CMix HD Handbook

Chyron Publication Number 2A12194

September 2004

Chyron Corporation

5 Hub Drive

Melville, New York 11767

631-845-2000

www.chyron.com

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Safety Statement: English

Antistatic Wrist Strap

Warning: If using an antistatic wrist strap, the grounding cord must contain a 1 meg ohm to 10 meg ohm series isolation resistor.

Chassis Grounding

Warning: The chassis is grounded through the ground conductor of the A/C line cord. To prevent an electric shock hazard, only plug the line cord into a properly grounded A/C wall receptacle, as verified by a qualified installation technician.

Double Pole/Neutral Fusing

Warning: This unit may contain a neutral line fuse.

Fuse Replacement

Caution: For continued protection against fire, replace fuse with the same type and rating.

Power Cord

Caution: Only use the Line Cord which was supplied with the equipment, or a factory approved alternate. Do not use an extension cord.

Power Source

Caution: Equipment may only be operated at the specified line voltage and frequency.

Servicing

Warning: Servicing must only be performed by a qualified Service Technician. The removal of service access panels may expose an individual to hazardous voltages. Line cord should be disconnected before any servicing is performed.

FCC Statement of Compliance

Caution: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

EN55022:1994 Class A

Caution: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

CSA Statement of Compliance

This class A digital apparatus complies with Canadian ICES-003.

Rapport De Sûreté: Français

Bracelet antistatique

Avertissement: Si un bracelet antistatique est utilisé, le fil de mise à la terre doit contenir une résistance isolante série de 1 mégohm à 10 mégohms.

Mise à la terre du chassis

Avertissement : Le châssis est mis à la terre au moyen du conducteur de masse du fil électrique secteur. Pour empêcher tout risque de choc électrique, ne brancher le fil électrique secteur que dans une prise de courant murale mise à la terre correctement et inspectée par un technicien d'installation agréé.

Fusible neutre/bipolaire

Avertissement : Cet appareil peut contenir un fusible secteur neutre.

Remplacement du fusible

Mise en garde : Pour assurer une protection continue contre les incendies, remplacer le fusible par un fusible du même type et ayant la même valeur limite.

Cordon électrique

Mise en garde : N'utiliser que le fil électrique qui a été fourni avec le matériel ou un fil de rechange agréé par l'usine. Ne pas utiliser de rallonge.

Alimentation

Mise en garde : Le matériel ne peut fonctionner qu'à la fréquence et à la tension secteur indiquées.

Réparations

Avertissement : Les réparations ne doivent être effectuées que par un Technicien S.A.V. agréé. Le retrait des panneaux d'accés pour les réparations risque d'exposer la personne les retirant à des tensions dangereuses. Le fil électrique doit être débranché avant toute réparation.

EN55022 : 1994 Classe A

Mise en garde : Ce matériel est un produit de la Classe A. Dans un environnement domestique ce produit risque de causer des interférences radio, auquel cas l'utilisateur peut être obligé de prendre les mesures appropriées.

Declaration de conformite auz normes d'ACNOR

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Sicherheit Aussage: Allemand

Antistatische Armschlaufe

Warnung: Bei der Verwendung einer antistatischen Armschlaufe muß die Erdungsschnur einen in Reihe geschalteten Isolierwiderstand zwischen 1 Megaohm und 10 Megaohm besitzen.

Chassiserdung

Warnung: Das Chassis ist ¸ber den Erdleiter der Wechselstromnetzschnur geerdet. Zur Vermeidung von Berührungsgefahr darf die Netzschnur nur in eine sachgemäß geerdete Wandsteckdose für Wechselstrom gesteckt werden, die von einem qualifizierten Installateur geprüft worden ist.

Zweipol-/Neutralleiterabsicherung

Warnung: Das Gerät kann eine Neutralleitersicherung besitzen.

Auswechseln der Sicherung

Vorsicht: Zur Aufrechterhaltung des Brandschutzes muß die Sicherung durch eine Sicherung des gleichen Typs und der gleichen Größe ausgewechselt werden.

Anschlußschnur

Vorsicht: Es darf nur die mit dem Gerät gelieferte Netzschnur oder ein vom Werk genehmigter Ersatz verwendet werden. Eine Verlängerungsschnur darf nicht verwendet werden.

Stromquelle

Vorsicht: Das Gerät darf nur mit der vorgeschriebenen Netzspannung und Frequenz betrieben werden.

Wartung

Warnung: Die Wartung darf nur von einem qualifizierten Wartungstechniker durchgeführt werden. Das Abnehmen von Wartungsabdeckplatten ermöglicht den Zugang zu lebensgefährlichen Spannungen. Die Netzschnur sollte vor allen Wartungsarbeiten getrennt werden.

EN55022: 1994 Klasse A

Vorsicht: Das Gerät ist der Klasse A zugeordnet. Es kann beim Hausgebrauch Hochfrequenzstörungen verursachen, die der Benutzer gegebenenfalls angemessen beseitigen muß.

Dichiarazione Di Sicurezza: Italiano

Fascetta antistatica da polso

Avvertenza - Se si usa una fascetta antistatica da polso, il cavo di terra deve essere munito di un resistore d'isolamento in serie con un valore nominale di resistenza compreso tra 1 e 10 mega-ohm.

Collegamento a massa dello chassis

Avvertenza - Lo chassis è collegato a massa attraverso il filo di terra del cavo di alimentazione in c.a. Per evitare scosse elettriche, inserire la spina del cavo di alimentazione in una presa di rete collegata all'impianto di messa a terra. Rivolgersi ad un tecnico qualificato per verificare la correttezza del collegamento.

Polo doppio/fusibile sulla linea neutra

Avvertenza - Questo apparecchio potrebbe contenere un fusibile sulla linea neutra.

Sostituzione del fusibile

Attenzione - Ai fini di una protezione continuata contro gli incendi, sostituire il fusibile con un altro dello stesso tipo e potenza nominale.

Cavo di alimentazione

Attenzione - Usare esclusivamente il cavo fornito in dotazione con l'apparecchio, o un cavo approvato dalla casa fabbricante. Non usare cavi di prolunga.

Alimentazione

Attenzione - Far funzionare l'apparecchio soltanto alla tensione di linea e alla frequenza specificate.

Manutenzione

Avvertenza - Gli interventi di manutenzione vanno eseguiti soltanto da un tecnico qualificato del servizio assistenza. Rimuovendo i pannelli d'accesso per compiere la manutenzione si potrebbe venire a contatto con tensioni pericolose. Prima di eseguire qualsiasi intervento di manutenzione, staccare la spina del cavo di alimentazione dalla presa di rete.

EN55022: 1994, Classe A

Attenzione - Prodotto di Classe A. In un ambiente domestico questo prodotto può causare interferenza dannosa per le radiocomunicazioni, nel qual caso l'utilizzatore potràessere costretto ad adottare misure correttive.

Declaración De Seguridad: Español

Brazalete antiestática

Advertencia: Si utiliza una brazalete antiestática, el cordón de puesta a tierra deberá tener una resistencia aislante de 1 mega ohm a 10 mega ohm conectada en serie.

Puesta a tierra del chasis

Advertencia: El chasis se pone a tierra mediante el conductor de puesta a tierra del cable eléctrico de c.a. Para evitar el peligro de una electrocución, conecte el cable eléctrico únicamente a una toma de pared de c.a. puesta a tierra correctamente y verificada por un técnico de instalación cualificado.

Fusible de lÌnea neutral/Doble polo

Advertencia: Esta unidad puede incluir un fusible de lÌnea neutral.

Reemplazo del fusible

Precaución: Para obtener una protección continua contra el peligro de incendio, reemplace el fusible por uno del mismo tipo y capacidad.

