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Section 1: Introduction

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Scope of Manual

This Technical Guide provides detailed information to help you plan, install, and configure your Dveous/MX Universal Format Digital Video Effects system. For operations information, please see the Dveous/MX Operations Manual - P/N 9100-0401-00.

Section Descriptions

This manual covers installing and using the Dveous/MX hardware. The manual is separated into the following functional topics.

Section 1 – Introduction

This section presents an overview of the Dveous/MX system, its standard features and options. It also includes a summary of basic operations and basic signal path block diagrams.

Section 2 – Installation

The Installation section covers the physical aspects of a Dveous/MX system. This includes power and cooling requirements, and size and weight specifications. It covers all rear panel connections, with connector pinouts, and discusses connecting a Control Panel.

Section 3 – System Overview

This section contains the information needed to configure the Dveous/MX chassis. It defines the front panel LEDs and the internal configuration switches. It also covers powering the system on and off and updating software. Discussions of board overviews, first birthday procedure, power supply removal and fan assembly removal are also in this section.

Section 4 – Option Installation

This section details procedures for installing and replacing hardware options in the chassis. These include optional transform boards for extra HD channels as well as an additional input board to increase the total inputs from 6 to 12.

Section 5 – Applications

The Applications section covers integration of Dveous/MX into an existing system and the remote protocol interfaces that Dveous/MX supports.

Section 6 – Setup Menus

This section details the engineering and setup menus. It covers the settings and ranges in menus used for system timing and configuration. This section also discusses disk menu operations settings.

Section 7 – Appendix A

This section is a list of commonly requested assemblies and their Accom part numbers.

Manual Conventions

In this manual, all Control Panel keys are called buttons to avoid confusion with the video keying process.

Keycap labels appear in bold capital letters: the **3D TRANS** button, the **RUN→** button. Menu names are capitalized: the Warp menu, the Input menu. Softkey labels are in bold upper and lower case italicized letters: the ***Rotate*** softkey. Softknob labels appear in bold upper and lower case letters: the **H Pos** softknob. Otherwise, softknobs appear as softknob A, softknob B, softknob C, and softknob D, starting on the left with softknob A.

A sequence of button presses appears with 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 derived from a key signal. This manual uses the word *image* generically to indicate the channel's output (video, key, or shadow).

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 up to 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 (frame) and interlaced (field) rates.
- 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, communicate with 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, setups and JPEGs.

Options

- Additional transform boards can be installed for extra HD channels.
- Additional 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.

Reference Requirements

You must operate Dveous/MX locked to an external reference input. Dveous/MX accepts either tri-level sync or black bust (bi-level) in NTSC or PAL as reference. The reference must match the selected video format frame rate. For instance, NTSC black burst will lock up to 525 SD formats as well as any HD formats running at 59.94 or 29.97. HD at 1080/24P would require tri-level sync running at a 24 frame rate.

The reference input is a high impedance loop thru for daisy chaining the reference signal to other devices. This loop thru must be terminated at 75-ohm if not used and termination should always be at the end of the reference signal.

Refer to section two for more information on reference requirements.

Control Ports

There are six control ports on the rear of the Dveous/MX Main Chassis.

- The three RS422 serials ports support Sony, SMPTE, GVG Peripheral Bus, CPL and Switcher Aux Bus Protocols. A fourth port supports the communication between the control panel and the chassis.
- Two GPI (General Purpose Interface) ports supply extensive input and output switch closure-based remote control. The GPI outputs can also provide tally information. Input and Output functions are assignable and trigger-edge mode is selectable in the **Remote Setup** menu. Pinouts and specifications for the GPI ports are provided in Section 2. Configuration is discussed in Section 6, Setup Menus.

Overview of Terms

The terms below are commonly used when discussing Dveous/MX.

- **Channel**—The term "channel" has been used to describe either the video or key processing path, inputs, or outputs. Most DVE systems process luminance and chrominance in the video path but only luminance in the key path. Usually, a "two-channel" system or effect refers to the number of video images involved, and implies that the key channels are included. This is not the case with Dveous/MX.

  Dveous/MX has the unique ability to process either a key signal or a video signal on the second "twin" channel. This means that a twin channel can have one video and one key path, or two video paths and no key path; it can generate raster-shaped key signals at output.

  In this manual, "channel" can refer to a video path or a key path, and, unless specifically noted, they are interchangeable. Please refer to the Video and Key Signal Paths section later in this document for a complete explanation with illustrations.

- **Multichannel**—"Multichannel systems" in the past always referred to the video channels, with the accompanying key channels implied. Thus, a four-channel system had four video paths and four key paths. Dveous/MX's multichannel capabilities are different because both channels can process video. You can use these channels in four different ways:
  - **V (Video)** — *Dual Twin SD Configuration (HD mode)*
    The transform board processes only one video source in HD mode. All transform, warp, and lighting effects are available on that video channel. The DVE processor internally generates the associated key signal. The key signal is full screen "white" with adjustable opacity and edge softness.
  - **V + V (Video + Video)** — *Dual Twin SD, Dual Twin HD and Single Twin HD Configurations (SD & HD mode)*
    The transform board independently processes two video sources in either SD or HD mode. 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.
  - **V + K (Video + Key)** — *Dual Twin SD, Dual Twin HD and Single Twin HD Configurations (SD & HD mode)*
    The transform board independently processes one video and one key source. All transforms are available to the key signal independently from the video. The key channel also has clip, gain, and horizontal phase controls.

- **VK + S (Video/Key + Shadow)** — *Dual Twin SD, Dual Twin HD and Single Twin HD Configurations (SD & HD mode)*
  In this mode, the transform board derives a full-bandwidth drop shadow from the key input. It processes the video and key (which are tied together) in the A channel, with independent control of the shadow in the B channel. Besides the clip, gain, and horizontal phase controls for the key part of the A channel, there are color and opacity controls for the shadow channel.

Control Panel Buttons

A brief description of the Control Panel and its button groups follows.

The Menu Screen

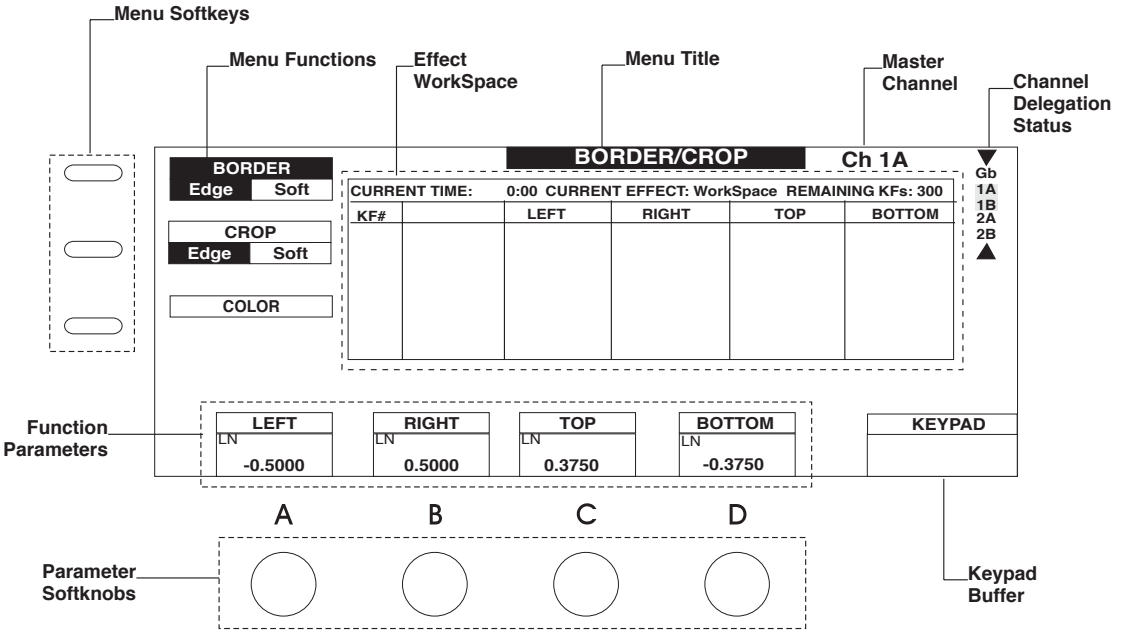
Menu Display

The menu screen is in the upper left corner of the Control Panel. You can adjust brightness and contrast in the Engineering Setup menu.

