NewTek™

TriCaster®

TC1, 410 Plus, and TC Mini

Live Video Production

User Guide

NDI®

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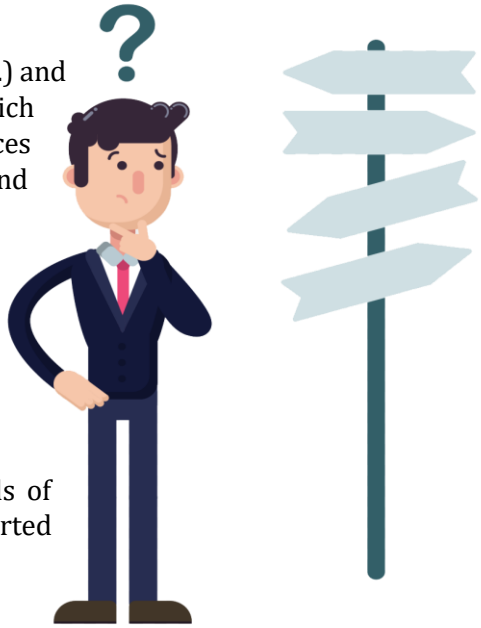
PART I (GETTING STARTED)

Connections and registration, a top-level overview of primary features, and a hands-on tour to get you started.



This manual tells you everything you need to know to perform common operations with your NewTek live production system. It attempts to convey this essential information in a friendly yet concise way, while also providing a deeper reference section you can turn to when you really need more detail.

Even if you are the hands-on, 'I never-ask-directions!' type, please peruse this page. If questions about your NewTek product arise later, you may find that the information here allows you to jump directly to the details you need with a minimum of reading.



- *PART I – GETTING STARTED*
  Introduction – connecting devices (cameras, monitors, etc.) and registration, ending with Chapter 4, Web Features, which among other things includes an overview of online resources to help familiarize you with common operations and features.

- *PART II – REFERENCE*
  This section covers the fine details of using your system (for those who need it, or who simply like to know everything about everything).

- *PART III – CONTROL PANELS*
  Your Live Production system can be taken to new levels of convenience and functionality with the addition of a supported external hardware control panel.

- *PART IV – APPENDICES*
  Certain topics which benefit from in-depth coverage are in this section, along with cross-references to relevant information elsewhere in the manual and concluding with a keyword index. Appendix F: lists all shortcut keys.

Chapter 2 INTRODUCTION



Thank you for purchasing this NewTek product. As a company, NewTek is extremely proud of its record of innovation and its commitment to excellence in design, manufacture, and product support. You will find it exceptionally powerful and versatile. This chapter provides a quick tour of its components and features.

SECTION 2.1 OVERVIEW

Time and again, NewTek's innovative live production systems have redefined broadcast workflows, provided new creative possibilities, and delivered significant cost benefits. Our products include the most complete, reliable, and efficient integrated systems available for live production and web streaming, with capabilities suited to almost any broadcast need. You can produce and distribute live video programs from diverse sources in ultra-high definition formats (up to 2160/59.94p).

As well, Support for innovative NDI® (Network Device Interface) protocol places your new system squarely in the forefront of IP technology solutions for the video broadcast and production industries. And, thanks to NDI's versatile architecture, this does not isolate you in a proprietary 'walled garden'. NDI's astonishing third-party adoption, support for interchange with other IP standards, and extensibility ensure your investment will *expand* your production horizons, rather than limit you to restrictive (and expensive) alternatives.

SECTION 2.2 PREMIUM ACCESS MEMBERSHIP

NewTek's optional Premium Access membership (available from the NewTek Store) helps you to optimize the total cost of cost of ownership of your production systems while keeping you up-to-date with the latest features. Premium Access is a subscription-based add-on that gives a host of new features to your TriCaster, including LiveGraphics, LivePanel, Advanced Audio, Virtual PTZ, and Virtual Set Library. You will read about many Premium Access features listed throughout this manual, but for more in-depth information, please see Appendix A: Premium Access Features.

SECTION 2.3 LAUNCH SCREEN

The *Launch Screen* appears shortly after you power up your live production system. This is the command center where your production projects are configured and launched.

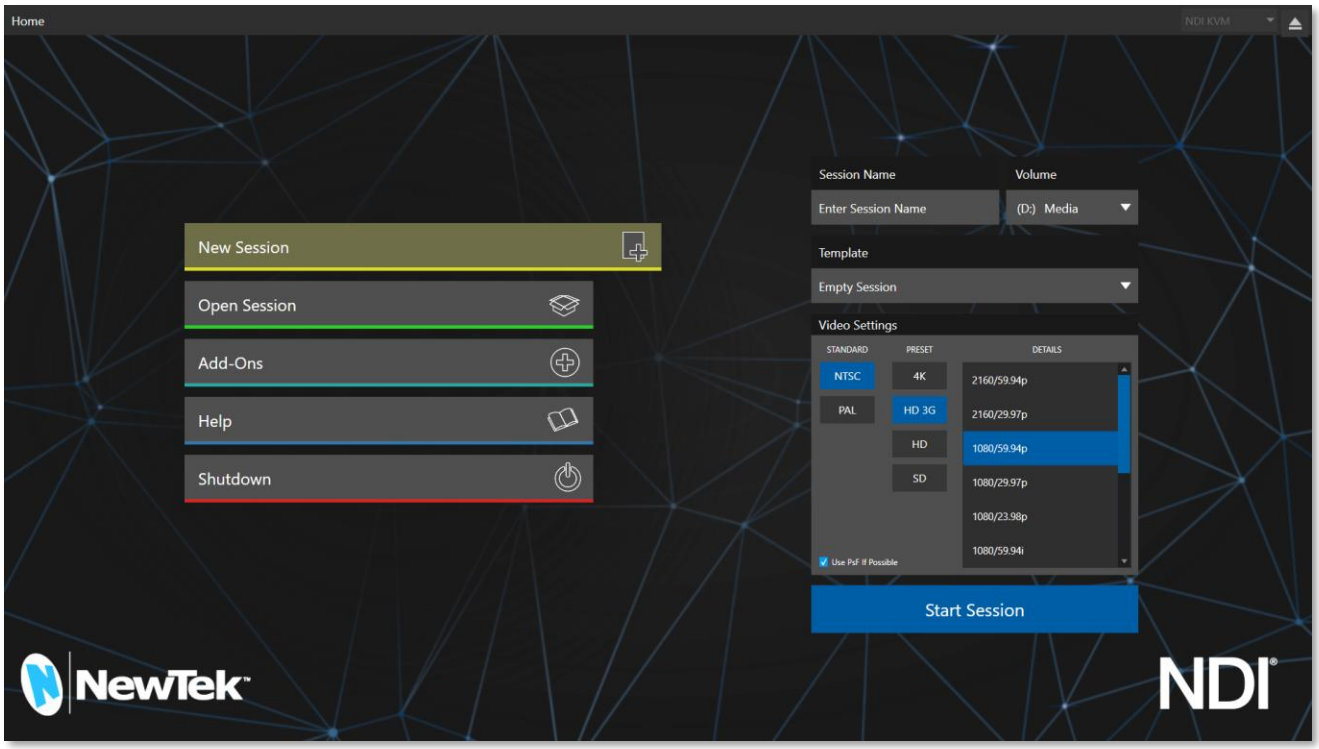


FIGURE 1

The *Home page* of the *Launch Screen* provides several important functions, notably allowing you to create (and re-open) *sessions*. Sessions are an important concept – essentially a custom preset prepared for an individual production or other purpose. Later, when you re-enter an existing session, all of its assets and settings and even control states are remembered.

Selecting a session takes you 'into' the session. TriCaster will show you the *Session Page* next, where you can *Manage* content and more – or launch the *Live Desktop* to begin production.

SECTION 2.4 LIVE DESKTOP

Your system's live production features are all available from the *Live Desktop*, which in many ways mimics familiar video production equipment (however, the *Live Desktop* provides far more functionality in its integrated environment than similar single-purpose devices).

The various features, controls and modules comprising the *Live Desktop* are arranged in horizontal bands, as seen in Figure 2.



FIGURE 2 (TC1 SHOWN)

- The top-most band comprises a convenient and powerful *Dashboard.*
- The area just below the *Dashboard* is *normally devoted to a multi-pane monitoring display, providing source and output views.

  * This can be re-sized, even completely hidden; or the display can be customized to complement external *Multiview(s),* or for numerous other purposes.

- The central *Live Control* section is home to the *Switcher*, *Transition, DSKs* (overlay channels*)* and *M/E* controls (*M/E* panes can be minimized and are hidden from view in Figure 2).
- By default, the bottom third of the *Live Desktop* is home to tabbed control modules, including *Media Players, Buffers,* and the *Audio Mixer*.

SECTION 2.5 FEATURES

Let's take time for a brief overview of just *some* of the key features of your system.

2.5.1 PHYSICAL

- Handsome and rugged chassis.
- Easily accessible audio and video, monitoring and network connectors (typically on the backplane for convenient installation in industry standard mounting).

2.5.2 MULTI-TIER FAILSAFE

'Always on Air' features provide multi-tiered redundant failsafe mechanisms in both hardware and software.

To name just a few:

- Multiple software failsafe systems continually monitor and safeguard the live performance. Any recoverable software error conditions are quickly and unobtrusively dealt with.
- Video pass-through ensures that as long there is AC power, audio and video from the highest numbered local *hardware* input are routed to *Output 1* in a case of catastrophic software condition.
- If at all possible, streaming output and recording also continue even if all else fails.
- Your NewTek live production system also has a comprehensive integrated system restore feature. You can quickly reset the system to factory defaults or create and use custom drive images on external volumes to restore the system.
- If a control panel connection should fail, the system attempts to reconnect automatically without user intervention.

  * Please note that TriCaster TC Mini does not support Multi-tiered failsafe.

2.5.3 A/V INPUT AND OUTPUT

It's worth taking a moment to consider that each NDI output potentially substitutes for multiple traditional outputs.

For example – it is not unusual to need multiple physical outputs from a traditional video switcher for a single source – one for recording, another to broadcast, one for local monitoring and so on, with each destination consuming precious hardware connections. This is not the case with NewTek production systems, which allows multiple downstream connections to a single NDI output.

Thus, it requires no hyperbole to state that your NewTek system provides virtually unlimited outputs, without expensive additional hardware. And if you do require more standard SDI outputs than the four provided, the system is easily extended using any number of rack-mountable output modules.

- Live switch up to 16 (TC1) external video sources, and nearly as many internal sources.
- Various models may support SDI or HDMI video input and output, internal and network video sources, and analog audio input and output
- Connect popular video routers to greatly multiply input options.
- Control supported *PTZ* cameras via NDI (or other common IP control protocol) or serial connection.
- Freely mix multiple video formats, and output UHD and HD sessions simultaneously.
- Multiple *Media Player* modules allow you to insert pre-recorded video, music, sounds and imagery into your live presentations.
- Select Microsoft Windows® or Apple Macintosh® computers on the same network as *Switcher* inputs for your live productions using NDI Screen Capture.
- Update *Buffers* in 'watch folders' from networked graphic workstations, even when these are displayed live.
- *Live Link* offers new opportunities by bringing the power of the internet into your TriCaster. Bring in live web pages, graphics, or images into your HTML Buffers and into your live production.
- Transmit output to other NDI-enabled systems across the network.

- Create complex *M/E* effects and compositions using multiple sources and versatile virtual sets with live (virtual) camera moves.
- Cascade effects in endless creative ways using multiple re-entrant M/Es.
- Use switcher row color groups to automatically harmonize video sources for multiple *M/E* s, etc.
- Mix internal and external audio sources, including analog or SDI Embedded audio.
- Multiple video outputs, including streaming, can supply unique video formats; designate output mixes or individual sources for output in various formats up to 2160/50.94P.
- Send Main or *AUX audio mixes independently to a variety of physical and IP audio outputs.

  * Please note that TriCaster TC Mini does not support AUX mixes.

2.5.4 SKYPE TX CALLERS

- NewTek's innovative Skype TX support uses Microsoft's powerful Skype TX™ platform to connect Skype™ calls from almost anywhere in the world directly to a Switcher input (number varies by model), with automatic handling of return audio and video (including mix minus). All you need is a network connection to an external (Windows® platform) computer running the free Skype TX control application that provides call management.

2.5.5 TIMECODE

- Default Quicktime® recording format includes full 'per frame' timecode.
- IsoCorder™ recorded clips from multiple sources are easily aligned for synchronized post show editing using embedded timecode.

2.5.6 MONITORING

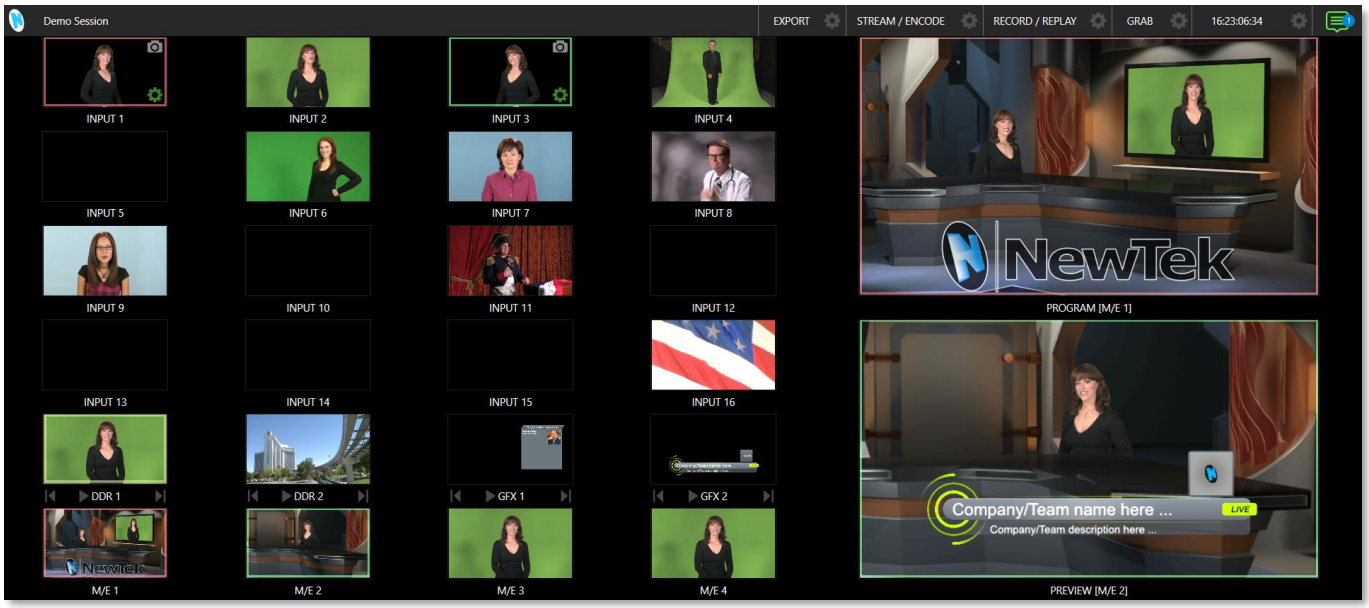


FIGURE 3

- The *Live Desktop* includes a large *monitoring pane* with multiple and easily customized *Workspaces.* By default, this area includes *Program* output and *Look Ahead Preview* monitors with associated controls, along with all inputs.
- The monitor array at left allows you to keep an eye on all live and internal video sources, including *Media Players* and *Network* sources.
- External *Multiview Workspaces* (number varies by model) offer many alternatives, including numerous multi-bridge layouts, overlays, and *Event Clocks.*
- Monitor sources on both *Live Desktop* and external *Multiviews* are user-configurable, and include *Media Player* clip timecode counters, and custom logo display.
- **Waveform* and **Vectorscope* monitors help you calibrate your signal to ensure your output meets broadcast standards and looks great.
  * Varies by TC Mini model

2.5.7 VIDEO PROCESSING

- Full 4:4:4:4 32-bit floating point internal processing of all video sources.
- *Proc Amps* and *White Balance* controls for every source preserve pristine image and color fidelity.

2.5.8 THE SWITCHER

The powerful Switcher module, which provides native support for popular professional video routers and NDI (Network Device Interface) protocol, puts countless sources at your fingertips in a familiar *Program/Preview* row control interface.



FIGURE 4 (TC1 SHOWN)

For less complex productions, the *Switcher's* convenient *Express mode* simplifies the process (Figure 5 (TC1 shown)). This one-button operating mode will be especially welcome in environments where volunteers or less experienced operators are involved.

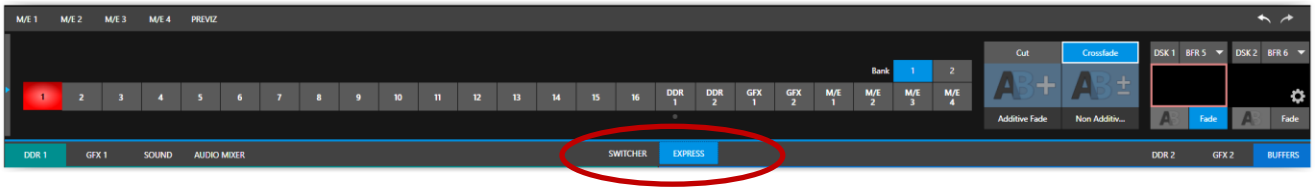


FIGURE 5 (TC1 SHOWN)

Additionally, support for switching using a touchscreen has been provided. See something interesting on a viewport in the monitoring section? Just *tap* the corresponding viewport to instantly send that source to *Program* output, using the current *background transition* (if any).

VIDEO LAYERS AND TRANSITIONS

The *Transition* section of the *Live Desktop* provides powerful tools for arranging and displaying the numerous video and graphic layers contributing to your ultimate program output.

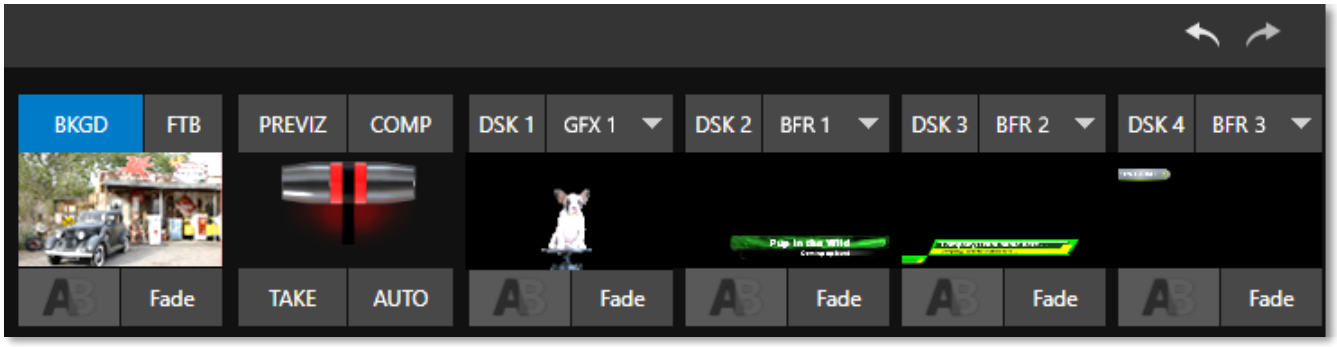


FIGURE 6 (TC1 SHOWN)

- Freely *hot-punch* or *transition* between external sources, internal *Media Players*) and *M/E effects*.
- Latch selected *Switcher* and *M/E* source rows in color groups to synchronize switching operations.
- Multiple *DSK* (Downstream Key) *Switcher* channels and independent *KEY* channels for each *M/E,* permit endless creative possibilities.
- *DSK* and *KEY* sources are always represented in small full motion 'confidence monitors'.
- Use any of the hundreds of transitions supplied to reveal either *Background* or *DSK/Key* channels with animated wipes, trajectories, and dissolves, or select colorful and dynamic *Animation Store* transitions with overlays, sound and *TransWarp™* effects.
- Create an unlimited number of custom transition effects with embedded sounds, dynamic cloth effects, and full color overlays using the integrated *Animation Store Creator* application.
- Create eye-popping animated graphics using your favorite software (e.g., Adobe After Effects®), and convert them to animated *Buffer* effects that you can display without tying up a *Media Player*.
- Reveal combinations of video layers with one operation of the *T-bar* or click on *Take*/*Auto* buttons.
- Or use *per-layer* controls to independently control display of any layer with or without transitions.
- Select individual transition effects for any layer and adjust *Speed*, *Reverse* and *Ping Pong* options.

DSK CHANNELS



FIGURE 7 (TC1 SHOWN)

DSK layers support downstream overlays (*M/E Keys* are *upstream* overlays, i.e., ahead of the main *Switcher*).

- Display *DSK* channels independently and swap them during a switch with custom transitions.

- Use *Media* Players to overlay title pages, including scrolls, crawls, and lower-thirds, or assign a *Camera* feed or *Network* source to an overlay channel.
- Alternatively, use the *Buffer* channels to assign a specific title, still image or animation effect to any overlay channel.
- Independent *Crop*, *Position, 3D Rotation*, and *Scale* controls for each *DSK* channel permit you (for example) to configure multiple sources as 'Picture in Picture' elements, revealing them with individual custom effects.

2.5.9 M/ES



FIGURE 8

Color-coded *M/E* (Mix/Effect) banks provide stunning effects.

These include secondary video mixing capabilities, switching (with traditional wipes or *Animation Store* transitions with *TransWarp* capabilities), full alpha channel support and best in class *LiveMatte*™ real-time keying technology for green/blue screen effects, jaw-dropping dynamic virtual sets, and much more.

Each *M/E* bank supports:

- Up to four (varies by model) primary video sources per effect.
- *KEY* (overlay) channels with individual transition capabilities.
- *S*ub-mix functionality, with individual transitions for A/B *Background* layers and *KEY* channels.
- Individual *Scale*, *Position*, *Crop* and *Rotation* controls and motion *Tracker* support for all channels.
- Powerful *Comp* (composition) preset features let you animate layer and overlay position, rotation, and other attributes in full motion.
- Convenient *MEM* system allows instant access to pre-configured *M/E* setups.

2.5.10 VIRTUAL SETS



FIGURE 9

- Achieve the look of large, sophisticated studio sets in a very small space with NewTek's *LiveSet*™ virtual set technology.
- Virtual sets support up to four keyable video sources.
- *Zoom* and *pan* the virtual 'camera' during live production (without touching the physical camera).
- Or use a *Holographic LiveSet* to freely rotate and zoom the camera view.
- Set up custom virtual set animation targets even while live.

2.5.11 RECORD AND STREAM

- Record your live-switched production at full resolution to a high-quality QuickTime® format.
- Captured Quicktime files include embedded timecode (on supporting models).
- IsoCorder™ technology supports up to multiple internal a/v recordings at once, chosen from among local hardware camera inputs and all four outputs (number varies by model).
- Easily grab still images from *Switcher* input sources, or batch capture selected outputs.
- Simultaneous output for broadcast, projector, and live web stream to in-house and remote audiences.
- Stream live to multiple Internet destinations for redistribution and archive your stream locally.
- Perform instant replays with custom transitions and playback speed with just one button press.
- Or use NewTek's TimeWarp™ instant replay control panel to mark, replay and manage highlights.

2.5.12 MEDIA EXPORT

Export support makes it easy to distribute content to multiple targets in one pass. This module stores credentials for social media and upload sites and provides a queue for uploading and file conversion.

Clips and stills from live sessions can easily be added to the *Export* queue without interrupting production, for distribution to multiple hosting services and social media sites (including Twitter®, Facebook®, YouTube®, and more) all with a single click – even when live production recording is still underway.

This is great for concerts, galas, sport events, game shows and more. The *Export* feature directly addresses FTP sites and network locations too; transfer media to multiple locations at the same time to meet post-production needs or other collaborative and archival requirements.

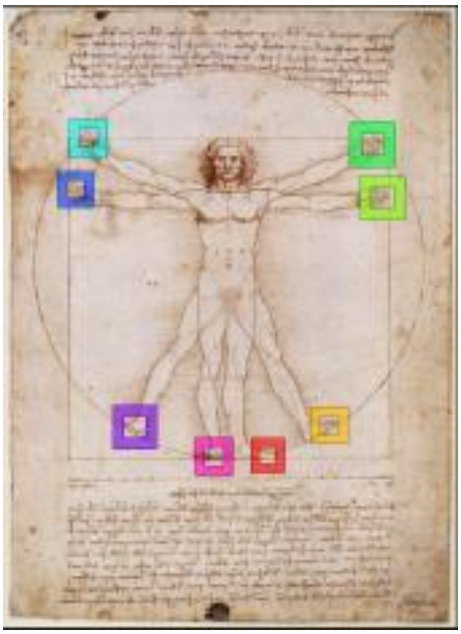
2.5.13 AUTOMATION

Record, edit, and play back macros, whether a simple operation or more involved series of events at the touch of a button. Use powerful integrated automation systems to trigger these, simplifying complex tasks and ensuring consistent operations.

Hint: See also Live Story in the Appendix on Premium Access features.

2.5.14 HOTSPOTS, TRIGGERS AND TRACKERS

Define multiple onscreen *Hotspots* for different (chromakeyed) sources, and *trigger* macros automatically whenever something opaque enters the hotspot. This live interactivity opens countless creative applications.



Trackers provide motion data from selected color regions as they move about the frame in real-time. Lock other video sources to *Tracker* output using *Position* tools in *M/Es* banks and *DSKs* and they will follow obediently.

Note: The features detailed in this section varies by TriCaster TC Mini models.

2.5.15 IMPORT

IMPORT MEDIA

The integrated *Import Media* feature provides a convenient one-stop approach to gathering productions assets.

- Batch import media files for use in *Media Players.*
- Imported files are automatically categorized as stills or clips, and can be pre-assigned to the specific players, making them easy to find and use during live productions.
- When necessary, imported files are transcoded to formats that ensure smooth playback.

2.5.16 AUDIO MIXER

The integrated *Audio Mixer* provides extensive multi-channel control and management.

- Neural Voice Isolation (AI Audio) has been implemented in all TriCaster models to enable/disable noise reduction per channel on each Audio Mixer input.
- Adjust numerous internal and external audio sources and introduce them into your program manually or automatically.
- Control output levels for program, headphones, auxiliary outputs, recorders, and stream separately.
- Convenient *Audio Mixer MEM* system allows single-click access to prepared setups.
- Automation allows complex 'video follow audio' options and 'threshold macros' (varies by TC Mini models).
- Exclusive or latched *Solo* controls
- Independent 7-band *EQ*, *Compressor/Limiter* and *Noise Gate* available on the inputs.
- Complete multi-bus matrix routing options (not a TC Mini feature).
- Configurable *VU meters*: Show calibration on digital (dBFS) or analog (dBVU or dBu) scales.

2.5.17 INTEGRATED MEDIA PLAYERS

Media Players and title system serve up graphics, titles, video clips and audio files quickly and easily during your live productions.