Cable de potencia

Precaución: Utilice únicamente el cable eléctrico que se entrega con el equipo, o bien un cable alternativo aprobado por la fábrica. No utilice cables de extensión.

Fuente de energÌa

Precaución: El equipo únicamente debe usarse con el voltaje y la frecuencia especificados.

Servicio

Advertencia: Todo servicio deberá ser realizado por un Técnico de Servicio cualificado. El desmontaje de los paneles de acceso de servicio puede exponer a una persona a voltajes peligrosos. El cable eléctrico deberá desconectarse antes de realizarse el servicio.

EN55022: 1994 Clase A

Precaución: Éste es un producto de Clase A que puede generar radiointerferencias en un entorno doméstico. En este caso, el usuario podrá verse obligado a tomar las medidas correctivas necesarias.

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1. Introduction

CMix HD is a 1RU rack-mount upconverter/router/switcher providing three output channels; one, High Definition and two, Standard Definition. The Standard Definition video output must be set to match the video standard of the video/key and program video inputs. High Definition video output is independently software-selectable for either the **1080I** or **720p** standard. The frame rate of the HDTV output will match the frame rate of the video inputs. All inputs are Standard Definition, 525- or 625-line format.

Each channel is capable of displaying an independent mix of up to 4 input layers over optional Program video. CMix HD is controlled by a PC (or appropriate PC-based device) running Windows 2000 or Windows XP; connection to the host machine is achieved via the Universal Serial Bus (USB). CMix HD may be used with Chyron devices such as Duet LE/LEX, or with other broadcast-quality video sources.

2. Unpacking Your Purchase

Your package contains:	The CMix HD unit
	1 AC power cord
	1 USB cable
	1 Rack-slide kit

If anything is missing or appears damaged, call Chyron Customer Service immediately at 888-4-CHYRON or 631-845-2132.

If you'll be using CMix HD without Chyron's Lyric software, contact our Customer Service Department to inquire about installing the CMix HD Control Panel as a 'standalone' application. See §6.1 for more information.

3. Installation

3.1 Mounting Considerations

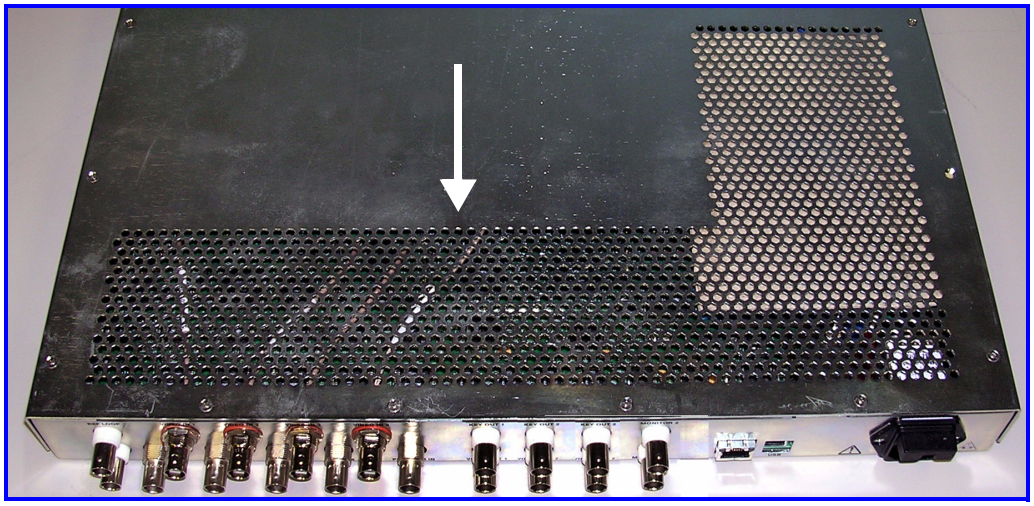

Figure 1. CMix HD's air outlet vents

Caution must be exercised not to block the air outlet vents at the rear of the chassis' cover (see **Figure 1**).

CMix HD may be mounted in a 19” rack using the rack-slide mounting kit.

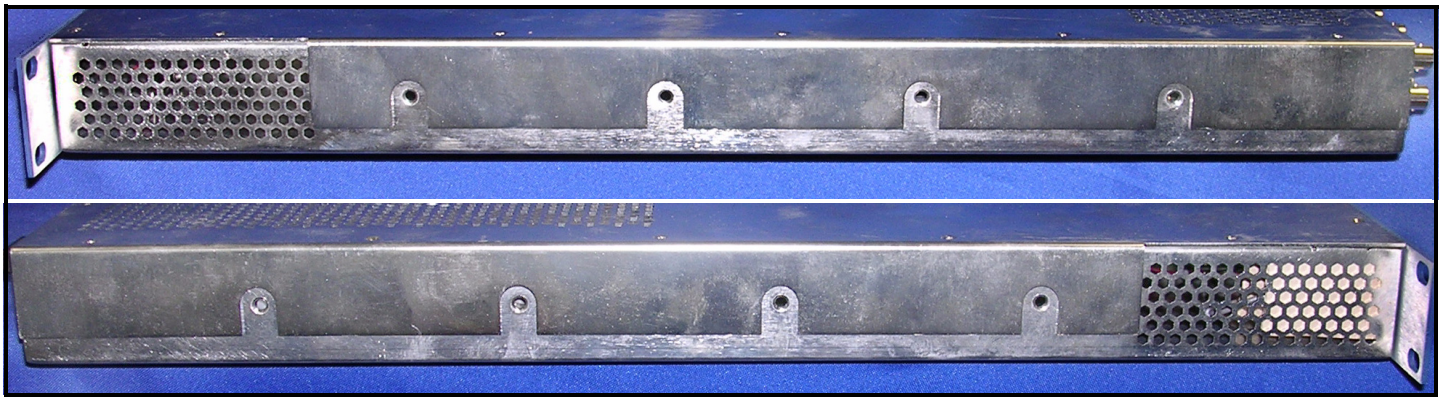

Figure 2. CMix HD’s rack-slide mounting positions

Once the chassis is secured to its rack-slides, and the rack-slides to their mates in the rack itself, power, data and signal connections should be made before rack-mounting is finalized. See the next section.

3.2 CMix HD’s Connections

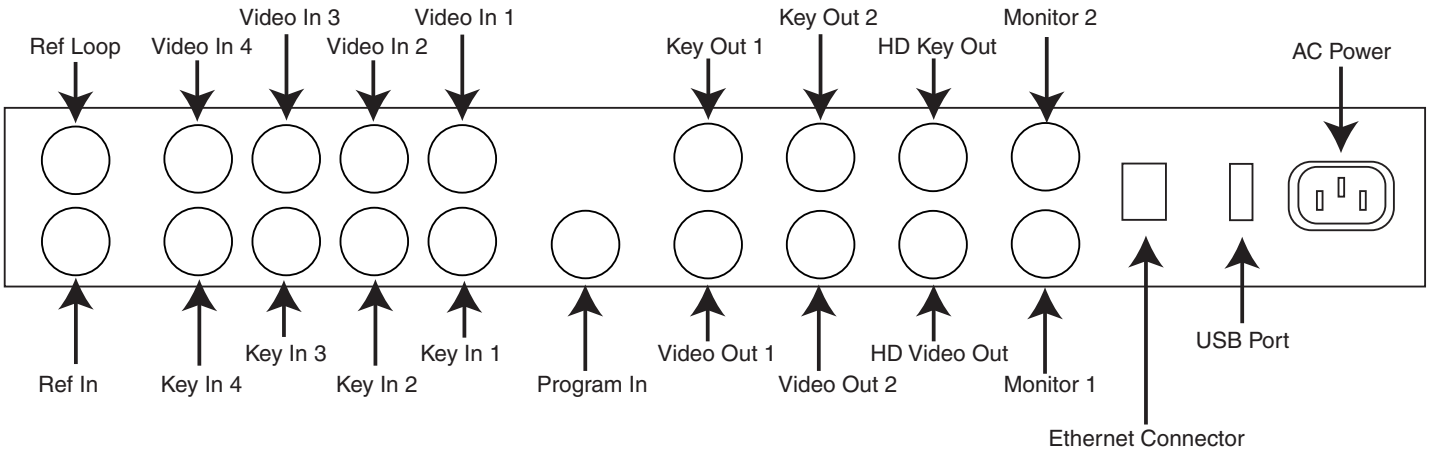

Figure 3. CMix HD rear panel connectors

3.2.1 AC Power connector

Standard PC-type grounded connector. Connect to 100 - 240 VAC power source; system’s power supply is auto-switching.

