oscillators running while modifying or inserting keyframes, as you could end up with a basic effect containing undesired OrbitalFX influences. The safest approach is to build the basic effect first, then with the OrbitalFX **Main Power** off, configure and enable the desired oscillators, modifying the appropriate keyframes where each oscillator's power is turned on or off. All OrbitalFX settings are put into workspace once you modify or insert a keyframe after it is configured. At this point it is safe to enable OrbitalFX **Main Power**.

Note: The status of Main Power is not a part of the effect, and is not remembered when saving it.

If you change an oscillator's setting, for example its frequency, you can modify any keyframe to write the change to the workspace effect.

Using OrbitalFX with Keyframe Effects

Use care when patching oscillators to parameters used within an effect. The result could be a subtle modification or a dramatic change.

The **Comb** field setting determines whether the output of a given oscillator replaces the value for its parameter (*Set*), or just trims it (*Add*). You cannot adjust any parameter with an oscillator patched to it that has the Comb field to *Set*, manually or with an effect – OrbitalFX has total control over that parameter if the oscillator is powered on and Main Power is set On or Standby.

Oscillator Combining

Applying multiple oscillators to a single parameter leads to a wide variety of results, from adding subtle harmonic effects to ramping oscillator effects on and off. The Comb Type (Combine Type) setting determines how the oscillators interact.

Dveous/MX effectively creates a mathematical expression from the oscillator settings to determine the action of the parameter. The expression is determined by oscillator order. It is important to take this into account when setting up your effect.

Comb Type (Combine Type) selects between *Set*, *Add*, and *Multiply*.

- *Set* replaces the parameter's existing values with those its oscillator generates. An oscillator using *Set* overrides any previous ones patched to the same parameter.
- *Add* trims the parameters values. An oscillator using *Add* has its values added to any previous ones patched to the same parameter.
- *Multiply* provides a scaling or "volume control" of previous oscillators patched to the same parameter. It is not advised to use *Multiply* on the first oscillator of a group.

Combining Example

The following example uses 3d Trans Target H Locate, and assumes Dveous/MX is at the factory normal.

1. Set **3D Trans** *Target Z Locate* to 56.
2. In the OrbitalFX menu, set **Main Power** *On*.
3. Select oscillator 1. It should already be patched to 3dTrans Targ H Loc.
4. Set **Slaves** to *0*.
5. Set **Power** *On*, **Waveform** to *Sine*, **Freq** to *100,* and **Amp** to *3.0*. You should now see the picture moving back and forth across the screen.
6. Toggle the **Misc** softkey to select *Copy*. Press *2* then **A** (Store Osc). This makes a copy of the current oscillator (1) and puts it into oscillator 2.
7. Press **Main Power** then select oscillator 2. Turn power on, set its **Comb** to *Add*, **Freq** to *900*, and **Amp** to *0.25*. The picture should now "stutter" as it moves back and forth. This is the second oscillator being added to the original.
8. Toggle the **Misc** softkey to select *Copy*. Press *3* then **A** (Store Osc). This makes a copy of the current oscillator (2) and puts it into oscillator 3.
9. Press **Main Power** then select oscillator 3. Turn power on, set its **Comb** to *Multiply*, **Waveform** to *Ramp*, **Freq** to *10*, **Amp** to *0.5*, and **Offset** to *0.5*. The picture should

now start with a small back and forth movement in the center that gradually grows. Once it reaches its limit it jumps back to being a small movement.

The above example sets up osc 1 + osc 2 x osc 3. Setting oscillator 3's Amp to 0.5 gives it a total swing of 1.0 (0.5 to –0.5); the Offset of 0.5 ensures the ramp goes from 0.0 to 1.0. Multiplying the result of osc 1 + osc 2 by 0.0 (the bottom of the ramp) gives a result of 0.0; multiplying by 1.0 (the top of the ramp) gives the result of full movement. The ramp values between 0.0 and 1.0 produce scaled results.

To use the above to turn up the action and leave it up, add a keyframe that turns oscillator 3's power off. The duration of keyframe one (which controls how long oscillator 3 is on) needs to be just long enough for the multiply to get to its end. Try different settings until you get the proper result.

Aligning Oscillator Clocks

Each oscillator's clock starts running when its power is turned on. If clocks of related or synchronizing oscillators get out of alignment, align them in one of two ways.