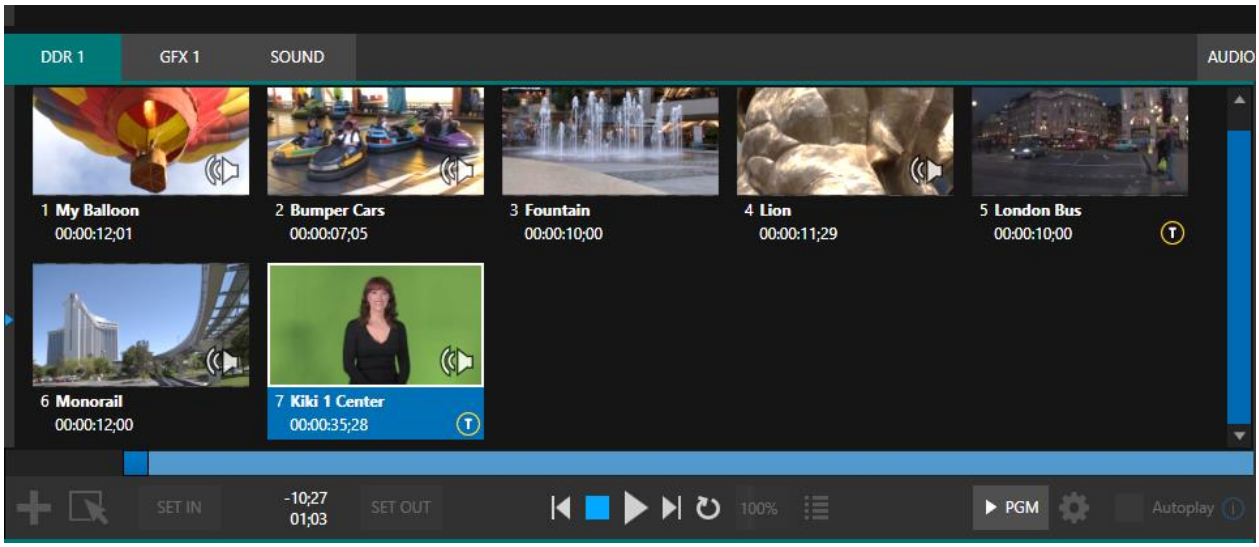


FIGURE 10 (MEDIA PLAYERS VARY BY MODEL)

- Add a/v clips, sound or still images to *Media Player* playlists.
- Trim and re-order playlist entries.
- Add colorful transitions between clips.
- Flexible playback controls include variable *Speed* and *Loop* options.
- Each *Media Player* has its own volume and other advanced audio controls in the *Audio Mixer*.
- Convenient 'per clip' audio level and playback *Speed* control.
- *Autoplay* feature starts and stops playback automatically based on *Switcher* activity.
- Control *Media Players* with *macros* triggered by other events (varies by TC Mini models).
- Assign titles, graphics, clips, or buffers to multiple *DSK* or M/E *Key* channels.
- Edit titles live, even while 'on air'.
- Instantly transition a clip to the *Main Switcher* or an *M/E*, play it, and then restore the target's original source using the *Show On* feature.
- Store playlists and player configurations in *MEM slots* for easy recall.

2.5.18 BUFFERS

The *Buffers* module provides quick review and management of the internal media buffer system, providing combined playback and asset management tools, and is fully supported by the *Macro* system.

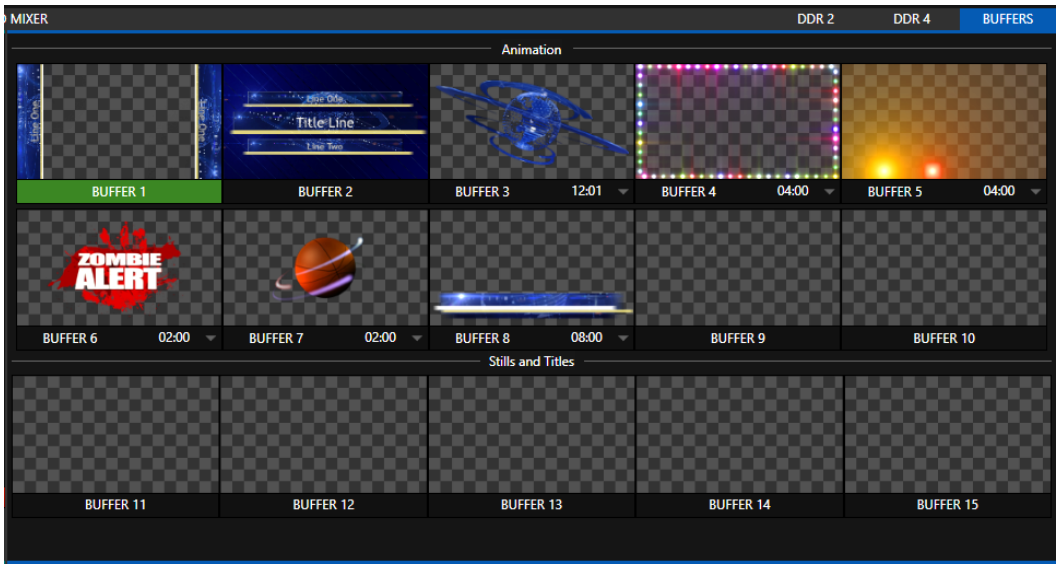


FIGURE 11

Buffers can be applied in any video channel, including all main *Switcher* and *M/E* rows, or as overlays in the countless *DSK*/*KEY* channels. *Buffer* 'slots' can contain animated effects (compiled from your own clips using the supplied A*nimation Store Creator* application), still graphics or title pages, or – when enabled – dynamic LiveGraphics – all with full alpha channel support.

Buffer effects are resident in reserved *Switcher Memory,* making it possible to use them all at once without tying up *Media Players*. Thus, *Buffers* effectively substitute for *many* additional *DDRs*.

2.5.19 TITLES AND GRAPHICS

An extensive set of live-editable title pages in various theme packs are supplied, all ready for immediate use in your productions. Also included in the software suite is a special 'offline' version of LiveText™, NewTek's professional titling and graphics application. This allows you to create your own great looking custom title pages and motion graphics, including scrolls and crawls that can be played back in *DDRs*.

Hint: See also LiveGraphics in Appendix: A.4 LiveGraphics

2.5.20 OPTIONAL CONTROL PANELS

Several different control panel options have been designed to complement your system, making your live production operations even more convenient. Once you get your hands on one, you'll never want to let go. In addition to primary control panels, NewTek offers an optional instant replay control panel called TimeWarp™. See your local reseller for a demonstration of these powerful extensions to your system.

In summary, your NewTek live production system gives you more combined production power than any other single broadcast appliance. Let's jump in now. First, we'll get you connected; following that, we'll explore some of the system's foremost features.

Chapter 3 SETTING UP



This chapter explains how to connect power, monitors and audio visual sources, and external control devices to your NewTek live production system. It also reviews the registration process. After completing this short section, you'll be all set to begin using your new unit.

To begin, let's review 'what came in the box':

- Your NewTek live production system
- A/C power cabling
- NewTek mouse and keyboard
- Four Mini DisplayPort adapters for TC Mini

SECTION 3.1 COMMAND AND CONTROL

Hint: The user interface requires a minimum monitor resolution of 1920x1080.

1. Connect an external computer monitor to a video output port (please be aware that the video ports on the TriCaster motherboard are *not* used).
2. Included in your TC Mini are four Mini DisplayPort outputs adapters. Connect the correct adapter for your monitor or display.

Note: The user interface runs on the monitor selected as the "main display" in the Windows control panel Display applet. Section 3.7.2 discusses supplemental monitor connections.

3. Connect the *mouse* and *keyboard* to USB ports.
4. Connect the *power cord* to an A/C power receptacle.
5. Turn on the computer monitor.
6. Press the *Power* switch, located behind the flip-down front door on rack-mount systems, or the faceplate on TC Mini.

At this point, the blue *Power LED* will illuminate, and the device will boot up. (If this does not happen, check your connections, and retry).

Though not a requirement, we do strongly recommend that you use an uninterruptable power supply (UPS), as for any 'mission critical' system. Likewise, consider A/C "power conditioning", especially in situations where local power is unreliable or 'noisy'. Surge protection is especially important in some locales.

A word about UPS devices:

'Modified sine wave' UPS devices are popular due to low manufacturing costs. However, such units should be viewed as being of low quality and possibly inadequate to fully protect the system from abnormal power events.

For a modest added cost, consider a "pure sine wave" UPS. These units can be relied on to supply very clean power, eliminating potential problems, and are recommended for applications demanding high reliability.

Power conditioners can reduce wear on power supplies and other electronics, and provide a further measure of protection from surges, spikes, lightning, and high voltage.

SECTION 3.2 WINDOWS® LOGIN

Although the system can be operated without a password requirement, it is recommended to use one to secure your system from unwanted use or intrusion. In particular, use of a password is required if you intend to use the system's support for Skype TX® a/v sources. Thus, a password is required by default.

Important note: The default password for new (or 'newly restored') systems is simply "newtek", entered without the quotation marks, of course.

SECTION 3.3 LICENSE AND REGISTRATION

On first launch, your system will present an *End User License Agreement* dialog. After you accept this, one or more *Registration* dialogs are presented. If requested, enter the unique *Serial Number* and *Product ID* for your system.

NOTE: IF YOU LEAVE THE SERIAL NUMBER FIELD BLANK, AND PRESS CONTINUE, THE SYSTEM WILL RUN; HOWEVER, OUTPUT WILL DISPLAY A WATERMARK UNTIL THE SOFTWARE HAS BEEN UNLOCKED.

Hint: If the Serial number doesn't appear automatically and you can't find it on your unit, contact NewTek's Support center – see https://www.newtek.com/support/get-support/

You can register and obtain your registration code directly on the local system, or on another system connected to the Internet. If the system is connected to the Internet, the registration process guides you through the necessary steps.

Hint: Information on connecting to a network can be found in Section 3.14.

After registering, enter the resulting *registration code* into the field provided in the *Registration dialog*.

3.3.1 UPDATES

Hint: It's a good idea to record the login name and password you choose when creating your website profile and keep them in a safe place. Jot down the registration code too; it could come in handy if you ever need to restore the system's software to as-shipped state when you don't have access to the Internet.

UPDATES

It's a great idea to check for recent free software updates for your system at this time, too – visit https://www.newtek.com/downloads/ to do so.

ENHANCED SUPPORT (PROTEK)

NewTek's optional ProTek℠ service programs offer renewable (and transferable) coverage and enhanced support service features extending well beyond the standard warranty period. Please see http://www.newtek.com/protek.html or your local authorized NewTek reseller for more details regarding ProTek plan options.

SECTION 3.4 RACK MOUNTING

Most NewTek systems are designed for convenient mounting in standard 19" racks (mounting rails are available separately from NewTek Sales). Please keep in mind that adequate cooling is a very important requirement for virtually all electronic and digital equipment.

We recommend allowing 1.5 to 2 inches of space on all sides for cool (i.e., comfortable 'room temperature') air to circulate around the chassis. Good ventilation at the front and rear panel is important, and TC1 requires ventilated space above the unit (1RU minimum is recommended).

Hint: When operating your system in a 'road case' for mobile production, it's best to do so with both the front and back covers (of the road case) removed.

When designing enclosures or mounting the unit, supplying good free air movement around the chassis as discussed above should be viewed as a critical design consideration. This is especially true in fixed installations where the unit is installed inside furniture-style enclosures. See Appendix E for more detail.

SECTION 3.5 INPUT CONNECTIONS

3.5.1 CONNECT A/V SOURCES

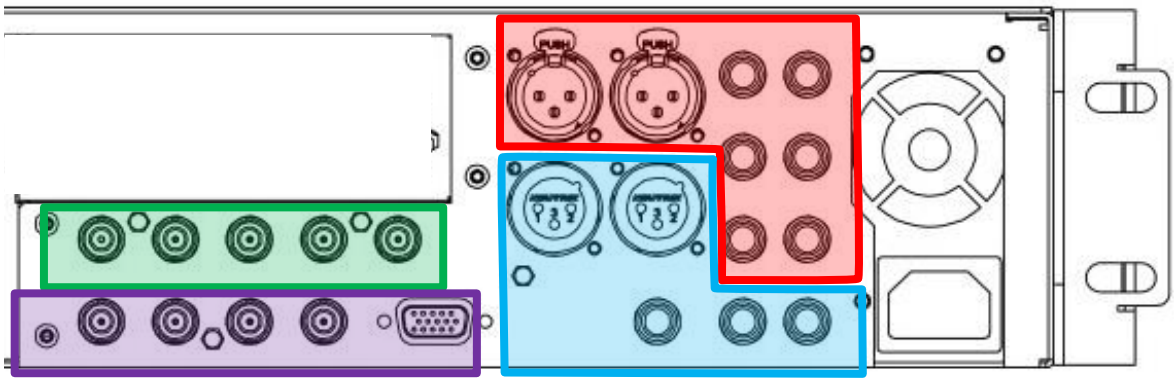


FIGURE 12 (TC1 AND 410 PLUS)

- **Analog audio inputs: 1-4**
- **Analog audio outputs: 1(Master) & 2 (AUX 1), and Phones jack**
- **SDI Video Inputs 1-4 and Genlock input.**
- **SDI Video Outputs 1-4 and Tally connector**

Note: Hardware details as depicted are subject to change without prior notice. Also, TC Mini provides clearly labeled (mic and line level) audio inputs on its faceplate.

Connect any local SDI video sources to one of the four BNC connectors in the *SDI IN* section.

Note: SDI video sources with embedded audio do not necessarily require separate audio connections.

3.5.2 CONNECTING A CONTROL PANEL

Please refer to 21.1.1 Connection and Configuration for a discussion of connecting and configuring control panels.

3.5.3 CONNECTING A VIDEO ROUTER

With the appropriate software installed, your system (not a TC Mini feature) can control and access output from router models supporting the popular Grass Valley® Native Protocol, as well as Black Magic Design® Video Hub routers.

The implementation offers a number of configuration options; a basic setup would be as follows:

- Connect the router to the system by Ethernet cable, and then connect one (or more) of the router's video outputs to SDI inputs with matching numbers, using suitable video cables.

  (For example, by default router output number 3 would be connected to *Input 3* for control communication between the devices to be properly linked.)

- Click the *Shutdown* icon on the *Home page* (Launch Screen) and click the *Administrator Mode* at right.
- In the *Administrator Mode* panel, click *Exit to Windows.*
- Navigate to the appropriate folder below by model:
  - C:\ProgramData\NewTek\TriCaster\Configuration
- And open the file named *router_setup.xml* by double-clicking it (it will launch in *Notepad*).

This file is where you add the routers you wish to connect. Each router is identified by an entry you insert between the starting and closing "config" tags, as explained in the file comments.

A typical entry might be as follows:

<grassvalley ip="10.28.1.128" port="12345" name="AJA KUMO"/>

- Save the file after editing and re-launch the system.

Note: The system communicates with routers using individual IP address and port numbers, allowing multiple routers to be connected simultaneously. File comments explain how you can bypass the default 1:1 mapping of router outputs to inputs when required or prevent accidental changes to inputs that are displayed on Program output, along with other extended configuration options. If you assign names to router inputs or outputs in this file, make sure the names for each are unique.

Some routers allow each router input to be provided with a unique name. In such a case, the NewTek system may be able to access that name and use it for *Switcher* buttons as appropriate.

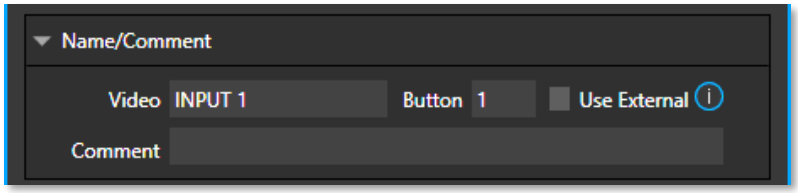


FIGURE 13

To enable this behavior, checkmark the *Use External* (name) switch in the *Input Configuration* panel (Figure 13) – see Section 8.1.1 for more detail.

BLACK MAGIC DESIGN® AUTO-DETECTION

For backwards compatibility reasons, these routers are auto detected by default. (Black Magic® routers may use a USB control connection, rather than a network connection. The router's firmware should be up to date. If detection fails, please contact BMD support for assistance.)

You can, if you wish, disable auto detection by editing the XML configuration file discussed above. (You might do this to avail yourself of the extended configuration options that are provided by doing so.) To do this, simply add the line below to the <config> section of the file.

```
<blackmagic_config discovery="false"/>
```

SECTION 3.6 GENLOCK CONNECTION

The *Genlock* input (varies by model) on the backplane is for a 'house sync' or *reference signal* (often a 'black burst' signal intended specifically for this purpose). Many studios use this method to synchronize equipment in the video chain. Genlocking is commonplace in higher-end production environments, and genlock connections are typically provided on professional gear.

If your equipment allows you to do so, you *should* genlock all cameras *and* the NewTek system. To connect the genlock source, supply the reference signal from the 'house sync generator' to the *Genlock In* connector. (See Section 3.13 regarding genlock configuration.)

SECTION 3.7 OUTPUT CONNECTIONS

Next, we'll discuss the audio and video output connectors along with relevant settings. We'll start with video output, not only so you can view your results but because certain items are best considered before beginning a live production session.

Note: Any PoE device must be connected indoors, in the same building as the TriCaster. For product safety, there can be no cable connections external to the building where the TriCaster is operating.

3.7.1 A/V OUTPUT

Your NewTek system provides multiple video and audio output connector groups, and very flexible display options. Here are some of the possibilities:

- TriCaster's of various types can output a huge number of different sources – including as many as four different mixed compositions, up to twenty nine more NDI outputs, multiple internal recorders, three local monitors, and Internet streaming.

- All hardware inputs and all outputs are always presented to your local network as NDI sources, ready for varied utilization at any convenient place where your network extends.

- Send program output, secondary mixes, or custom 'monitor bridge' layouts to as many as three supplemental monitors (varies by model).

- Stream program output to one or more Content Delivery Networks (varies by model) via a suitable network connection.

Each of the primary outputs (termed *MIX 1-(2* or *4*, by model*)* can be configured independently (video format settings for these outputs are provided in the Live Desktop's *Output Configuration* panel.

1. Connect downstream video production devices to the connectors in the *SDI (or HDMI) OUT* section as desired.

2. NDI and Streaming outputs obviously require a network connection, and in the latter case, an Internet connection.

3. Connect audio outputs.

    a. *Analog audio* – Connect external audio devices to the connectors in the *AUDIO OUT* section.

    The backplane for rack-mount models offers two pairs of analog audio output connectors:

    Note: TC Mini supplies analog audio output on two ¼" (6.35 mm) audio jacks on its faceplate.

        i. *OUT 1* XLR connectors provide (balanced, line level) sound from the *Master* mix.
        ii. *OUT 2* connectors provide sound from the mix assigned to the *AUX 1* audio bus.

    b. *Digital audio* – A separate digital audio connection is not necessary for SDI or NDI output.

3.7.2 SUPPLEMENTAL VIDEO OUTPUTS

As mentioned back in Section 3.1, there are multiple monitor ports on the system's backplane. The operating system will have set one of these as the "main display", and this is where the *Live Desktop* (the primary user interface and Multiview on the same screen) appears.

Hint: You can choose which monitor is the "main display" by choosing Administrator Mode, then clicking Display under the Settings heading.

For rack-mounted systems, additional monitor ports *located just above the SDI inputs on the backplane* are available to connect monitors or projection devices (etc.) for various purposes, including program output for IMAG (Image Magnification) installations.

TC Mini comes with four Mini DisplayPort outputs to connect to your monitor or display.

TC1 supports the use of three such extra displays, and 410 Plus allow two.

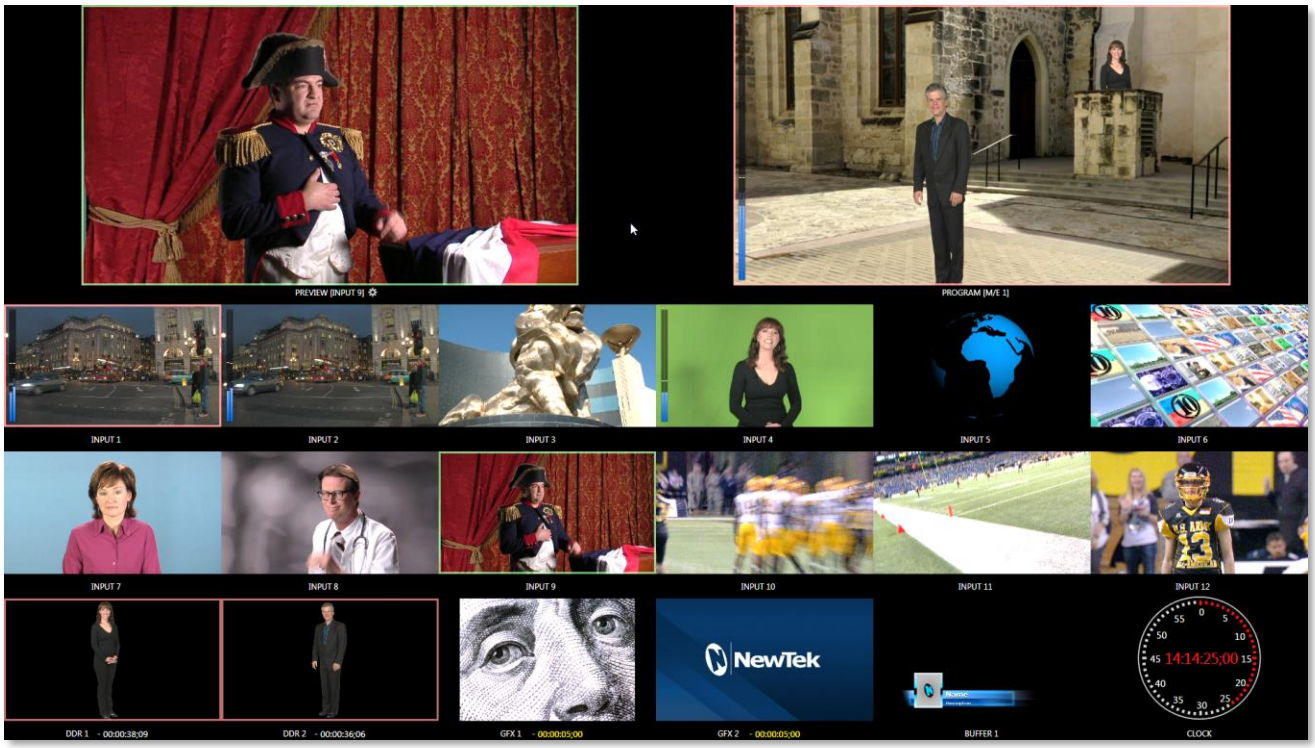


FIGURE 14

These supplemental monitors are referred to as *Multiview* outputs and can display a variety of optional layouts that can be selected and configured at any time in the *Live Desktop*.

Note: A mismatch of output format and connection type is possible at times. For example, imagery in a Graphics player may not match the current output resolution or the selected connection type. Display mismatches can often be handled, but in rare cases the source may simply not be shown.

SECTION 3.8 TALLY LIGHTS

Rackmount TriCaster models provide *Tally Light* support to allow you to connect external tally lights and similar devices.



FIGURE 15

These typically provide a red LED for a video input selected on the Switcher's *Program* row. (NDI outputs also natively support tally over the network, without a separate connection.)

Note: Some third party tally solutions are listed at:
https://www.newtek.com/solutions/newtek-developer-network/

Here is a pin-out listing for the HD15 Tally connector:

- Pin1 – LED1
- Pin2 – LED2
- Pin3 – LED3
- Pin4 – LED4
- Pin5 – reserved
- Pin6 – reserved
- Pin7 – GPI3
- Pin8 – GPI4
- Pin9 – GND
- Pin10 – GND
- Pin11 – GPI1
- Pin12 – GPI2
- Pin13 – NC
- Pin14 – 3.3V (20 Ohms current limit)
- Pin15 – NC

Engineering Notes

- Pins 1-(4 or 8) are 'hot' when the LED should be illuminated.
- Each LED pin 1 (4 or 8) has a 200 ohm current limiting resistor.
- With no load (open circuit) the LED pins can reach 5V. With a typical LED load, they can be expected to reach about 3V.
- GPI stands for General Purpose Interface. Pins 11 and 12 are assigned for possible future use as GPI1 and GPI2 connections, but software support for GPI triggers has not been implemented at this time.
- To prevent damage to internal components when making connections to the tally light jacks, care should be taken that connection to Pins designated GND (Ground) are always at ground potential.

SECTION 3.9 STARTING A SESSION

If your system is not already running, power it up now to reveal the *Launch Screen*. (If it is already running, but is in the *Live Desktop*, you will need to exit, then click the large triangular *Back* button at left on the *Session Page* to return to the *Home Page*.)

The *Launch Screen* consists of two similar pages labeled *Home* and *Session*. Among other things, the *Home Page* is where you choose basic session settings (see Section 5.1 for a discussion of sessions).

The Home Page

When no previously created sessions exist, the *Home Page* defaults to *New*, inviting you to create a new session.

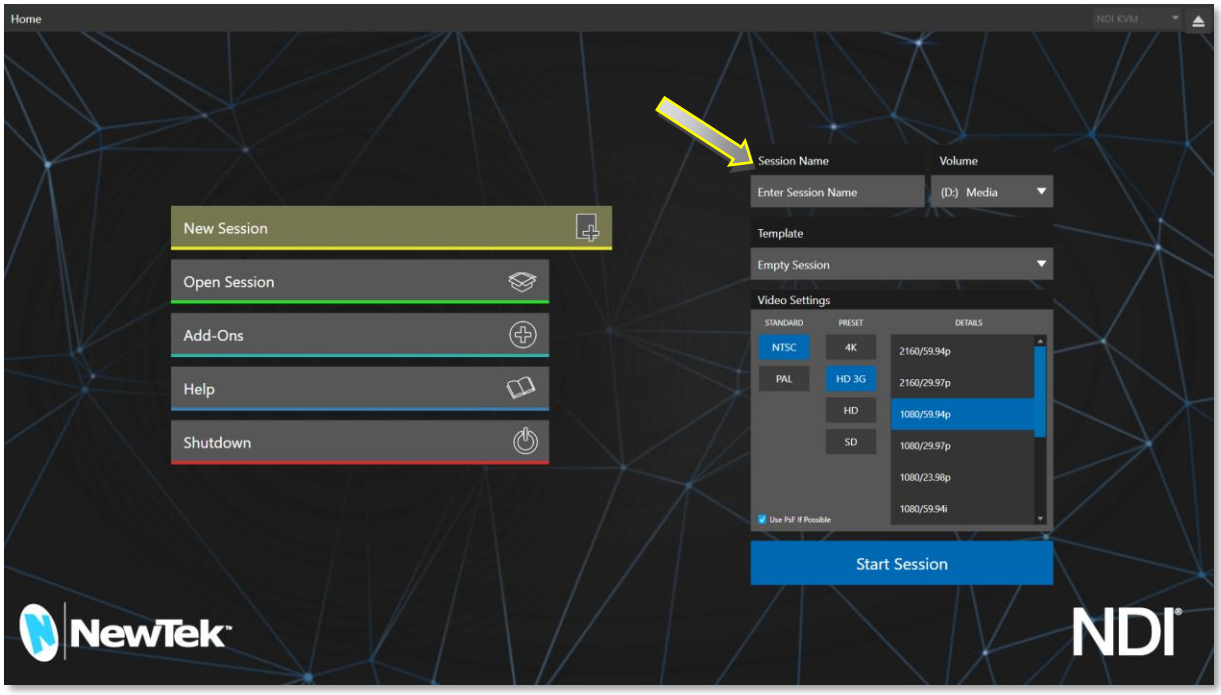


FIGURE 16

A link containing the text "*Enter Session Name*" is shown at the top of the right-hand pane when the *New* Session link is selected at left. Click in this text box to modify the default name using the keyboard if you like (otherwise, the default name will use the current date).

> *Note: A variety of optional session configurations are provided for your live production needs. You can choose either 4K (UHD), HD (High Definition), or SD (Standard Definition) operating modes. SD options include both 4:3 and 16:9 (widescreen) image aspects. You can also select between different video Standards according to your locale, choosing NSTC or PAL.*

Continue with session creation by designating the video *Standard* used in your locale. For the moment, let's click the HD 3G button in the *Preset* list, which establishes *1080/59.94p* as the session format, then click the *Start Session* link below. By default, new sessions are created on the D: (Media) drive (see Section 5.2.1 for a discussion of session *Volume* options).

THE SESSION PAGE

Clicking *Start Session* opens the *Session Page*, providing access to a number of other possibilities. For now, as our intention is to configure our connections in the *Live Desktop*), please click the *Live* link at left.



FIGURE 17

Simply click the link labeled *Start Live Production* to launch the *Live Desktop*, which is where you will spend all your time during live production.