3.2.2 USB Port

Your host machine, running Windows 2000 or Windows XP, will detect CMix HD as a new piece of hardware and configure the USB connection.

3.2.3 Ethernet Connector

Not used at this time.

3.2.4 Video Outputs

3.2.4.1 Monitor 1 & Monitor 2

These BNC connectors offer **analog** video monitoring output for each of the system's two outputs (SDI VIDEO OUTs 1 & 2). Connect to standard NTSC/PAL monitors. When CMix HD is operating in 525-line mode, analog monitor output is NTSC; in 625-line mode, analog monitor output is PAL.

3.2.4.2 Video Out 1 & Key Out 1

SMPTE 259M SDI. Provides unprocessed video and appropriate key signal from Channel 1 of CMix HD to external device. Line 21 and Ancillary data from Program In will pass through from Program In to Video Out 1.

3.2.4.3 Video Out 2 & Key Out 2

SMPTE 259M SDI. Provides unprocessed video and appropriate key signal from Channel 2 of CMix HD to external device. Line 21 and Ancillary data from Program In will pass through from Program In to Video Out 2.

3.2.4.4 High-Definition Video Out & Key Out

SMPTE 274 (1080i) or SMPTE 296 (720p). Provides upconverted video and key outputs that are identical in program content to Video Out 2 & Key Out 2.

3.2.5 Video Inputs

Signal format: SMPTE 259M SDI

CMix HD's four video and key input pairs may be combined in any order by means of compositing and/or blending layers. All mixer settings may be controlled as animation elements by Chyron's Lyric application or other programs created with the digital pcCODI Developer's Kit. Typical inputs to the Mixer are video from a clip player or from a character generator. Multiple graphics planes can be combined; for instance, CMix HD could simultaneously composite elements created by CAL and Lyric applications, a bug inserter and an animated background orginating from clip playout.

3.2.5.1 Program In

NOTE

This video input may be used as a digital genlock source; your selection of analog or digital genlock may be set in software (see §3.2.6.2 for more about analog genlock).

The Program In signal is essentially a fifth video layer, distinct from the four Video and Key input pairs (**§3.2.5.2**). Program Video is always below Layer 4. All Layers are *on top of* Program Video.

Also note that Program In is where the system takes in Line 21 data such as Closed Captioning and Ancillary data. This data is passed through CMix HD and inserted into the SD Video Out 1 & 2 signals (**§3.2.4.2** and **§3.2.4.3**).

The Program In signal is protected by a bypass relay that automatically routes the signal to Program Out in case of power loss to the system.

3.2.5.2 Video In and Key In, Pairs 1 - 4

These pairs of video and key inputs comprise CMix HD's four fully-manipulable layers. Each of these four signals may be routed to either or both of the system's SD output channels; the mix composed for output to channel 2 determines the output of the high-definition video and key signals. The arrangement of output layers defines visual display priority. Layer 1 is on Top, layer 4 on the bottom. Program Video is always below layer 4. All Layers are on top of Program Video.

3.2.6 Analog Reference Connections

CMix HD may be optionally genlocked to the SDI Program Video Input or to an analog composite video black burst reference signal. Selection of genlock source is made in software.

3.2.6.1 Ref Loop

This BNC connector is an **output** of the black burst signal received at the **Ref In** connector. This provides a means to share analog sync with other devices, such as Chyron's digital pcCODI-type Video Processors, clip players and other mixers and switchers.

NOTE

To share blackburst among multiple systems using the Ref Loop facility, you must remove the shunt at jumper JP24, located on the printed circuit board near the Ref Loop and Ref In connectors.

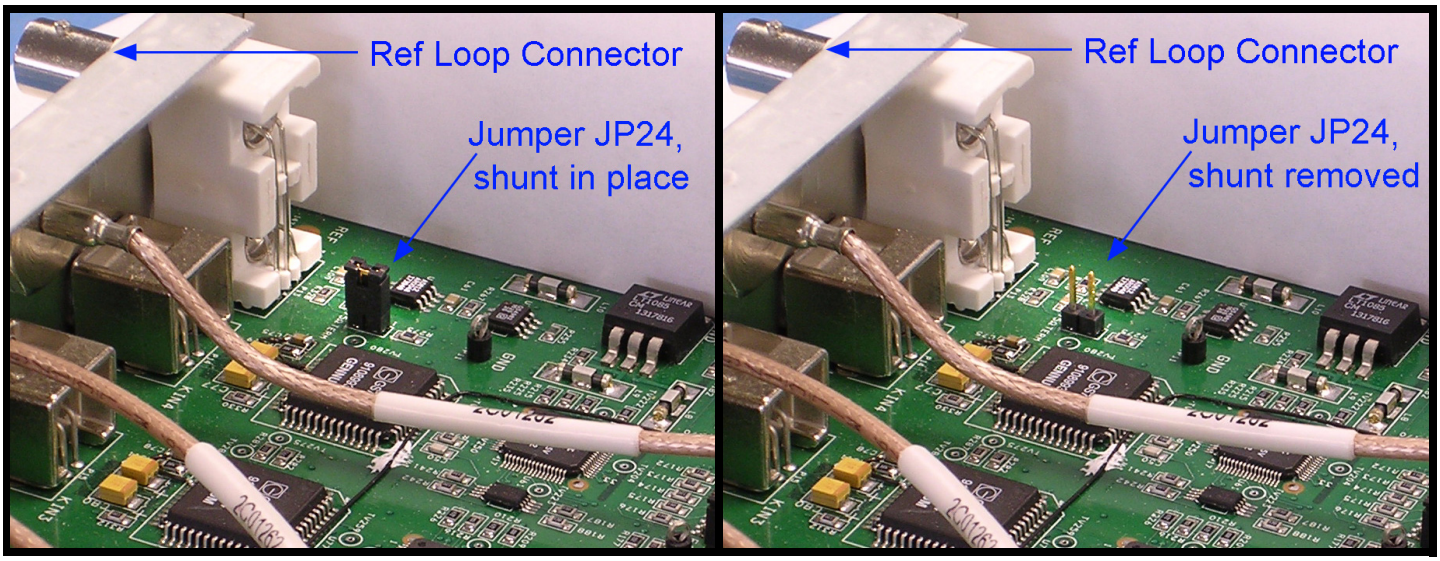

Figure 4. Removing jumper JP24's shunt to enable sharing of blackburst with other devices

3.2.6.2 Ref In

Connect a composite analog black burst signal to this BNC connector. **Also note that this video input may be used as an analog genlock source**; your selection of analog or digital genlock may be set in software (see §3.2.5 for more about digital genlock and §6 for more about software used with CMix HD).

Note: CMix HD systems are shipped with the JP24 shunt disabled, and a 75Ω terminator connected to the REF LOOP connector.

