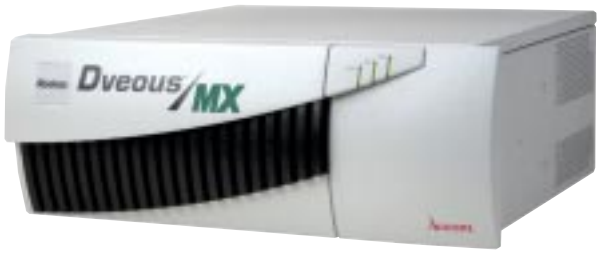
Quick Contents

Section 1:
Introduction to Dveous/MX



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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 9100-0402-00, 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.

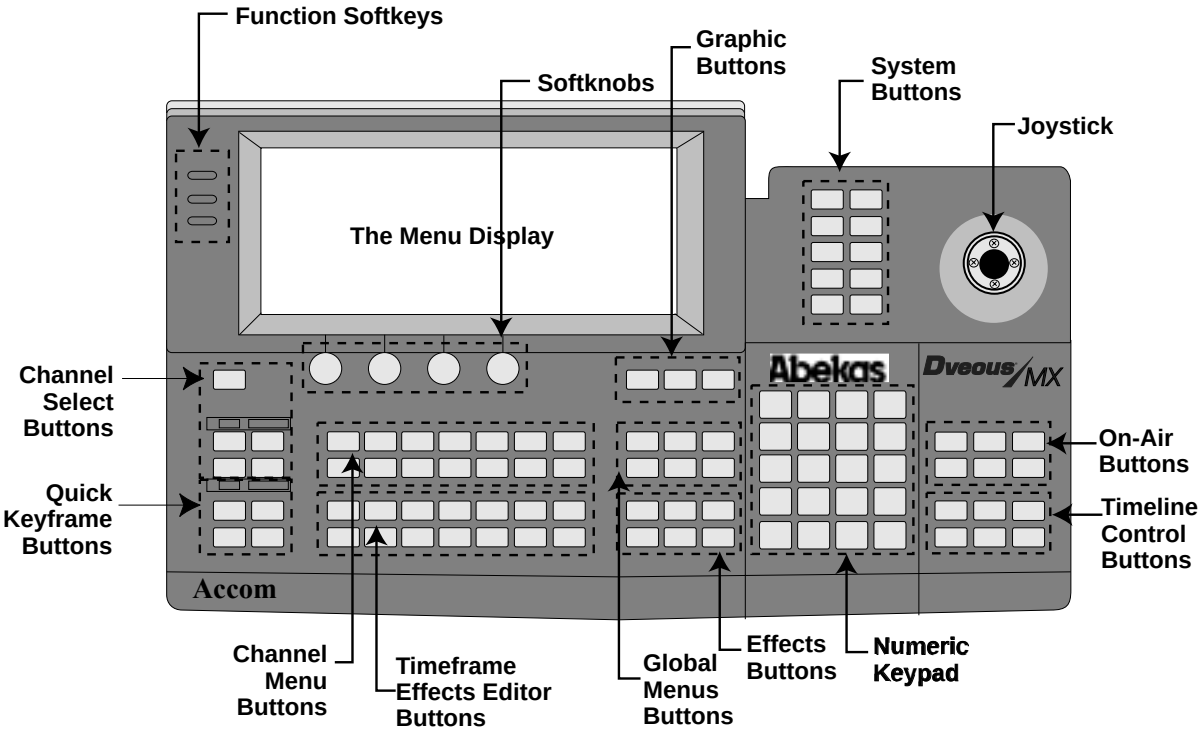
Dveous/MX Single channel configuration

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.