To align the clocks of all oscillators on delegated channels, press the **ALIGN** + **ORBITAL FX** buttons at the same time.

Align the current oscillator and its slaves (on all delegated channels) by pressing **ALIGN** + **A** (*OSC #*). Simply twisting the **Clock** softknob in that situation also aligns the appropriate clocks, setting the their clocks to the same value, whatever that may be. Use the numeric keypad to enter a specific value and align the clocks.

General Operational Notes

- Use **CLEAR** + **ORBITAL FX** to set all oscillators to default (on all delegated channels).
- Use **CLEAR** + **A** (*Osc #*) to set the current oscillator and its slaves to default (on all delegated channels).
- RUN ENV in the PERSONALITY Menu under MISC, allows you to select how OrbitalFX will run.
  - Post - Recall the saved OrbitalFX state when you run.
  - Live - DON'T recall the saved state. This allows the live user to have an OrbitalFX effect running and hit RUN to start a timeline portion of the effect. The OrbitalFX clocks will not reset and cause a hiccup.

Patch Bay *Var* Setting

There are two concerns when patching oscillators to parameters from the list below: figuring out the real name for the parameter you want to patch, and knowing the proper ***Amp*** and ***Offset*** values.

The parameters vary greatly on their number requirements, and a lot of them do not even use numbers (on and off settings and such). Set ***Amp*** with the range of the given parameter in mind. To control a parameter that has an on and off setting, set ***Amp*** to 1 and ***Offset*** to 1. For a parameter that has 4 settings (*1 Chnl_Input_front_inv* for example), set ***Amp*** to 2 and ***Offset*** to 2. Remember that the ***Amp*** value determines how far above and below the ***Offset*** value the oscillator goes.

Several of these parameters do not lend themselves to OrbitalFX control (for example *73 Chnl_warp_shape*), and produce results that are mostly useless.

Note: Most of the following parameters can be figured out with their name. Those that need extra explanation have italics text in parenthesis added.

Local Channel Parameters

3D TRANS
117 Chnl__3dTrans_src_rh_rot
118 Chnl__3dTrans_src_rv_rot
119 Chnl__3dTrans_src_rz_rot
120 Chnl__3dTrans_src_h_loc
121 Chnl__3dTrans_src_v_loc
122 Chnl__3dTrans_src_z_loc
123 Chnl__3dTrans_src_ah_pos *(axis)*
124 Chnl__3dTrans_src_av_pos *(axis)*
125 Chnl__3dTrans_src_az_pos *(axis)*
126 Chnl__3dTrans_targ_rh_rot
127 Chnl__3dTrans_targ_rv_rot
128 Chnl__3dTrans_targ_rz_rot
129 Chnl__3dTrans_targ_h_loc
130 Chnl__3dTrans_targ_v_loc
131 Chnl__3dTrans_targ_z_loc
132 Chnl__3dTrans_targ_ah_pos *(axis)*
133 Chnl__3dTrans_targ_av_pos *(axis)*
134 Chnl__3dTrans_targ_az_pos *(axis)*

2D TRANS
135 Chnl_Trans_h_pan *(post H)*
136 Chnl_Trans_v_pan *(post V)*
137 Chnl_Trans_zoom *(post Zoom)*
138 Chnl_Trans_h_inpos *(pre H)*
139 Chnl_Trans_v_inpos *(pre V)*
140 Chnl_Trans_h_aspect
141 Chnl_Trans_v_aspect
142 Chnl_Trans_src_size *(pre/aspect size)*
143 Chnl_Trans_h_skew
144 Chnl_Trans_v_skew
145 Chnl_Trans_perspcv
BORDER CROP
30 Chnl_Crop_cpin_left
31 Chnl_Crop_cpin_top
32 Chnl_Crop_cpin_right
33 Chnl_Crop_cpin_bottom
49 Chnl_Crop_cpin_soft_left
50 Chnl_Crop_cpin_soft_top
51 Chnl_Crop_cpin_soft_right
52 Chnl_Crop_cpin_soft_bottom
55 Chnl_Border_bottom_width
56 Chnl_Border_left_width
57 Chnl_Border_right_width
58 Chnl_Border_top_width
59 Chnl_Border_opac
60 Chnl_Border_hue
61 Chnl_Border_lum
62 Chnl_Border_sat
63 Chnl_Border_softness
MULTI
22 Chnl_Mosaic_h_tile
23 Chnl_Mosaic_v_tile
24 Chnl_Mosaic_size
25 Chnl_Mosaic_mosaic_on
29 Chnl_Mosaic_motdet
42 Chnl_Crop_cpin_h_multi
43 Chnl_Crop_cpin_v_multi
COLOR CRCTR
146 Chnl_Ccr_Y_Gain
147 Chnl_Ccr_U_Gain
148 Chnl_Ccr_V_Gain
149 Chnl_Ccr_Y_Offset
150 Chnl_Ccr_U_Offset
151 Chnl_Ccr_V_Offset
152 Chnl_Ccr_Y_Gamma
153 Chnl_Ccr_U_Gamma
154 Chnl_Ccr_V_Gamma
155 Chnl_Ccr_Y_Knee
156 Chnl_Ccr_U_Knee
157 Chnl_Ccr_V_Knee