THE LIVE DESKTOP

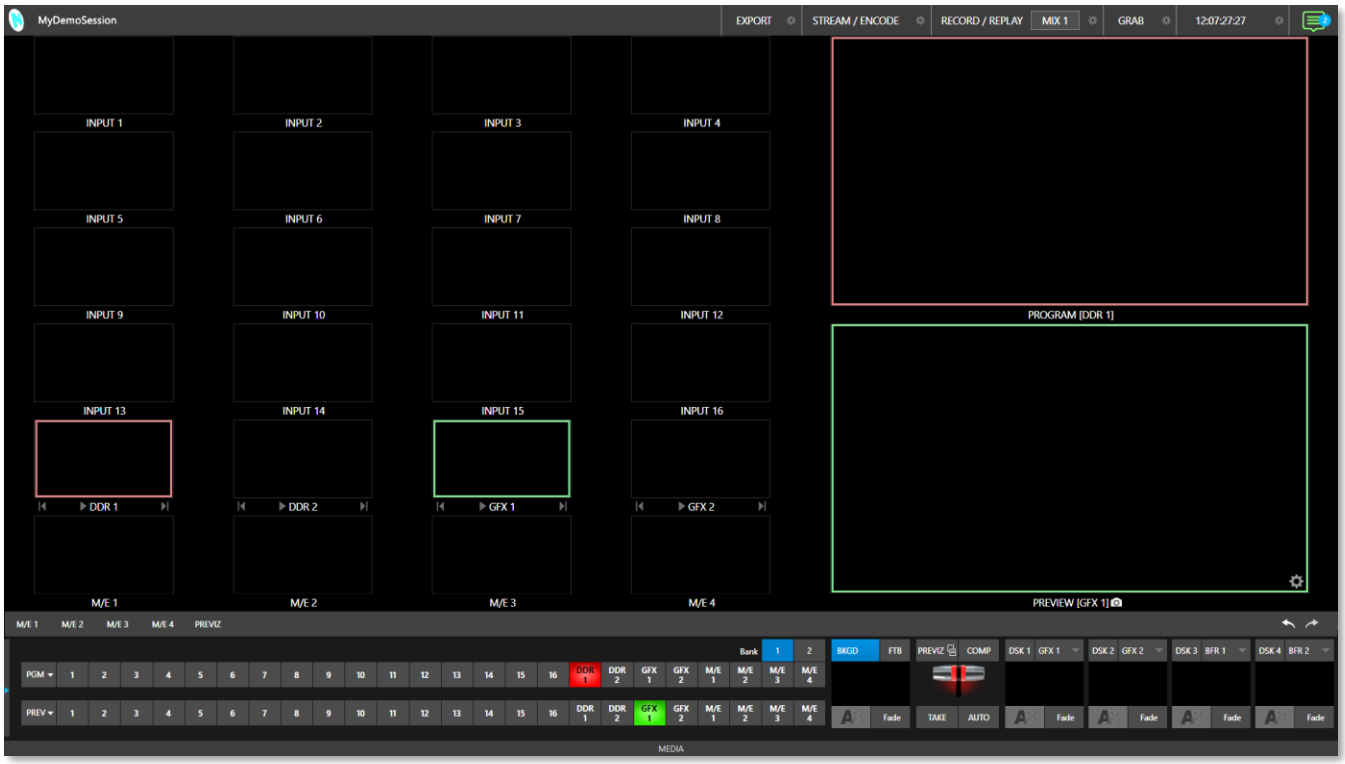


FIGURE 18 (SHOWS TC1)

Initially, as you have yet to configure input devices or add content, the *Live Desktop* will look a bit barren (Figure 18). Take a quick look around, but then let's continue to configure your devices. (We had a brief glimpse at the *Live Desktop* back in Section 2.4, but we'll examine it further in Chapter 4, Web Features, coming up soon.)

SECTION 3.10 CONFIGURE A/V OUTPUT

3.10.1 PRIMARY OUTPUTS

Complete video monitoring is provided right on the *Live Desktop* in a multiview occupying the upper section of the screen. This lets you operate without even connecting downstream video monitors or devices. (For facilities using NDI-enabled broadcast devices and systems, there would be no necessity to bother with *any* traditional connections.)

Often, though, you will want to connect external monitors or other downstream devices to the *SDI OUT* connectors of a rackmount TriCaster (see Section 3.7). In either case, you will be faced with decisions about the output formats, and audio and video sources provided to downstream systems.

For rackmount TriCaster models, the primary 'mixed' a/v outputs are presented to downstream devices by various means as depicted in the following table.

	Video Output				Audio Output				
Name	**Source**	**Format**	**SDI**	**NDI**	**Source**	**SDI**	**NDI**	**Master ch.1, 2**	**Aux ch.1, 2**
Mix 1	Selectable	Selectable	✓	✓	Selectable	✓	✓	Analog Out 1	Analog Out 2
Mix 2	Selectable	Selectable	✓	✓	Selectable	✓	✓	Dante DVS 1, 2	Dante DVS 1, 2
Mix 3	Selectable	Selectable	✓	✓	Selectable	✓	✓	n/a	n/a
Mix 4	Selectable	Selectable	✓	✓	Selectable	✓	✓	n/a	n/a

Hint: There can be many additional outputs apart from these primary ones and the Stream outputs configured in the same pane. We'll discuss supplemental outputs in Section 3.10.2.

Output configuration for TC Mini is similar, but it has two primary video outputs and these use NDI exclusively (although you can direct video output to one of the three supplemental Mini DisplayPorts, as well). Options vary by TC Mini model.

Let's take a closer look at output configuration options.

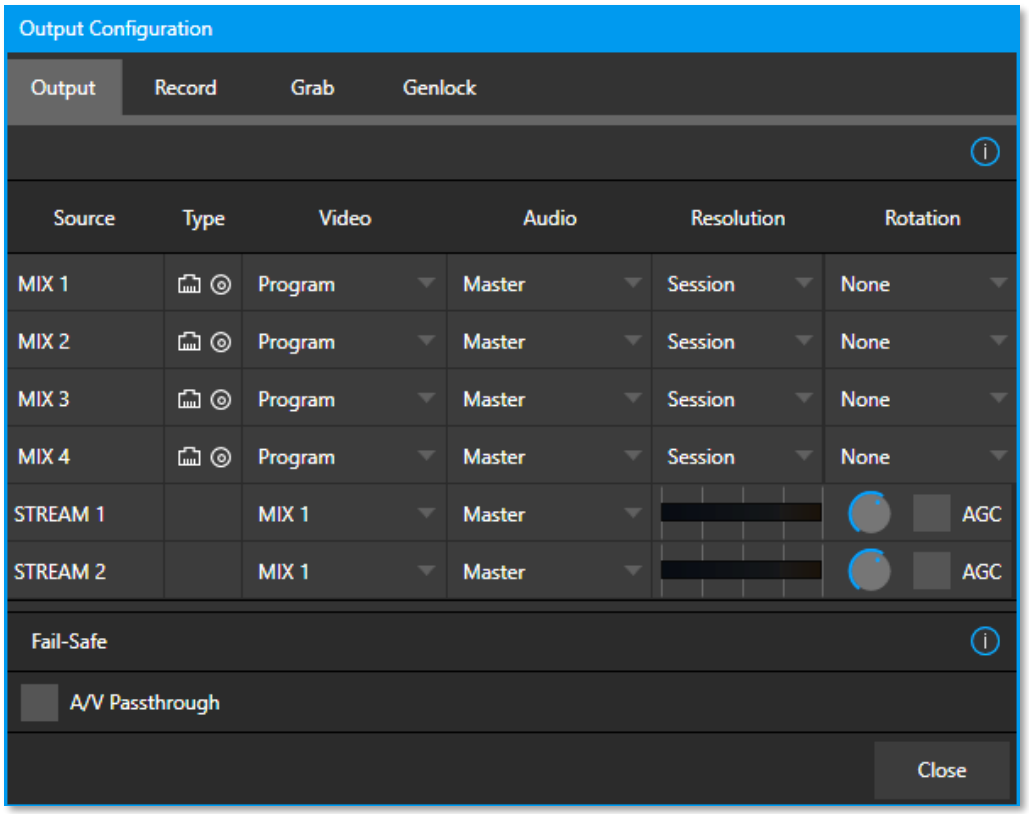


FIGURE 19 (SHOWING PREMIUM ACCESS OPTIONS)

1. Move your mouse pointer to the large *Program Output* monitor on the *Live Desktop*.

2. Click the *Configure button* (gear) that appears at lower right over the viewport to open the *Output Configuration* panel (Figure 19).

Hint: If you are using a touch interface, tap two fingers together on any viewport to open the corresponding configuration panel.

This panel hosts tabbed panes, and the first one is labeled *Output*. This is where the signals sent to each of the video output busses designated *MIX 1-4* (or *Mix 1* and *2*, for TC Mini) as well as the *Stream* output are configured. There are various decisions to make for each output:

- What video source will you assign to the output?
- What audio source will accompany it on digital connections that carry both signals?
- Which video format will be transmitted?

And so on …

Hint: Resolution and color adjustments for devices connected to the various 'monitor ports' on the backplane are located in the Display Settings panel, accessible from the Workspaces menu in the main Dashboard.

Output Channel Options

Let's review video *Source* selection first. A drop-down menu by that name permits you to select sources for the primary video outputs. The primary output connectors are identified by number in the SDI OUT group on the system backplane on rack-mount models and appear on your network as NDI sources (varies by model).

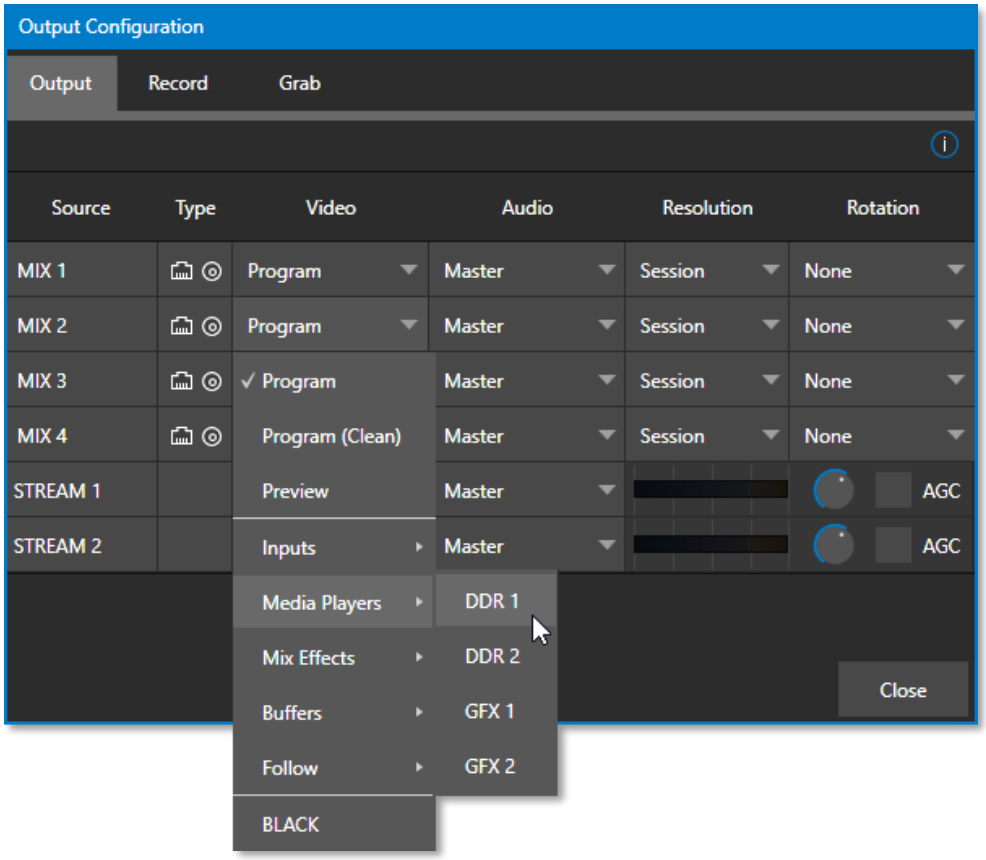


FIGURE 20

Hint: NDI sources are listed by supporting systems as machine_name (channel_name). So, if your system is named MyTC1, the 2nd output appears as "MyTC1 (MIX 2)".

Optional *Source* selections for *MIX* output channels include any of the following:

- *Program* output
  - A clean *Program* feed
- The 'look ahead' *Preview*
- The feed from any input
- Graphic or video output from a *Media Player*
- Direct output from any *M/E*
  - Clean output from any *M/E*
- Output from any of the *Buffers*
- *Follow* selected *M/E Program* or *Preview*, or a *Switcher* color group
- *Black*

Audio menu options include any of the *Master* or *Aux* mixes (audio mix options vary by model) or the sound from a selected audio input. The *Resolution* menu lets you independently configure the format for each output.

Note: See Section 8.2 for detailed information on all output options.

3.10.2 SUPPLEMENTAL OUTPUTS

The 'mixed' outputs mentioned above are just the tip of the iceberg. Direct support for internet streaming, multiviews, and recorders drastically reduce the need for 'outputs' as they are traditionally defined in this space. But this is just the beginning. Extensive NDI (Network Device Interface) options provide NewTek systems with more powerful and plentiful output capabilities than any other video mixer on the market.

FULLTIME NDI OUTPUTS

First, in addition to all primary outputs being provided as network sources (NDI), rack-mount systems provide many secondary NDI outputs. Among NDI sources provided (automatically, without any configuration steps required) to outboard systems over the network are the following:

- **Local SDI sources** – all four SDI inputs, if in use (rack-mount systems only).
- **Mix 1-4** – the aforementioned 'mixed' *Switcher* outputs
- **Media Players** – the displays from the four *Media Players* that provide visual output (varies by model)
- **Buffers** – still image output from all buffers (animated buffers are treated as still frames)
- **Multiviews** – with the NDI KVM feature enabled each monitor screen is available over NDI, with or without remote mouse and keyboard connection capabilities.

Note: Supplemental NDI outputs vary among TC Mini models.

SECTION 3.11 CONFIGURE VIDEO INPUTS

Source selection settings for video inputs can be accessed in the *Live Desktop's* monitoring section, so let's spend a few moments there before continuing.

The individual monitor viewports on the *Live Desktop* can be flexibly assigned to different *Switcher* sources and outputs. Complete monitor layouts can be stored and recalled using tools located in the *Workspace* menu, located in the *Dashboard* across the top of the screen.

We'll look into this in depth in the *Reference Section* of this manual, but for now let's configure the video sources you connected earlier (Section 3.5.1).

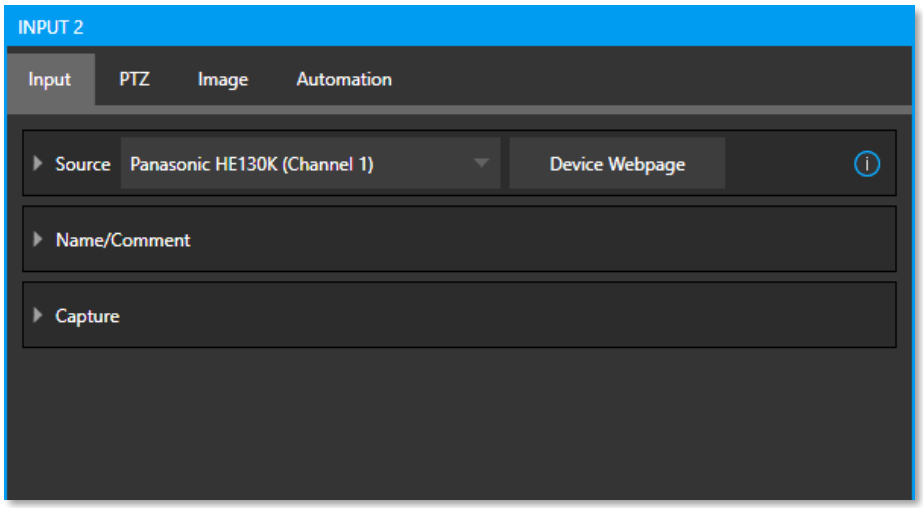


FIGURE 21

1. Click *Workspace* in the *Dashboard* (at the top of the *Live Desktop*).
2. Monitoring *layout presets* are listed at the top of the menu as *Interface A* through *D.* Select the layout labeled *A* under *Multiview 1* (if it isn't already check-marked).
3. By default, this default monitoring pane shows individual viewports for the various *Switcher* sources.
4. To continue to assign sources, you could select *Configure* from an input monitor's (right-click) context menu, but let's take a different approach.

   Move your mouse over the viewport for *INPUT 1* and notice that a *Configure button* (*gear* icon) appears at lower right. Click this to open a tabbed settings panel (Figure 21).

   Hint: As a quicker way to access the Input configuration panel, simply double-click the viewport; or, for a touchscreen, tap the viewport with two fingers.

5. Click the *Source* drop-down menu to see a list of sources you can select. SDI inputs (not a TC Mini feature) and *Black*, along with *Skype TX Caller* connections (count varies by model) are listed first under the *Local* heading. Additional NDI sources discovered on your network are grouped below under source device headings.

For NDI sources, simply selecting completes the connection. If you choose an SDI source, further selections may be required.

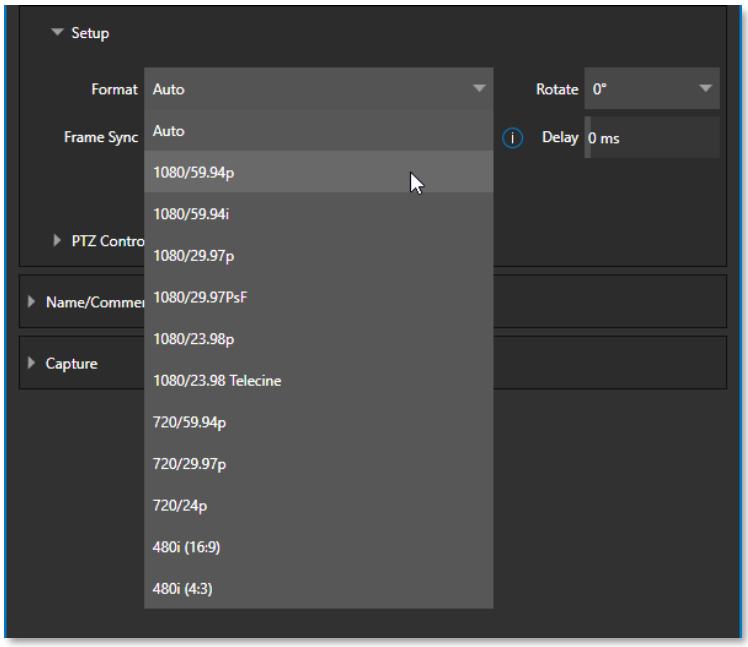


FIGURE 22

6. The *Format* menu defaults to *Auto-Detect*. Generally, this option will suffice. Otherwise, for SDI sources you can manually select the correct *Format* (Figure 22).

7. Close the *Configuration* panel for now (click the *Close* button, or simply 'click outside' the panel to close it).

8. Continue to configure additional video sources in the same manner.

We'll look at the other options and settings later, but at this point you should be able to view the video inputs you have configured on the *Live Desktop* multiview monitors.

3.11.1 CONFIGURE A VIDEO ROUTER INPUT

Right-click on the *Switcher* row button for the video input where the router is connected (see Section 3.5.2 for more detail) to select which router input will be transmitted to the *Switcher* input.

Note: Not a TC Mini feature.

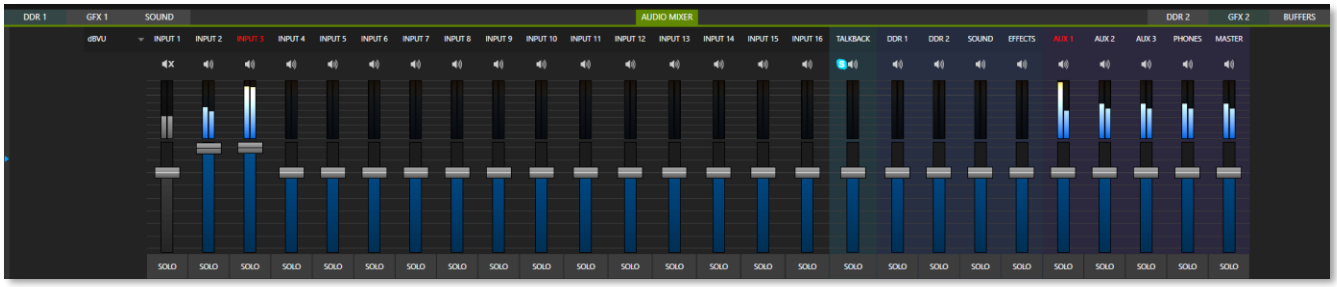


FIGURE 23

Click the *Audio Mixer* tab (centered in the lower third of the *Live Desktop)* to reveal audio features, including configuration controls for all internal and external audio sources and outputs, including streaming.

In addition to internal sources and outputs, the *Audio Mixer* supports up to sixteen (varies by model) external audio source connections, which can each be assigned to a nearly endless list of audio source types.

Each input and output has its own control column with *Volume* slider(s), VU meter(s), and other convenient features. An identifying label sits at the top of each control panel. Roll the mouse pointer over the label to reveal a *Configuration button* (gear) at right which, when clicked, opens the *Configuration* panel for the input (Figure 24).

In this latter panel, click the *Connection* menu to display options for an input. You will see the local hardware inputs listed in the *Local* group as "IN 1", "IN 2", etc.).

Local connections can be assigned to 'listen' to either an SDI embedded audio source connected to the corresponding video input, or analog audio inputs provided on the unit (varies by model). Choosing a local hardware audio source causes another menu to be displayed at right, which is where you can choose whether to connect to sound from the *Embedded* (SDI) or analog hardware input (Line or Mic level, varies by model).

Note: Analog audio levels conform to SMPTE RP-155. The maximum input/output level is +24 dBu and the sample rate is 48 kHz.

Beyond this, you have the option of assigning the audio delivered over the network from any NDI or other supported network audio source (such as Audinate's Dante™ sources) available on the system.

Returning to the audio *Input Configuration* panel, note that it holds both basic and advanced audio features. In

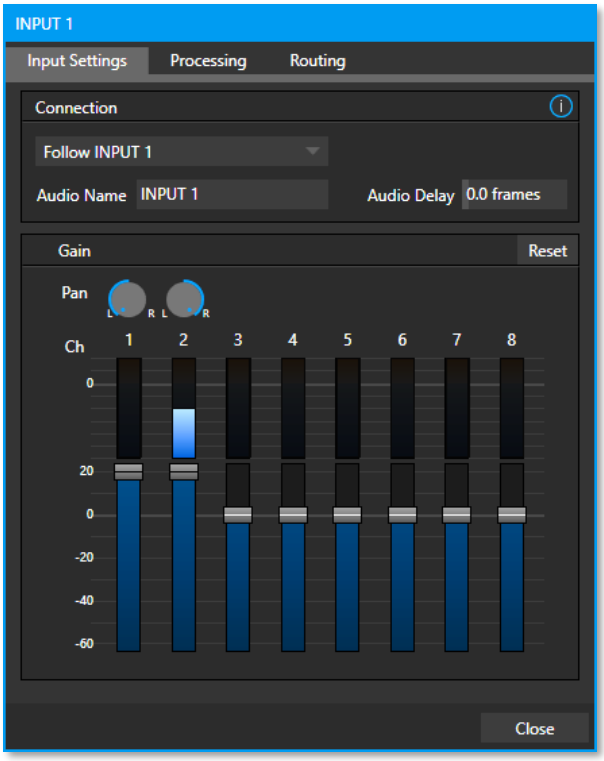


FIGURE 24

the former category, volume sliders are provided below *VU meters* for each audio source and output. Source sliders default to their 0dB gain setting on first launch. After adding audio sources, adjust these sliders as required.

Hint: Most numeric controls in the interface can be reset to their defaults using Shift + double-click on the control knob. The default value for Gain sliders is 0dBVU.

AUDIO HEADROOM

In digital audio systems, levels exceeding 'legal' values are 'clipped' (uniformly assigned the maximum value). This results in audible issues that cannot be easily corrected later. For this reason, it's customary to configure normal operating level (also referred to as the 'alignment level', and sometimes, 'nominal level') well below the clipping limit – sufficiently so that occasional excessively loud sounds (say, loud laughter or applause) can be accommodated without risk.

This range above between nominal level and the highest *possible* level is commonly referred to as 'audio headroom'. What is considered a suitable headroom allowance can vary from one locale to another, in different industry applications, and even in individual studios. NewTek systems follow well-established audio conventions, providing 20dB of headroom above nominal level (+4dBu at 0dB on the VU scale).

Hint: Confusion can sometimes arise because different calibration scales are common in various audio realms, and even for different device types and software.

For example, analog mixers commonly show levels on VU scales indexed as just described. In contrast, digital devices and editing software usually display levels in dBFS (Decibels Full Scale) with 0dBFS – the absolute maximum signal level that can be recorded – at the top. NewTek VU meters have selectable indexing, allowing you to view a traditional dB VU scale or dBFS as you please (see Section 15.9.1).

Whatever scale you choose, use *Volume* controls (and, for *Mic* connections, the *Gain* controls in the *Configuration panel*) to avoid over-modulation. The *Compressor/Limiter* feature (also located in the *Audio Configuration* panel) is another powerful tool to help you prevent clipping – see Section 15.10.

SECTION 3.13 CONFIGURE GENLOCK

Enable and configure this feature (not supported on TC Mini) as follows:

1. If the *Live Desktop* isn't already open, launch a live production session from TriCaster's *Home* page.
2. Access the *Output Configuration* panel by double-clicking the (*Live Desktop*) *PROGRAM* viewport.
3. Click the *Genlock* tab (Figure 25).
4. The default *Reference Type* in the *Genlock* settings group is *SD (Bi-level)*, as this is currently the most common reference signal type. However, if you supply an HD reference signal to the Genlock input, you may want to change the setting to *HD (Tri-level)*. Please note that 1080/59.94p Tri-level genlock signals are not supported.
5. With the aid of downstream *Waveform* and *Vector Scopes*, adjust *Horizontal* and *Vertical Position* and *Phase* settings in the *Genlock* section of the *I/O Configuration* panel.

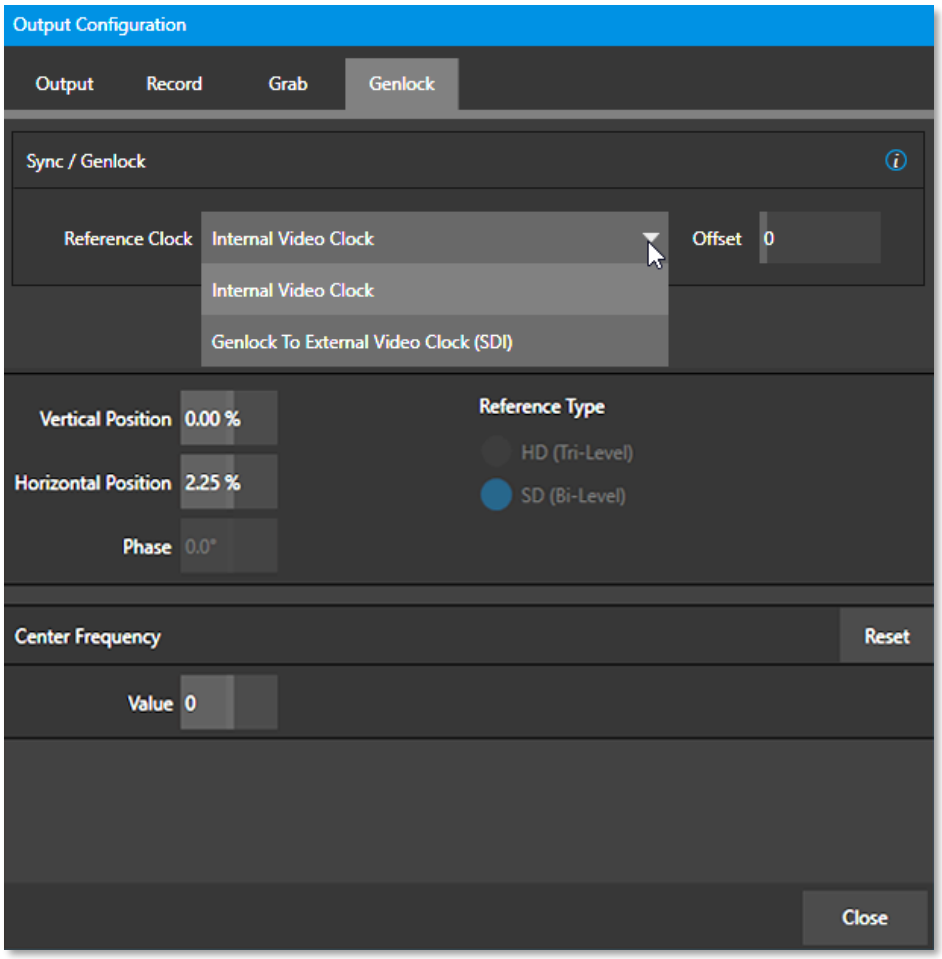


FIGURE 25

Ideally both the cameras and your NewTek system's output should be genlocked. If they are not genlocked to the same reference signal, by default the *Switcher* will automatically apply a TBC (Time Base Correction) operation. (Time base correction may drop or insert frames as necessary to maintain sync, hence is a less desirable approach.)