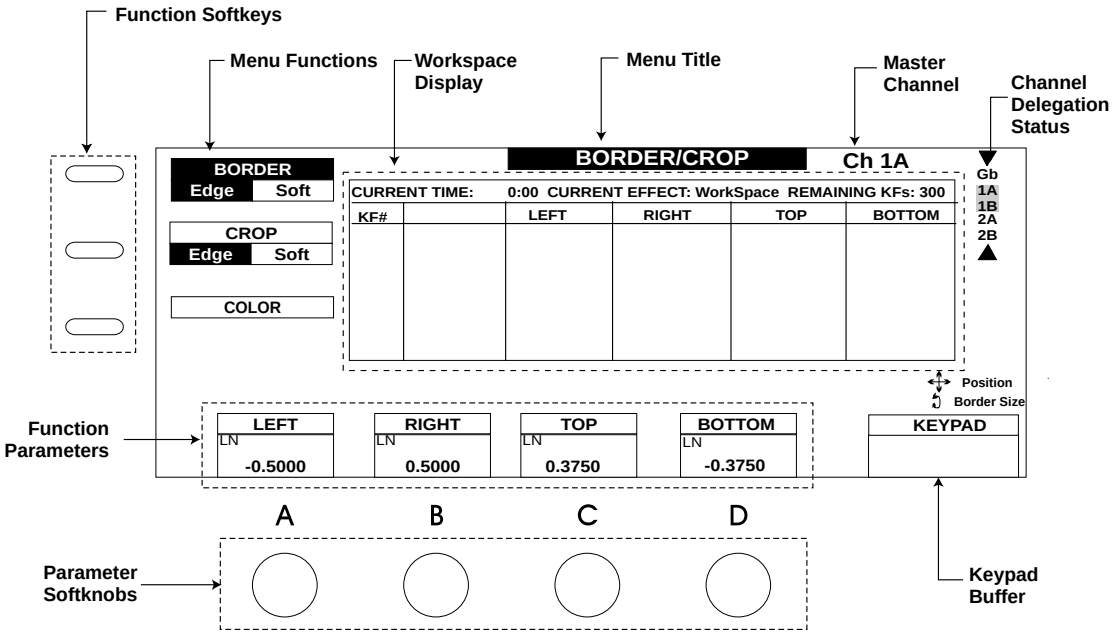
- Channel buttons let you transform your image in either the Source or Target plane.

- 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) chan-

nels 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.

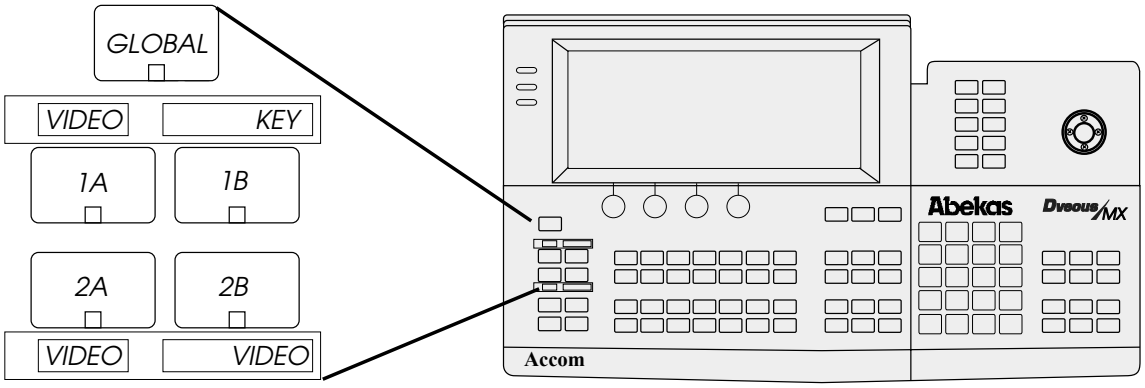
Channel Select Buttons

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.

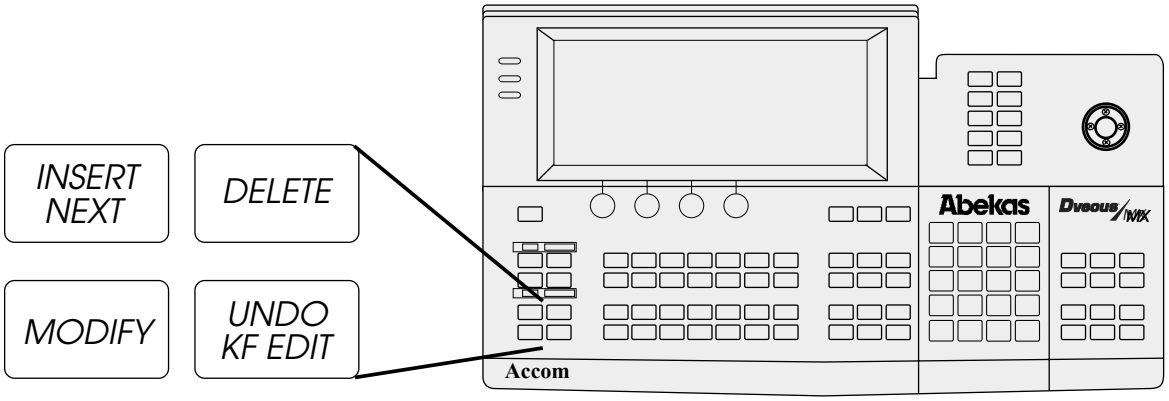
For detailed information about delegating and configuring channels, see *Delegating Channels* and *Configuration* in Section 2 – Getting Started.