Menu Labels and Controls

Some of the information displayed in the menu screen changes depending on Dveous/MX's current status and the current menu. The figure below shows a typical display.

The top line shows the current menu title, and indicates the currently selected master channel (the one the menu settings reflect): 1A, 1B, 2A, or 2B. The master channel display does not appear in global menus.



A menu can have up to three different softkeys. The softkey labels appear on the left side of the menu screen. Select a softkey by pressing the button next to its label. When you press a softkey, a black highlight indicates that it is active. If there is more than one label for the softkey, pressing it toggles the function, and the highlight indicates the active mode. Also, up to four parameters for each

softkey function can appear above the softknobs at the bottom of the menu display. You can adjust these settings with the softknobs, the keypad, or the joystick. The motion path type assigned to the parameter appears above the softknob values.

You can change softknob settings several ways:

- Turn the softknob.
- Enter a value in the numeric keypad, then press the corresponding **A**, **B**, **C**, or **D** button in the top row of the numeric keypad. For example, to enter the value 17 in softknob A, enter **17** on the keypad, then press **A**. This applies to softknobs that use numeric values.
- Use the joystick to change softknob settings. Adjust softknob settings with left/right arrows by moving the joystick left and right. Adjust settings with up/down arrows by moving the joystick up and down. Adjust softknob settings with circular arrows by twisting the end of the joystick handle.
- You can copy a value from one softknob to another. With the keypad buffer empty, press the keypad softkey (**A**,**B**, **C**, or **D**) for the softknob you want to copy. This copies the value to the keypad buffer. Pressing another keypad softkey (**A**, **B**, **C**, or **D**) enters the value in that softknob and clears the buffer.
- You can invert a value by pressing the **+/-** button, then the keypad softkey (**A**, **B**, **C**, or **D**) for the softknob. Use this for values that accept negative numbers.
- You can also use **TRIM** to trim a value: press **1** — **TRIM** — **A** to add 1 to the value in softknob A.
- You can reset values and entire menus to their default settings:
- Press **CLEAR**, then **A**, **B**, **C**, or **D** to reset the softknob value to default. Hold **CLEAR** and press more than one keypad softkey (**A**, **B**, **C**, or **D**) to reset multiple values.
- Hold **CLEAR** and press a softkey to clear all the values for that softkey to default. This resets both the softkey setting (if it is a toggle or flag) and any softknob values.
- Hold the **CLEAR** button and press a menu button to reset all the values for that menu to default. This resets all softkeys and softknob values.

A keypad buffer appears in the lower right corner of each menu. The buffer can display one of the following:

- Empty (default).
- A number waiting to be assigned to a softknob.
- A number and the word ***Trim***.
- The word ***Align***.
- The word ***Clear***.
- The +/- symbol.
- The message **<<Set Path>>** and a list of the path types: **JP** (jump), **LN** (linear), **SL** (smooth linear), **T1** (Tension Continuity Bias 1), **T2** (Tension Continuity Bias 2), and **SM** (smooth). A cursor indicates the currently selected path type.

The center of the display shows information about the current timeline and effect. The top line (***CTime***) indicates the current point on the effects timeline as seconds:frames. The next five lines indicate the current keyframe and total keyframes for each channel's effect. For example, if channel 1A is on keyframe 2 of a five keyframe effect, the display reads ***Ch 1A: Kf 2 of 5***. There are two ***Free Kf*** lines. The first one shows the number of keyframes available for addition in the current effect (there is a maximum of 300 keyframes per effect). The bottom line shows the number of keyframes available in the system keyframe pool.

Below the effect information display area is a single line edit buffer that shows your keyframe editing command strings (TimeFrame Effects Editor or Quick Keyframes keystroke sequences). If Dveous/MX recognizes the command string, it confirms by displaying ***OK*** at the end of the string when you press **ENTER**. If it does not, an error message appears after the unrecognized command string.

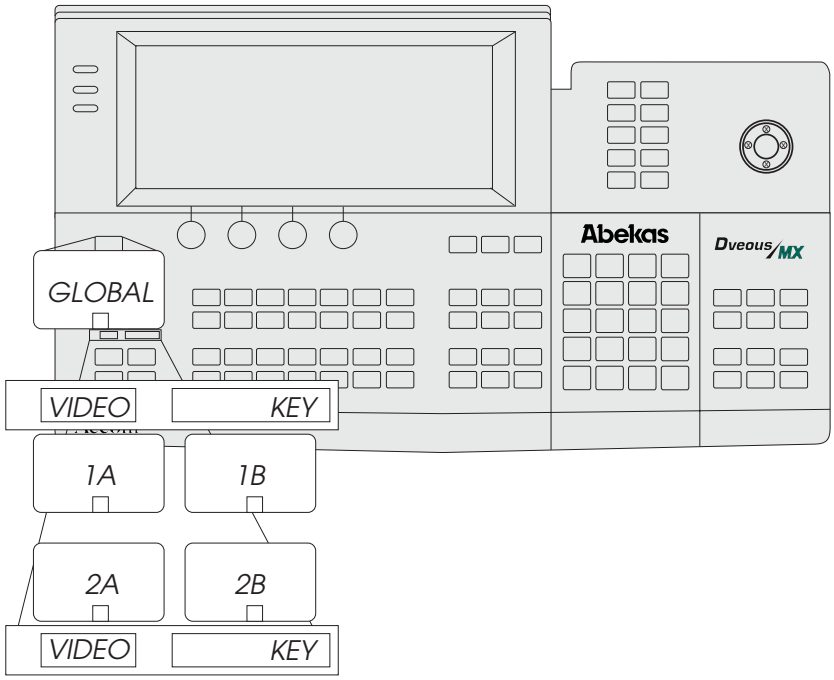
You can “lock” the joystick control to the current menu settings, then change to a different menu and use the softknobs to control the settings there. The joystick still affects only the settings it is locked to.

Channel Select Buttons

The Channel Select buttons include **GLOBAL**, **1A**, **1B**, **2A,** and **2B**. They are the red buttons on the left side of the Control Panel, below the menu display. **1A** and **1B** comprise the single twin channel. **2A** and **2B** comprise the second (dual) twin channel. The global channel affects every channel equally. Press a Channel Select button to light its LED and make it the active channel. The menus reflect the status of the active channel, and any changes you make in the menus affect the active channel.

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 can be either ***VIDEO*** or ***KEY***, depending on how you have configured your channels. See the discussion at the end of this section for more details on configuring channels.

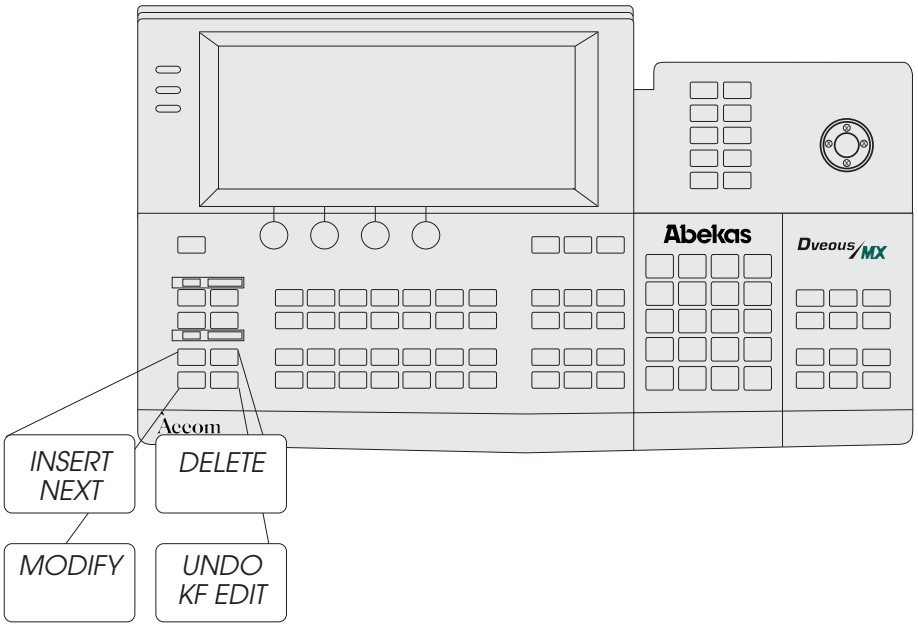
When a channel is designated as the "master," its settings appear in the menus. You can have more than one channel active at a time, but only one channel can be the "master" channel. Though the menus reflect the master channel's settings, any changes you make in the menus affect all active (selected) channels. Hold a Channel Select button for half a second to designate it as the master without de-selecting other channels. Double press a Channel Select button to select it as the master channel and de-select all other channels. You can toggle any other channel on and off after designating a master channel by pressing its Channel Select button once.