When genlocking is active and properly configured, the timecode in the *titlebar* will display in green.

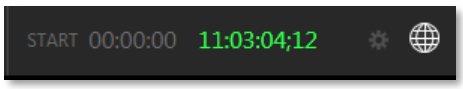


FIGURE 26

Note: For a deeper discussion of genlocking, please see Section 8.2.3.

SECTION 3.14 NETWORKING

Of course, the system provides extensive support for NDI sources and outputs across a network. Few will be surprised to find that this next generation feature requires your system to be connected to the network. ☺

TC1 has two Gigabit ports, as does TC Mini. Generally, simply connecting a suitable cable from an Ethernet port on the backplane to your local network is all that is required to connect to a *local area network* (LAN). In some settings, additional steps may be required.

You can access the system *Network and Sharing* control panel to accomplish more extensive configuration tasks – see *Settings: Configure Network* under the heading *Administrator Mode* in Section 5.2.4. If further help connecting is required, please consult your system administrator.

The next section (Chapter 4, Web Features) will introduce you to online tutorials, training materials and other assets to guide you through your learning experience.

Note: NDI Input supports dual network cards allowing for an even greater degree of quality when using NDI sources across your network. Some NewTek Live Production products facilitate this by design, in other cases you may need to add a USB3 network adapter. This feature is not available for Apple or Linux NDI enabled systems or mobile devices.

Chapter 4 WEB FEATURES



This chapter provides information meant to guide you to other resources that will introduce the major components and functions of your NewTek system. This includes extensive online training resources, friendly and helpful online communities, web-based external control, and more. More detailed reference material on all aspects follow in Part II (Reference).

Having made the essential external connections in the previous section, you'll want to start your first practical live production session, and skim through some important fundamentals. This would be a good time for us to introduce you to a special feature of your system: TriCaster has its very own webpage. Premium Access members also enjoy a web-based control system, referred to as LivePanel.

SECTION 4.1 PASSWORD PROTECTION

First though, let us note that (for security reasons) features that can control your production over the network are under password protection by default (initially, the username and password are both set to "admin").

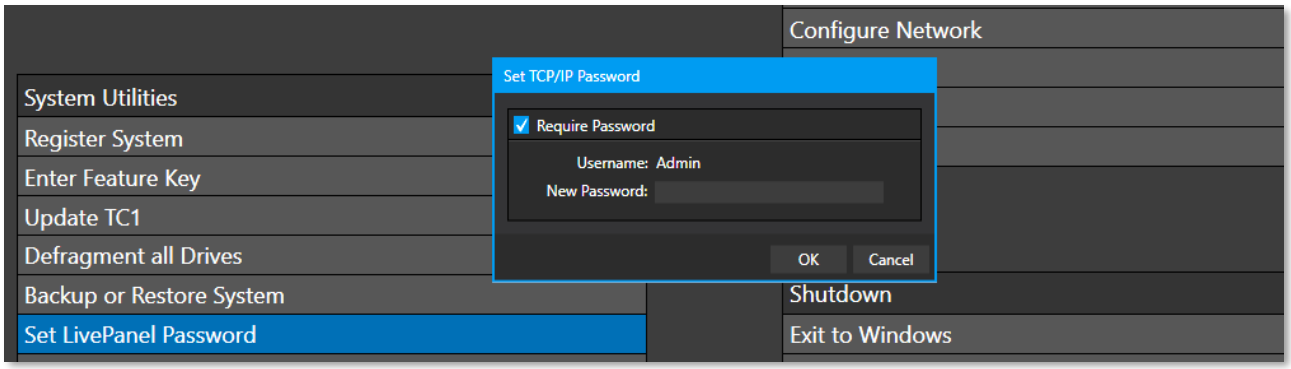


FIGURE 27

To enable or disable this security feature, or to modify the password, select *Administrator Mode* from the *Shutdown* menu on the *Home Page* main menu in the *Launch Screen*.

SECTION 4.2 RESOURCES

The basic webpage system provided by all TriCasters primarily features a Resources page, discussed shortly in the context of the more sophisticated LivePanel implementation (included with Premium Access membership, and available from the NewTek Store). In addition to the Resources page, you will find pages listing system keystroke shortcuts, as well as a reference to system.

Having launched a session (refer to Section 3.9 if you need a refresher), click the *Notification* button at extreme upper-right in the *Dashboard* at the top of the *Live Desktop*.

Click this to open the *Notification Pane*, and then click the *Web Browser* button in the footer of that panel to view the webpage in a local browser.



FIGURE 28

IMPORTANT NOTE: This view is provided so you can preview the NewTek LivePanel features. It is not intended that you use the NewTek LivePanel web apps in a browser running on the local system.

To view the LivePanel webpages externally instead, simply connect any suitable device (be it a laptop, tablet, or desktop computer) to the same network, open this external device's web browser and navigate to the URL shown beside the *Web Browser* button.

Hint: Access to LivePanel does not require an external Internet connection, though some of the links provided on the Resources page will fail without one.

Please note that *LivePanel* is a paid option for most TriCasters with Premium Access. When it has not been enabled, *LivePanel* will offer the *Resources* and *Keystrokes* pages only.

The *Resources page* is always available, and – by virtue of links to online documentation and assets – and thus is also always up to date and relevant. You can, for example, access the Resources page from an iPad® or other mobile device to follow along with the steps outlined in an online video tutorial or to view details of a feature in the *User Guide* while operating live.

4.3.1 VALUABLE CONTENT

You'll notice different types of content grouped under the following headings on the *Resources* page:

- **Documentation**
  - *Version Introduction* – a brief overview
  - *User Guide* – the document you are reading
  - *Automation and Integration Guide* – provides a wealth of information pertaining to all aspects of macros and automation features, along with discussions of third-party solutions and topics related to integrating NewTek live production systems into your studio pipeline.
  - Animation Store Creator and Virtual Set Editor Guides
- **Training** – online video tutorials and Operator Certification programs.
- **Extras** - updates, codecs, utilities, and the NewTek *DataLink* browser extension.
- C**ommunities** – forums, blogs, YouTube® videos, Facebook®, and more …
- **Support** –Customer Service and product protection programs.

The 'hamburger' menu at left in the titlebar of TriCaster's web page provides access to additional web assets, including:

- **Preview Presets** – which among other things provides a very convenient extension to TriCaster's PTZ control features.

- **Shortcut Commands** – a categorized listing of shortcut commands for use in macros or custom network control systems.

SECTION 4.4 VIDEO TRAINING

NewTek is in the video production business, and it couldn't be more appropriate for us to provide online classes to help you get the most out of your system. NewTek University provides an opportunity to gain the skills and knowledge you or your team need to succeed. Classes range from 3Play Operation to Live Production with TriCaster to NDI and Performance Media Networking. Also included are a sample of NewTek University online classes with several free courses.

Visit our webpage to find more or see our YouTube channel takes you to a long list of tutorials for NewTek products designed for all users, novice, or adept. From initial product registration to live production, streaming and exporting to social media services, to advanced topics such as *M/E*s, *Tracking, Hotspots* and *Automation*, you'll find it illustrated and explained here.

It's very likely that you will be able to easily learn the basics of live production with NewTek systems by viewing these videos. When you need deeper knowledge, you will find Part II of this guide, the Reference section, helpful.

Hint: Generally, thanks to the considerable consistency across the NewTek family of products, you will be able to benefit from tutorials prepared for any model.

SECTION 4.5 OPERATOR CERTIFICATION

NewTek's official Operator Certification program might interest you too, both as a way to obtain relevant skills and knowledge as well as to assure potential clients that your attainments have been validated and recognized.

PART II (REFERENCE)

A thorough examination of the various aspects of your NewTek system. Every button, menu item, feature and control is considered in this section, so you can take full advantage of your system.

Chapter 5 THE LAUNCH SCREEN



The Launch Screen is the gateway to a suite of applications as well as maintenance and management features for both sessions and the system. We'll discuss each of these in the pages that follow, beginning with a review of the concept of sessions.

The Launch Screen's *Home Page* appears whenever you launch your TriCaster. From this screen you will create and launch *sessions*, then choose what sort of operations you wish to perform within it by selecting a link on the (similar) *Session Page*.

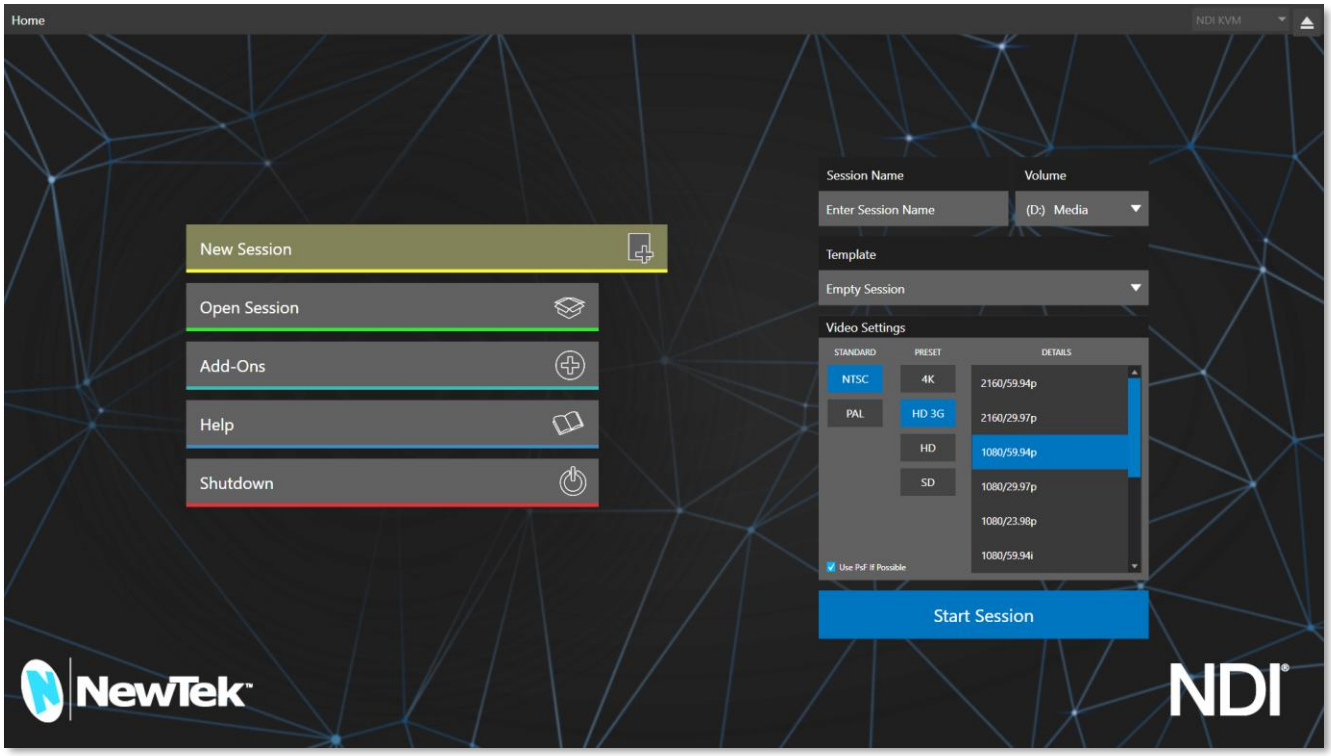


FIGURE 29

Your intention may be to begin a new live production, or to produce another episode of a live series. Perhaps you wish to prepare title pages for an upcoming event or perform system maintenance. We'll look into each of these in turn, but first let's consider a fundamental production concept, the *session*. What is a session, and why are sessions both important and valuable to you?

SECTION 5.1 INTRODUCTION TO SESSIONS

Any production involves a specific operating environment. The *session* is where TriCaster stores the details of that environment. Obviously, then, configuring session settings properly is important:

- What broadcast standard is used in your locale? Is it *PAL*, common in Europe among other places, or perhaps *NTSC*, standard throughout North American?
- If your task includes SDI cameras or similar SDI sources, what video format do these sources supply?
- Are cameras connected using hardware inputs, NDI, or a mixture of both connection types?

As you continue, you may make other adjustments relevant to your current production requirements:

- You might adjust cameras using the *Proc Amps* provided in *Input Configuration* panels.
- If your production plans include the use of greenscreen staging, you will doubtless adjust the *LiveMatte* settings for one or more cameras to provide optimal keying.
- Perhaps you will use Workspace *Display Settings* to adjust the preview monitor color characteristics.
- What are your output device connection preferences?
    - What video mixes and other internal sources do you want to route to which outputs?
    - Do you intend to configure a connection for a projection system? What external audio connections and adjustments are required?
- You might create a playlist of custom title pages in a *Media Player*, along with additional graphic elements for the *Buffers*.

During the course of the actual live production, you may perform further fine-tuning, and also add to the media content used in the presentation:

- You might grab a series of still images from *Program Output*.
- Or record video clips from the production for replay.
- And capture the network *Stream* output as a file.

The list of adjustments, activities and assets involved in a specific production goes on, but the main point to grasp is that the *session* is comprised of all of the above collectively. If you do not deliberately delete the session, all of your session media and all of your session settings are ready for immediate recall and re-use.

When you re-open an existing session, it's just as if you were continuing an earlier event. Thus, if you return to the same venue another day under similar conditions, simply re-open your prior session and you are virtually ready to go. (Of course, it's the professional course of wisdom to test *everything* before beginning any event.)

Finding your files – automatically.

Typical sessions include many media clips, along with graphics, titles, and buffers. Naturally, users must ensure make sure that all of media required is on hand for the session.

To help with this task, the system will automatically locate the necessary media, even when drive settings have been changed on the system (as, for example, when a session backup has been restored onto different drives compared to the original setup).

Naturally, you can store multiple sessions and re-open them freely. This greatly simplifies management of files associated with producing unique programs, and easily accommodates different users with their own individual requirements and preferences.

SECTION 5.2 THE HOME PAGE

Having discussed sessions, let's go on to consider how sessions are created, and how you choose which one to work on. These items, along with a few other top level functions, are found in the *Home Page*.

This primary screen is the first thing you encounter after launch. It is dominated by the main menu shown in Figure 30.

Choosing a link from the menu updates the right-hand pane of the *Home Page* to provide options and controls related to your choice.

For example, the first thing you will likely do on launching a brand new unit is create a session.

In anticipation of this, the *New* icon is pre-selected automatically whenever there are no existing sessions. This results in the relevant session options being displayed at right, as shown in Figure 31.

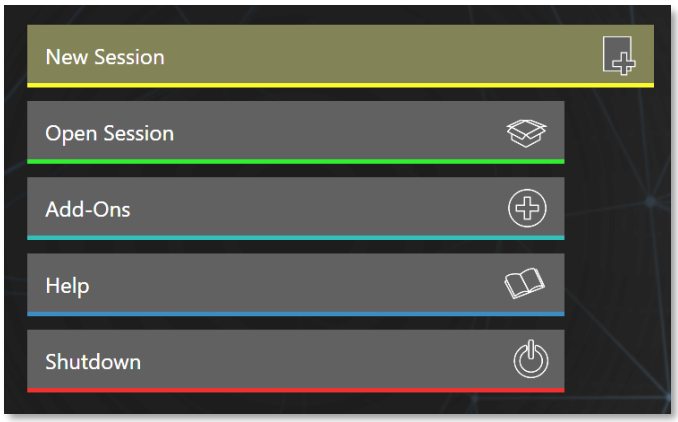


FIGURE 30

5.2.1 NEW (SESSION)

As just mentioned, clicking *New* on the link populates the pane at right with related options.

Principally, for each session you must designate (by selecting switches) your local video standard.

- Select NTSC or PAL
- Select a session format, whether by clicking one of the convenient Preset buttons, or making a manual selection at right (such as 1080/59.94p)

SESSION NAME

You will see a name field for your session listed above the options pane on the right. You can click in this field to modify the default name (which will be the current date) using the keyboard.

TEMPLATE

The *Template* drop-down menu lists all sessions currently available on the system. If you select an entry, the session you create subsequently retains all settings of the source session.

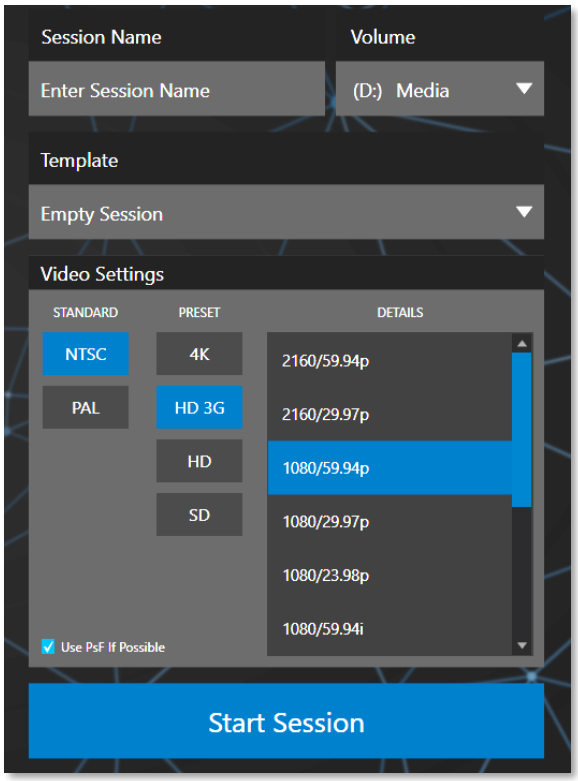


FIGURE 31

VOLUME

A menu labeled *Volume* appears just right of the *Session* name. This selection designates a primary hard drive for the session (and its associated content) to be created and stored on.

> *Note: When using internal IsoCorder™ capture modules to record multiple sources, you may assign more than one volume to capture duties. Sessions track recorded clips too, providing easy access to them for live use.*

Suitable storage volumes that are detected are listed in a drop-down menu when you click on the *Volume* control. You can select any volume shown as the session drive, though external drives are not recommended for active use as session drives.

FORMAT AND OUTPUT CONSIDERATIONS

Remember that for live production, you can simultaneously supply both SD and HD output for *either* SD or HD sessions. The session setting does have some significant ramifications, though. For example, if your session format is SD 4:3, this is the file format captured by the *Record* function when capturing *Program* output – even when the video cameras supplying your inputs are HD; and the opposite is also true.

> *Note: See Section 8.2 for more information on Video Output configurations.*

Having made your selections, you would normally click the *Start Session* button at lower right to launch the *Live Desktop* – but first, let's explore a few other features of the *Home Page*.

5.2.2 TITLEBAR TOOLS

EJECT



FIGURE 32

An *Eject* button at the top-right corner of the page allows you to safely disconnect external drives. (Drives can also be ejected from *the Live Desktop.*)

> *Note: Media configured as Read Only is not shown for the New or Open (session) features, since they cannot be used for sessions. However, Read Only media can be used for import purposes.*

5.2.3 NDI KVM

KVM is an abbreviation for "keyboard, video and mouse". You will notice an NDI® KVM menu just left of the Eject button. This feature leverages NDI protocol to provide superb KVM functionality, giving you complete control of your system from anywhere on the network where you can run the Windows version of NDI Studio Monitor.

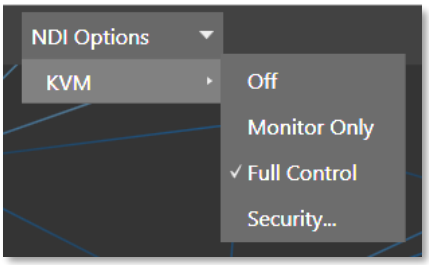


FIGURE 33

To enable this feature, go to the Launch screen's Home page, and use the titlebar *NDI KVM* menu (Figure 33) to select which operating

mode you wish to apply, choosing between *Monitor Only* or *Full Control* (which passes mouse and keyboard operations to the remote system).

Use the *Security* option in this menu to apply *NDI Group* control to limit who on your network can view the *NDI KVM* output from the host system. To view the output from the remote system and control it, select the machine's NDI output in the *Studio Monitor* application supplied with the free NDI Tool pack, and enable the KVM button overlaid at upper-left when you move the mouse pointer over the screen.

You can select to view or control the User Interface or another *Multiview*, or both with multiple instances of *Studio Monitor* (Figure 34) open on the receiving unit.

Hint: Note that Studio Monitor's KVM toggle button can be relocated to a more convenient spot by dragging.



FIGURE 34

Note, too, that this feature gives you a great way to multiple your *Multiviews* around your studio or campus. You can even use these displays as video sources for another NDI-enabled system. System audio will also pass to the receiver, and you can even copy and paste text between the two systems.

With the User Interface running full screen in *Studio Monitor* on a receiving system, it's hard to remember that you're controlling a remote system. Even touch is supported, meaning you can run the User Interface output on a Microsoft Panel system for portable touch control over your entire live production system.

Hint: To learn about using NDI KVM with audio, see Section 15.4.2 NDI KVM Audio

OPEN (SESSION)

If there are existing sessions on the system, the main menu at left on the *Home Page* will default to *Open* (Figure 35). Clicking *Open* causes the *Sessions List* to appear at right. This pane lists all sessions stored on currently mounted storage media.

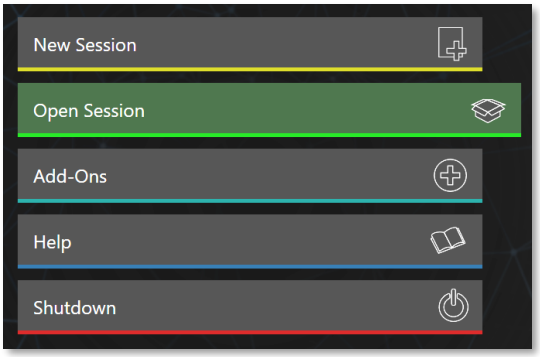


FIGURE 35

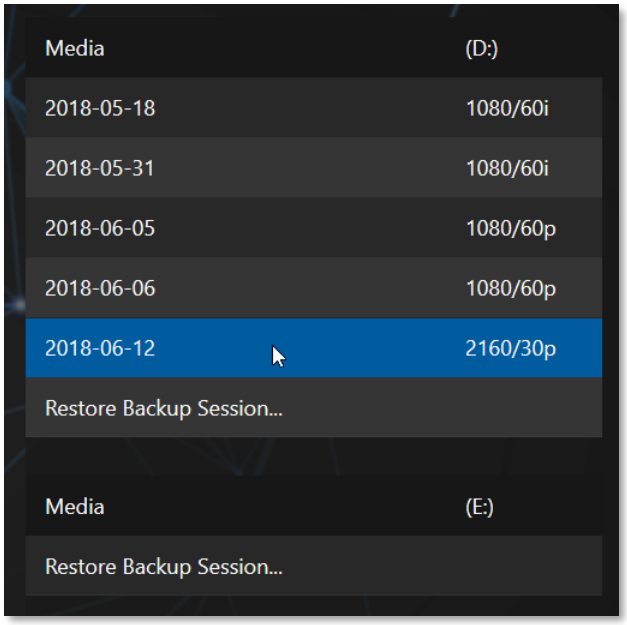


FIGURE 36

Available sessions are grouped under the names of the storage volume they are located on (Figure 36). The listing shows the *Session Name* and *Format* for each session, on each drive. Let's look at the *Sessions List* briefly before we open a session.

AUTO-LAUNCH SESSION

Normally, a few seconds after launch, TriCaster automatically reloads the last session you were in, allowing you to basically power up into the last session unattended. You can, of course, interrupt this process by selecting another session or pressing any key. Advanced users can modify this behavior, either by designating a specific session to auto-launch irrespective of the most recent manual selection, or by disabling the feature entirely.

> *Important Note: Modifying this feature requires changes to the Windows® registry. We strongly recommend that edits to the registry be performed only by experienced persons, as the system can be rendered inoperable if this is done improperly.*

To do this, add a new value named *auto_launch_session* to:

HKEY_LOCAL_MACHINE\SOFTWARE\NewTek\XD\Admin Screen

Set its value data to the name of an existing session, and that session will auto-open on launch (instead of the 'last open' session). If the specified session does not exist, the auto-launch feature will not proceed, by

setting *auto_launch_session* to "_Disabled" (or some other suitable string) rather than a real session name you can effectively disable auto-launch.

CONTEXT MENU

Right-click a session name to open a context menu with two items listed in it: *Rename* and *Delete*. Be aware that the *Delete* function should be used thoughtfully, as it cannot be undone.

All content stored in the named session's folders will be deleted, including imported clips, images and titles, any clips captured to the default session folders, and even *LiveText* project files created within the session (unless you have deliberately saved the projects and related files to locations outside the session folders).

Note: Content that is not local to the session, but which was used in it is not deleted. For example, you may have added still images to your playlist directly from a USB thumb-drive, doing so without importing the files into the session. Those external files will not be deleted.

RESTORE SESSION BACKUP

In another section of the *Launch Screen* (*Session Page>Manage*) there is a feature that allows you to back up the current session to another storage volume.

The *Restore Session Backup* link at the bottom of the *Session List* (for each drive) is provided to complement this feature. To restore a session you have previously archived, click *Restore Backup Session* (Figure 36), and use the file explorer provided to select a *SessionBackup* file.

Click *Open*, and a progress gauge will track the restoration process. In due course, the newly restored session will be added to the *Session List* for the specified drive.

Hint: Restoring a session that has a lot of content can take considerable time. Be judicious, then, if considering a restoration shortly before a scheduled live production.

Administrator Mode – the *DMZ…*

It's worth considering why this mode is provided. Your NewTek system plays a central role in your video productions. Though technically 'a computer', it is un-wise to expect it to serve 'dual-duty' as both a live production system and a general purpose computer.

Administrator Mode serves as a demilitarized zone between the live production system and host operating system.

It is important not to burden your system with software or accessories that compromise its performance or reliability. The Administrator Mode screen provides access to key settings and options, while limiting exposure to system options that could have that sort of negative impact.

OPENING A SESSION

Click or tap a name in the *Session List* to launch that session and display the *Sessions Screen*.

5.2.4 SHUTDOWN

This selection provides *Restart, Shutdown,* and *Administrator Mode* links. The first two options are presumably self-explanatory, but the latter deserves a bit more discussion.

ADMINISTRATOR MODE

Selecting *Administrator Mode* from the *Shutdown* menu on the *Home Page* exits the live production environment and takes you to a new screen (Figure 37) that offers various functions and settings having to do with system maintenance and management.