158 Chnl_Ccr_Proc_Hue
159 Chnl_Ccr_Proc_Sat
160 Chnl_Ccr_Proc_Gain
161 Chnl_Ccr_Proc_Offset
176 Chnl_Ccr_YuvGbrMode

COLOR MODIFY

162 Chnl_Ccr_Y_Sol
163 Chnl_Ccr_U_Sol
164 Chnl_Ccr_V_Sol
165 Chnl_Ccr_Tint_Enable
166 Chnl_Ccr_Black_Sat
167 Chnl_Ccr_Black_Hue
168 Chnl_Ccr_Mid_Sat
169 Chnl_Ccr_Mid_Hue
170 Chnl_Ccr_White_Sat
171 Chnl_Ccr_White_Hue
172 Chnl_Ccr_Invert_Gain
173 Chnl_Ccr_Y_Inv_Gain
174 Chnl_Ccr_U_Inv_Gain
175 Chnl_Ccr_V_Inv_Gain

INPUT

1 Chnl_Input_front_inv
2 Chnl_Input_back_inv
3 Chnl_Input_front_type
4 Chnl_Input_front
5 Chnl_Input_back_type
6 Chnl_Input_back
45 Chnl_Crop_cpin_blur (V blur)
46 Chnl_Crop_cpin_h_blur
181 Chnl_Freeze_mode
182 Chnl_Freeze_type
183 Chnl_Freeze_strobe
184 Chnl_Freeze_duty

WARP

64 Chnl_warp_f__mod
(V Freq, Split V Position Bottom Right)
65 Chnl_warp_decay
(Split V Position Bottom Left)
66 Chnl_warp_h_pos
(Position, H Position, H Split)
67 Chnl_warp_v_pos
(V Position, V Split)
68 Chnl_warp_spread
(Frequency, H Freq, Radius, Size, Spread, Split V Position Top Right)
69 Chnl_warp_range
(Amplitude, Mag, Range, Twist, Split V Position Top Left)
70 Chnl_warp_axis
(Axis, Rotation, Split Rotate Top Left)
71 Chnl_warp_phase

(Alignment, Phase, Split Rotate Top Right)
72 Chnl_warp_p__width (Pulsewidth)
73 Chnl_warp_shape
75 Chnl_warp_quadrant_1_offset *(Cylinder Position, Left, Ring 1, Top Left,* Split H Position Top Left)
76 Chnl_warp_quadrant_2_offset (Right, Ring 2, Top Right, Split H Position Top Right)
77 Chnl_warp_quadrant_3_offset *(Bottom Left, Ring 3, Top, Split H* Position Bottom Right)
78 Chnl_warp_quadrant_4_offset *(Bottom, Bottom Right, Ring 4, Split H* Position Bottom Left)
79 Chnl_warp_useful_one (Split Rotate Bottom Right)
80 Chnl_warp_useful_two (Split Rotate Bottom Left)