Quick Keyframe Buttons

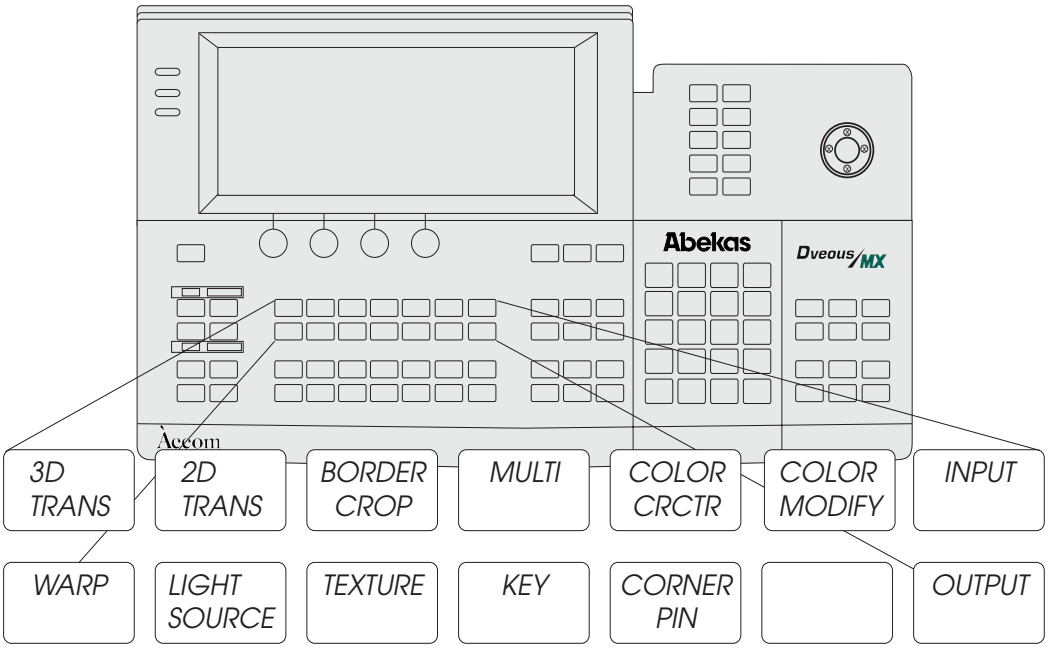
The Quick Keyframe buttons include the **INSERT NEXT**, **DELETE**, **MODIFY**, and **UNDO KF EDIT** buttons. All are located on the left side of the Control Panel. They only affect the current keyframe (the one that is currently highlighted in the timeline[s]).

These buttons are single press functions. Pressing **INSERT NEXT** inserts a keyframe after the current keyframe. Pressing **DELETE** removes the current keyframe, including its duration, from the timeline. Pressing **MODIFY** changes the current keyframe to reflect any changes in any parameter. Pressing **UNDO KF EDIT** "undoes" the last keyframe edit you made.



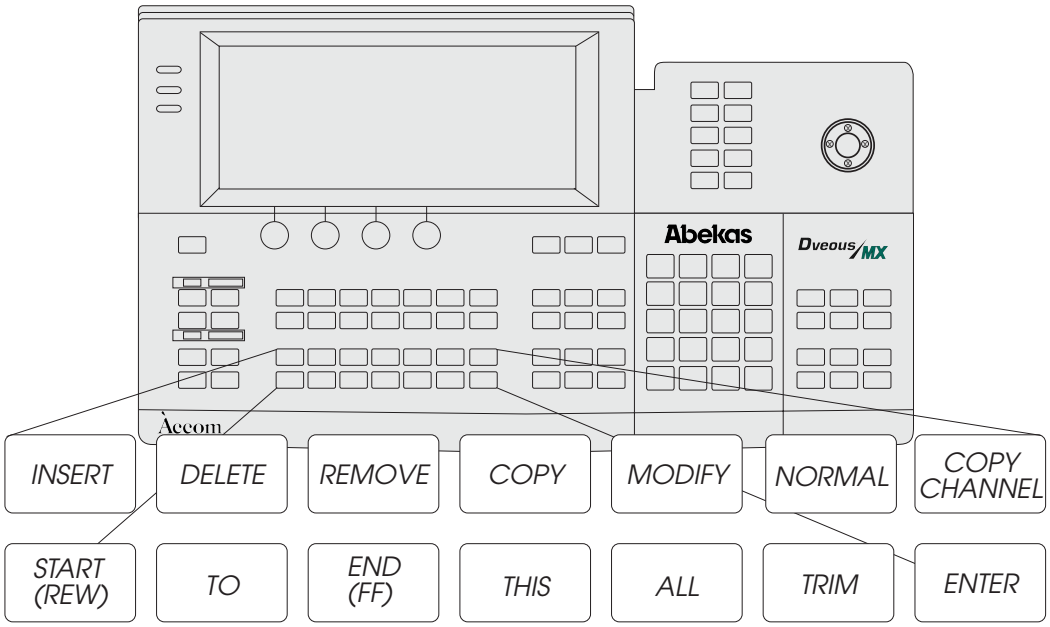
Channel Menu Buttons

The Channel Menu buttons include the **3D TRANS**, **2D TRANS**, **BORDER/CROP**, **MULTI**, **COLOR CRCTR**, **COLOR MODIFY**, **INPUT**, **WARP**, **LIGHT SOURCE**, **TEXTURE**, **KEY**, **CORNER PIN**, and **OUTPUT** menu buttons. These buttons are located below the softknobs. Use these buttons to access menus and parameters for the active channel(s).



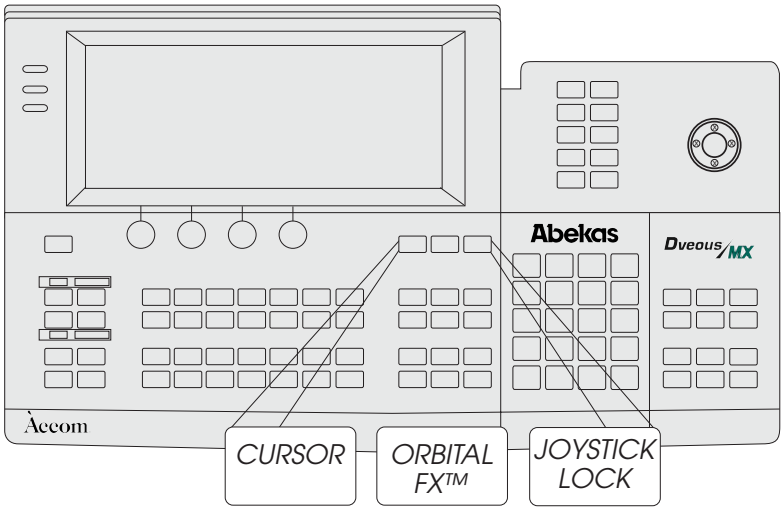
TimeFrame Effects Editor Buttons

The TimeFrame Effects Editor buttons, located below the Channel Menu buttons, include **INSERT**, **DELETE**, **REMOVE**, **COPY**, **MODIFY**, **NORMAL**, **COPY CHANNEL**, **START (REW)**, **TO**, **END (FF)**, **THIS**, **ALL**, **TRIM**, and **ENTER**. Use these buttons to insert, delete, edit, and copy keyframes in effects.