4. CMix HD Block Diagrams

4.1 Basic System

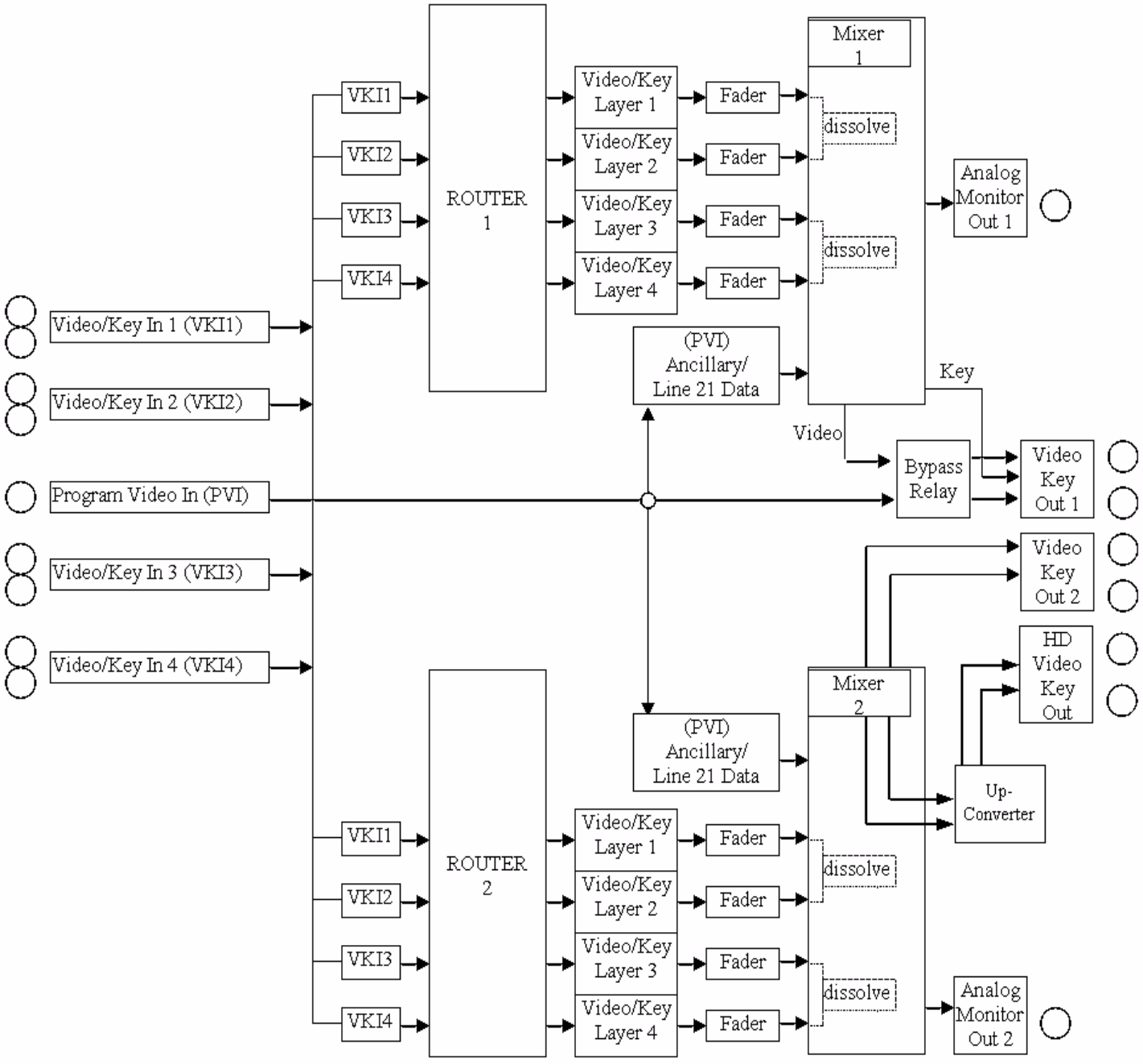

Figure 5. CMix HD block diagram

4.2 Sample Setup

The diagram below shows CMix HD used with a Chyron Duet LEX equipped with optional Internal Clip Player and Squeezeback board. Such an arrangement might be used to send a completely produced feed from a news network's regional bureau to its central facility, using the Chyron systems' resources to minimize demand on other assets, such as switchers and keyers at the central facility.

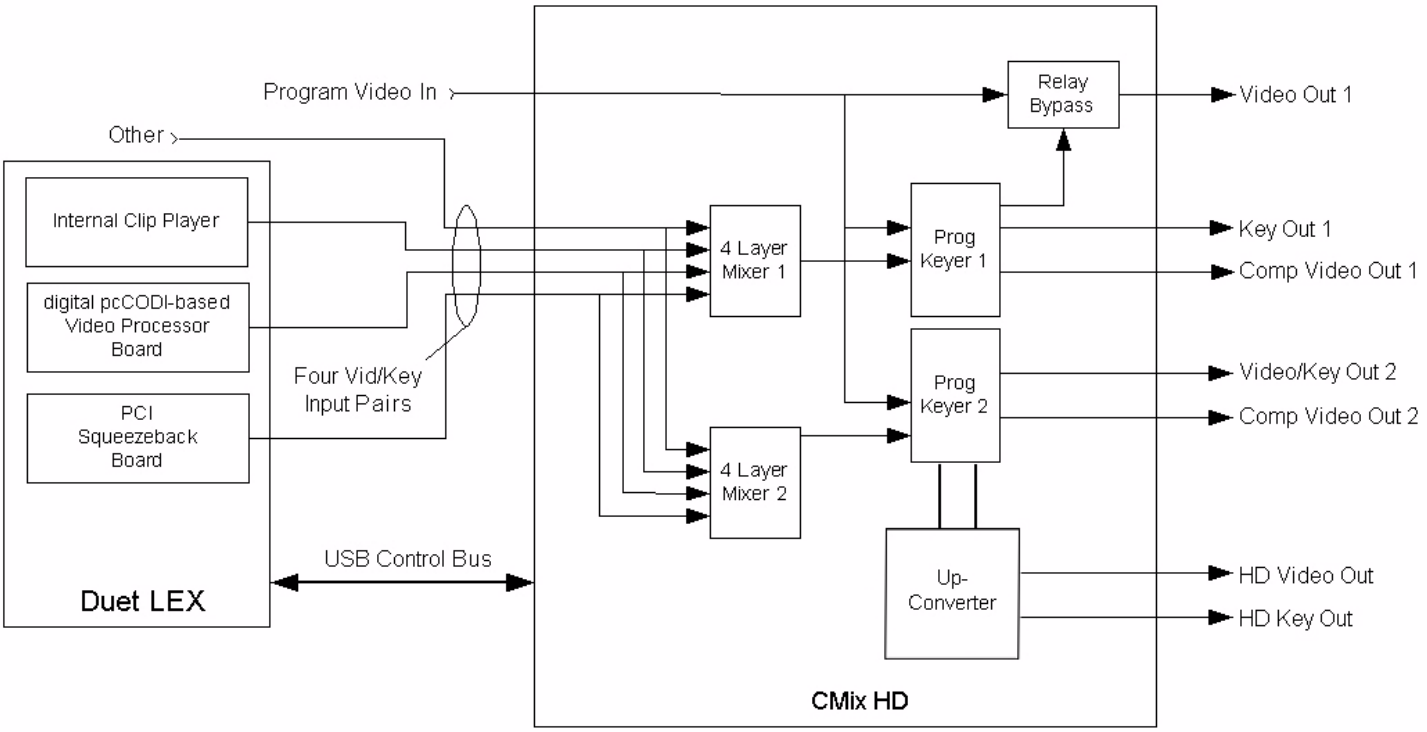

Figure 6. Example of CMix HD connected to Duet LEX for USB control and 3 video sources

In such an arrangement, Program Video In might be a camera signal showing a news anchorperson. Duet LEX's Video Processor Board could be generating a Lyric-created lower-third, while its Internal Clip Player and Squeezeback Board worked together to place footage from a reporter in a movable, shrinkable region over the anchorperson's shoulder. In this way, all compositing and/or keying is done outside of the production's main switcher, preserving its resources for other uses. Output to an HD simulcast duplicates the output of Video/Key Out 2, as shown above.