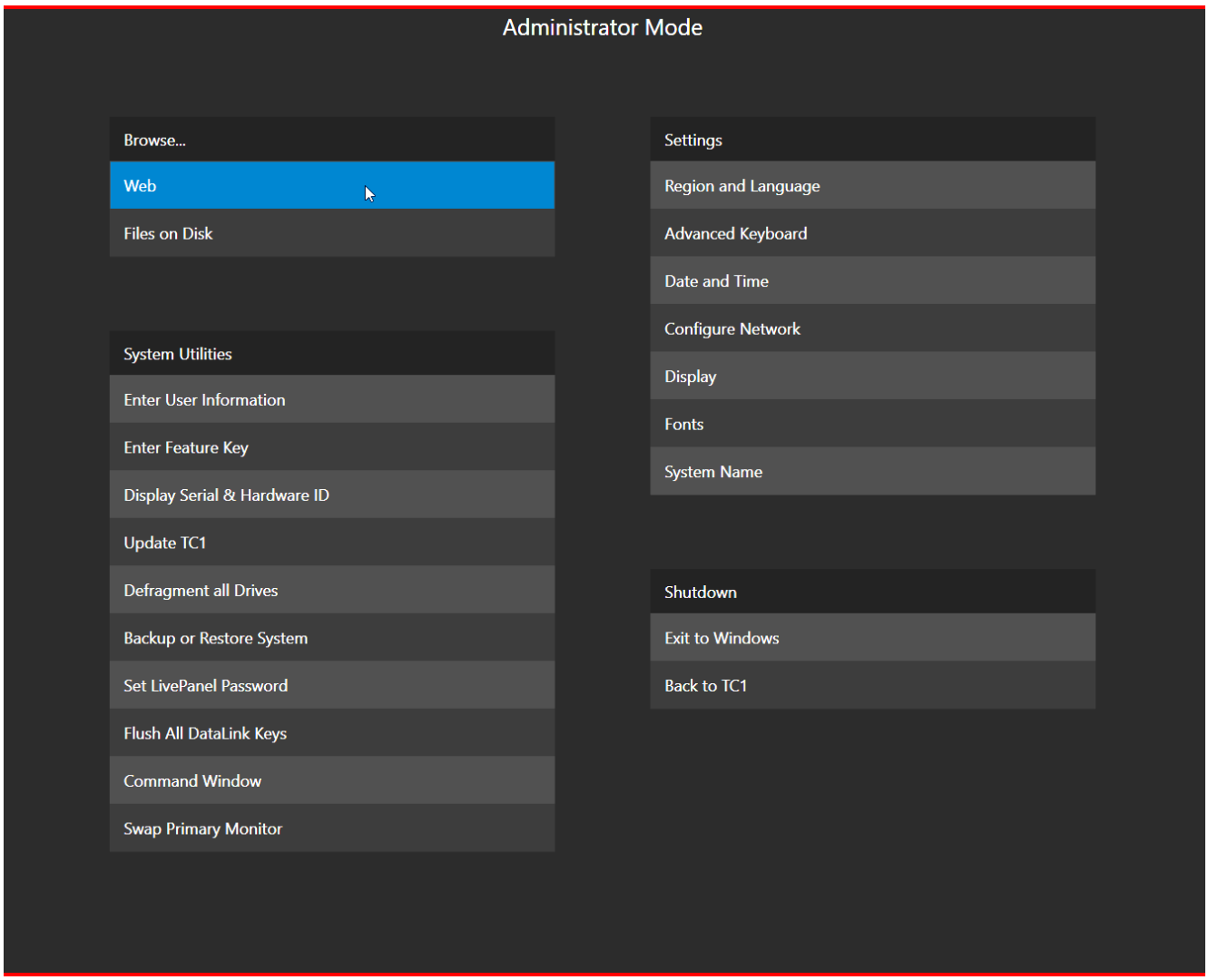


FIGURE 37

*Administrator Mode o*ptions are grouped under several headings, as discussed next.

BROWSE

- *Web* – Opens the default system Internet browser.
- *Files on Disk* – Opens a system file window.

- *Enter User Information* – the system shows a watermark on output before registration, so we encourage you to register early. Among other reasons, doing so will serve to identify the unit to NewTek as yours in case of theft, and will also allow you to check for software updates that may have been recently released. (The steps in the registration process were outlined back in Section 3.2, so we won't repeat them here.)

- *Enter Feature Key* – This link allows you to enable optional features.

- *Display Serial and Hardware ID*

- *Update* – NewTek may periodically provide software updates. Updates can enhance performance, security or even add useful new features. If the unit is connected to the Internet, clicking *Update* takes you to the *Updates and Downloads webpage* where you can locate the most recent software version.

  Having done so, you can download and run the *Auto Updater* for the new version, or use the *Download Tool* option, which allows you to store the related files on another system for later transfer to your NewTek live production system.

- *Defragment all Drives*

  Over the course of lengthy use, data on hard drives devoted to audio and video storage tends to become fragmented, which degrades playback performance. Defragmenting will correct this condition.

  You could think of your hard drive as being like a shelf in your library. As time goes along, the shelf fills with books. Some are quite large, others smaller – just as media files may be larger or smaller.

  As time goes along, you decide to remove books you have finished using from the shelf, to make room for new additions. You remove a book here, another there, opening gaps between the remaining books.

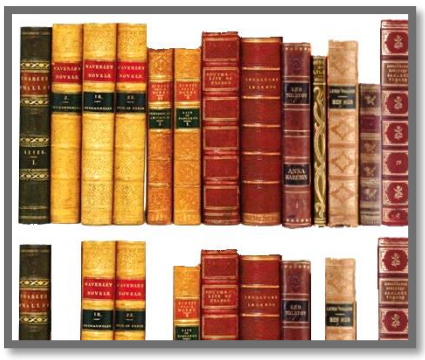
  

  FIGURE 38

  This makes some shelf space available by creating gaps between the remaining books. Sadly, another large new book may be too big to fit in any one of the gaps.

  A foolish librarian might tear the new book into smaller sections, just big enough to fit into the open spaces on the shelf. This would obviously be unwise. When you wish to refer to the book later, you will waste a lot of time locating and assembling its sections before you can access it.

  How much better it would be to slide the remaining books closer together, combining all the free space first. Unfortunately, computers are 'foolish librarians'. They tend to want to fill in all the gaps

in their storage areas, even if this requires literally shredding your 'book' (large video files from your sessions) into tiny fragments.

Defragmenting the storage volume has the same effect as sliding the books together, resulting in one or more larger gaps. The result is that the system doesn't have to frantically search in many different places to assemble the video streams from your recorded session.

Hint: Defragmentation can sometimes take considerable time, so it's not something you want to begin just before an important event.

- *Backup* or *Restore System* – A complete set of *Backup* and *Restore* features are available to help in the event of an unforeseen problem. We strongly encourage you to protect against any unforeseen occurrence by using the *Backup* feature soon after registering.

- *Set Live Panel Password* – Configure the password for access to the web pages and network control features provided by the unit.

- *Command Window* – Open a system command line window, allowing you (among other things) to use advanced commands to manage your system and network settings.

- *Swap Primary Monitor* – The *Live Destkop* will appear on the monitor designated as primary.

SETTINGS

- *Regions and Language* – Open the system language control panel.

- *Advanced Keyboard* – Open the system keyboard controls panel.

- *Date and time* – Open the system keyboard controls panel.

- *Configure Network* – Open the system network controls panel.

- *Display* – Open the system display controls panel (useful for configuring multiple monitors, among other things).

- *Fonts* –Open the system font management console, allowing you to add that new font your client wants you to use for their title pages.

- *System Name* – It can be very useful to modify the default name by which your system is identified on the network. This is especially true when more than one unit might be on the same network. The *System Name* feature opens the System Properties console's Computer Name tab. Click the *Change* button to modify the current name.

SHUTDOWN

- *Exit to Windows* – Leave the *Administration Mode* screen and display the standard system desktop.

- *Back to* (TriCaster) – Exit *Administration Mode* and return to the *Launch Screen*.

5.2.5 HELP

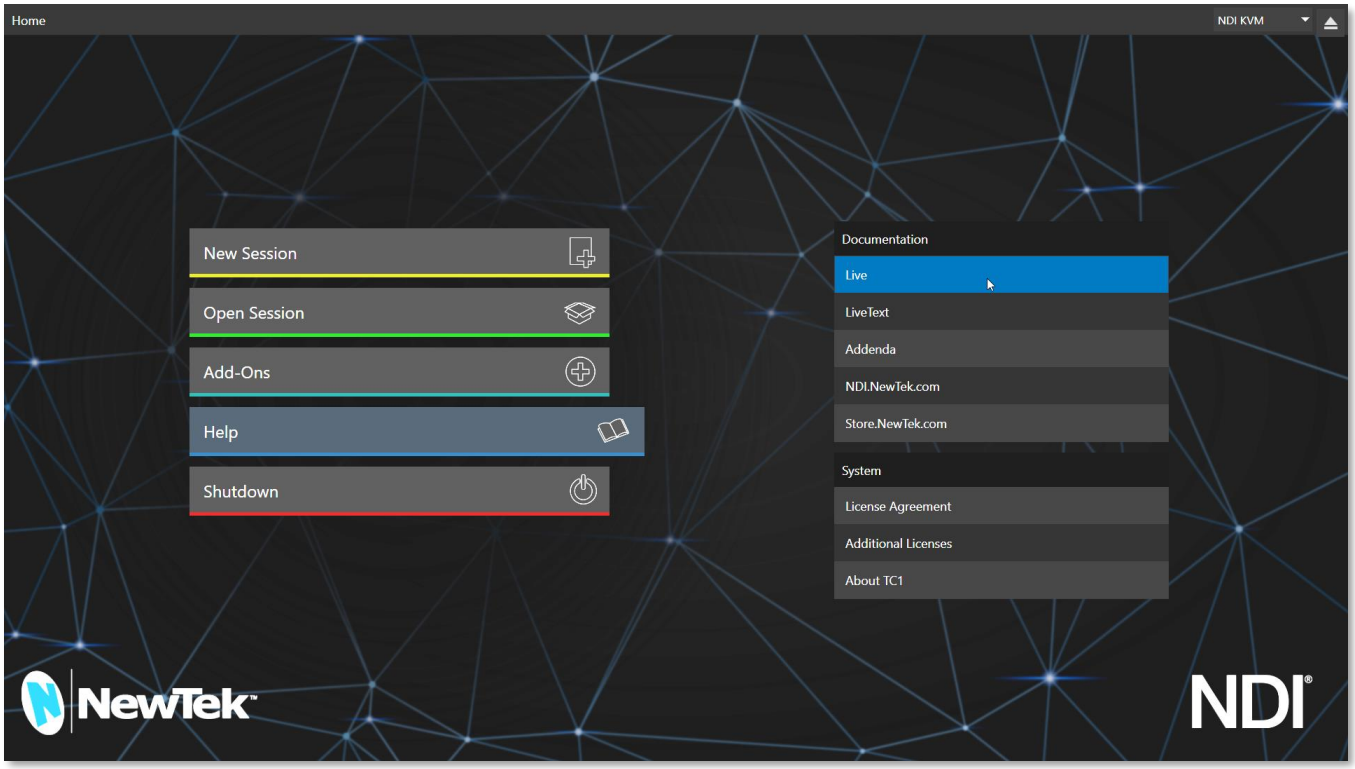


FIGURE 39

Select the *Help* icon to reveal links to open manuals and other information.

The primary User Guide is found here, as well as documentation for other software (such as the LiveText™ manual).

Click the *License Agreement* link to review the end user license requirements, or the *About* link to list software version information, credits, and acknowledgments.

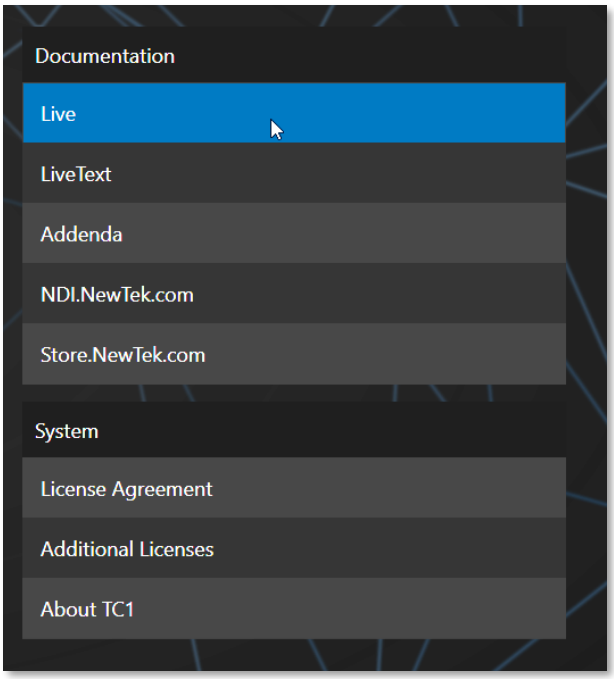


FIGURE 40

5.2.6 ADD-ONS

NewTek offers additional software tools to expand the power of your NewTek system. The icon labeled *Add-Ons* on the *Home Page* provides access to some of these tools.

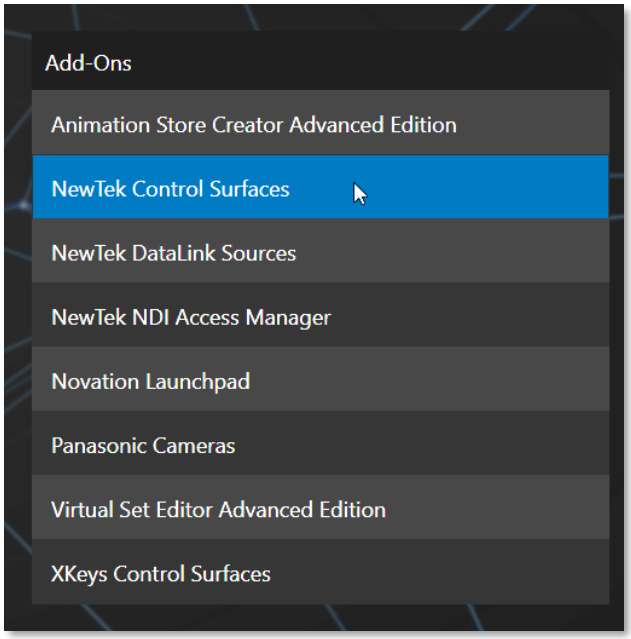


FIGURE 41

When you select the *Add-Ons* icon, links are displayed at right for installed software applications, allowing you to launch them.

For example, you will see links to the included *Animation Store Creator* utility as well as a demo version of the optional *Virtual Set Editor*™ program, the very useful *DataLink Configuration* applet (see also Section 5.3.3; please refer to the accompanying *Automation and Integration Guide* for full details on DataLink's many powerful source options), and much more.

SECTION 5.3 THE SESSION PAGE



FIGURE 42

Opening a session from the *Home Page* (whether using *Open* or *New*) takes you to the *Session Page*, providing a new set of selections on the main menu. The name of the current session is shown in the top-left corner of the screen (Figure 42). The current session is displayed in the form "Home/*session name*".

If you wish to leave the current session and return to the *Home Page*, you can click the large *Back Arrow* displayed at left, or the word "Home" in the session name label.

The main menu on the *Session Page* offers three selections. These are discussed next.

5.3.1 LIVE



FIGURE 43

The icon labeled *Live* represents the *Live Desktop*, your live production center. Selecting it (by clicking or tapping the link), presents a *Start Live Production* link button in the *Session Page's* right-hand pane; click this link to launch the *Live Desktop*.

5.3.2 GRAPHICS



FIGURE 44

TriCaster includes an integrated variant of LiveText™, NewTek's standalone titling and CG application. This version cannot be used while live, but gives you the ability to author title pages with text entries and images that *can* be updated while live. These pages are displayed from Media Players or Buffers during live production.

When you first enter a new session, no LiveText projects are listed in the area under *Project Name.* After you create one or more projects, the name(s) will appear here and, as you would expect, you can re-open the project by clicking its name.

Note: New LiveText projects, by default, are stored inside a folder named for the session, for example, you might find a project at:

D:\LIVETEXT PROJECTS\sessionname\projectname.cg.

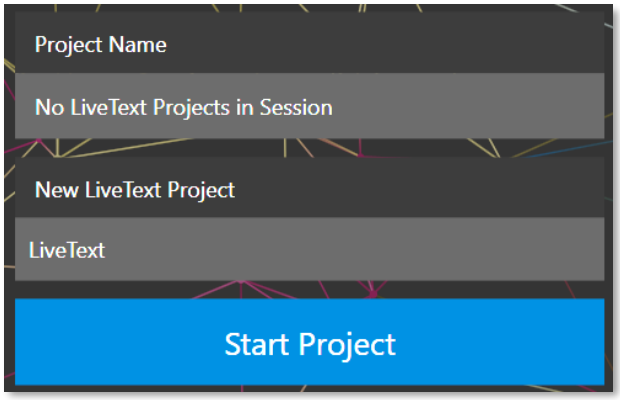


FIGURE 45

LiveText's internal *File* menu and *Save As* functions default to the same location. However, it is possible to use *File>Save As* to store a project in another location outside the session structure.

Be aware of a new *LiveText* project, click in the default project name filed (just above the *Start New Project* link) and modify it, then click *Start New Project*. When you finish working in *LiveText*, click the (x) button in its upper-right corner (or select *Exit* in the *File* menu) to return to the *Session Page*.

Note: The integrated version of LiveText cannot be accessed during live production operations. It is provided as a title page and graphics authoring tool only, not a CG server. A number of excellent third-party offerings, as well as the standalone version of LiveText (available from NewTek as a separate purchase) are listed and described in the accompanying Automation and Integration guide.

5.3.3 MANAGE

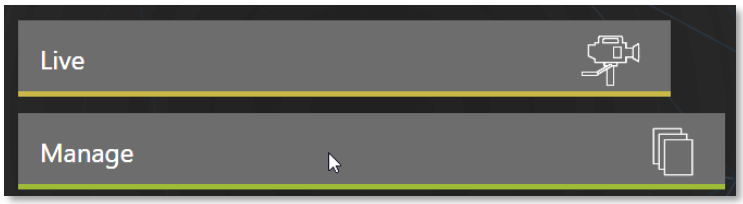


FIGURE 46

Various internal production modules provide filebins to permit you to manually administer files related to their projects, playlists, and so on. The *Manage* icon in the *Session Page* provides an alternative approach to file management.

At times you may find it useful to be able to quickly access the various files associated with specific sessions. Selecting *Manage* refreshes the options pane on the right-hand side of the *Session Page* with several convenient items.

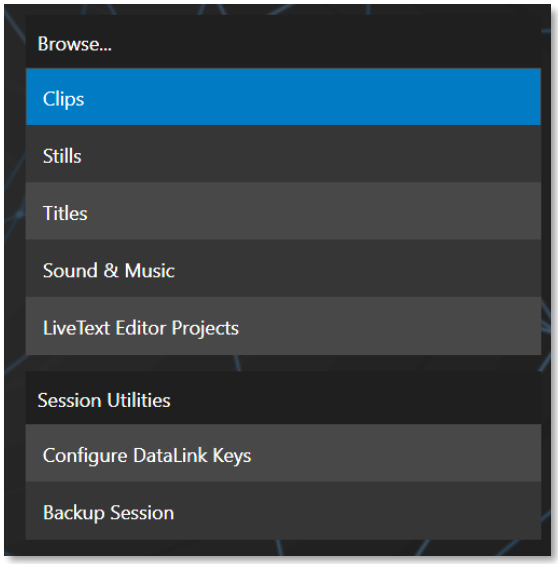


FIGURE 47

BROWSE

Under the label *Browse*, you will see direct links to the *Clips*, *Still*, and other content associated with the current session. Clicking one of these links (or selecting it with the up/down arrow keys and pressing Enter) opens a system file explorer.

You can use the familiar features and shortcut keystrokes in these windows (Cut, Copy, Paste, Rename, Delete and so-on) to manage the session content.

Hint: Of course, you can open several of these folders simultaneously, and navigate these file windows to other locations as well. For example, you might copy the title page (.cgxml) files from the Titles folder of one session into the Titles folder of a different one before deleting the first session.

Several other important features are contained in the *Manage* group, discussed next.

CONFIGURE DATALINK KEYS

DataLink™ is an astonishingly useful NewTek exclusive, allowing the handling and updating of text and image data from both internal and external source for use in title pages in real-time, as well as other purposes. Briefly, DataLink tracks variables (called *DataLink keys*) and their values and updates these values on-the-fly when used as entries in title pages.

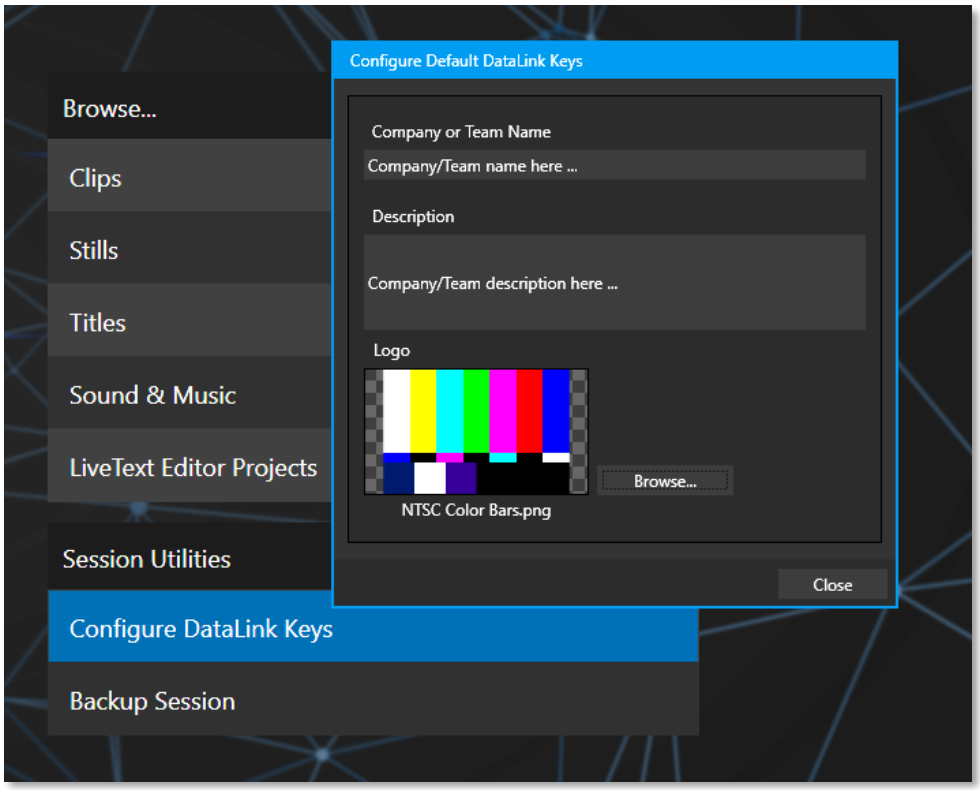


FIGURE 48

Hint: DataLink keys can serve in other ways too, for example to automatically insert information such as time or scores into labels and comments of social media uploads, or as instant replay clip metadata.

Since *DataLink* falls into the general realm of automation and has access to external sources, complete coverage of its features and capabilities is found in the companion *Automation and Integration Guide* included with this product; but we'll mention a few highlights as we go along as well.

Hint: If not today, we urge you to make definite plans to read the DataLink chapter in the Automation and Integration Guide. Without exaggeration, DataLink is a game-changer. It can save you a great deal of time, prevent embarrassing and potentially costly mistakes, and lift your productions to new heights.

The *Manage* group link labeled *Configure Datalink Keys* opens a dialog that allows you to pre-assign values to three special *DataLink* keys.

These *session keys* serve as the default first and second line text inserts and image used by many of the supplied template title pages. (By taking a moment to populate these keys with, for example, a company

name, motto, and logo, you will find much of the included graphic content ready to use for a given production without ever having to type another line.)

Backup Session

Clicking the *Backup Session* button opens a system file explorer that you can use to assign a storage location for the backup files. A progress gauge is displayed during processing, and if necessary, you may *Cancel* the operation. Of course, the session to be backed up is the current session (to back up a different session, return to the *Home Page* and *Open* a different session.

Note: The backup operation feature does not 'gather' media files in the backup, but it does store Media Player playlists. Provided the media files are still available, they will appear as expected when the session you backed up is restored.

Chapter 6 LIVE DESKTOP



The Live Desktop is the control center for all your live production work. It provides control over switching, transitions and overlays, titles and graphics, audio mixing, playback of digitized content, and much more. In addition, streaming and recording features are located here, along with keying and virtual set tools.

The *Live Desktop* is launched by creating (or opening) a session in the Launch Screen's *Home Page*, then selecting the *LIVE* icon and clicking *Start Live Production*.

SECTION 6.1 DISPLAY REQUIREMENTS

The *Live Desktop* requires a *minimum* screen resolution of 1920x1080.

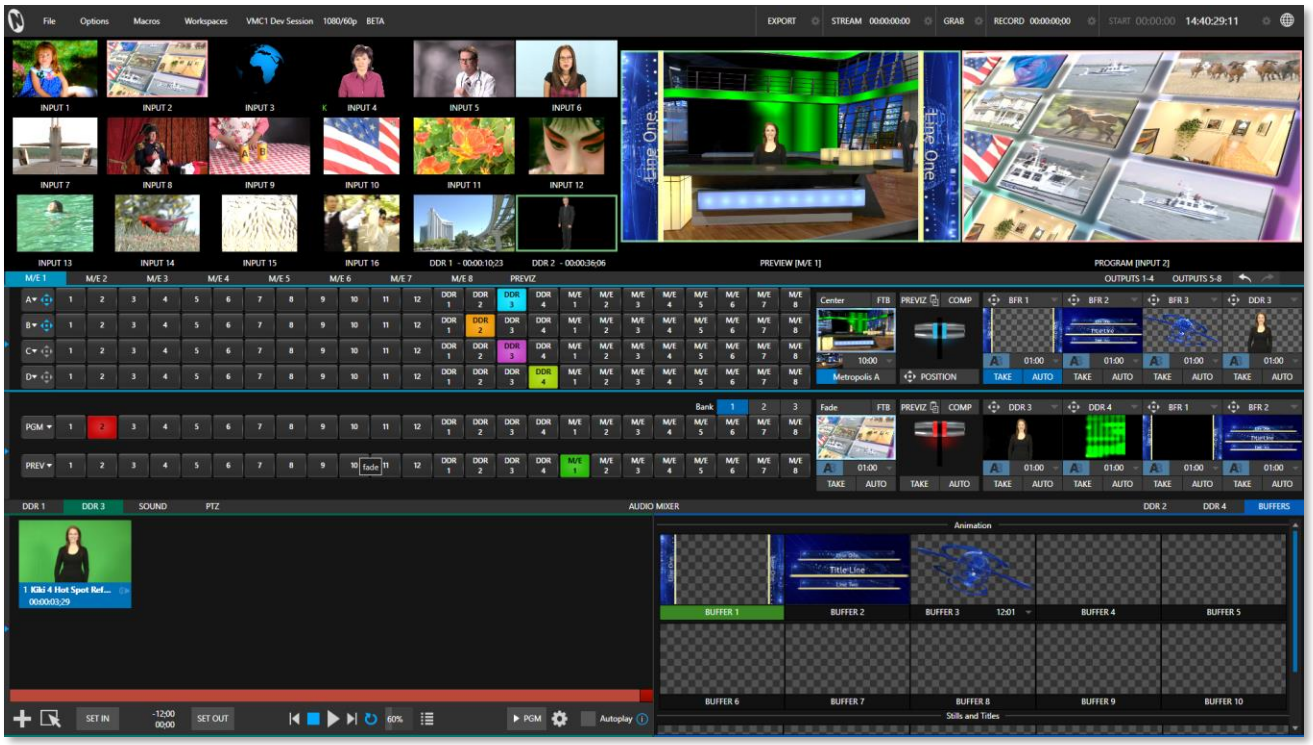


FIGURE 49

SECTION 6.2 OVERVIEW

The *Live Desktop* provides visual feedback for operations, including monitoring, live switching, and so on. While it is seldom necessary for it to appear as heavily populated as seen in Figure 49, we display it this way to illustrate that it can be logically divided into five horizontal bands, described from top to bottom in the following table.