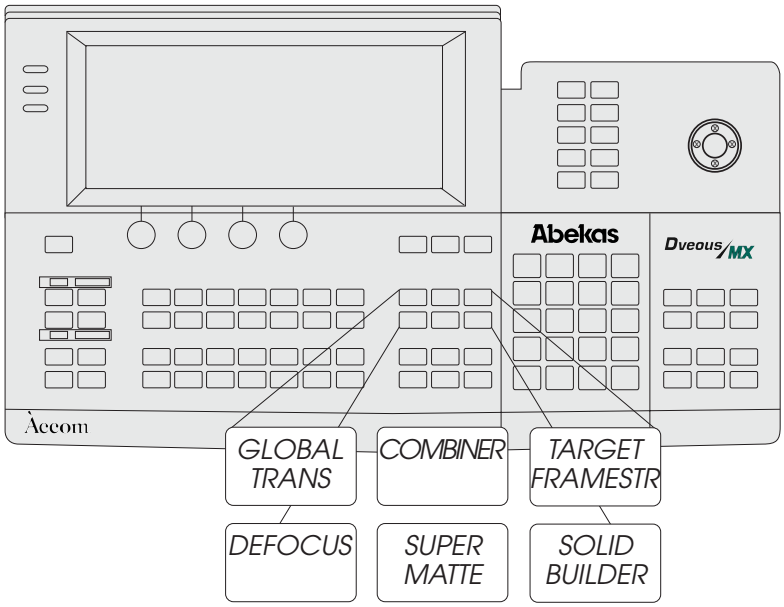
Graphics Buttons

The Graphics buttons let you enable graphic overlays, lock the joystick to the current menu controls and access the Orbital FX™ menu. Press the **CURSOR** button to turn on a cursor for each channel on the Dveous/MX output. The cursor appears at the intersection of the H, V, and Z axes for each channel, and a channel identification (1A, 1B, etc.) appears on the channel's image. This can help when you need to identify or position an image very precisely. Use **JOYSTICK LOCK** to dedicate the joystick to the current menu controls. This is handy if you want to continue using the joystick for positioning, for example, while using the softknobs in the Warp menu. Press the **ORBITAL FX™** button to display the **ORBITAL FX™** menu. Refer to the Dveous/MX Operations Guide for information on using this feature.



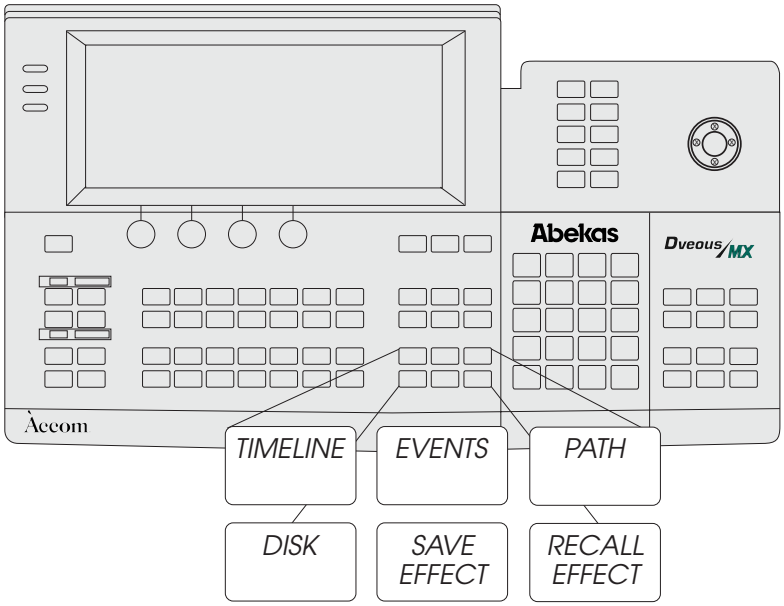
Global Menu Buttons

The Global Menu buttons are below the Graphics buttons, and include **GLOBAL TRANS**, **COMBINER**, **TARGET FRAMESTR**, **DEFOCUS**, **SUPER MATTE**, and **SOLID BUILDER**. These buttons access menus that control Dveous/MX functions that are not specific to the individual DVE channels (1A, 1B, 2A, 2B). This includes menus for controlling optional features.



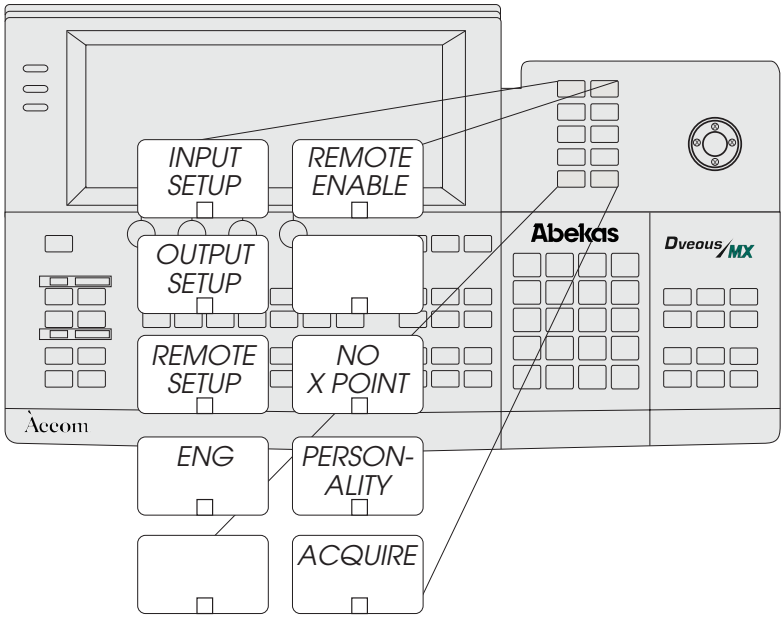
Effects Buttons

The buttons in this group, **TIMELINE**, **EVENTS**, **PATH**, **DISK**, **SAVE EFFECT**, and **RECALL EFFECT**, access menus that let you set controls for the effect as a whole. The Disk menu lets you save effects and setups to floppy disk or hard drive.



System Buttons

The System buttons include **INPUT SETUP**, **OUTPUT SETUP**, **REMOTE SETUP**, **ENG**, **REMOTE ENABLE**, **NO XPOINT**, **PERSONALITY**, and **ACQUIRE**. These buttons access menus that let you set up the Dveous/MX inputs, outputs, remote setups, and enables. Press **ENG** to bring up the Engineering menu.



Joystick

You can use the joystick to change parameter settings. Adjust parameters with left/right arrows by moving the joystick left and right. Adjust parameters with up/down arrows by moving the joystick up and down. Adjust parameters with circular arrows by twisting the joystick handle.

You can "lock" the joystick control to the current menu controls, then change to a different menu and use the softknobs to control the settings there. The joystick still affects only the settings it is locked to.

Numeric Keypad

The numeric keypad is located under the System buttons. Use the keypad to enter effect numbers, keyframe numbers, parameter values, etc. The **A**, **B**, **C**, and **D** buttons let you enter values into the softknob settings. For example, to enter the value 17 in softknob A, enter **17** on the keypad, then press **A**.