Quick Keyframe Buttons

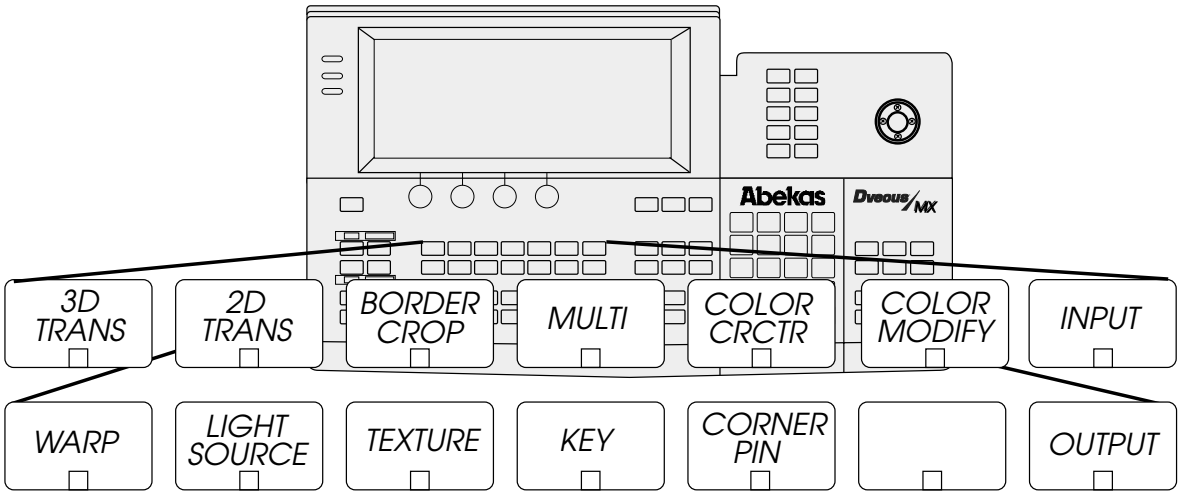
The four Quick Keyframe buttons only affect the current keyframe (the one that the effect is currently on). These are "single press" buttons that need only to be pressed once to carry out a keyframe command. (Other command buttons allow multiple presses for different functions.)

- **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.

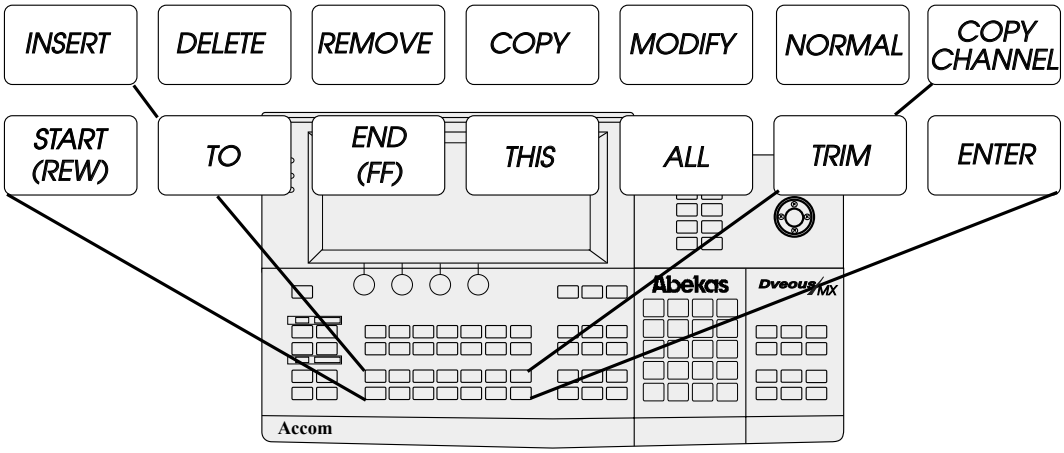


- **3D TRANS** – affects the image in three dimensional space. Position the image in Source or Target space, then resize it, rotate it or moves its axis.
- **2D TRANS** – affects the image in two dimensional space. Use this menu to change horizontal and vertical size and to position the image upstream (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.