5. CMix HD Specifications and Environmental Requirements

Video Inputs	• Program Video In • 4 Video In & Key In pairs • Reference In (analog blackburst only)
Video Input Format	SMPTE 259M; 525/625 lines, 10-bit serial data
Video Outputs	• HD: 1 Video Out & Key Out pair. SMPTE 274 (1080i) or SMPTE 296 (720p). Output identical in program content to Video Out 2 & Key Out 2. • SD: 2 Video Out & Key Out pairs (2 independent channels). SMPTE 259M; 525/625 lines, 10-bit serial data. • 2 Analog Monitor Video Outputs • Reference Loop (output of analog blackburst received at Ref In connector)
Source Impedance	75 Ohms
Signal Amplitude	800 millivolts @75 Ohms
DC Offset	0 +/- 0.1 volt
Rise/Fall Times	.60 nsec +/ - 0.25 nsec from 20 to 80% of full scale
Relative Jitter	+/- 0.600 nsec

Environmental	Temp. Range: 0° to 50° C/32° to 122° F. Relative Humidity: 20% to 90%, non-condensing
Dimensions	**Height**: 1.7” (4.3 cm) **Width**: 19” (48.3 cm) **Depth**: 19.6” (49.8 cm) **Weight**: 16 lbs (7.27 kg)
Power Requirements	100 - 240 VAC @4.5 Amperes, 60 or 50 Hz, auto-switching.
Peak Inrush Current	80 Amperes, maximum

6. Controlling CMix HD

6.1 Via the ‘Standalone’ Control Panel

The CMix HD Control Panel is available as a standalone application for use outside of Lyric as a manual and programmable mixer control panel.

When loaded from the CODI SDK CD, the installer places a Windows Control Panel on the system, as seen in the lower-right corner of **Figure 7**. Clicking the **Settings** button opens the menu seen at left in **Figure 11**.

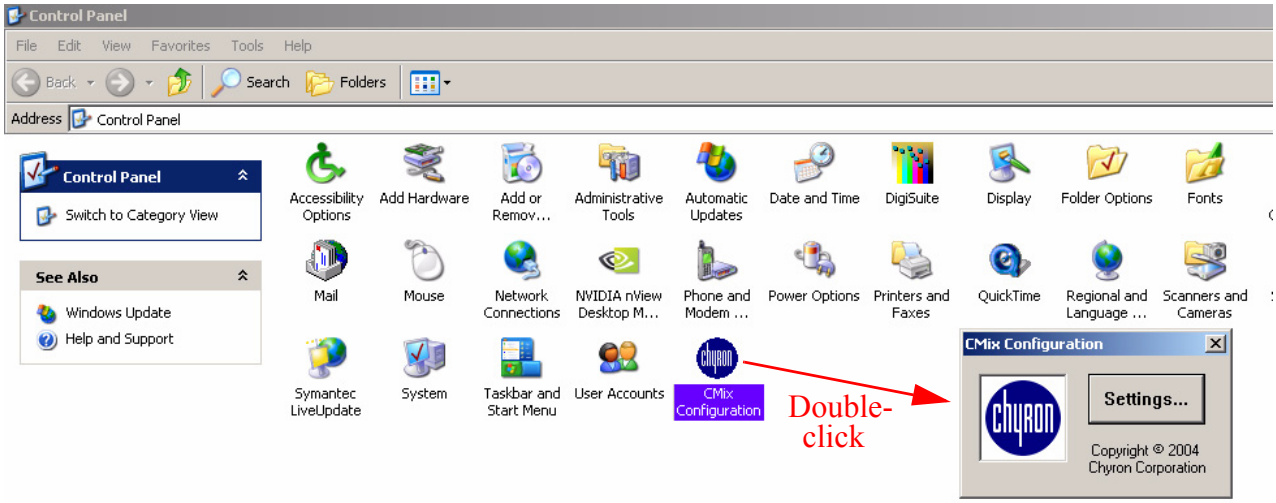

Figure 7. The CMix Configuration Control Panel

6.2 Software Installation for Use with Lyric

Note that when CMix's **.ocx** *control is installed as a Lyric plugin, the separate "Windows Control Panel" described in* §6.1 *is still available.*

CMix HD will receive commands via the USB bus, from Chyron's Lyric application running on a Duet LE, LEX or HyperX . Commands are created by a simple user interface called the CMix HD Control Panel. CMix HD commands may be animated on a timeline and stored in a Lyric message for easy playback. See §7 for an in-depth discussion of controlling CMix HD via Lyric.

CMix's software is an ActiveX control with the ***.ocx*** extension. This software works with the Lyric application as a **plugin**. For more information on Lyric plugins and Chyron's LEIF architecture, contact Chyron Customer Service.

The software is installed by the familiar Install Shield process. Locate the **CMix.exe** on the included CD and double-click it. The install process begins. Follow the instructions in the installation script, and click **Next** as needed. (To uninstall the CMix software, use the Windows Add/Remove Program facility.)

As with all Lyric Plugins, the file* CMix.ocx *must be located in the proper directory on your system. It should be in the Plugins folder of the Lyric installation that contains the copy of Lyric with which it will be used. If your system includes multiple versions of Lyric, make sure the .ocx file is in the correct version's installation! See the following illustrations.

Lyric version numbers may vary from what is pictured here.

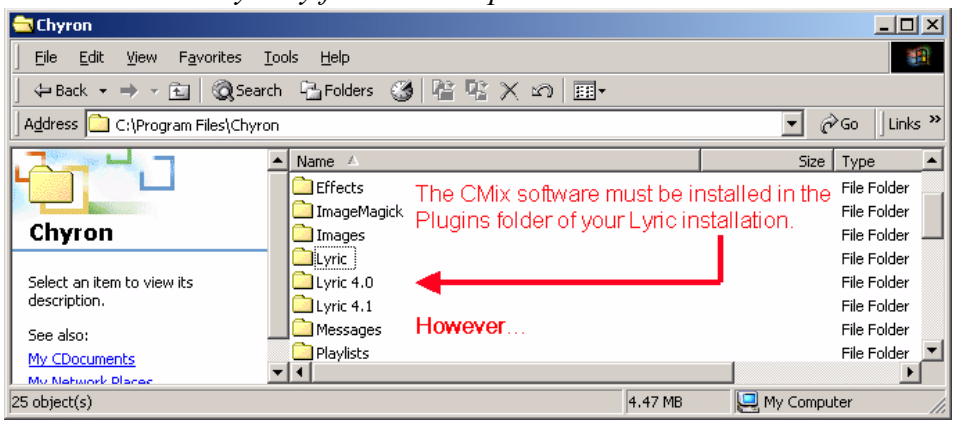

Figure 8. A system containing installations of two different versions of Lyric

The system pictured in **Figure 8** contains different versions of Lyric. In **Figure 9**, the installation script was successful, but did not place the file in the appropriate directory. The operator's intent here is to use CMix with Lyric Version 4.1.