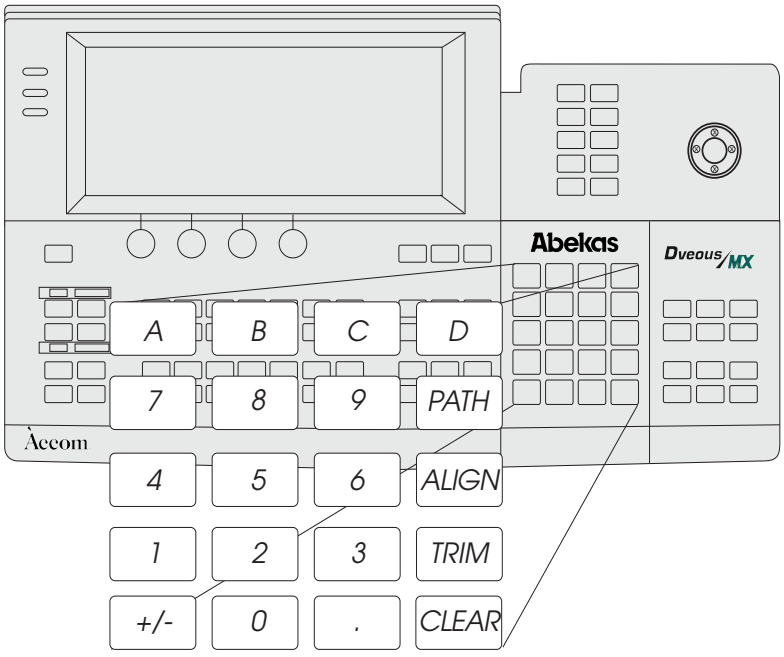
You can invert a value by pressing the **+/-** button, then the **A**, **B**, **C**, or **D** button for a softknob. Use this for values that accept negative numbers.

You can use **CLEAR** to erase the contents of the keypad buffer, the contents of the keyframe edit dialog, or reset entire softkeys or menus to default.

You can use **TRIM** to adjust values. For example, press **1 — TRIM — A** to add 1 to the value in softknob A.

Press **ALIGN** to put the word ***Align*** into the keypad buffer. Now pressing a keypad softkey (**A**, **B**, **C**, or **D**) brings the corresponding softknob value to its nearest "nominal" value. For example, aligning a rotation value of 39 degrees sets it to 45 degrees. Pressing **ALIGN**, then a menu softkey (left side of the display) sets all the softknobs to their closest nominal value.

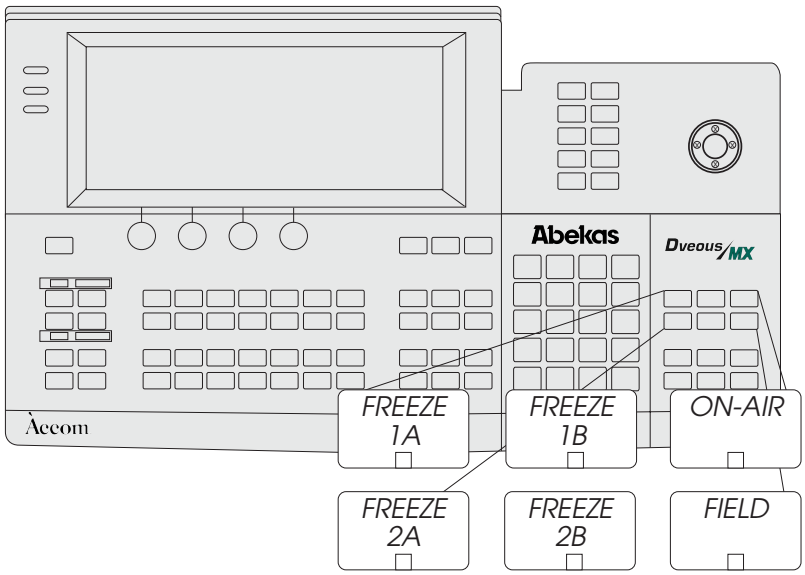
Pressing **PATH** displays the available motion path types in the keypad buffer. You can assign a motion path type to any parameter by pressing **PATH** to select the motion type in the keypad buffer, then the keypad softkey (**A**, **B**, **C**, or **D**) for that softknob.



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 channels 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: the channel 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.

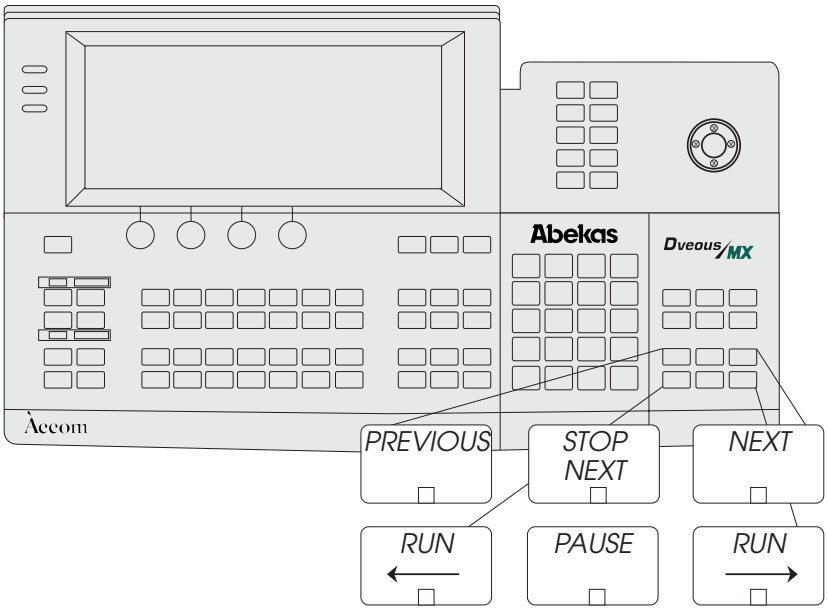


Timeline Control Buttons

These buttons are in the lower right corner of the Control Panel and let you step through keyframes in an effect, run an effect either forward or reverse, and pause a running effect.

Pressing **RUN→** runs the current timeline effect forward. Pressing **←RUN** runs the current timeline effect in reverse. Pressing the **PAUSE** button momentarily halts the effect. You can continue running it by pressing **RUN→** or **←RUN**. The **PAUSE** LED lights if the effect is currently paused, and one of the **RUN** button LEDs flashes to indicate the direction the effect was running when it was paused. Pressing the **PAUSE** button to turn its LED off takes the effect out of run mode. Use the **RUN→** or **←RUN** button to run the effect from the beginning or the end.

Pressing the **PREVIOUS** button steps the timeline back to the previous keyframe. Pressing the **NEXT** button steps the timeline forward to the next keyframe. Pressing the **STOP NEXT** button pauses a running effect when it reaches the next keyframe.



Video and Key Signal Paths

This discussion is an overview of the video and key signal flow paths, which will help you better understand how Dveous/MX works. It includes details of your options for channel configurations and block diagrams that show the system video and key signal paths in more detail.

Channel Configurations

Dveous/MX is capable of working in either Standard Definition (SD) or High Definition (HD).

In SD mode, the twin channel transform board has a main video channel (1A) and its "twin" video, key or shadow channel (1B) plus an additional video channel (2A) with its "twin" video, key, or shadow channel (2B).

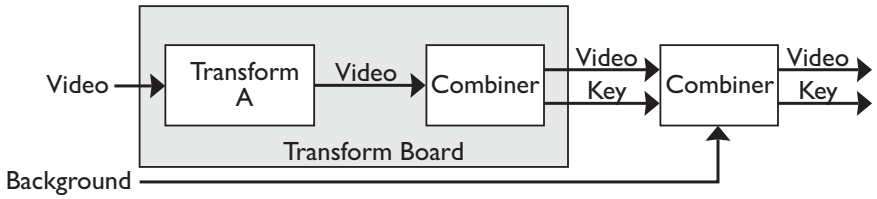
In HD mode, the transform board has a main video channel (1A) only; there is no "twin" video, key or shadow channel. An optional transform board may be added to provide a "twin" video, key or shadow channel (1B). Two more transform boards can be used which adds an additional video channel (2A) and its "twin" video, key, or shadow channel (2B).

This flexibility gives Dveous/MX four different channel configurations:

V (Video)

Dual Twin SD Configuration (HD mode)

The video channel has full control of all keyframe parameters including motion paths, warps, light sources, and textures. The transform board internally generates the key signal associated with this signal. The channel's key signal is raster size "white" with adjustable opacity and edge softness. This mode does not let you use the B channel.