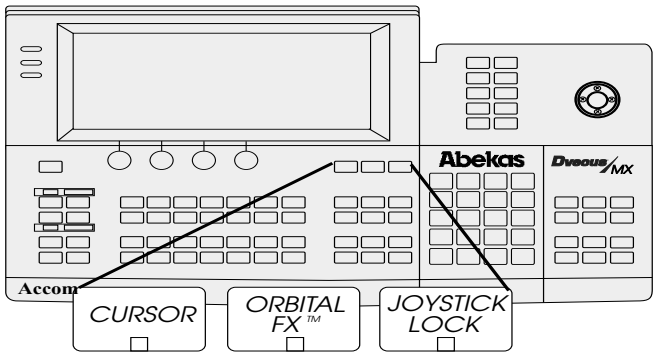


- **INSERT** – inserts a keyframe into the current time.
- **DELETE** – deletes a keyframe and moves the next keyframe to current time.
- **REMOVE** – removes a keyframe not effecting the timeline.
- **COPY** - copies specified keyframe to another location.
- **MODIFY** - replaces current keyframe with 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.

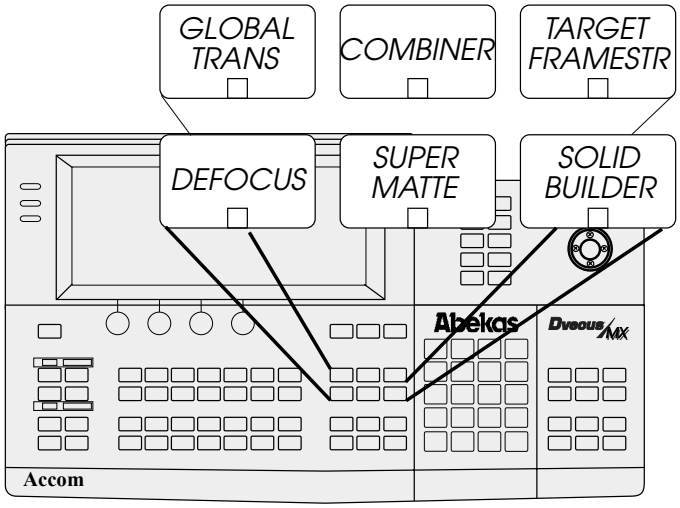
Graphics Buttons

- **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.

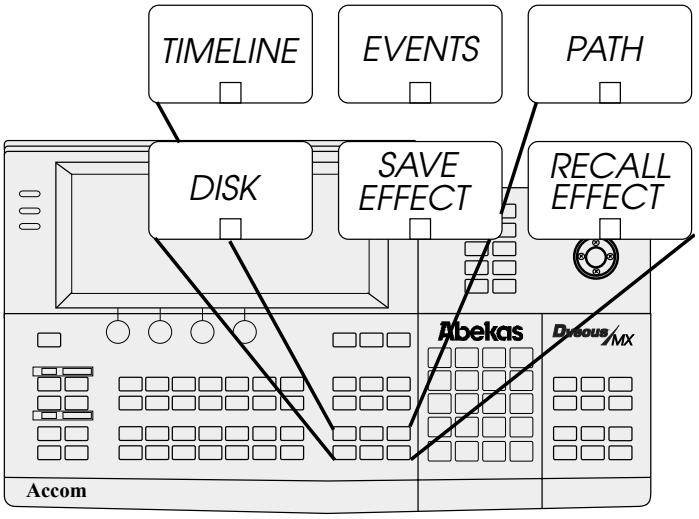


Note: In order to save effects created in these menus, you must delegate the GLOBAL channel.

- **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

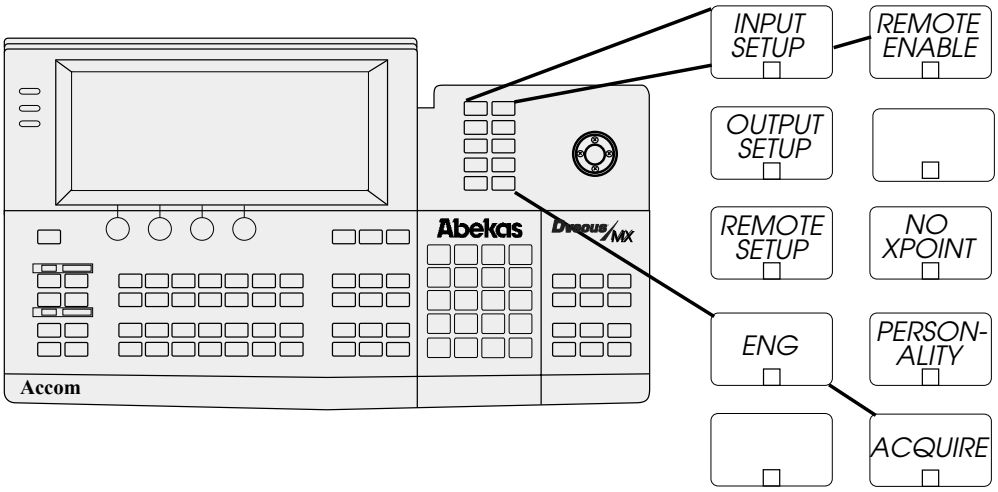
These six buttons access menus that set controls for the effect as a whole.