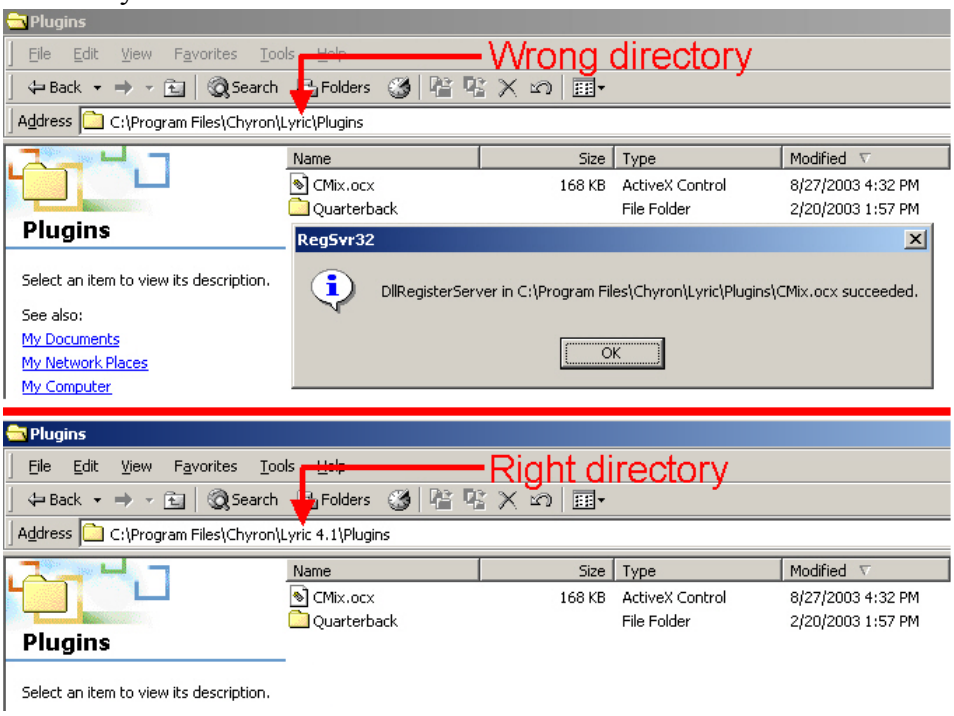

Figure 9. **Top**: Installation into the directory for the wrong version of Lyric.
Bottom: The CMix.ocx has been moved to the appropriate directory, in this case, Lyric Version 4.1

7. CMix HD and the Lyric application

7.1 Access CMix HD's controls in Lyric through the Tools menu

CMix HD is designed to allow mixing between output channels of a Duet LE/LEX system.This device combines four video/key input pairs plus one program video input layer into a single video/key pair output. The system contains two independent sets of mixing logic controlling two video/key outputs. The mixers share the same inputs, but the inputs can be assigned to different layers in each mixer.

7.2 System Setup

All components in the system must share a common gen/lock source. The usual configuration routes an analog black burst signal to CMix HD's Reference input and all of the graphics boards in the Duet LE/LEX. Duet LE/LEX systems have an internal cable that connects the reference inputs of all of the boards to a single external BNC. Connecting the analog black burst to any BNC labeled as REF IN should lock all of the boards in the system.

7.2.1 VPB Setup

With Lyric running, access the Duet Hardware configuration menu and go to the "Setup Board Configuration" tab.

1. Set the Key In control to "On", even if you don't have a key input to the VPB. (Setting it to "Off" will set the key output from that channel to 100% for the full frame, masking all lower layers in the mixer.)

2. Set the Video control to "Insert". (The other setting, "Video Only", disables the graphics from the VPB to the output.)

3. Set the Video Layer control to "Off". It is possible to key the VPB graphics over a Program Video input and then send this output to the CMix HD, but the system's video timing would be substantially altered.

4. To preserve Closed Caption data on line 284 (the CC line of the second field), set Ancillary Data to "On". (Setting this control to "Off" will generate VPB video on line 284. The VPB will never generate graphics on line 21. This action preserves any Closed Caption data that might appear there.)

7.2.2 Squeezeback Setup

Video Layer should be set to "Off". (Since the Squeezeback board has no Key Input, setting the Video Layer to "On" will set the Key output of the board to 100% for the full frame, starting at line 20. This would block any lower layer and the program video in the CMix HD.)

7.2.3 Video Timing Issues

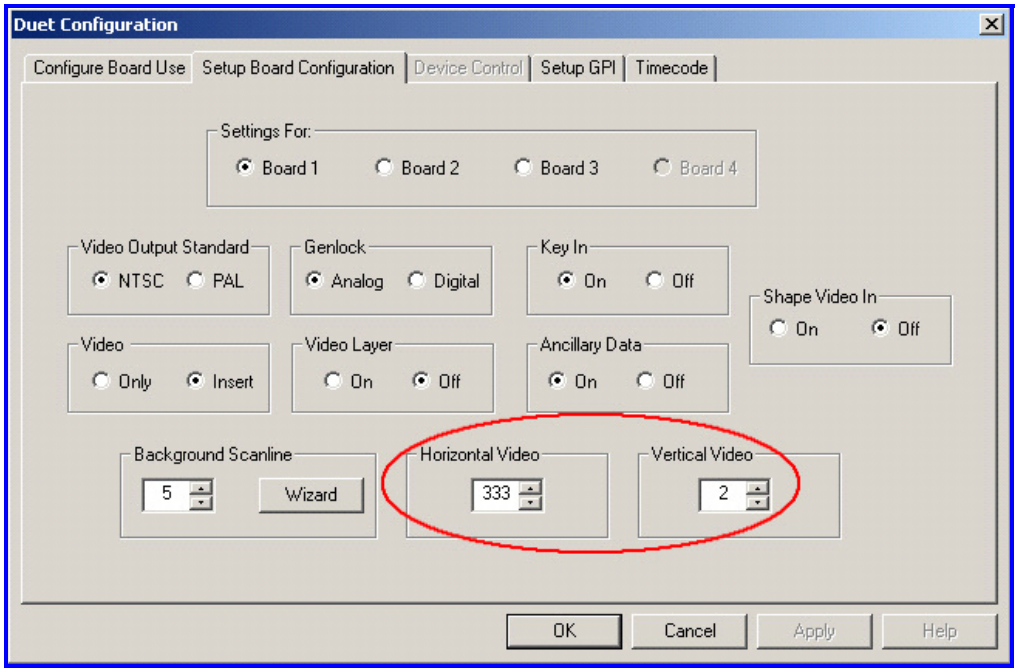

Figure 10. Recommended Horizontal and Vertical Delay Settings on Duet LE or LEX.

Proper mixing of the video sources requires that their **timing** be matched. **There is no time base correction inside the unit.**

The **Duet Configuration** menu (Setup Board Configuration tab) on the Duet LEX should be used to set all of the graphics boards with the same vertical and horizontal delay. This ensures that a graphic read by one frame buffer will appear in the same place on-screen as the other frame buffers.

Note that it is inadvisable to connect a single video source to both CMix HD's Program input and the inputs on any of Duet LE/LEX's VPBs. This is a function of the one-scan line delay created by the circuitry of the VPBs. (If the same signal were fed to both CMix HD's Program input and a VPB, the version of the signal passing through the latter would appear one line lower on CMix HD's output.) If you must use such an arrangement, the signal going to CMix HD's Program input should first be routed through a 1-scan line delay device.

When a Squeezeback board is being used to resize the video input, there will be a one-frame delay between that board's input and output. As noted above, if the same program input is being fed to both a Squeezeback board and the Program In of the CMix HD, the program video from the Squeezeback will be one line lower than the Program video. This cannot be corrected with the Squeezeback's controls. Again, to correct this, a one-scan line delay must be introduced from the Resizer In to the Program In of the CMix HD.

Chyron strongly recommends using the Squeezeback board to resize and reposition alternate video sources into the Program video output, but should not be used to resize Program Video before connection to a CMix HD input.

To resize Program Video, connect the video output of the CMix HD to the Resizer input of the Squeezeback; this places the Squeezeback board downstream of the CMix HD. In this configuration, the video output of the Squeezeback cannot be connected to the CMix HD input without causing timing problems at the switcher.