LIGHT SOURCE

81 Chnl_Light_src_xOver *(Source)*
82 Chnl_Light_src_gainMode *(Model)*
83 Chnl_Light_src_hiLoEnable *(Lights)*
84 Chnl_Light_src_hiHue *(Specular)*
85 Chnl_Light_src_hiLum *(Specular)*
86 Chnl_Light_src_hiSat *(Specular)*
87 Chnl_Light_src_hiOpac *(Specular)*
88 Chnl_Light_src_loHue *(Specular)*
89 Chnl_Light_src_loLum *(Specular)*
90 Chnl_Light_src_loSat *(Specular)*
91 Chnl_Light_src_loOpac *(Specular)*
92 Chnl_Light_src_hiYGain *(Diffuse)*
93 Chnl_Light_src_hiCGain *(Diffuse)*
94 Chnl_Light_src_loYGain *(Diffuse)*
95 Chnl_Light_src_loCGain *(Diffuse)*
96 Chnl_Light_src_ambYGain *(Diffuse)*
97 Chnl_Light_src_ambCGain *(Diffuse)*
99 Chnl_Light_src_type *(Spot/Bar/Flood)*
100 Chnl_Light_src_zpos
101 Chnl_Light_src_vpos
102 Chnl_Light_src_hpos
103 Chnl_Light_src_hrot *(Bar)*
104 Chnl_Light_src_vrot *(Bar)*
105 Chnl_Light_src_zrot *(Bar)*
116 Chnl_Light_src_gamma *(Focus)*
180 Chnl_Light_src_mode

TEXTURE

106 Chnl_Light_src_cropEnable
107 Chnl_Light_src_cropLeft

108 Chnl_Light_src_cropRight
109 Chnl_Light_src_cropTop
110 Chnl_Light_src_cropBottom
111 Chnl_Light_src_txtOffset
112 Chnl_Light_src_txtGain
113 Chnl_Light_src_texture *(Main-Source)*
114 Chnl_Light_src_txtFreeze
115 Chnl_Light_src_txtEnable

KEY

0 Chnl_Operating_mode *(VV/VK/VKS)*
7 Chnl_Input_keyStat *(White/Video)*
8 Chnl_Input_shadStat *(White/Video)*
12 Chnl_Keyer_setup_gain
13 Chnl_Keyer_setup_clip
14 Chnl_Keyer_setup_phase
15 Chnl_Keyer_setup_hue *(Shadow)*
16 Chnl_Keyer_setup_lum *(Shadow)*
17 Chnl_Keyer_setup_sat *(Shadow)*

CORNER PIN

34 Chnl_Crop_cpin_h_corner *(Top Left)*
35 Chnl_Crop_cpin_h_corner2 *(Top Right)*
36 Chnl_Crop_cpin_h_corner3 *(Bottom Rt)*
37 Chnl_Crop_cpin_h_corner4 *(Bottom Left)*
38 Chnl_Crop_cpin_v_corner *(Top Left)*
39 Chnl_Crop_cpin_v_corner2 *(Top Right)*
40 Chnl_Crop_cpin_v_corner3 *(Bottom Rt)*
41 Chnl_Crop_cpin_v_corner4 *(Bottom Left)*
47 Chnl_Crop_cpin_autokey
48 Chnl_Crop_cpin_cmotion

OUTPUT

9 Chnl_Keyer_setup_a_opac
10 Chnl_Keyer_setup_b_opac
11 Chnl_Keyer_setup_cross_fade
18 Chnl_Keyer_setup_priority
19 Chnl_Keyer_setup_z_offset_a
20 Chnl_Keyer_setup_z_offset_b
21 Chnl_Keyer_setup_z_softness

LOCAL NOT SUPPORTED

26 Chnl_Mosaic_image
27 Chnl_Mosaic_hasp
28 Chnl_Mosaic_vasp
44 Chnl_Crop_cpin_select
53 Chnl_Crop_cpin_key_source
54 Chnl_Crop_cpin_key_screen
74 Chnl_warp_wave
98 Chnl_Light_src_blackLevel
177 Chnl_Input_front_Ext_Xpnt
178 Chnl_Input_back_Ext_Xpnt
179 Chnl_Pause_On

SPARES (UNUSED)