- **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.

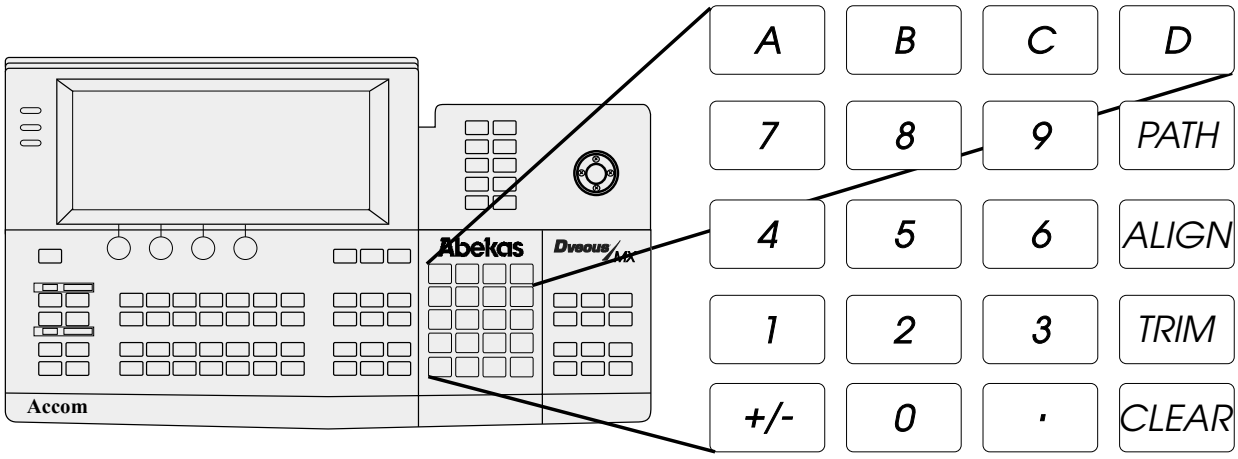


- **INPUT SETUP** - controls blanking adjustments for input video as well as Matte enables for each input.
- **REMOTE ENABLE** - controls 232/422 protocol and setup for each of the three remote ports.
- **OUTPUT SETUP** - controls output timing and blanking. Also configures SD/HD format, reference and 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.

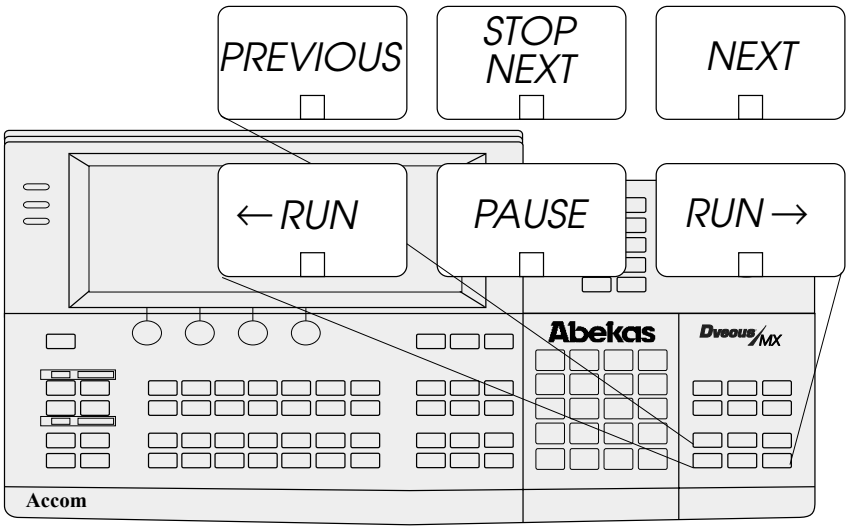


- **A, B, C,** and **D** – enters values into their corresponding softknob settings. For example, to enter the value 17 in softknob A, enter 17 on the keypad, then press **A**.
- **+/-** – inverts existing softknob values or lets you enter a negative number.
- **PATH** – toggles the available motion 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