7.3 The Output 1 and Output 2 controls

The **checkbox** at the top of each output section enables the controls within that section. Un-clicking a checkbox to disable an Output hides that Output's individual controls. This allows the user to create a mix effect for one channel without affecting the other.

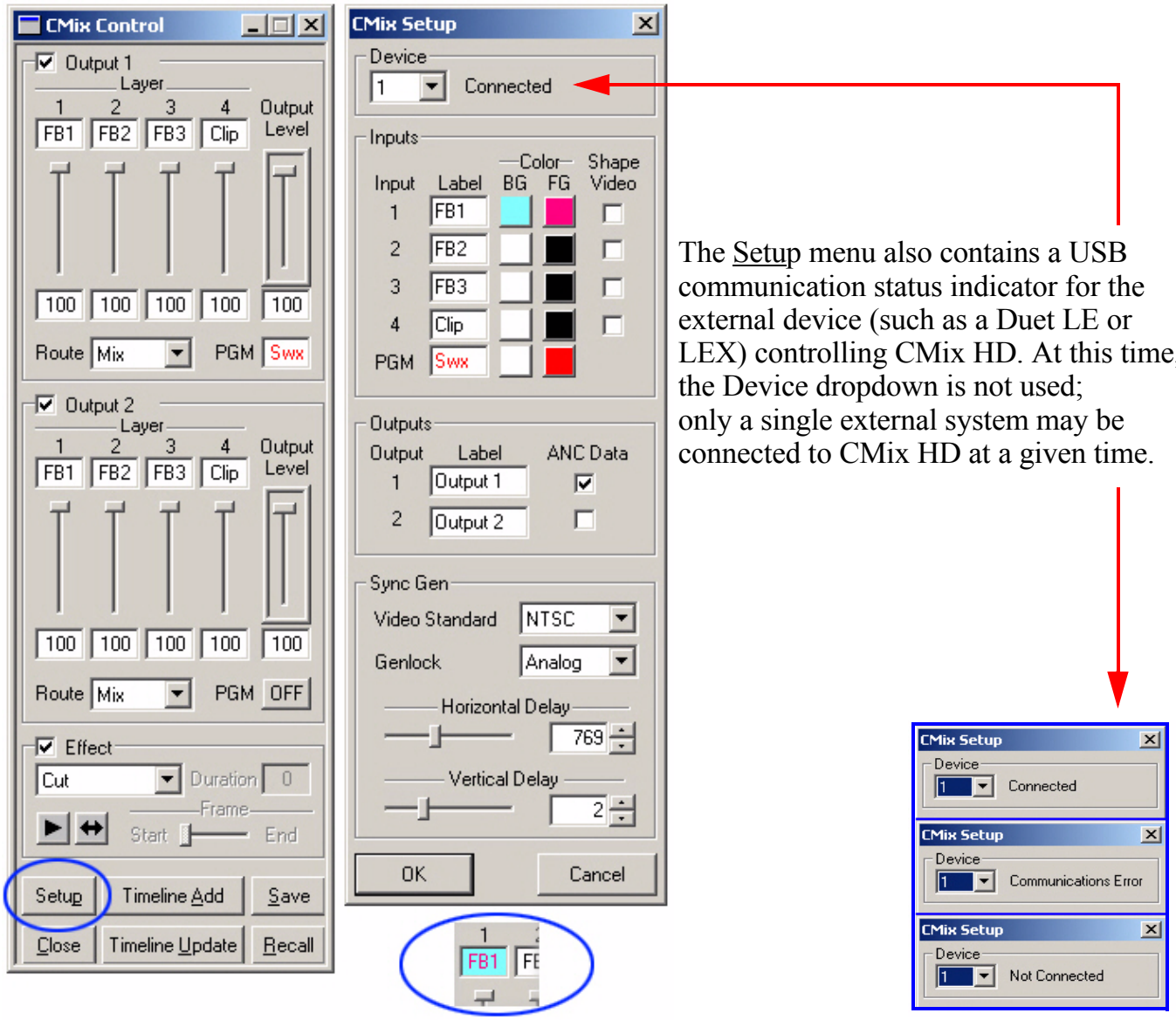

Figure 11. CMix HD's main controls (left) and controls-setup panel (right)

7.3.1 Setup Menu Controls

7.3.1.1 Video Inputs

It may be helpful to assign signal sources to inputs with some concern for the easiest arrangement to remember. (For instance, your Duet LEx's Frame Buffer 1 to CMix HD's Input 1, Frame Buffer 2 to Input 2, etc.)

These labels (including the label for the Program input) may be changed to indicate what sources are connected to which inputs. For this purpose, use the Setup function by clicking the button circled below left. Note that you may use the color chips and text entry fields on the Setup menu to vary the appearance of each input's label on the CMix HD interface.

7.3.1.2 Ancillary Data

Ancillary data present on the Program Video input may either be passed to the SD Program video outputs or suppressed. Place a check in the box next to the associated output to enable ANC data pass through to that output. Note that Ancillary data is never present on the HDTV up-converted output.

7.3.1.3 Sync Gen

- The Video Standard selected (NTSC/PAL) must match the video standard of the reference source.
- C-MIX HD may be gen/locked to either the Ref In connection (**Analog**) or the Program Video input (**Digital** video).

7.3.1.4 Delay Settings

- The **Horizontal Delay** setting can be used to adjust the overall timing of the video output in cases where the downstream device is unable to match SDI video input timing.
- The **Vertical Delay** setting is used to adjust the timing of the digital sync in the output video. See §7.2.3 for a discussion of proper setting for the vertical sync slider.

7.3.1.5 HD Upconverter Video Standard

1. **1080i/16:9**. This format adjusts the aspect ratio of the 4x3 input to 16x9. The image is thus 'stretched' horizontally to fill the screen from blanking to blanking. The timing of the video output is 1080 lines, interlaced at the same frame rate as the video inputs.

2. **1080i/4:3**. This format retains the 4x3 aspect ratio of the input signal. Content of the video input is centered on the HD output, and black bars are added on either side of the image. The Key output signal also maintains the 4x3 aspect ratio, for use downstream with an HD Keyer to allow background video to appear on these sides. 1080 interlaced lines of output.

3. **1080i/crop**. This format retains the 4x3 aspect ratio of the input. The SD input signal appears across the full width of the HD output, causing scan lines from the top and bottom of the input image to be 'cropped' from the HDTV output. 1080 interlaced lines of output.

4. **720p/16:9**. This format adjusts the aspect ratio of the 4x3 input to 16x9. The image is thus 'stretched' horizontally to fill the screen from blanking to blanking. The timing of the HDTV output is 720 lines, progressive scan, at the frame rate of the input video.

5. **720p/crop**. This format retains the 4x3 aspect ratio of the input. The SD input signal appears across the full width of the HD output, causing scan lines from the top and bottom of the input image to be 'cropped' from the HDTV output. The timing is 720 lines, progressive scan, at the frame rate of the video inputs.

Sharpness: This setting adjusts the filtering of the up-converted output. Values may be set from 0 to 7. Increasing this value increases the sharpness of the output image. Lowering the setting may help to soften motion artifacts in the HDTV output.

7.3.2 The Layer sliders

Any of CMix HD's inputs can be assigned to any layer by clicking the label window; this action opens a dropdown list of the available channels. (An Off option is also available in these dropdowns if you wish to disable the layer in the mix completely).

Each Output section's Layer sliders (1 through 4) correspond to CMix HD's four Video-Input-and-Key-Input pairs. These sliders control the transparency of each layer in the mix.

Remember: Any of the four inputs (which excludes the Program input) may be assigned to any of the four layers.