185 Chnl_Spare1

186 Chnl_Spare2
187 Chnl_Spare3
188 Chnl_Spare4
189 Chnl_Spare5
190 Chnl_Spare6

Global Channel Parameters

GLOBAL TRANS

0 Gbl__3dTrans_src_rh_rot
1 Gbl__3dTrans_src_rv_rot
2 Gbl__3dTrans_src_rz_rot
3 Gbl__3dTrans_src_h_loc
4 Gbl__3dTrans_src_v_loc
5 Gbl__3dTrans_src_z_loc
6 Gbl__3dTrans_src_ah_pos *(axis)*
7 Gbl__3dTrans_src_av_pos *(axis)*
8 Gbl__3dTrans_src_az_pos *(axis)*
9 Gbl__3dTrans_targ_rh_rot
10 Gbl__3dTrans_targ_rv_rot
11 Gbl__3dTrans_targ_rz_rot
12 Gbl__3dTrans_targ_h_loc
13 Gbl__3dTrans_targ_v_loc
14 Gbl__3dTrans_targ_z_loc
15 Gbl__3dTrans_targ_ah_pos *(axis)*
16 Gbl__3dTrans_targ_av_pos *(axis)*
17 Gbl__3dTrans_targ_az_pos *(axis)*
18 Gbl__2dTrans_h_pan *(no keyboard equiv)*
19 Gbl__2dTrans_v_pan *(no keyboard equiv)*
20 Gbl__2dTrans_zoom *(no keyboard equiv)*

COMBINER

37 Gbl_Dve_combiner_cross_fade
38 Gbl_Dve_combiner_ab_opac *(ch1)*
39 Gbl_Dve_combiner_cd_opac *(ch2)*
40 Gbl_Dve_combiner_priority *(fixed/zkey)*
41 Gbl_Dve_combiner_z_softness
42 Gbl_Out_combiner_cross_fade *(TFS)*
43 Gbl_Out_combiner_dve_opac *(TFS)*
44 Gbl_Out_combiner_tfs_opac *(TFS)*
45 Gbl_Out_combiner_priority *(TFS fix/zkey)*
46 Gbl_Out_combiner_z_softness *(TFS)*
48 Gbl_Background_source
49 Gbl_Background_freeze
76 Gbl_Background_z_pos
77 Gbl_Background_z_softness
78 Gbl_Background_z_cross_fade
79 Gbl_Background_priority *(fixed/zkey)*
80 Gbl_Framestore_source *(TFS source)*

TARGET FRAMESTORE

47 Gbl_Framestore_freeze *(TFS)*
82 Gbl_tfs_decay
83 Gbl_tfs_slinky
84 Gbl_tfs_sparkle_size

85 Gbl_tfs_sparkle_rate
86 Gbl_tfs_hue
87 Gbl_tfs_sat
88 Gbl_tfs_lum
89 Gbl_tfs_z_soft *(Comp mode)*
90 Gbl_tfs_xfade *(Comp mode)*
91 Gbl_tfs_effect_offOn
92 Gbl_tfs_effect_mode *(Attributes)*
94 Gbl_tfs_output_mode
96 Gbl_tfs_decay_offOn
97 Gbl_tfs_sparkle_offOn
98 Gbl_tfs_drop_offOn
99 Gbl_tfs_xfade_mode
100 Gbl_tfs_trail_color_offOn

DEFOCUS

21 Gbl_Defocus_one_src
22 Gbl_Defocus_one_aperature
23 Gbl_Defocus_one_luma_h
24 Gbl_Defocus_one_luma_v
25 Gbl_Defocus_one_luma_enable
26 Gbl_Defocus_one_chroma_h
27 Gbl_Defocus_one_chroma_v
28 Gbl_Defocus_one_chroma_enable
29 Gbl_Defocus_two_src
30 Gbl_Defocus_two_aperature
31 Gbl_Defocus_two_luma_h
32 Gbl_Defocus_two_luma_v
33 Gbl_Defocus_two_luma_enable
34 Gbl_Defocus_two_chroma_h
35 Gbl_Defocus_two_chroma_v
36 Gbl_Defocus_two_chroma_enable

SUPERMATTE

50 Gbl_SMatte_pattern
51 Gbl_SMatte_rot_mode *(angle/spin)*
52 Gbl_SMatte_rot_angle
53 Gbl_SMatte_rot_spin
54 Gbl_SMatte_split_enable
55 Gbl_SMatte_split_level
56 Gbl_SMatte_h_multiple
57 Gbl_SMatte_v_multiple
58 Gbl_SMatte_reflect
59 Gbl_SMatte_progress
60 Gbl_SMatte_hpos
61 Gbl_SMatte_vpos
62 Gbl_SMatte_softness
63 Gbl_SMatte_pers_mag
64 Gbl_SMatte_pers_rot
65 Gbl_SMatte_colour1_hue
66 Gbl_SMatte_colour1_lum
67 Gbl_SMatte_colour1_sat
68 Gbl_SMatte_colour2_hue

69 Gbl_SMatte_colour2_lum
70 Gbl_SMatte_colour2_sat
71 Gbl_SMatte_aspect
72 Gbl_SMatte_rings1
73 Gbl_SMatte_arms1
74 Gbl_SMatte_rings2
75 Gbl_SMatte_arms2