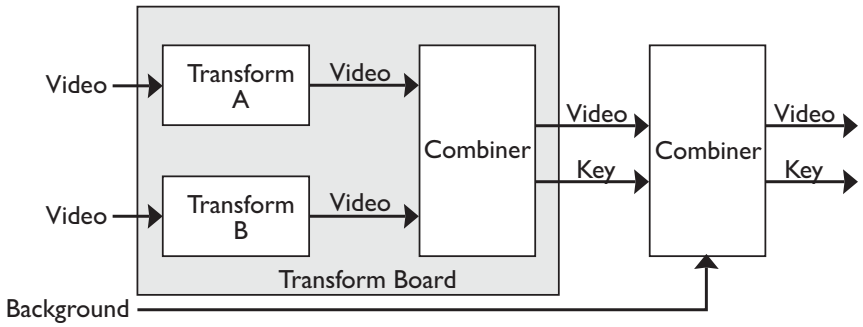


V + V (Video + Video)

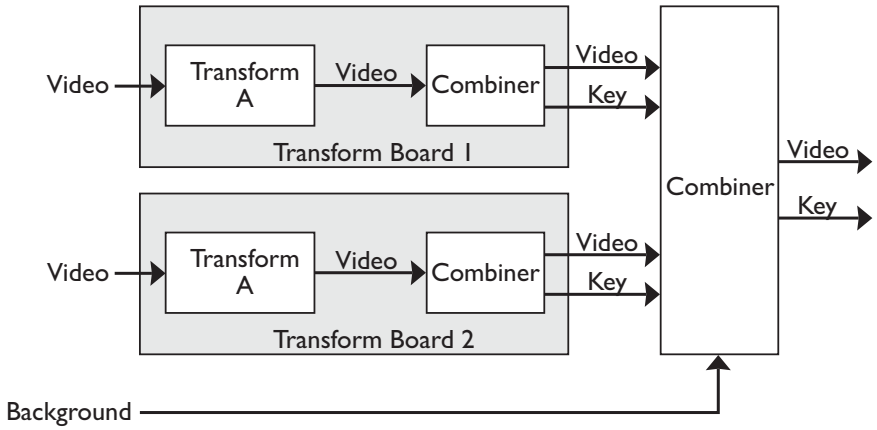
Dual Twin SD, Dual Twin HD and Single Twin HD Configurations (SD & HD mode)

This mode lets you use the B channel as a second video channel with independent control of all keyframe parameters including motion paths, warps, light sources, and textures. The transform board internally generates the key signals associated with these signals. The channels' key signals are raster size "white" with adjustable opacity and edge softness.

SD Mode:



HD Mode:

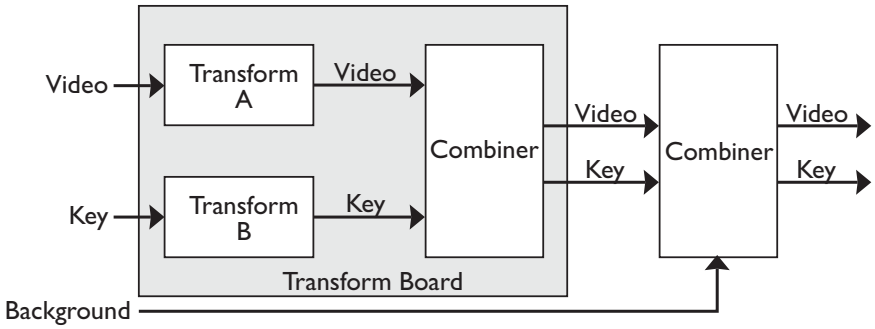


V + K (Video + Key)

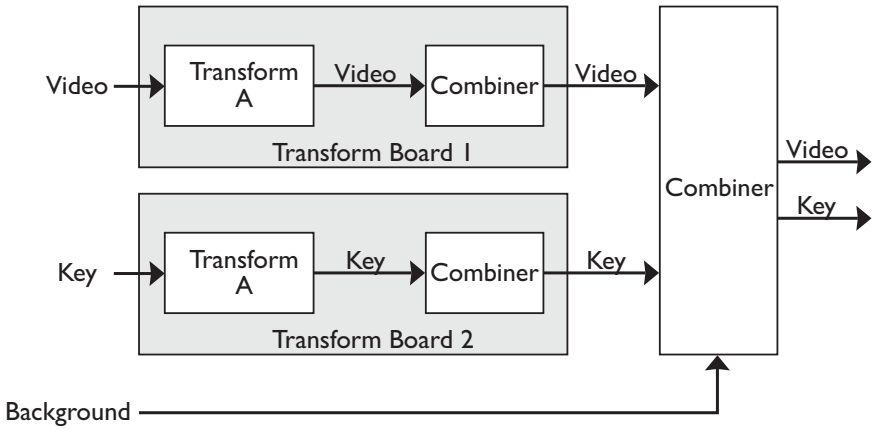
DualTwin SD, DualTwin HD and SingleTwin HD Configurations (SD & HD mode)

The transform board independently processes one video and one key source. 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. Note that, since you can move the key channel completely independently of the video channel, parts of the video channel that do not overlap the key channel are not visible. For this reason, select both channels when moving the image in this mode, unless this effect is what you want.

SD Mode:



HD Mode:

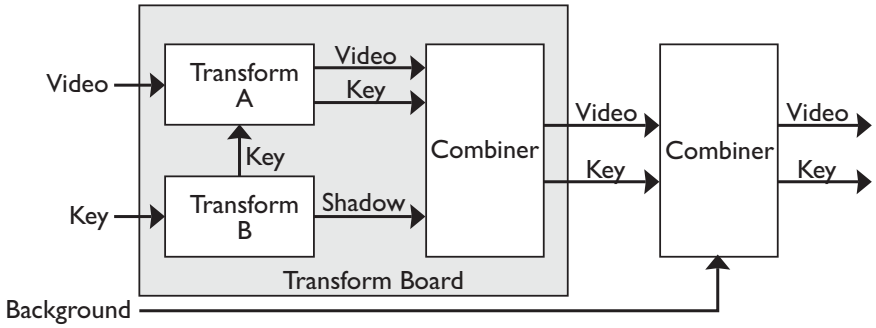


VK + S (Video/Key + Shadow)

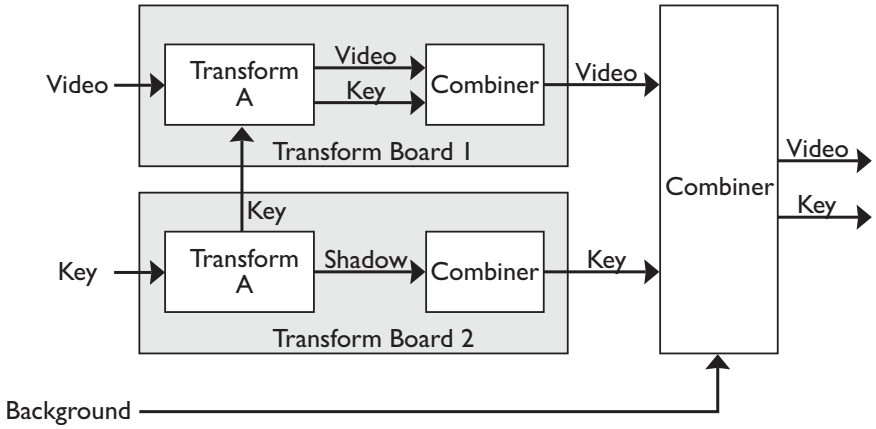
Dual Twin SD, Dual Twin HD and Single Twin HD Configurations (SD & HD mode)

This mode splits the B channel in two. The key signal moves with the main video channel (A), with a horizontal position control for the key signal. You can manipulate the shadow, which is derived from the key input, with the B channel, completely independently of the video/key. All keyframe parameters, including motion paths, warps, light sources, and textures, apply to the shadow channel.

SD Mode:



HD Mode:



Additional Channels

Dual Twin SD Configuration systems can be expanded to add a second twin channel transform board to provide a B channel in HD mode. This second transform board in HD mode allows configuration of the system as single channel Video + Video, Video + Key or Video/Key + Shadow mode. Two additional transform boards can be added to provide another set of A and B channels in HD mode. Refer to the sections above for more information on these modes.