1 - Dashboard

- Quick access to interface options and important tools, including *Publish* and *Macros* along with *Record*, *Stream, Workspace* and *Timecode* options.

2 - Monitors

- User configurable layouts – monitor live inputs along with internal sources (such as *DDRs*, *M/Es*, and *Buffers*) plus *Look Ahead Preview* and *Program o*utput
- *Waveform* and *Vectorscope* monitors

3 - M/Es

- *Effect* mode – control up to four primary video layers plus 4 overlay channels
- *Mix* mode – secondary switcher controls plus 4 overlay channels
- Each *M/E* includes dedicated an extensive complement of *Keyers*, transition generators, scaler/positioners, and more

4 - Switching

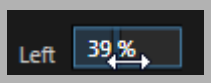
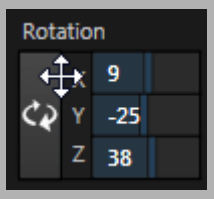
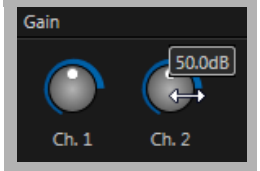
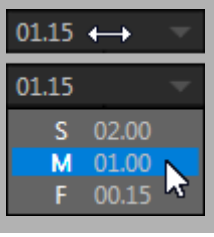
- *Switcher* rows – *Program* and *Preview* rows
- *Transition* controls – *T-bar* and *Delegate* buttons
- *DSK* video layer configuration and controls

5 - Tabbed Control Modules

- Internal *Media Players* and *Buffers*)
- *PTZ* (robotic) camera controls
- *Audio* (mixer) – input configuration, level control, *EQ* and *Compressor/Limiters*

SECTION 6.3 CONTROL TYPES

You will find various control types used repeatedly in the *Live Desktop*. Some examples are shown in the table below.

Control Type	Type	Examples	Usage
	Numeric Slider	Gain, Pan	Drag in line with the control's orientation to raise or lower the current value.
	Rotary slider	Position, Size, Rotate	Drag up-down to adjust one value, left-right to adjust the other value, diagonally to adjust two different values simultaneously. Hold down Alt while dragging vertically to modify the third value (Z) when provided.
	Rotary Knob (single-value)	Audio Gain	Drag left-right to adjust the current value.
	Combo-Slider	Transition, Zoom Duration	• Drag left/right to raise or lower the current value. • Click the digits to type in a new value. • Or click the triangle to open a drop-down menu.

To make very fine adjustments to slider values, hold down the Ctrl key while dragging the mouse (this increases accuracy by 10x). Hold down the *Shift* key and double-click most controls to reset them to their default values.

SECTION 6.4 CUSTOMIZING THE LIVE DESKTOP

The *Live Desktop* layout can be adapted to many different scenarios and provides several customization options that can be of benefit in your workflow. In this section, we'll touch on several of these.

6.4.1 RENAMING INPUTS

As charming as descriptive names like *Camera 1*, *DDR 2* and *M/E 5* are, you may wish to change these labels to something more appropriate for your local needs.

To do so, you will need to open the *Input Configuration* pane for the *Switcher* source in question. There are several ways to open this pane. You can use any of the methods described below to do so.

- Right-click a viewport in the *Live Desktop* or external *Multiview*, or a Switcher button, and select Configure from the context menu.

- Roll the mouse pointer over the viewport for the source and click the *configuration* (gear) icon shown at lower right.

- 'Two finger tap' the viewport.

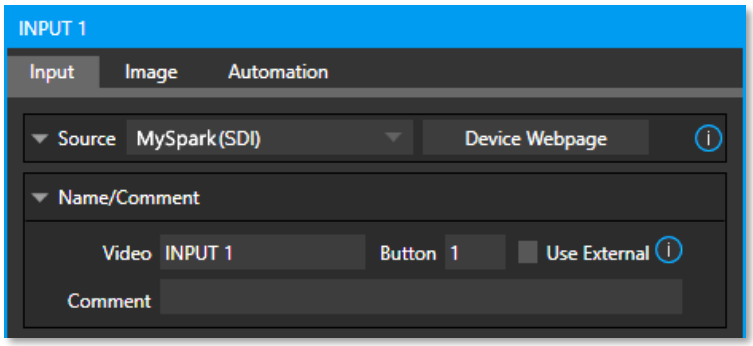


FIGURE 50

Expand the *Name/Comment* group in the *Input* tab of the *Input Configuration* pane, by clicking the twirl-down triangle at left. This group contains several editable text fields, including *Video* (the label shown under monitors), a shorter Switcher *Button* label, and the longer *Comment* field.

Hint: The Comment entry is more than just memory aid. NewTek's DataLink feature can automatically update title pages as inputs are displayed by drawing on the information you enter here.

6.4.2 WORKSPACES AND MIN/MAXIMIZE

Various layouts and custom monitoring options for the *Live Desktop* and *Multiviews* are provided in the *Workspace* menu.

When one or more *Multiviews* monitor is in use, *Workspace* preset options can be combined with great flexibility, letting you see *what* you want to see *where* you want to see it.

It's easy to set up complementary displays. Each connected monitor, including the *Live Desktop* screen (listed in the *Workspaces* menu as *Multiview 1*) has four unique presets, labeled A-D. You can load a different viewport layout into each of these presets, and recall them easily using this menu, or perhaps using Macros assigned to keystrokes.

In addition, each individual viewport can be assigned to any *Switcher* input source or output using its own context menu. So, for example, even if you initially use *Load Default* to assign identical viewport layouts to preset A and preset B for a given screen, you can configure each viewport differently in the two presets.

Switching between presets, then, will allow you to view different sources. Even the overlays (such as *Safe Area* display) for each viewport are fully independent.

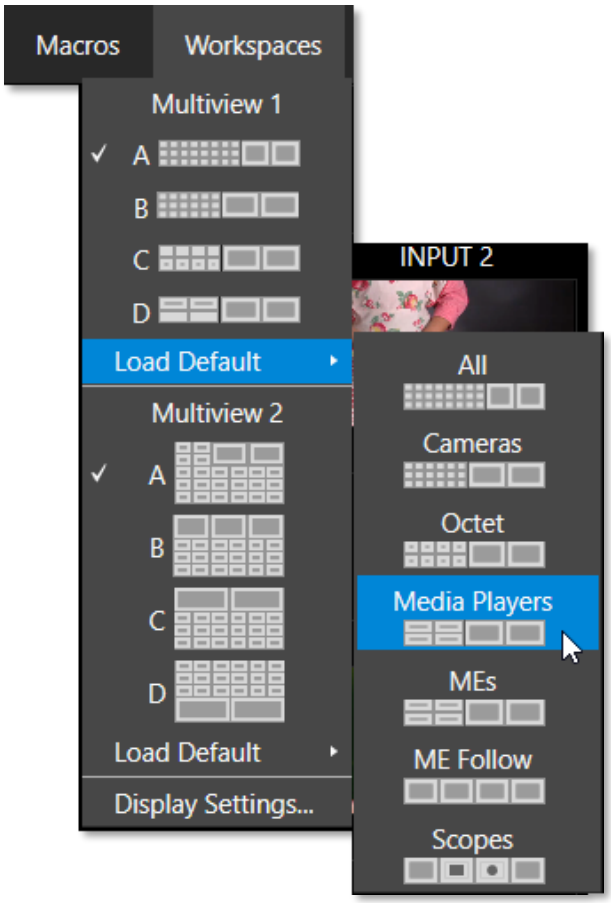


FIGURE 51 (OPTIONS VARY BY MODEL)



FIGURE 52

Notice too that, when the lower tabbed modules are visible, you can also drag the horizontal divider between the *Live Desktop* monitor pane and the *Switcher* up or down to modify its position.

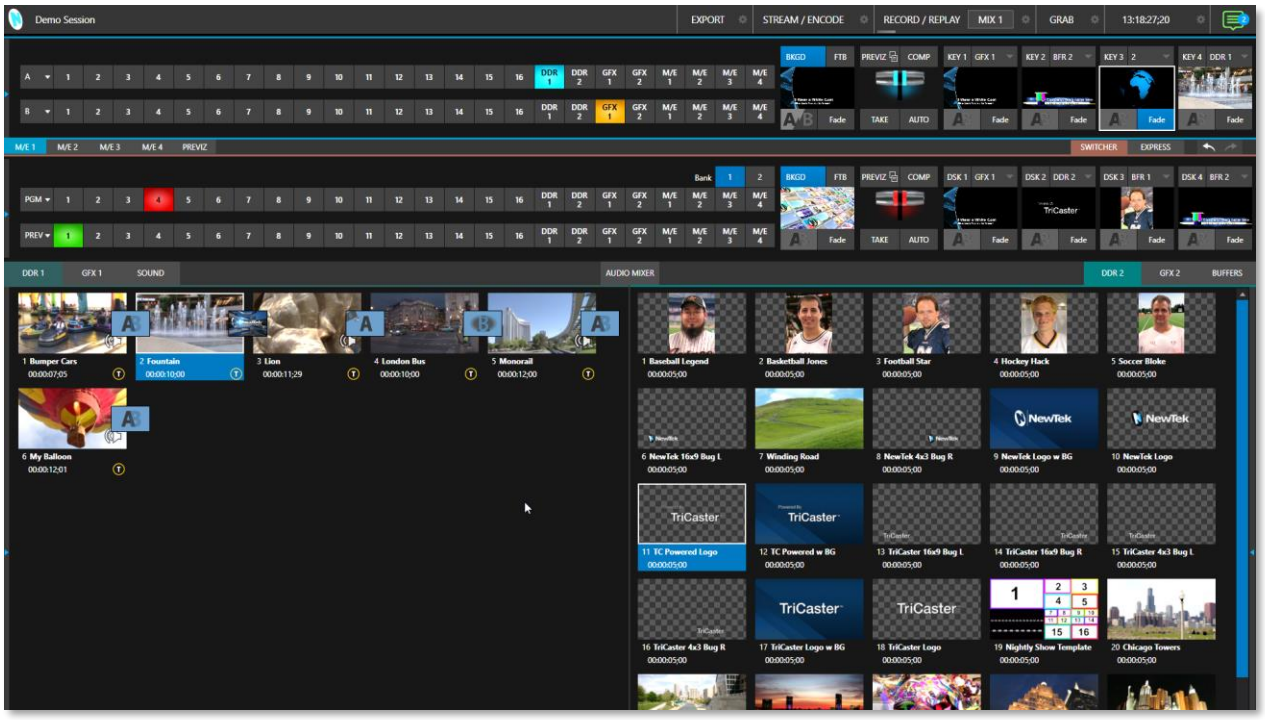


FIGURE 53

You can even move the horizontal divider all the way up to the bottom of the *Dashboard*, thus hiding the *Desktop* monitor pane entirely (Figure 53), providing much more room for other modules in the process.

> *Hint: Reset the horizontal divider to its default locations by double-clicking it. Also, note that a vertical drag bar is provided just left of the* Program *and* Preview *viewports in some Workspaces.*

Neither is it necessary to display modules you don't access frequently (say, for a simpler production) at all times. For example, the M/E pane is hidden by default; click the *Mix Effects* label or an *M/E tab* above the *Switcher* to toggle display of the *M/E* pane – or press the keyboard shortcut "m".

6.4.3 EXPRESS SWITCHER MODE



FIGURE 54

In a related innovation, an alternative *Switcher* interface provides new opportunities to customize both the interface and workflow. The Switcher's *Express* mode is very compact, freeing valuable *Live Desktop* space. Viewports in the multiview area above are significantly larger than in the more familiar two row (Program/Preview) *Switcher* mode.

Too, *Express* mode (Figure 54) provides a simple 'single-click' workflow, ideal for less complex productions, when a control panel is in use, or in environments involving student or volunteer operators who may struggle with traditional switcher workflows.

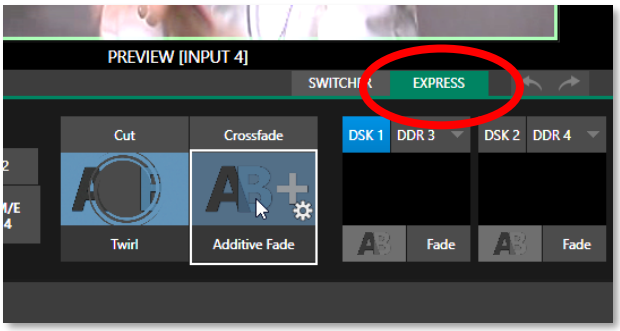


FIGURE 55

You can easily switch between the standard *Switcher* mode and *Express* operating modes by clicking their eponymous tabs at right in the horizontal bar just above the *DSK* controls.

For more information on these two modes of operation, see Chapter 9, Switcher, Transitions and Overlay. Several additional workflow and interface options are hosted in the *Options* menu, which we will discuss shortly (in Section 7.1).



The Dashboard groups important production features and system display controls in one convenient place for quick access and review. As well, the Dashboard serves to provide information on the current session, status updates and storage usage, along with timecode and the Macros and Options menu.

The *Dashboard* is home to several important displays, tools, and controls. Prominently located at the very top of the *Live Desktop*, the *Dashboard* occupies the full width of the screen.

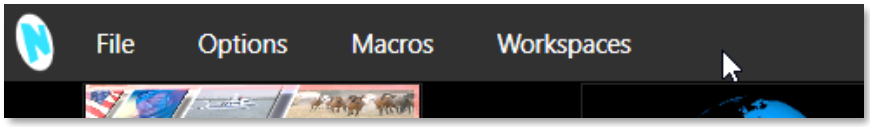


FIGURE 56

Initially, to avoid overwhelming users, the left end of the *Dashboard* simply shows the name of the current session. Moving the mouse pointer to the top of the screen reveals the set of menus shown in Figure 56.

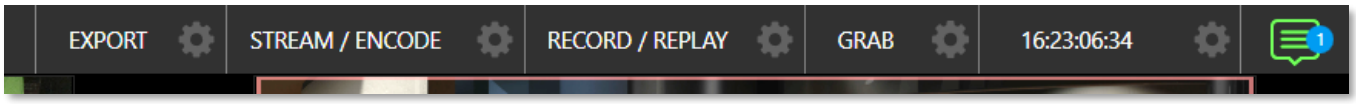


FIGURE 57

The right half of the *Dashboard* (Figure 57) contains additional features and tools that are more frequently accessed, for which reason they are displayed full-time. The various elements comprising the entire *Dashboard* are listed below (starting from the left):

1. *File menu*
2. *Options menu*
3. *Macros menu* – see Chapter 16
4. *Workspaces* menu – see Chapter 10
5. *EXPORT button* and Configuration (gear) – see Chapter 18
6. *STREAM/ENCODE* button and *Configuration* (gear) – see Chapter 17
7. *RECORD/REPLAY* buttons and *Configuration* (gear) – see Chapter 19
8. *GRAB* button and *Configuration* (gear) – see Chapter 19
9. *Clock(s)* and *Configuration* (gear) – see Chapter 7
10. *Notification List* - Chapter 7

Some of these items are so important that they rate their own chapters. Others are detailed in various sections of this guide (cross references to the relevant sections of the manual are provided above). In this chapter, we'll focus on those *Dashboard* features not discussed in greater depth elsewhere.

SECTION 7.1 FILE MENU

This menu drops down to reveal the following items:

- *Eject* – opens a sub-menu that lets you safely disconnect selected storage volumes
- *Import* – easily add media files from external sources to the appropriate session folders, and automatically transcode them to friendly formats for optimal playback if necessary. (*Import Bin* features are similar to those of the *Publish Bin*.)
- *Share Media Folders and Buffers (see* Section 11.3)
- *Exit* – close your live production session, and return to the *Session page* of the *Launch Screen* (all session settings are stored on exiting)

SECTION 7.2 OPTIONS MENU

A number of very useful interface and workflow options are presented in the *Options* menu.

- *Tabs Follow*

    - Enable *Follow Preview Row for All Inputs* to display the tabbed pane for a *Preview* row source automatically on selection changes (for *M/E* selections, the *M/E* pane must be maximized in order to see the *M/E* tab update).

    - When *Tabs Follow Preview for M/Es* is checked, only the *M/E* pane selection updates (when you select an M/E as source on *Preview*).

    - *Tabs Follow All Delegates* updates the *Desktop* in sync with control panel delegate changes.

Hint: Control panel delegate operations can sometimes result in a tabbed module that you want to view being obscured when certain options are enabled. When this happens, press the control panel Delegate button again to re-display the tabbed pane you are interested in.

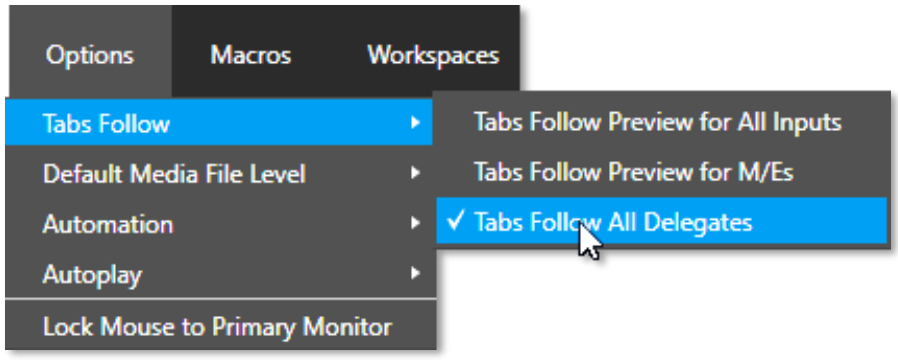


FIGURE 58

- *Default Media File Level* – the default 'per-clip' audio level applied to imported media files is controlled by this option.

- The *Macro Triggers* menu offers the following options:
  - *Tally* – Enables *State Change* macros configured in the *Automation* tab (*Input Configuration* panel) for any video source.
  - *Audio Levels* – Enables the *Run Macro at* (threshold dB) feature for *Audio Mixer* sources.
  - *Disable Hotspots* – Disable macro triggering based on *Hotspot* activity (see Section 8.1.4).
  - *Disable Hotspots on M/Es* – When this is on, *Hotspot* macros are only triggered if the source is visible on *Program* output (including via an *M/E* shown on *Program* output, or a *DSK*).

- *AutoPlay*
  - *Enable Autoplay Out on M/Es* – Enables *Autoplay's* transition-out behavior for *M/E's* (*Mix* mode) displayed on *Program* out (off by default).
  - *Extend Play* – When enabled along with *Autoplay* in the *DDR …*
    - Playback will extend past any marked out point, up to the last frame of the file – even if the operator manually removes the *DDR* from output.
    - After the last frame is displayed, the playhead advances to the next playlist item.

- *Click Viewport to Show on PGM* – When this feature is enabled, clicking a viewport (or tapping a viewport on a touchscreen) will select the corresponding video source on the main Switcher's *Preview* row and perform the current *Background transition* to display it on *Program* output.

- Enabling *Lock Mouse to Primary Monitor* prevents the mouse from traveling into the external Multiview display.

SECTION 7.3 MACROS

Macros provide extremely important production benefits – sufficiently so that we have not only have given them a place of their own in the User Guide (Chapter 16), but they are also discussed in greater detail in the accompanying *Automation and Integration Guide*. Also, note that the *Shortcut Commands* used in macros are listed on your TriCaster's locally served Home web page.

SECTION 7.4 WORKSPACES

The *Workspaces* menu opens when clicked to reveal control groups for each detected screen (the number of multiviews supported varies by model). These control the monitor viewport layouts shown on the *Live Desktop* and external *Multiview* displays. *Workspace* features are discussed in Section 10.1.

SECTION 7.5 CLOCK

The Dashboard also hosts a clock which, in addition to showing the current time, can display countdowns to event start and end times when enabled.

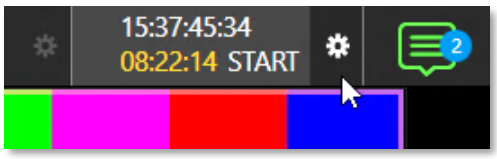


FIGURE 59

To access time features, click the small gear icon next to the timecode display at right in Live Desktop's *Dashboard*.

Hint: You can set the system clock, as for any computer; simply exit to the Windows® Desktop to do so.

7.5.1 LTC TIMECODE

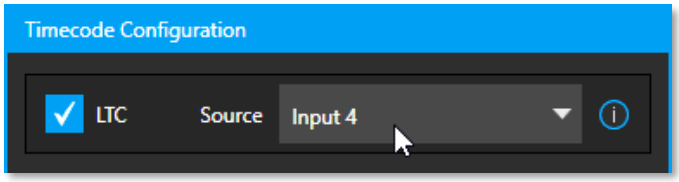


FIGURE 60

Linear timecode has long served as a method of sharing an external timecode reference in video production. Output from an external *timecode generator* is supplied to devices in the video pipeline using a standard audio connection.

Choose an LTC source in the *Timecode Configuration* panel, and the feature will decode time stamps from the audible signal, using the values for clock displays as well as embedded timecode when recording video (if the file format supports this). This is a great asset for post-production purposes.

Hint: The timecode display in the Live Desktop titlebar is tinted blue when external timecode is in use. If the external connection is lost for any reason, the display changes to white. TriCaster will attempt to maintain continuous timecode from the interruption on, until a valid signal is restored (in which case the display turns blue once more).

7.5.2 EVENT TIME

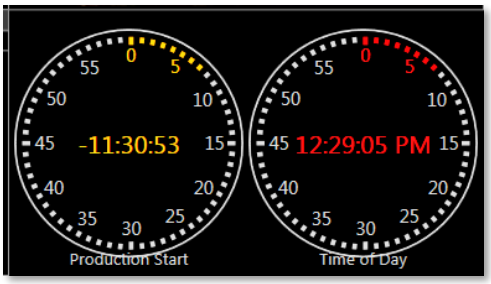


FIGURE 61

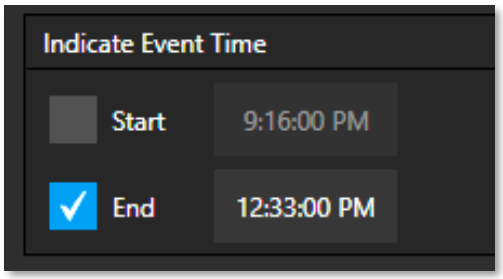


FIGURE 62

Two switches under the label *Indicate Event Time* allow you to configure *Start* and *End* times for your upcoming show. Beside each of these is an editable time field. Enable the *Start/End* switches, then click inside the field to modify the time value by direct entry or drag left right to raise or lower the current value.

During live production, the *Dashboard* and as well as monitor panes and default *Multiview* layouts offer *Broadcast Clock* displays based on the current timecode. Secondary clock displays show a useful countdown to the (production) *Start* and *End* times when the corresponding switches are enabled in the *Timecode Configuration* panel.

SECTION 7.6 NOTIFICATIONS

The last item at right on the *Dashboard* is the *Notification* icon (Figure 63). A 'number bubble' indicates how many un-viewed entries have accumulated. Clicking the icon displays the *Notification Pane*, which provides both helpful information and also some very useful tools.

The *Notification* icon can be colored white, green, amber or red. The color indicates the type of messages available for review:

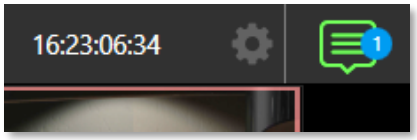


FIGURE 63

- A green icon denotes an informative message, as well as the availability of new media.
- An amber icon indicates a warning message has been received.
- Higher priority alert messages are denoted by a red icon.

The highest priority (un-viewed) item in the list at the moment determines the *Notification* icon color. After you open the panel to review the notifications in the list, the icon turns white.

Individual items can be cleared from the list using the context menu opened with the triangle gadget shown at right when you roll the mouse over an entry, or you can empty the list with one click using the *Clear All* button in the footer of the panel.

Information appearing in the *Notification Pane* can include the following:

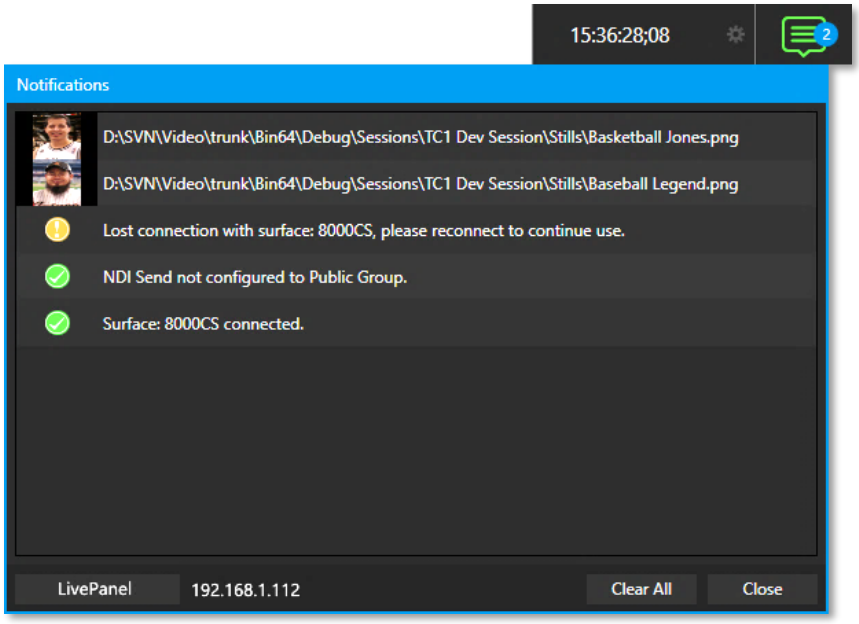


FIGURE 64

- Session name, format, and software build number (press *Alt + b* on the keyboard to update this item)
- Status messages pertaining to operations or system conditions; these may be benign notifications or cautionary. For example, a message indicating that the connection to a control panel has been lost is given an icon with an amber color. A higher priority warning triggers a message with a red icon.

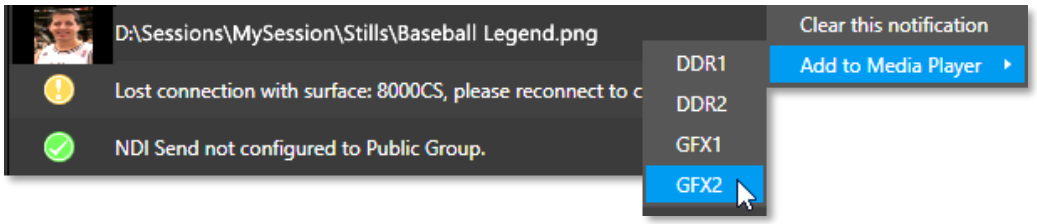


FIGURE 65

- In some TriCaster models, and a Premium Access feature, a special message is added if a clip or still image is added to one of the *Session's* media file locations (such as the session *Clips* and *Stills* folders). These entries show a thumbnail icon at left, along with the filename and path. In this case, the item's context menu includes an *Add to Media Player* option (Figure 65), which lets you immediately append the new file to a selected *Media Player* playlist.

Hint: This last feature is particularly handy when adding files across the network, as perhaps when using the DataLink for TriCaster plugin to import images from the popular Chrome web browser.