SOLID BUILDER

101 Gbl_Slab_enable
102 Gbl_Slab_width
103 Gbl_Slab_height
104 Gbl_Slab_depth
105 Gbl_Slab_frontPosV
106 Gbl_Slab_frontSizeV
107 Gbl_Slab_frontPosH
108 Gbl_Slab_frontSizeH
109 Gbl_Slab_topPosV
110 Gbl_Slab_topSizeV
111 Gbl_Slab_topPosH
112 Gbl_Slab_topSizeH
113 Gbl_Slab_sidePosV
114 Gbl_Slab_sideSizeV
115 Gbl_Slab_sidePosH
116 Gbl_Slab_sideSizeH
117 Gbl_Slab_slabSide
118 Gbl_Slab_slabSide1B
119 Gbl_Slab_slabRoll_Dir
120 Gbl_Slab_enable_ch1a
121 Gbl_Slab_enable_ch1b
122 Gbl_Slab_enable_ch2a
123 Gbl_Slab_enable_ch2b

GLOBAL NOT SUPPORTED

77 Gbl_Framestore_z_enable
89 Gbl_tfs_source
91 Gbl_tfs_blank_mode

Warp Menu Parameters

The challenge in controlling the Warp menu parameters is determining which patches apply to each warp shape's controls. The following list provides *Var* values assigned to the *Modify* and *Position* controls used by the warp shapes. Warp pattern #71, Split, has its *Position* controls listed separately at the end.

The number (68 for Spread for example) is the ***VAR*** value to enter in the Patch Bay mode. The Warp View controls have no tie to OrbitalFX (and would be peculiar to use if they did).

MODIFY

Alignment	71
Amplitude	69
Axis	70
Frequency	68
H Frequency	68
Mag	69
Phase	71
Position	75
Pulsewidth	72
Radius	68
Range	69
Rotation	70
Size	68
Spread	68
Twist	69
V Frequency	64

POSITION

Bottom	78
Bottom Left	77
Bottom Right	78
H Position	66
H Split	66
Left	75
Position	66
Right	76
Ring 1	75
Ring 2	76
Ring 3	77
Ring 4	78
Top	77
Top Left	75
Top Right	76
V Position	67
V Split	67

SPLIT V POSITION

Bottom Right	64
Bottom Left	65

Top Right	68
Top Left	69

SPLIT H POSITION

Bottom Right	77
Bottom Left	78
Top Right	76
Top Left	75

SPLIT ROTATE

Bottom Right	79
Bottom Left	80
Top Right	71
Top Left	70

Continuous Rippling Effect

This section describes creating an effect that causes the movement to appear to run continuously. The concept can be applied to numerous situations, but the example used is a common one involving circular ripples. The goal is to make the image look like the rippling never stops.

The basic task is to have OrbitalFX change the Warp menu's Phase parameter so that a ripple moves exactly one ripple period, as determined by the Warp menu's Frequency setting, then jump back to where it started and go again. The OrbitalFX Ramp waveform is perfect for actually running the effect, but is less than ideal for setting it up. For that we will use the Square waveform.

The following assumes you have good video for rippling purposes (flat color fields are disappointing). The grid test pattern of the Texture menu works very well.

1. Press **NORMAL NORMAL NORMAL ENTER** to force Dveous/MX to a known starting point.
2. Press the **WARP** button, set **Warp** *On*, **Category** to *Ripple*, and **Type** to *Circular*. Toggle the **Demo** mode *On* then *Off*. This applies static ripples to the picture.
3. Press the **ORBITALFX** button. Ensure oscillator 1 is selected, and set its **Slaves** to *0*.
4. Use **Patch Bay** to patch VAR *70* to oscillator 1.
5. Set the oscillator's *Power* to *On*, **Waveform** to *Square*, and **Frequency** to *200*.
6. Start turning up the amplitude. You will see a rapid cut between the amplitude limits. As you keep turning up the amplitude you will see that there is a point where the two images appear as one. This indicates that amplitude is jumping the Warp Phase parameter exactly one ripple period. (The amplitude value should be about 0.25 in this example; this value is determined by the Warp Frequency setting.)
7. Change the oscillator's **Waveform** to *Ramp*. The ripples now appear to be perpetually moving from the center out.

C

R

S

T