Signal Paths

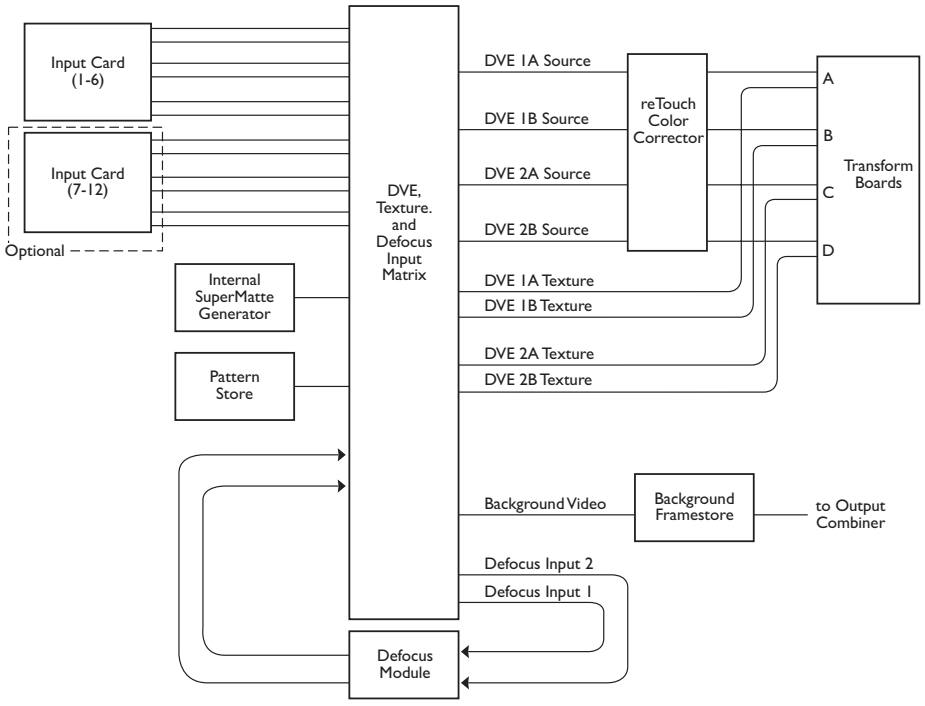
Inputs

Dveous/MX supports 6 high definition video and/or key inputs An additional 6 inputs can be added as an option.

Crosspoint Matrix

Dveous/MX's Combiner board has a 16 input by 11 output crosspoint matrix that lets you route sources internally. You can route any source in the matrix to any destination fed by the matrix. These are the 16 matrix inputs:

- External inputs 1 through 12 (6 standard, 6 optional).
- The SuperMatte output (dual color wash generator).
- The Pattern Framestore output, which is used to generate video test patterns and textures.
- Two outputs for the dual channel wide range Defocus module.



The matrix outputs feed these 11 destinations:

- The DVE channel video inputs. These matrix outputs are routed through the reTouch Color Correctors before passing to the DVE channel inputs.
- The DVE channel texture inputs.
- The Background Framestore.
- The dual channel wide range Defocus module inputs.

DVE Paths

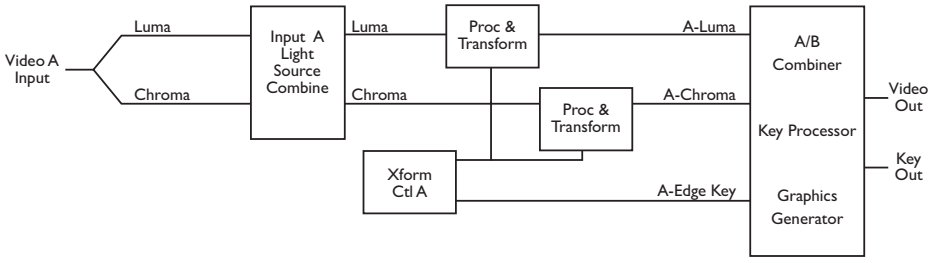
You can configure the DVE channels four ways: Video, Video+Video, Video+Key, and Video-Key+Shadow. This discussion includes a drawing for each mode. Please refer to the System Description section earlier in this manual for a detailed description of the Dveous/MX system configurations.

Video Mode

DualTwin SD Configuration (HD mode)

In the Video mode, the transform board processes one full 4:2:2 video path. This channel has a video input which feeds the border/crop processing, then pass to the light source model. Then the light source, including texture, is applied to the image.

This channel has a transform controller, which generates addressing for the main transform framestore and filter coefficients for the horizontal and vertical bandwidth filters. The video is filtered and then passed to the motion detection and vertical upsampling circuitry. From here the video is written into the main transform framestores.



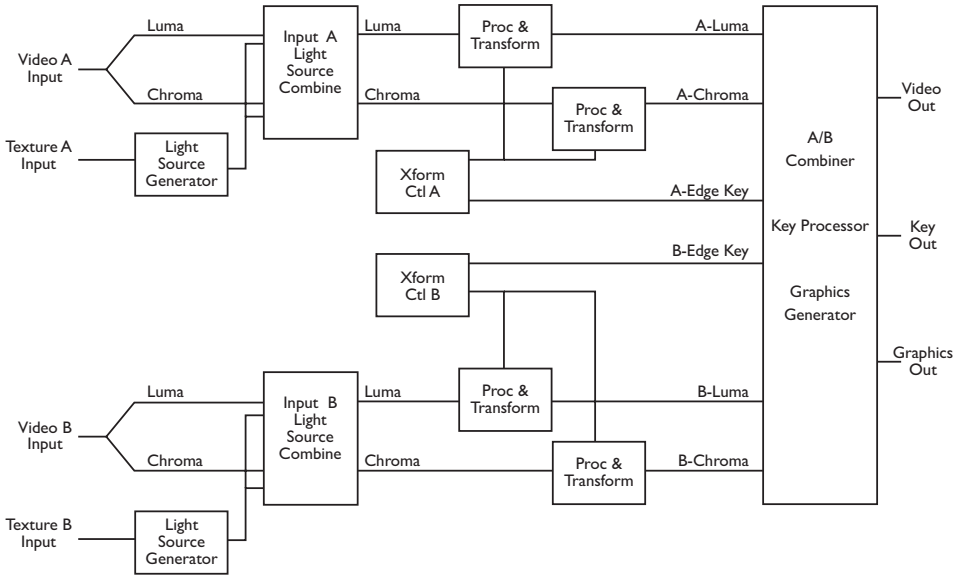
The video is read out of the transform framestores, with addresses generated by the channel's transform controller, and sent to the output interpolators. The transformed video from each channel passes to the combiner.

Video+Video Mode

DualTwin SD, DualTwin HD and SingleTwin HD Configurations (SD & HD mode)

In the Video+Video SD mode, the transform board acts as two identical video-only DVE channels, each processing a full 4:2:2 video path. In HD mode, two transform boards are required. Each channel has a video input and a texture source input with dedicated freeze buffers. The texture inputs feed each channel's light source model, where the textures are applied to the light source calculations. The video inputs feed the border/crop processing, then pass to their respective light source models. Then the light source, including texture, is applied to each image.

Each channel has its own independent transform controller, which generates addressing for the main transform framestore and filter coefficients for the horizontal and vertical bandwidth filters. The video for each channel is filtered and then passed to the motion detection and vertical upsampling circuitry. From here the video is written into the main transform framestores.



The video for each channel is read out of the transform framestores, with addresses generated by that channel's transform controller, and sent to the output interpolators. The transformed video and generated key information from each channel passes to the combiner, which composites the two channels together.