Chapter 8 I/O CONFIGURATION

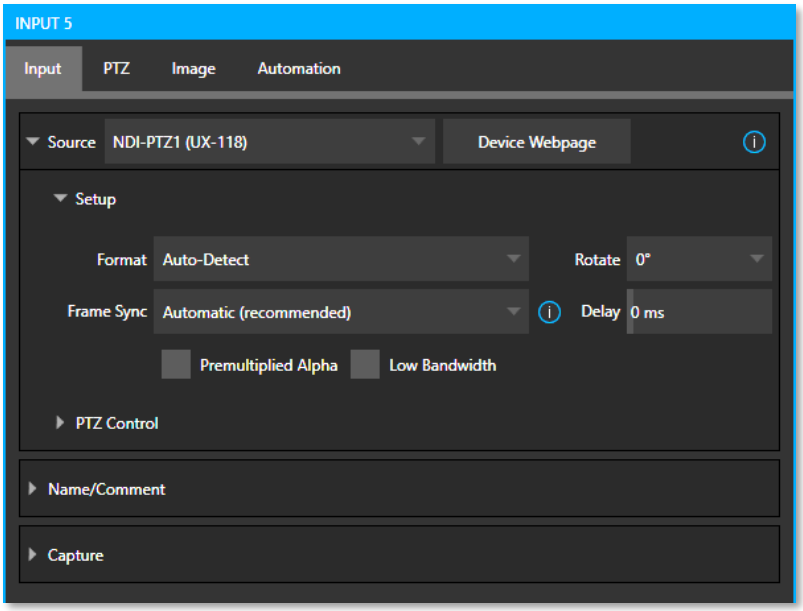


Your NewTek system provides extensive control over video sources, along with endless creative features. Each source has Proc Amp, keyer (LiveMatte™) and Crop (a.k.a., 'garbage matte') features. Input Configuration panels are also home to real-time Hotspot and Tracker features. The number and flexibility of outputs supplied is astonishing, too, and we'll discuss these fully in this chapter.

The addition of NDI® (Network Device Interface) support provides you with virtually unlimited input and output possibilities. Generally, an NDI source needs little if any configuration; other source types may require you to choose between optional connection methods and settings.

SECTION 8.1 INPUT CONFIGURATION

8.1.1 INPUT TAB



- Any external NDI source, Skype TX Caller, or local hardware source connected to one of the system's hardware input connectors can be flexibly assigned to any *Switcher* input.

- This also means that sources can be re-ordered on the *Switcher*.

  (Likewise, default audio sources for *Switcher* inputs can be flexibly re-assigned in the *Audio Mixer* module. For example, audio Input 1 and video Input 1 are not inextricably linked.)

FIGURE 66

The assignment of one of the various types of source to a *Switcher* button (e.g., "Input 1" on the *Switcher*) is made in the *Input Configuration* panel (Figure 66), introduced to us back in Section 3.10.2.

Open *Input Configuration* by any of the following methods:

- Double-click the monitor viewport for a *Switcher* input.
- Click the *Configuration* (gear) icon shown at lower right when the mouse pointer is rolled over above the viewport.

- If you have a touchscreen, you can two-finger tap the viewport.
- Or right-click a *Switcher* input button and select the *Configure* menu item.

SOURCE

Use the *Source* menu in this panel to assign one of the many sources available to the corresponding *Switcher* input. Available video sources are grouped under labels named for the device supplying them.

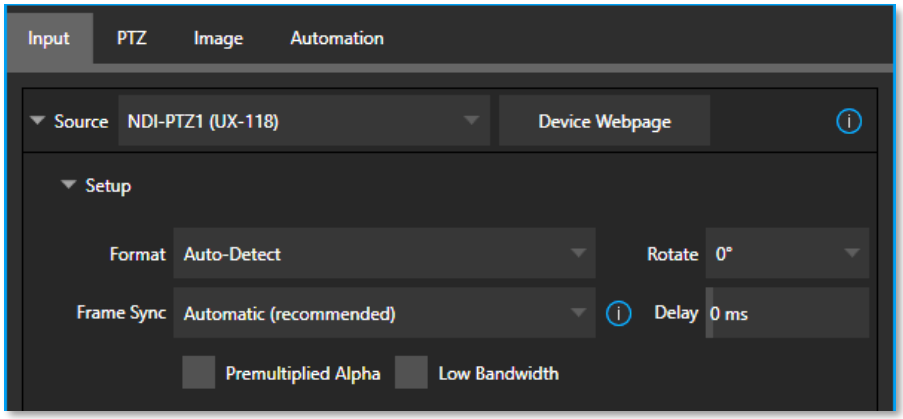


FIGURE 67

The *Local* group in the *Source* menu includes those sources connected locally to the system's hardware inputs (e.g., SDI BNC connectors), any other local hardware sources detected (such as a webcam), along with *Skype TX Caller* connections hosted by the local system (in contrast to externally hosted Skype TX sources, such as those supplied by a NewTek Talkshow® VS-4000 system), and *Black*.

* Please refer to Appendix B: Skype and Skype TX, for more on this useful source option.

SETUP

FORMAT

If you use the twirl-down triangle gadget at left to expand the *Source>Setup* control group (Figure 67), you will see that the *Format* for these diverse source types defaults to *Auto*. In the case of an NDI source (and often, for hardware sources too) no further settings are required.

For hardware video sources, additional *Format* options are provided in this menu, allowing you to choose a setting manually if the *Auto* option is unable to correctly identify the format. Let's explore other features located in the *Input Configuration* panel.

DEVICE WEBPAGE

For network connected sources (such as NDI sources), a *Device Webpage* button may appear just right of the *Source* menu. Click this button to access the remote device's own configuration webpage.

VIDEO DELAY

At times, typically due to upstream processing and architecture, video may arrive at the system's inputs ahead of the corresponding audio. The *Video Delay* feature allows you to compensate for these issues to establish a/v sync.

FRAME SYNC

By default, *Frame Sync* is set to *Automatic* for all external source types, allowing you to work with a wide array of potential video sources without concerns about video timing.

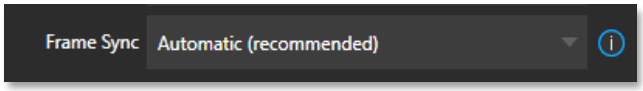


FIGURE 68

This option *(Automatic*) enables the full array of timing correction tools available to achieve smooth and accurate frame timing in your productions, including features that correct for issues caused by 'less than ideal' networks.

The next menu option (*On*) enables full-time frame synchronization and may well suffice in some video pipelines. This alternative has the benefit of ensuring the lowest throughput latency possible on a video switcher using frame-sync (2-3 frames).

The final *Frame Sync* option is *Off*. Disabling *Frame Sync* altogether ensures the very lowest possible throughput latency for genlocked sources. Note that sources with *Frame Sync* disabled *must* be genlocked, and in phase (that is within 180° of the current *Switcher* output). Otherwise, video from the source will simply not be seen. In practice, disable *Frame Sync* for genlocked sources only, then adjust the *Phase* setting (see Section 8.2.2) until video is displayed and you should be all set.

PREMULTIPLIED ALPHA

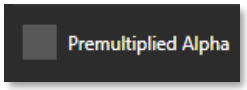


FIGURE 69

If you are supplying imagery (video sources, video clips, or still images) that support transparency by means of an embedded alpha channel, your choice here will be important. There are two 'flavors' alpha channel pixel encoding. The first is often called 'straight' or may be referred to as 'non-premultiplied.' Unsurprisingly, the alternative is 'premultiplied.'

The *Premultiplied Alpha* switch is off by default. Making the correct selection is necessary for correct compositing over other imagery.

LOW BANDWIDTH

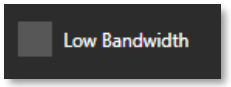


FIGURE 70

For NDI sources, a *Low Bandwidth* option is shown. This allows you to force the sending device to a lower quality video stream that may nevertheless be quite useable if the source is not intended to be displayed full screen. This option may be preferable in network settings with limited capacity (such as WiFi).

PTZ Control

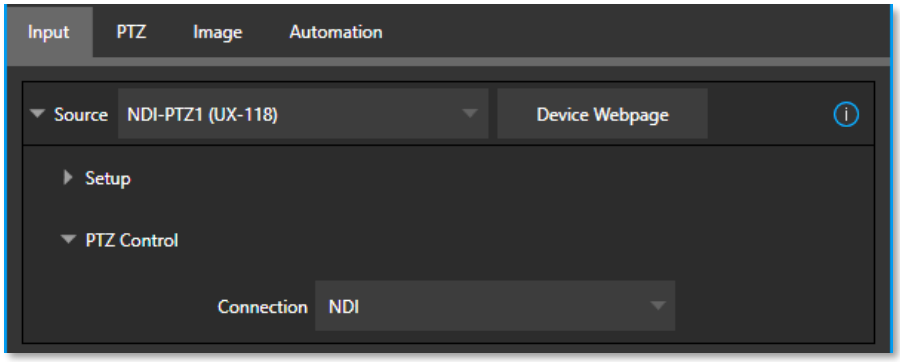


FIGURE 71

For many source types, a *PTZ Control* menu is shown in the *Source* control group. The default control *Connection* type is *NDI* which, assuming you are configuring an NDI source, makes life a lot easier because there is nothing else to configure.

Otherwise, if you *must select a 'legacy' control connection type like RS422, etc., or perhaps a non-NDI network connection, additional controls may be shown in this group to let you configure things like *Baud Rate*, *Com Port*, *IP Address*, and the like.

Name/Comment

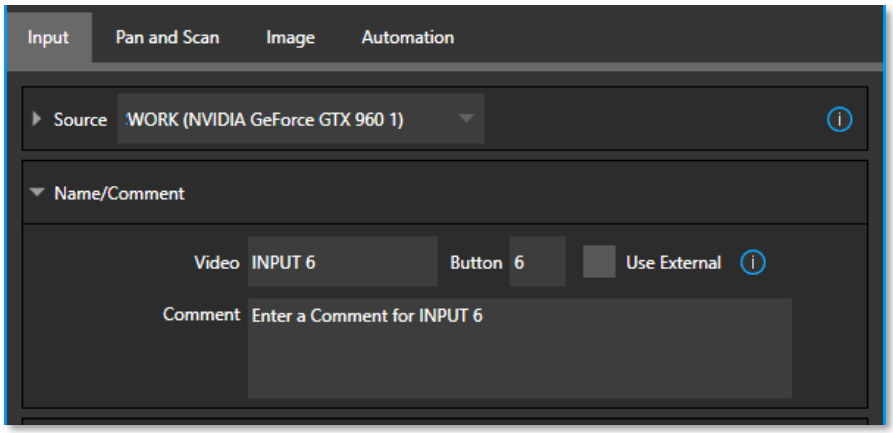


FIGURE 72

Expanding the *Name/Comment* control group reveals text entry boxes that allow you to provide labels for your video sources – specifically, the *Video* entry will appear beneath viewports in multiviews and some menus (where space permits), and the short *Button* text will be used to label *Switcher* buttons.

Enable the *Use External* switch to automatically pass the channel name for a remote source such as an SDI router or NDI channel to the *Video* label field.

The *Comment* entry lets you enter memo text that can serve as memory aids, but or another very valuable purpose, too. Specifically, the values entered in these two fields supply the values for special *DataLink* keys.

Among other things, the values from these *DataLink* keys can be used to update text values in title pages, or to add information to the filename of recordings.

Hint: For example, you could use a macro to automatically display a title page briefly any time you switch cameras. The Name and Comment entries for inputs update the values assigned to DataLink Keys named %PGM Source Name% and %PGM Source Comment% base on Program row selections.

You might enter "Bill Jones, CEO" as the Video name for a camera, and "Megadyne Computronics, Inc." as the Comment. Continue to give unique values to inputs in similar fashion. Then enter %PGM Source Name% on the first line of a title page, and %PGM Source Comment% on the second line. When you change cameras, your macro will display the page, correctly identifying the talent based on the input Name and Comment.

CAPTURE

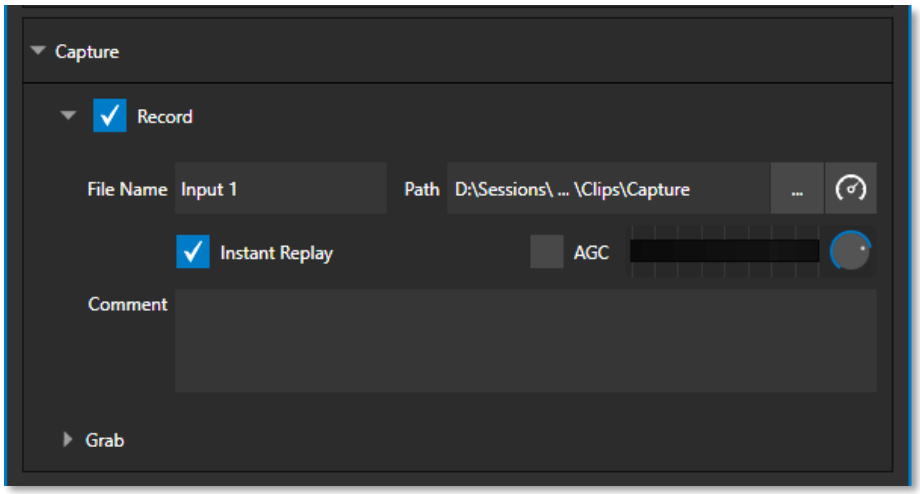


FIGURE 73

Each Switcher source has a *Capture* group in the *Input* tab. This control group shows settings and options for grabbing still images and, for appropriate sources, recording. These important capabilities are discussed in full in Chapter 19, Record, Grab, and Replay. The controls shown in Figure 73 are detailed in Section 19.1.2.

8.1.2 PTZ/PAN AND SCAN PRESETS

Another control group appears on the lower part of the *Input tab* when appropriate. This group may be labeled either *PTZ Presets* or *Pan and Scan Presets*, depending on the source type.

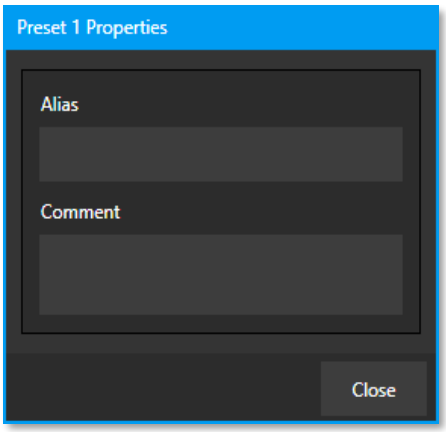


FIGURE 74

In either case, the features and options presented in this group are similar. At the top, you will see 16 numbered preset slots. Rolling over these slots reveals two gadgets: Click the snapshot (camera) gadget to store or update a preset. Click the configuration (gear) gadget to show a *Preset Properties* panel (Figure 74), with two text boxes labeled *Alias* and *Comment*.

The entries in these two text boxes, like the *Name* and *Comment* values discussed earlier, provide the values for special *DataLink* keys that can in turn be used in various ways.

For example, the *Alias* entry for the second preset of the second input will be assigned to the *DataLink* key %PTZ2_Preset2_Alias%.

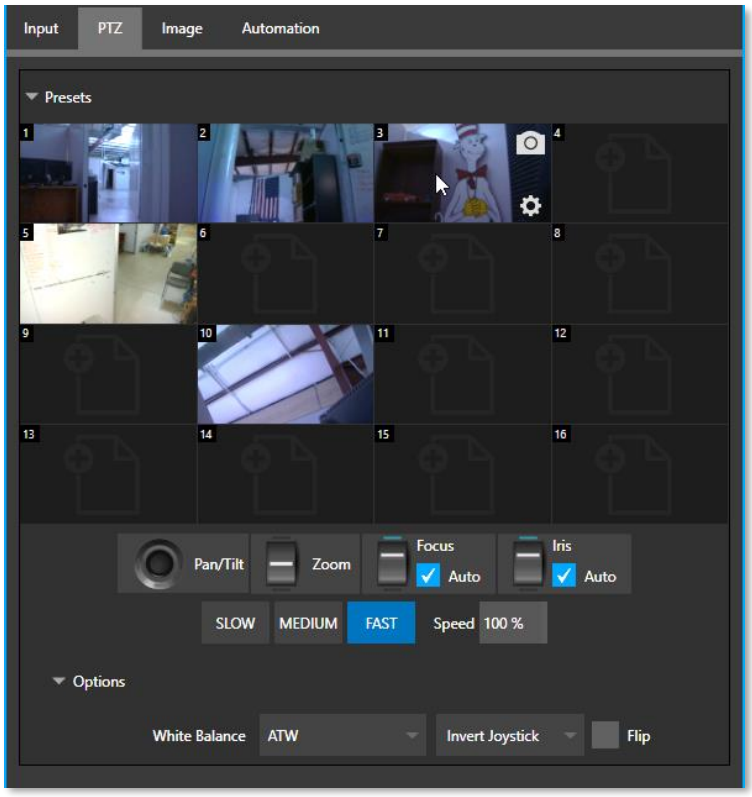


FIGURE 75

A set of controls located below the *preset bin* allows you to control connected PTZ cameras, or to affect sources supporting *Pan and Scan* features in similar fashion (you might think of these sources as providing a sort of 'virtual PTZ' functionality).

Note: NewTek NC1 Spark units connected by NDI will show Virtual PTZ (Pan and Scan) controls. With Premium Access membership, most Switcher sources feature Virtual PTZ. – see Appendix A: Premium Access Features.

SLOW, MEDIUM, and *FAST* preset buttons complement the numeric *Speed* control slider at right. These affect the speed of the transition from the current position to that stored in a newly selected preset.

The *Options* group, when expanded, reveals *White Balance* options along with a menu that allows you to invert the operation of the *Joystick* on individual axes (both in the interface and on connected hardware control panels).

Note: Focus, Iris, and White Balance features are only shown when a PTZ cameras is connected to the input. However, features in the Input Configuration panel's Image tab, discussed next, can provide similar functionality to White Balance automation.

8.1.3 IMAGE TAB

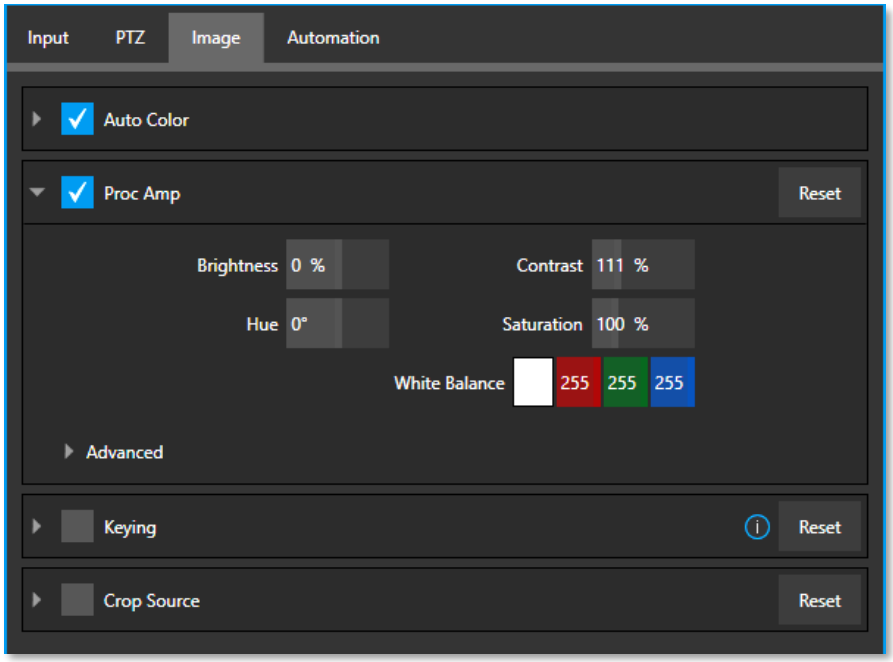


FIGURE 76

The *Image* tab in the *Input Configuration* panel hosts a set of features that provide extensive color control processing, chromakeying, and cropping options for every video source.

AUTO COLOR

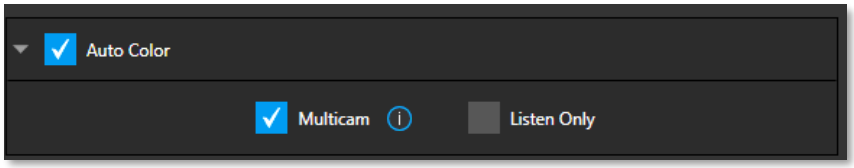


FIGURE 77

Lighting conditions can change dramatically during many live events, especially those held outdoors. Adding to this problem, production usually involves multiple cameras and, all too often, these may not have uniform color characteristics. Ensuring consistent color when switching from one angle to another, avoiding unwelcome brightness or color shifts as evening falls or when a cloud obscures the sun briefly can be troublesome, and expensive.

Auto Color, a unique feature capable of dynamically adapting the color characteristics of your video sources as lighting conditions vary, can minimize these problems. For many productions, simply enabling *Auto Color* is all it takes to produce a show that looks amazingly consistent.

MULTICAM

By default, each camera with *Auto Color* enabled is processed uniquely – without reference to other sources. Often, though, even greater consistency can be achieved by treating sources in similar illumination environments as a group. Enable *Multicam* for several cameras causes *Auto Color* to evaluate and adjust these cameras in unison. You might, for example, enable *Multicam* for court-side cameras in an interior sports venue, while treating exterior or studio feeds individually.

LISTEN ONLY

The *Listen Only* switch allows you to include a source in the *Multicam* group without adding its own feed to the group evaluation. Thus, a camera trained on a giant purple dinosaur can be automatically corrected without disproportionately biasing the group evaluation and *Auto Color* correction. Alternatively, one might enable *Multicam* for a number of sources, turning *Listen Only* on for all but one camera – effectively making that camera the color reference all other cameras in the group will follow.

Note: The Proc Amp, discussed next, is downstream of the Auto Color system. This allows you to apply further manual color adjustments to your individual sources, whether for fine tuning or to achieve a specific "look".

PROC AMP

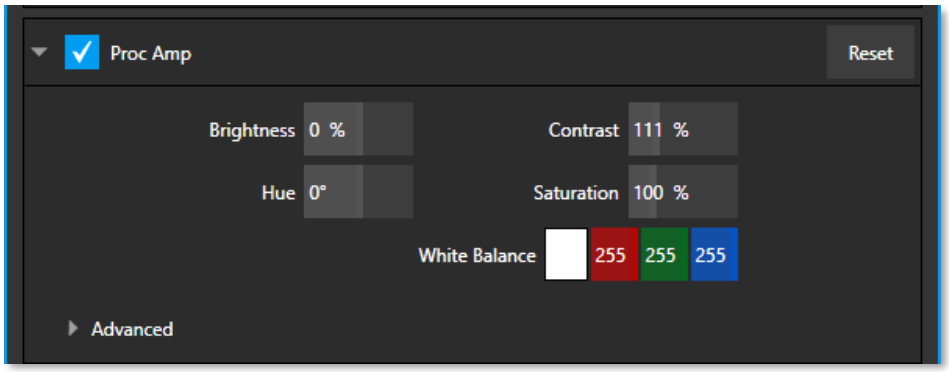


FIGURE 78

A switch at the top of the *Proc Amp* control group toggles the feature on/off. Other controls operate as follows:

- *Brightness*: Adjustment range from -50 to +50 IRE (the default being 0).

  As reference, the full luminance range of the visible portion of a video signal can be thought of as '100 IRE units' (named for the Institute of Radio Engineers) – ignoring minor regional variations.

- *Contrast* – Adjustment range from 25 - 400% (default 100%).

- *Hue* – Adjustment range between -180° and +180°. Adjusts the master color of the video signal from the attached source, swinging the entire image through the color wheel's spectrum.

- *Saturation* – Adjustment range from 0-500%. Zero saturation results in a 'black and white' picture; increased saturation results in richer colors. High saturation values can exaggerate the color portion of the signal.

  (Note that over-saturated colors are considered illegal for broadcast transmission and may result in display problems on some devices.)

  Hint: Proc Amp adjustments are applied downstream of LiveMatte, which can help when composing greenscreen shots to match a background or LiveSet.

White Balance – to *automatically* white balance, click and hold the mouse button on the *Color* well, and then slide the 'eyedropper' pointer onto the monitor for the corresponding source. Release the mouse button over a part of the image that should appear as white after processing.

ADVANCED COLOR CONTROLS



FIGURE 79

This secondary control group is revealed when you click the expander (triangle) beside its label.

In addition to per color channel (RGB) *Brightness* and *Saturation* sliders, it adds *U Offset* and *V Offset* controls.

- The U portion of the video signal carries blue and yellow color information. Rotating the *U Offset knob* clockwise shifts the signal toward blue, while a counter-clockwise twist shifts the signal toward yellow.

- The V portion of the video signal carries red and green color information. Rotate *V Offset* clockwise to shift the signal toward red and counter-clockwise to shift the signal toward green.

Hint: Your system provides Waveform/Vectorscope monitors, which are an invaluable aid to you for accurately calibrating your video sources.

KEYING

The Keying control group in the *Image tab* hosts *LiveMatte*, a powerful real-time keying system for live production. Keying is a popular and powerful method of compositing multiple images, whether photos, video clips or live camera streams.

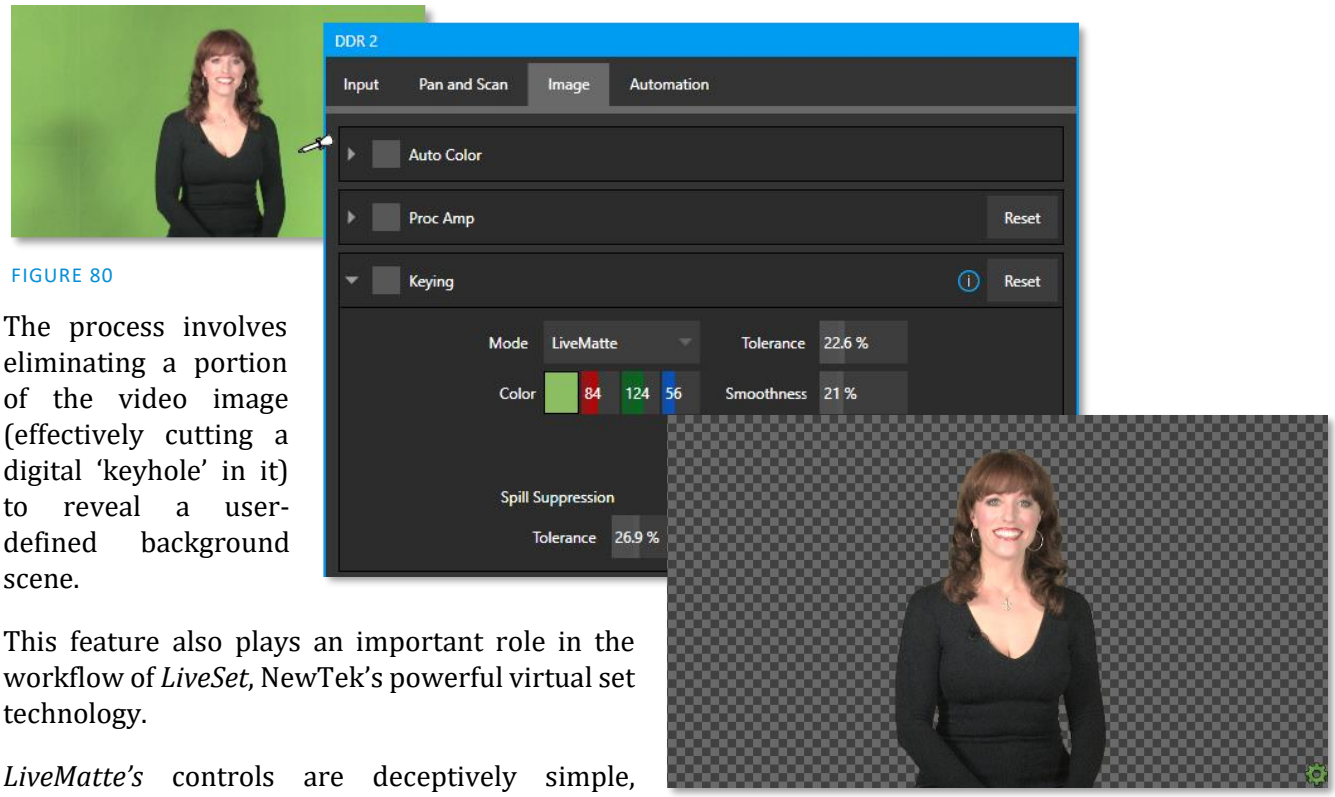


FIGURE 80

The process involves eliminating a portion of the video image (effectively cutting a digital 'keyhole' in it) to reveal a user-defined background scene.