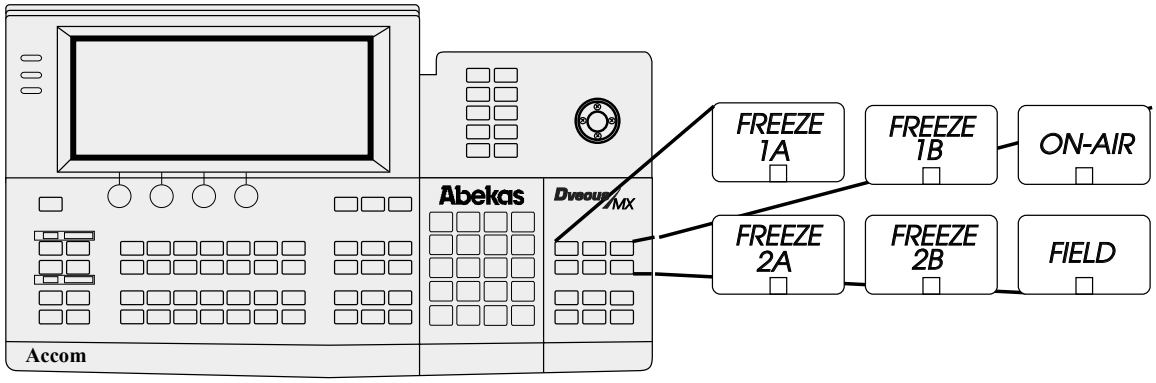
The six Timeline Control Buttons let you run through an effect.



- **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

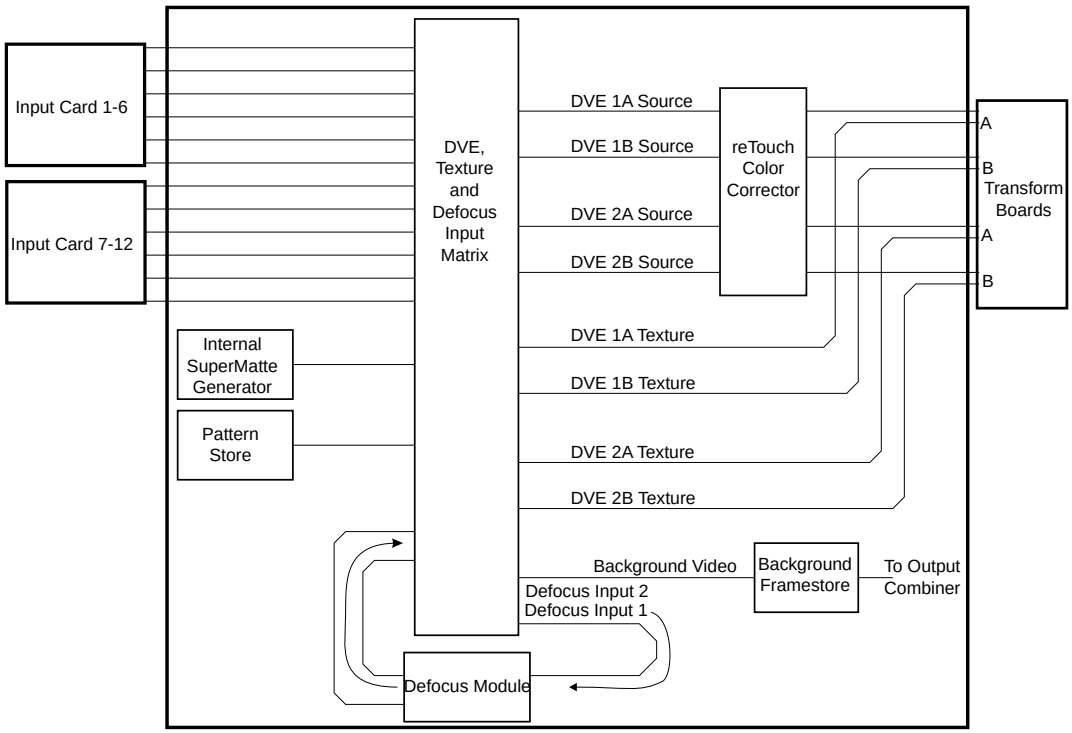
A dual twin system provides another set of A and B channels. The configurations' possibilities are the same as with the single twin system and are described above.

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.