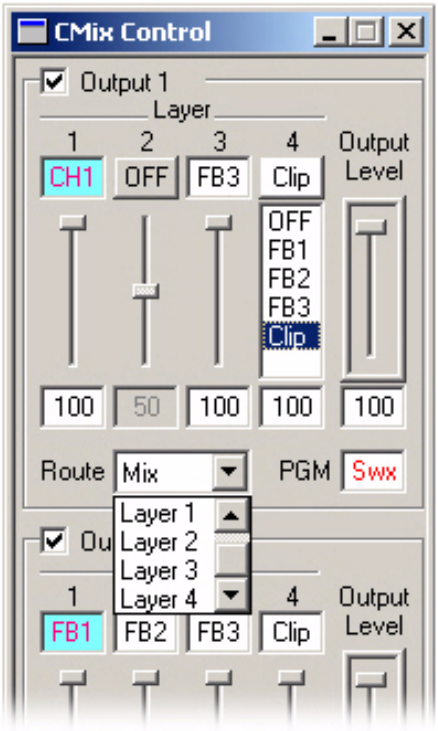

Figure 12. Input-to-layer assignments and layer transparency levels

7.3.3 The Output slider

The Output slider to the right of the Layer sliders controls the overall transparency of the entire mix.

7.3.4 The Route dropdown list

The **Route** dropdown at the bottom of each Output section contains these selections: **Mix**, **Layer 1**, **Layer 2**, **Layer 3** and **Layer 4**. Use this dropdown to send one layer's signal at a time, full on, to the Output channel. Selecting Mix returns the system to normal operation.

NOTE

The Route controls affect ALL of CMix HD's Outputs (and remember, HD Out follows SD Out 2). Their effect is NOT confined to the Monitoring outputs.

7.3.5 The Program Input control

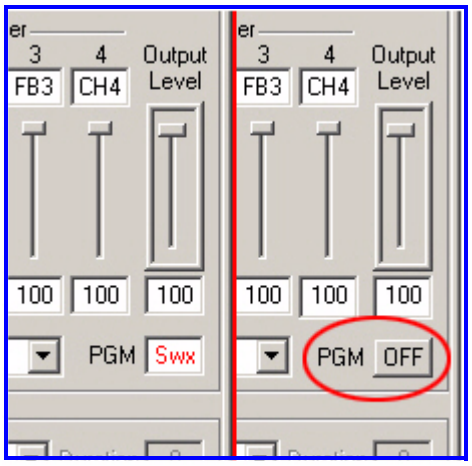

Figure 13. The Program input can only be assigned to a source or turned off.

The **Program** input to the system's mixes can only be turned on and off, as seen above right; its level may not be varied. Clicking on the Program window toggles the input on and off (so be careful with your mouse!). If the Program source is turned off, CMix HD inserts black in its place, and all other components of the mix(es) you've created are unaffected.

7.4 Effects

This section selects a **Cut**, **Dissolve** or **Fade** effect to be used when the mix is rendered to output. These effects consist of starting and ending mixer states for each of CMix HD's two outputs, when the output is enabled. When **Dissolve** or **Fade** is selected, the user may specify a Duration in video Frames. The Duration and Frame controls are disabled if Cut is selected.

The Play ▶ button renders the effect to output. Interpolation between starting and ending values is always linear.

The Swap ↔ button executes the programmed effect and switches the signal on Output 1 to Output 2 and vice-versa. Note that when a CMix HD is connected to a Duet LE or LEX system, the "regular" Swap button ⟷ fullfills the same function as described above.

To set up an effect, move the **Frame** slider to Start and set the Layer and Output level controls to their desired initial values. Move the Frame slider to End and set the Layer and Output levels to their desired final values. Note that the level controls can only be adjusted when the Frame slider is at either Start or End.

The Frame slider also serves as a "scrub" control for previewing an effect.

If you wish to execute a Dissolve effect, the combined transparency of Layers 1 and 2 must equal 100% (the same requirement applies also to the combined transparency of Layers 3 and 4). Note that if the sliders are set to incorrect values, the control panel will correct the settings automatically.

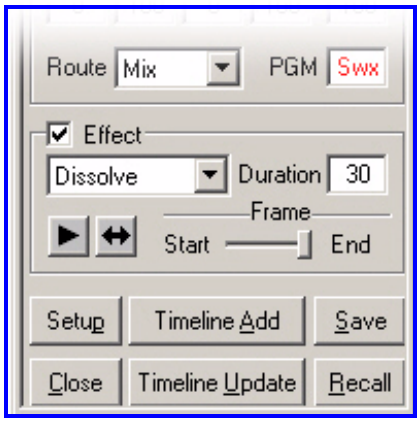

Figure 14. CMix HD's Effect controls

7.5 Other controls

- Setup As mentioned above, the Setup control opens a menu in which you may label the inputs and outputs of CMix HD, in addition to setting each input's Video Shaping.

- Timeline Add A mixer effect can be added to the current scene by clicking the **Timeline Add** button. The mixer effect appears as an object on the Timeline* (as well as on the Scene Graph). By default, the length of the new entry will be the effect duration specified in the Mixer Control Panel. However, this value as well as the start time of the effect can be modified using Lyric 's standard Timeline editing tools (mouse or keypad controls). You may click "Timeline Add" more than once to add multiple mixer effects to the timeline as separate objects; however, the start and stop times must not overlap.

*Keep in mind that the "CMix HD" element on the Timeline and Scene Graph is not a separate "real" object visible on the Canvas. Rather, inclusion of the object in the Timeline, Scene Graph and Keyframe Graph is how Lyric incorporates the recorded values of the Mixer settings into the composition.

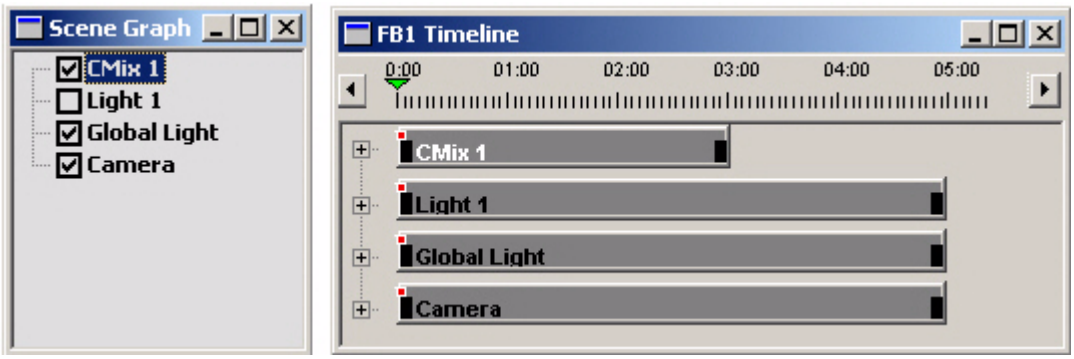

Figure 15. A 'mix object' as seen on the Scene Graph and Timeline

- Save and Recall Dynamic effects or static mixer settings can be saved to a file by clicking on the **Save** button. Note, however, that the CMix HD panel's Save button *only stores CMix HD settings and effects information!* The files created in this manner have the familiar **.lyr** extension, and can be entered in the Lyric Playlist for automated playback based on timecode or other control parameters. These Lyric messages can also be read from the Canvas via a Message Number and the Read controls, or by opening a file with an alphanumeric name. Settings and effects saved in the file execute immediately when read back.

To save a complete Lyric composition containing text, light sources and other 'real' objects in addition to CMix HD effects, use the **Timeline Add** control to incorporate CMix HD effects execution information into a savable Lyric message.

Clicking the Save or Recall buttons displays the standard Windows file selector, open to the default Message directory set up in Lyric Preferences.

- 

Click this control to be certain that your most recent changes to Mixer video settings are applied to Mix objects on the Timeline.

- 

This button closes the CMix HD Control panel. Be sure you've saved your work before closing the panel.

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