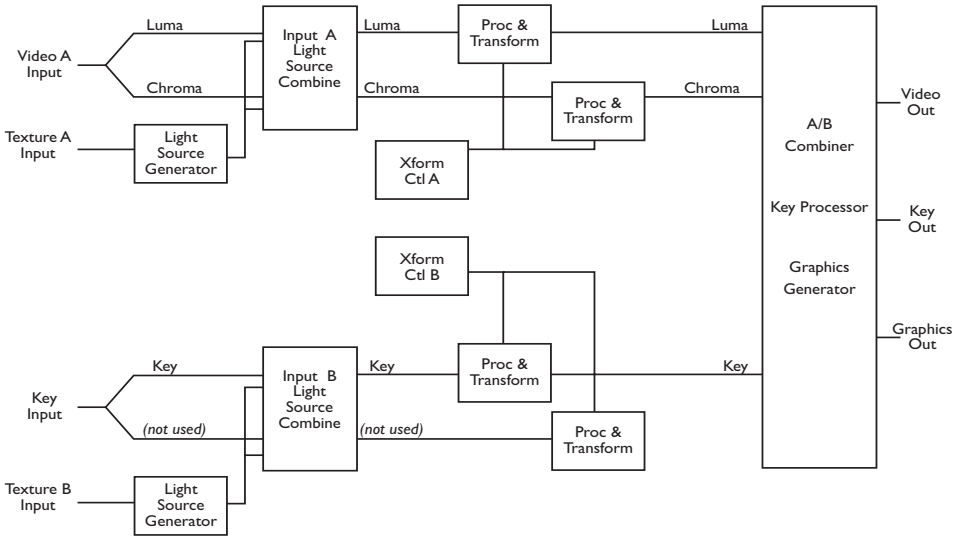
The combining process uses either a fixed key priority (A over B or B over A) or a Z (depth) based key priority. In Z key mode, the Z position of each channel in 3D space determines its priority relative to the other channel. The graphics output consists of axis grids and channel identifiers for each channel.

Video+Key Mode

Dual Twin SD, Dual Twin HD and Single Twin HD Configurations (SD & HD mode)

The Video+Key mode differs from the Video+Video mode only in that the board processes the B channel as the key signal for the A channel, with additional key clip, gain, and horizontal phase adjustments. Note that the chrominance processing of the B channel is not used in this mode since key signals have luminance information only. This makes the A channel 4:2:2 and the B channel 4:0:0.

The A/B Combiner's key output is effectively that of the B channel, and not the raster-based signal seen in the Video+Video mode. Since the key (B) transform can be independent of the video (A) transform, it is possible to position the transformed key so that the transformed video is not visible, or only partially visible, in the final composited output.

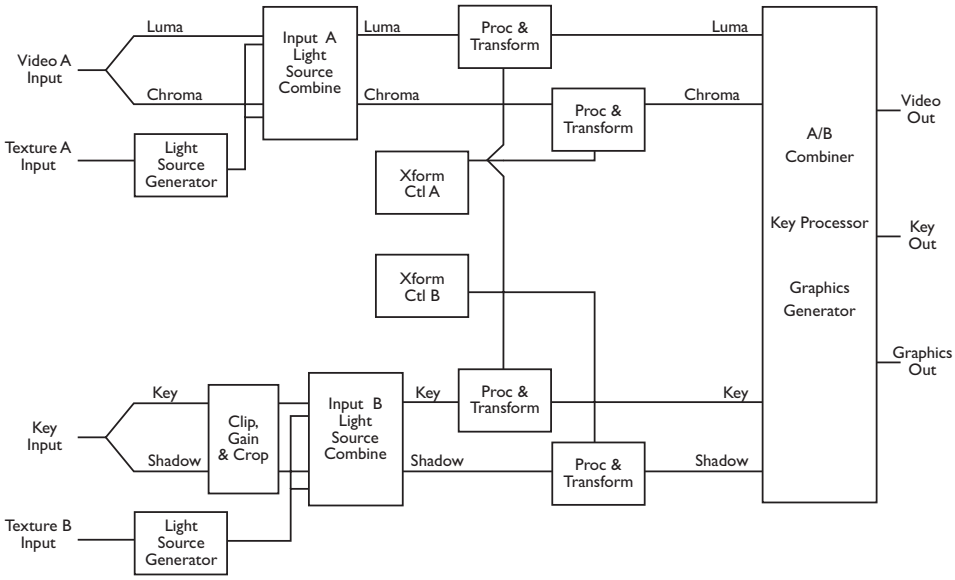


Video-Key+Shadow Mode

DualTwin SD, DualTwin HD and SingleTwin HD Configurations (SD & HD mode)

The Video-Key+Shadow mode is similar to the Video+Key mode, except that the key signal input to the B channel is processed by the A channel's transform controller, so that the video and key are transformed at the same time. Also, the key input is used to create a drop shadow. The drop shadow is routed through the chrominance part of the B circuitry, and processed by the B channel's transform controller, which provides independent shadow transform control. Although the actual signal paths are the same as in Video+Video mode, from an operational point of view, this makes the A channel a 4:2:2:4 path and the B channel 0:2:2.

The A/B Combiner key output in this mode is a combination of the key shadow signals processed by the B channel.

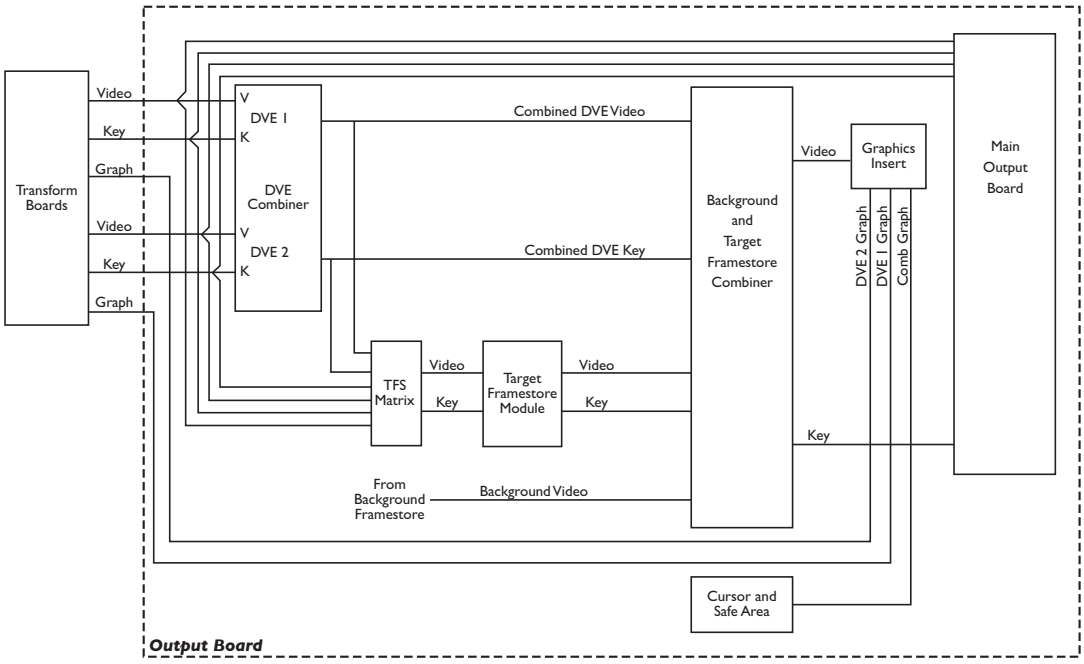


Outputs

Each transform board supplies three signals to the Combiner board: video, key, and graphics. The video signal is either a transformed version of the A input (Video, Video+Key or Video-Key+Shadow modes) or of the combined A and B inputs (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 raster-shaped edge key (Video, Video+Video mode). The graphics signal has a channel identifier and up to three axis cursors per channel, which are visual clues used for creating complex objects or movement

Note: Dual Twin SD Configuration systems operating in HD mode do not have a B channel. Refer to the System Description section for more information.

The video and key signals connect to both the DVE Combiner and the Target Framestore keyers. The DVE Combiner combines the transform boards' combined video and key signals into a single composite of the four channels. This combined output is then keyed over the Target Framestore (TFS) and the background.



The Target Framestore lets you create trail, sparkle, and smear effects, as well as composite drop-ins. You can select the 1A/1B DVE output, the 2A/2B DVE output, or the combined four channel DVE output as the input source for the Target Framestore. Also, since the TFS stores key and Z (depth) information, it has its own Z key priority, and can be placed “over” or “under” the live DVE channels.

The direct unshaped video and key from each transform board is also fed to the main output intended for use as key and fil inputs to a switcher or external keyer. See Section 6, Setup Menus, Output Setup Menu for more information on selecting these outputs.