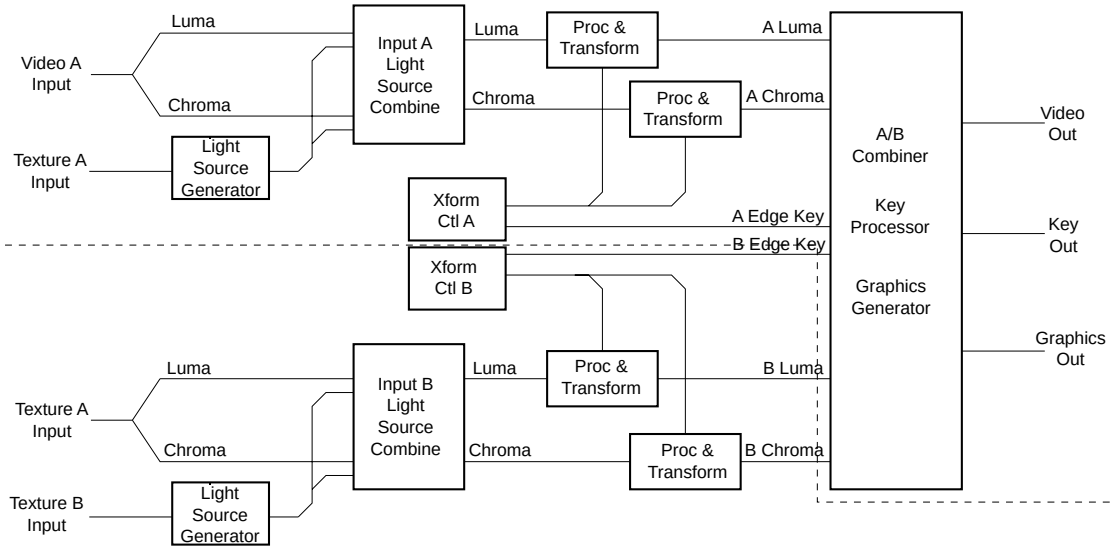
The DVE video/key sources feed the reTouch™ Color Corrector function. The Color Corrector output supplies the transform boards' input. The transform boards use the texture signals to modify the light source generator.

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.

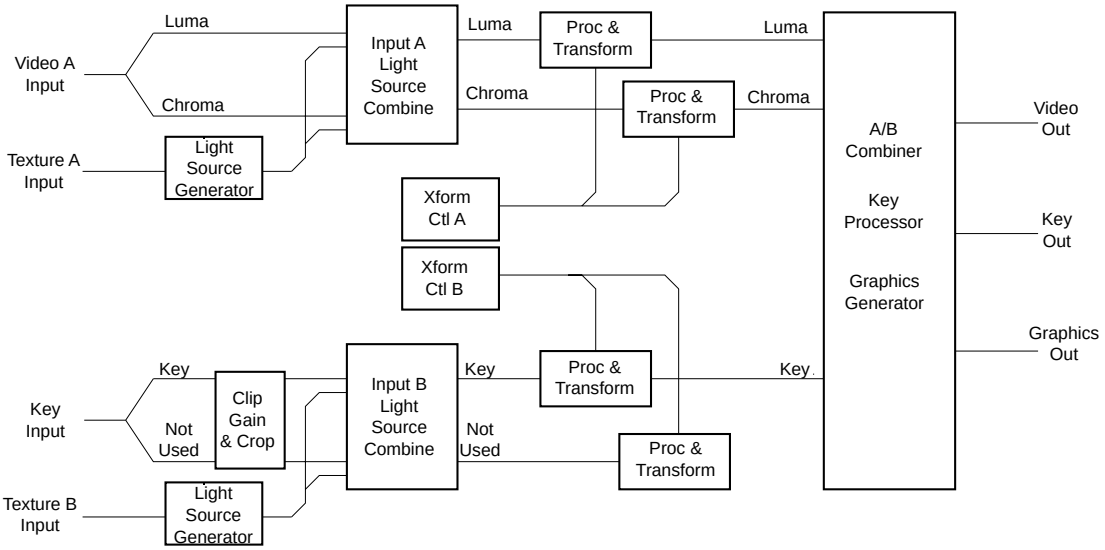
There are two transform controllers: one is dedicated to the A input, the other to the B input. Each transform controller generates an edge key signal that defines the transformed raster edges. The transformed outputs are then combined into a single video and key output and sent to the Combiner for output 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.

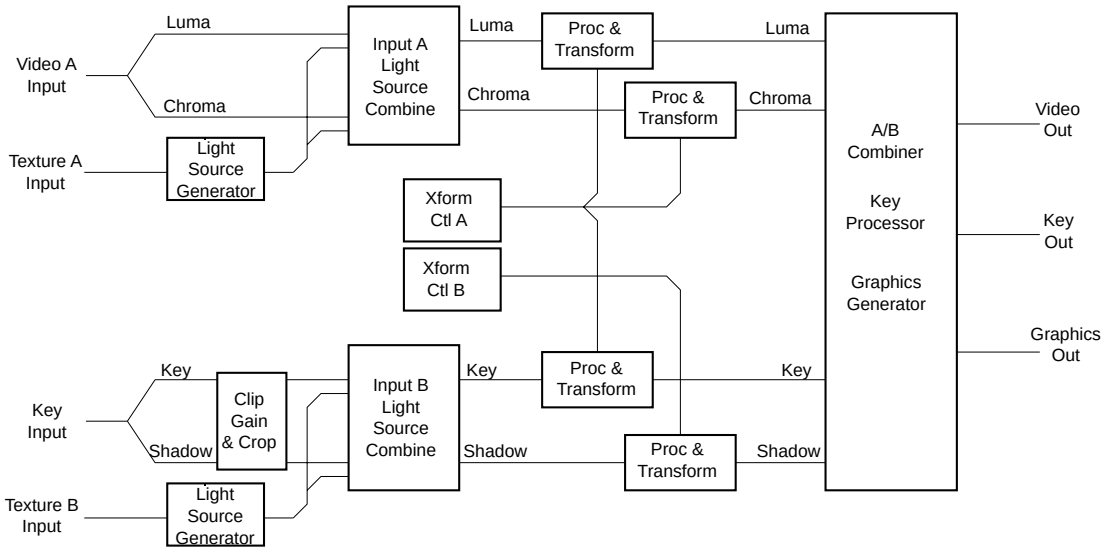
The A/B Combiner's key output is a transformed version of the input, and not the raster-based signal seen in the Video+Video mode. The B key transform is independent of the A video transform.



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.

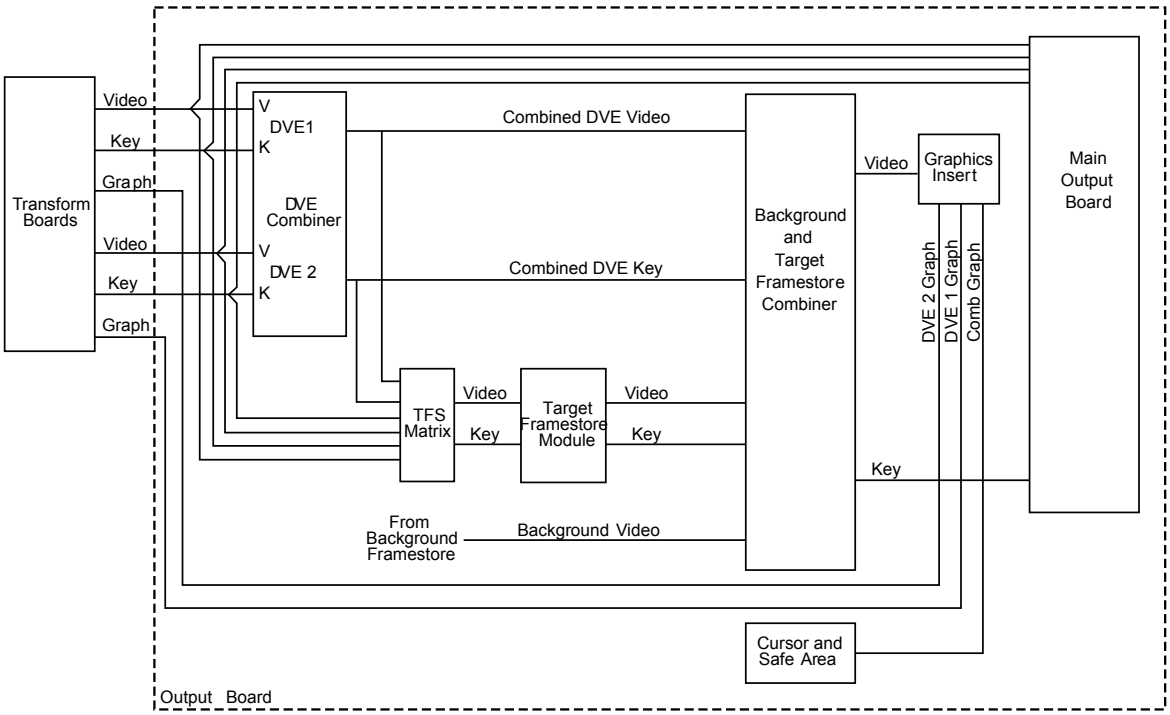
The transforms for the A channel also control the key path. The B channel transforms control the shadow signal, allowing completely independent control of the shadow. The A/B Combiner key output is a combined key/shadow signal.



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.