This feature also plays an important role in the workflow of *LiveSet*, NewTek's powerful virtual set technology.

LiveMatte's controls are deceptively simple, making a great deal of complex digital manipulations easy to use. Even so, much can be said about getting the best results. For that reason, we've devoted a whole chapter in this manual to discussing it – please see Chapter 13, LiveMatte .

Hint: When LiveMatte, Proc Amp, or Crop settings are active for a source, bright green, blue and yellow indicators are lit under its monitor.

CROP SOURCE

It is very common for a source to be supplied with unintentional inclusions; these are often items that remain after chromakeying is applied, but which need to be removed along with the background. (Common examples include microphones or lighting fixtures dangling from above, or perhaps a harsh crease, blemish, or tear in the background screen.) Or, as is frequently the case, the source video itself may have a few pixels of black or video 'noise' along one or more of its edges.

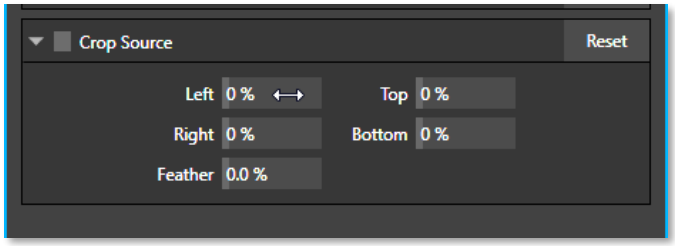


FIGURE 81

The settings in the *Crop Source* control group can be used to remove such unwanted 'garbage' from the scene, and for other purposes, too – such as to isolate a portion of the screen for use as a 'Picture in Picture' overlay.

Numeric controls in this group let you define margins for each side of the frame. Drag left or right on the number fields to adjust the values interactively or click a field to enter an exact value using the keyboard. The region defined by these controls is completely removed. Use the *Feather* setting to soften the edges.

Hint: For added convenience, similar cropping tools are available separately in the Position panels of DSKs, along with the Key and, for LiveSet Effects, each layer's settings for MEs.

8.1.4 AUTOMATION TAB

Automation is one of those wonderful things that really transform your workflow. The *Automation tab*, located in the *Input Configuration* panels for all video sources is one of several places where related features can be found.

Macros, discussed in Chapter 16, might be viewed as the basic building blocks of automation. Macros can easily be recorded and edited, and equally easily they can be triggered by a keystroke shortcut, control panel button, or similar means; but that isn't really 'automation', is it? It's actually a manual operation.

Somewhat obviously, automation should happen automatically based on predetermined criteria. The automatic transmission in your car shifts all by itself when certain conditions are met. In similar fashion, the features of the *Automation tab* allow you to predetermine what will happen when certain conditions are met. Consider the *State Change* control group.

STATE CHANGE

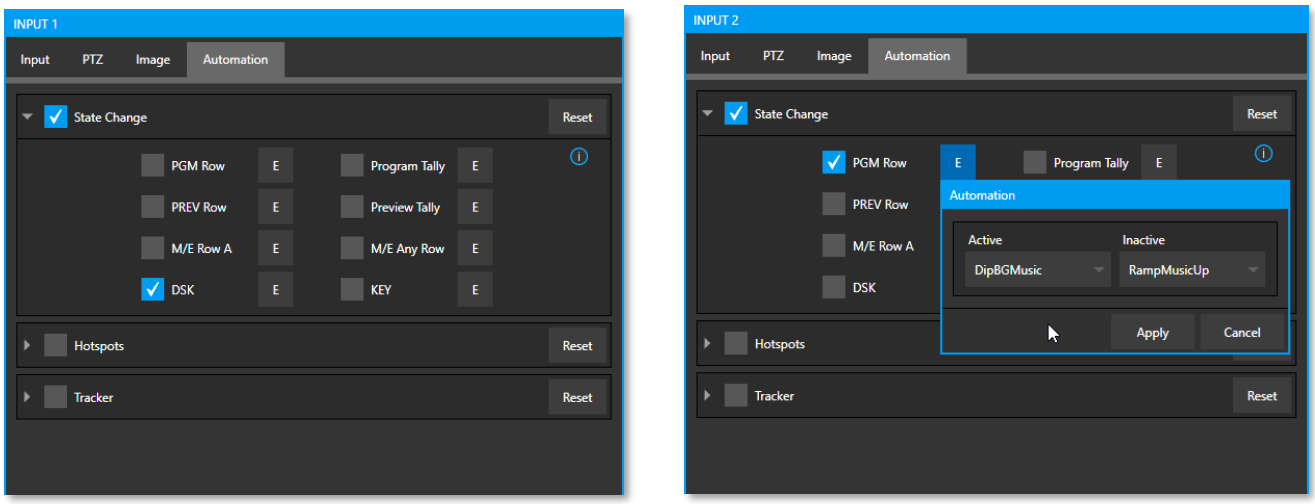


FIGURE 82

Click the [E] button next to a one of the 'state' options (see Figure 82) to assign macros that will be executed on specific *Switcher* operations that affect the specified state.

For example, the accompanying images depict macros that control the volume level of the *SOUND* player. Whenever *Cam 1* is newly selected on the Switcher's *PGM* row, the *Active* macro will run. Conversely, replacing *Camera 1* with a different *PGM* row selection will execute the *Inactive* macro.

Hint: The "E" on the button is short for "Event".

The *State Change* implementation thus allows you to automate all manner of operations based on such things as the following:

- *Program* or *Preview* row selection.
- Displaying/ hiding the source in a *DSK* or *KEY* channel.
- Selecting/de-selecting it on an *M/E*'s *A* row, or any *M/E* row, or …
- Showing or hiding a source on the *Program* or *Preview* output.

This is immensely powerful, and lends itself to endless applications, such as (to suggest just a few):

- Automatically fly in a title as you switch to remote sources, and remove it after a specified time
- Select a different *Audio Mixer* preset automatically when you switch from viewing a source in the B monitor of a virtual set on *Program* to displaying it full screen
- Then change back to the original audio setup when you switch back to the anchor desk.

The possibilities are truly endless.

Hint: More coverage of both macros and the larger topic of automation can be found in the accompanying Automation and Integration Guide.

HOTSPOTS



FIGURE 83

The next control group in the *Automation tab* is devoted to *Hotspots* – another powerful and interactive automation feature. A *Hotspot* is a user-defined region of the screen that (when active) detects opacity changes inside its boundaries (for which reason, *Hotspots* require *LiveMatte* to be enabled to work properly).

With *LiveMatte* properly configured, the *Hotspot* feature can trigger a macro when opaque pixels are newly detected in an active *Hotspot.*

For example, someone in a greenscreen set can trigger a macro by walking into a location in the frame where a hotspot has been defined. A second macro when all opaque pixels – i.e., the talent – moves out of the defined hotspot zone. All manner of creative implementations are possible.

Hotspot setup, options and use are further discussed in Chapter 5 of the supplemental *Automation and Integration Guide*.

TRACKER

The *Tracker* control group provides real-time motion tracking features. This feature allows you to choose a colored region of the video frame using tools similar to those found in the *LiveMatte* tab (see Chapter 13).

The tracked region is defined by choosing a primary *Color* using the color picker tool. The *Tracker* follows this region as it moves and shifts within the frame over time, and outputs the motion data for downstream application. *Tracker* output from one source can be used to dynamically modify the positioning of other video sources, when configured to do so in their individual *Position* panels.

ADJUSTING TOLERANCE

Click the eyedropper, and, while holding the mouse button down, drag the pointer over top of the monitor for the source you want to track (see Figure 84). The *Tracker's* color swatch updates as you drag, until you release the button to finalize your selection.

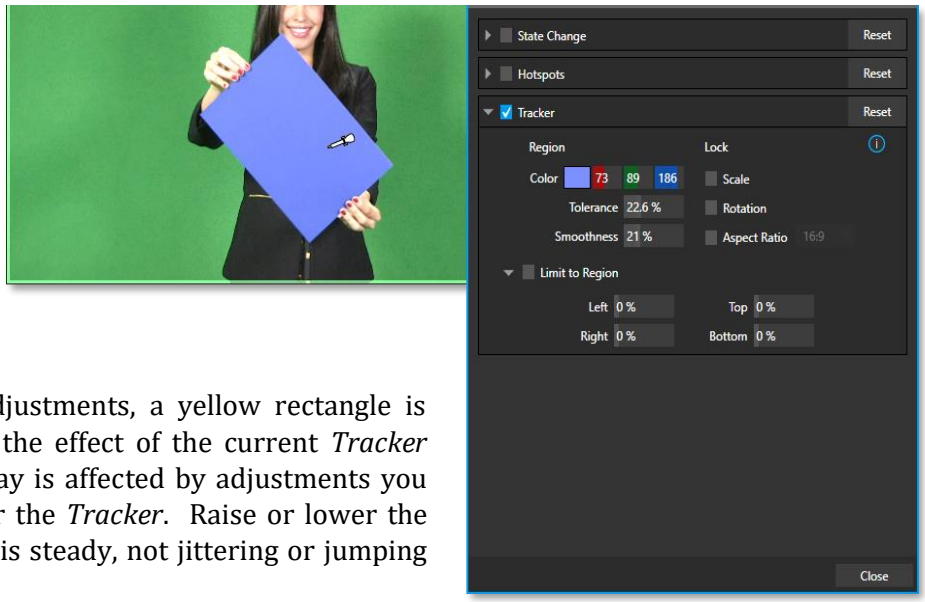


FIGURE 84

To assist you while making adjustments, a yellow rectangle is overlaid on the video to show the effect of the current *Tracker* settings. Watch how this overlay is affected by adjustments you make to the *Tolerance* value for the *Tracker*. Raise or lower the *Tolerance* value until the result is steady, not jittering or jumping about.

Hint: The yellow overlay disappears when you close the panel (or disable the Tracker), but you can show it full-time if you wish. To do so, right-click the desired viewport, and enable Tracking Markers from the Overlays options group in the menu.

SMOOTHNESS

The *Smoothness* setting works just like the *LiveMatte* feature with the same name. Its impact on tracking *data* output may seem minimal, but it can be important when used with the *Advanced Tracking* effect in *M/E* panels (see Section 14.2.2).

LOCK

At right are controls that permit you to *Lock* certain *Tracker* attributes, preventing them from changing in the scene.

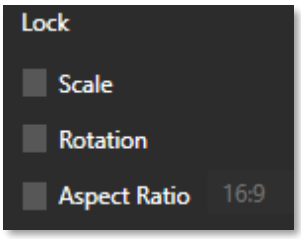


FIGURE 85

- Lock *Scale* to prevent the *Tracker* from automatically compensating when the scale of the tracked region grows or shrinks during motion.
- Likewise, when *Rotation* is locked, the orientation of Tracker output is constrained.
- The *Aspect Ratio* lock forces the *Tracker* to conform to a square (*1:1*), or rectangular (*4:3* or *16:9*) shape.

Hint: Locking channels in this manner makes it easier to obtain a steady motion track; but often, your choices will be dictated by creative requirements.

LIMIT TO REGION

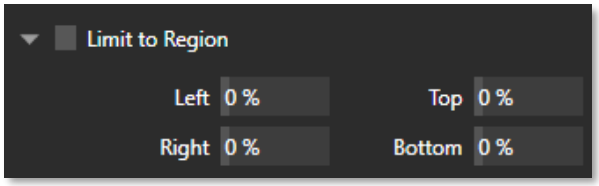


FIGURE 86

The *Tracker* is designed to follow the largest shape in a frame that meets the defined color criteria. At times, similar colored articles or inclusions in the frame can interfere with *Tracker* output.

The settings in this group allow you to limit the area of the frame the Tracker monitors, which can help you sidestep this issue. We'll discuss the application of the *Tracker's* data stream when discussing the *Positioner* tools.

SECTION 8.2 OUTPUT CONFIGURATION



FIGURE 87

Roll the mouse pointer over the *Program* monitor to reveal a *Configure* button (Figure 87) at right in the titlebar below the display. Click it to open the *Output Configuration* panel.

Hint: As for other viewports, alternatively 'two finder tap' on a touchscreen or, if Click Viewports to Show on PGM is disabled in the Options menu, double-click the mouse on the viewport to open this panel.

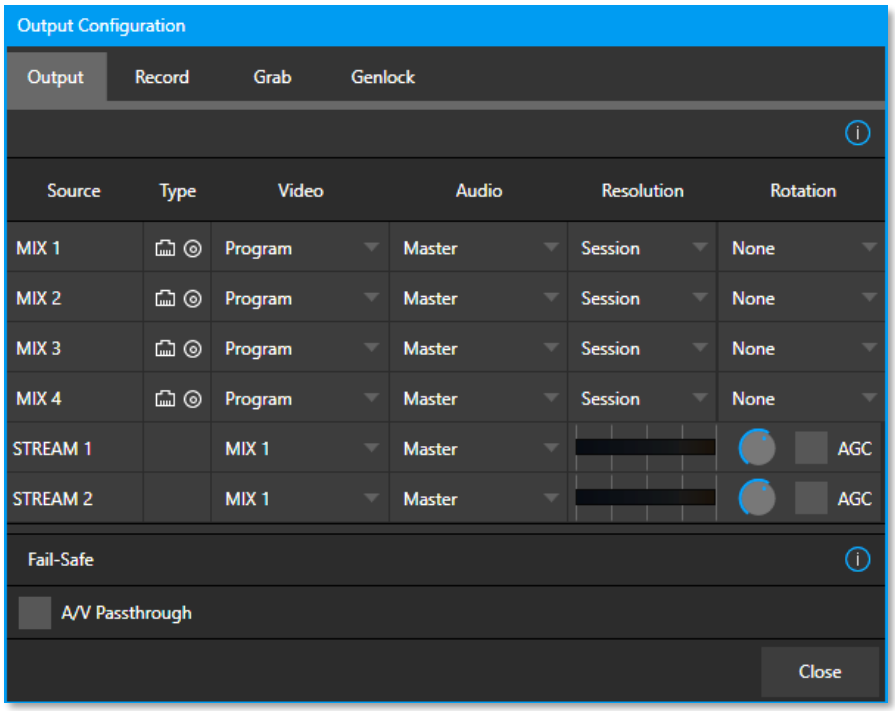


FIGURE 88 (TC1 SHOWN)

The *Output tab* in this panel contains controls governing the system's primary outputs.

8.2.1 OUTPUT TAB

We discussed *Primary* and *Secondary* outputs back in Section 3.10. The first four entries in this panel are primary outputs; typically, these are also 'mixed' outputs, hence their default labels – MIX 1, 2, etc. These video sources are sent to the corresponding SDI output connectors (when provided), and also as NDI (Network Device Interface) outputs.

VIDEO

The *primary* outputs support the largest number of optional video sources and, uniquely, can follow a delegated *M/E*, or a *Switcher* color group. All other outputs can be assigned to follow a primary output or show another designated *Switcher* source (excluding M/Es).

AUDIO

In similar fashion, you can choose which audio source accompanies any of the primary outputs. Choose any individual audio mixer input, or any of the mixed audio outputs, Master, or Aux (audio mix options vary by model).

RESOLUTION

The Resolution menu allows you to choose the video format for each output. Select the video format for downstream devices you intend to connect to the corresponding output here. The formats available are drawn from the list below, according to whether the session is in PAL or NTSC mode:

- 2160p
- 1080i or 1080p – depending on the session format
- 720p
- 480p – progressive standard definition NTSC sessions only
- 480i (4:3) –interlaced standard definition NTSC sessions only
- 480i (16:9) –interlaced standard definition interlaced NTSC sessions only
- 576p – progressive standard definition PAL sessions
- 576i (4:3) –interlaced standard definition PAL sessions
- 576i (16:9) – interlaced standard definition PAL sessions

Note: Output 1 always transmits video in session format, thus shows a Resolution display only.

Generally, source formats that are inconsistent with the current output resolution setting are automatically conformed when possible. In some cases, such as non-standard format sources, the output format may be modified to provide a suitable display. That said, it's best to avoid non-standard sources if possible.

STREAM

The *Stream* controls in the *Output* tab let you independently assign any of the primary mixes to one or more streaming encoder (encoder count varies by model). Likewise, for models with multiple audio busses, you can send audio from the *Master* audio mix or any of the *Aux* busses to either streaming encoder.

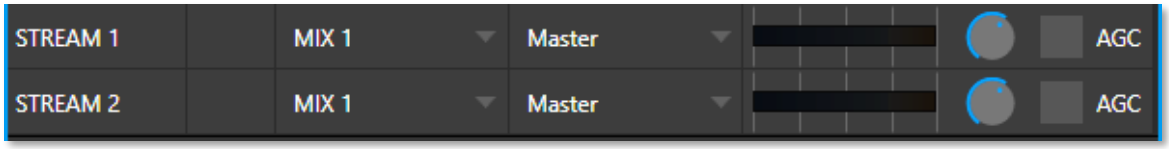


FIGURE 89

The audio controls also include individual *VU* meters, *Gain* knobs, and an *AGC* (Automatic Gain Control) option. These allow you to modulate audio for the streams separately from your primary audio outputs.

Hint: Streaming output is always de-interlaced.

Streaming Output involves more options, too, since there are so many different ways to stream. In this panel, you simply configure the audio and video sources sent to the streaming output. All other options and settings relevant to streaming are discussed in Chapter 17.

FAILSAFE

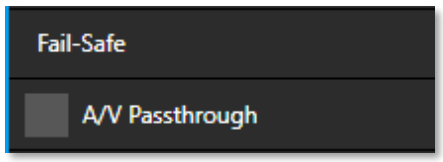


FIGURE 90

NewTek's multi-tiered 'Always on Air' hardware and software failsafe systems provide confidence that, short of a complete power failure, the show will go on. Video passthrough ensures that as long there is power,

audio and video from hardware Input 4 is routed to *Output 1* in case of a catastrophic software condition. If at all possible, streaming output and recording also continue even if all else fails.

In some studio settings, however, more elaborate hardware failsafe systems may be in use. Typically, such systems take over broadcast duties whenever the output signal fails. In this sort of pipeline, the native failsafe video passthrough mechanism can actually *prevent* the external system from engaging.

For this reason, a *Failsafe* control group has been added to the *Output* tab. This lets you disable the A/V passthrough when necessary. (Note that A/V passthrough is off by default and must be deliberately enabled to function.)

Hint: Only use fail-safe when a stable video source is connected to video Input 4.

8.2.2 RECORD TAB

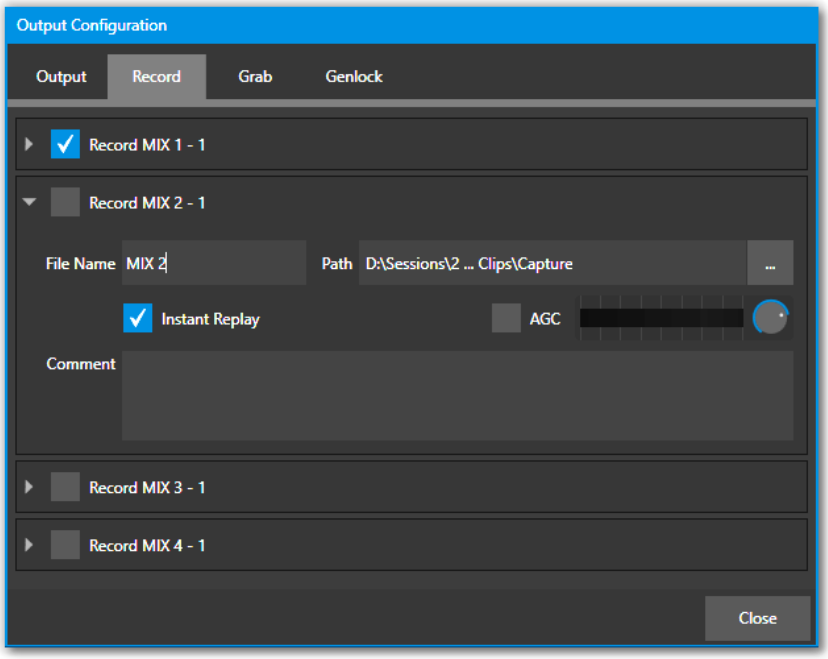


FIGURE 91

Each MIX output source has a corresponding *Record* control group to provide settings and options for capture. These important capabilities are discussed in full in Chapter 19, Record, Grab, and Replay. The controls shown in Figure 91 are detailed in Section 19.1.2.

8.2.3 GENLOCK TAB

The *Genlock* feature allows your NewTek system to 'lock' its video output to a reference video signal supplied to its *Genlock* input connector (varies by model).

This synchronizes system video output to external equipment locked to the same reference. Genlocking is not a *requirement*, but it is very beneficial, and you should definitely use it if you have the capability.

Miniscule local timing differences between these may force tiny delays during switching operations, which can contribute to throughput latency. Thus, serving i) the *Genlock* input and ii) other video devices in the chain with a single reference is the best approach.

You could think of it this way:

- Genlocking your *cameras* has the effect of locking their output together, ensuring optimal synchronization for live switching. This may result in throughput latency benefits.

- Supplying the same sync source to the *Genlock* input ensures a match between the system's video output and any downstream video devices required to handle both it *and* other (genlocked) sources.

  Note: Digital audio is less tolerant in certain respects than analog audio. Some devices require SDI sources to be genlocked when mixing digital audio (whether for recording or live production).

  NewTek systems, however, include dynamic audio re-sampling for each input. Genlocking SDI audio/video sources is not a requirement. Still, genlocking sources and other production devices to a single house reference signal, or genlocking the cameras directly to the NewTek live production system's output is encouraged (to genlock cameras, see your camera manual).

Hint: The term "genlock" refers to "generator locking".

Professional video devices often provide a "genlock input", which allows an external reference signal (often referred to as 'house sync') to control its video timing.

The output of video devices connected in this manner is synchronized to the reference signal, and they are referred to as 'genlocked'.

Genlock settings are hosted in a tab by the same name in the *Output Configuration* panel (Figure 92).

VERTICAL POSITION, HORIZONTAL POSITION AND PHASE

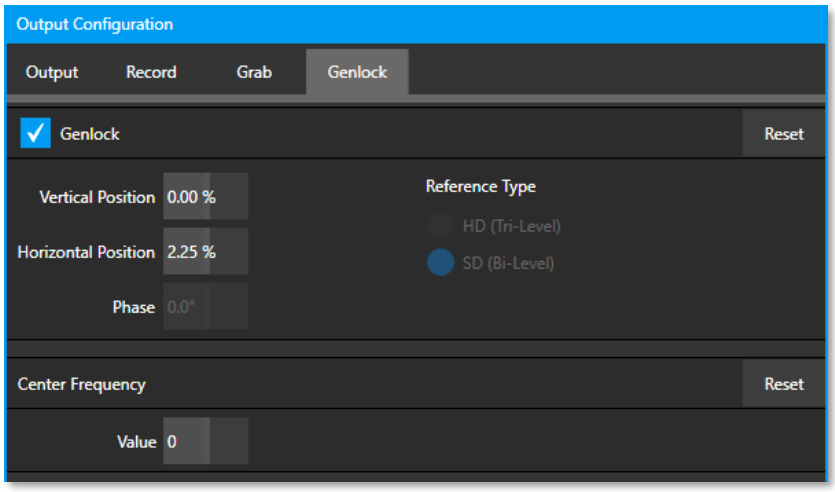


FIGURE 92

Locking all devices to house sync is important, but this alone does not actually ensure a perfect downstream match. Consider an army marching along: each step the soldiers take occurs at precisely the same moment,

so we could say their timing is synchronized. Even so – problems result if one soldier leads with the left foot while everyone else is on the right. Or perhaps everyone is evenly spaced and perfectly aligned but for one misfit who 'tailgates' the soldier ahead of him and keeps stepping on his heels.

This is essentially why adjustable settings exist in the *Genlock* panel. The *Horizontal* and *Vertical Position* settings pin the image in the proper space in the frame, and in doing so could be likened to making sure each marching soldier is in position relative to his fellows (as viewed from above). The *Phase* setting ensures proper color alignment, corresponding to making sure everyone is on the left or right foot at the same time.

Together, the *Vert Position*, *Horiz Position* and *Phase* settings let you tweak synchronization to arrive at an optimum match between devices. Typically, these settings are fine-tuned with the aid of a downstream vectorscope and waveform monitor. (A discussion of these adjustments goes beyond the scope of this manual, but a quick online search for the keywords "genlock" and "adjust" turns up a number of excellent references).

Reference Type

The 'bi-level' reference signal long used for standard definition television is often used for genlocking both SD and HD installations. However, the *HD (Tri-level)* reference sources are also supported by the *Reference Type* settings option.

Notes: Reference Type options do not appear for SD sessions. Also note that 1080/59.94p Tri-level genlock signals are not supported.

Center Frequency

This setting is applied when a genlock reference signal is *not* in use. To adjust the setting, supply color bars to an input and pass video output to a downstream vectorscope. The vectorscope display is completely stable when *Center Frequency* is properly adjusted.

Note: See also Section 8.1.1, Frame Sync.

Chapter 9 SWITCHER, TRANSITIONS AND OVERLAY



Many Live Desktop features replicate traditional video switcher controls in an easy to comprehend and use fashion. The Live Destkop features powerful transition controls, downstream overlay channels, interactive layer monitors, and powerful automation features.

The central part of the *Live Desktop* (between the monitoring section and the tabbed modules) is taken up by the *Switcher* and related controls and features, including *Layer Controls*, which include main and *DSK* (Downstream Keyer) *Transition* controls and configuration features.

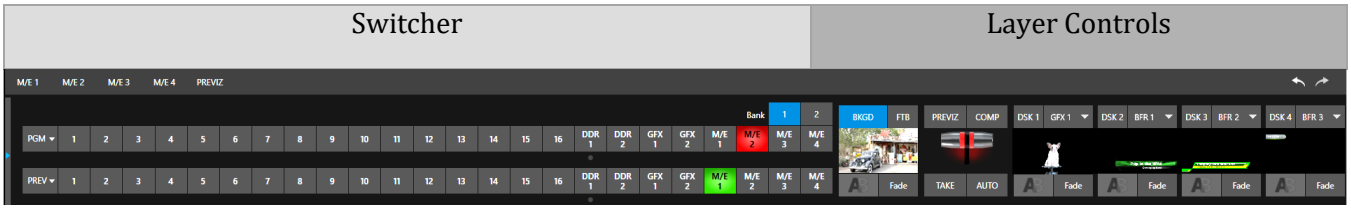


FIGURE 93 (TC1 SHOWN

SECTION 9.1 SWITCHER MODES

Many TriCaster models support two different *Switcher* modes, allowing you to choose which one is best suited to your need for a given program and environment.

The standard *Switcher* interface (Figure 93) provides control over your main *Program* video output using the familiar *Program/Preview* row method.

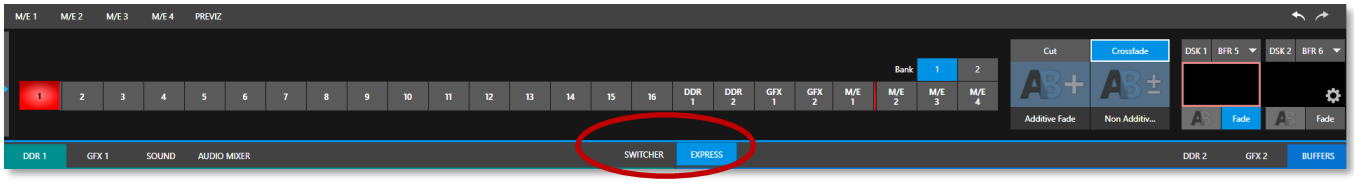


FIGURE 94 (TC1 SHOWN)

For less complex productions, the *Switcher's* convenient *Express mode* simplifies the process (Figure 94; see Section 9.11). This one-button operating mode will be especially welcome in environments where volunteers or less experienced operators are involved.

Hint: Additionally, support for switching using a touchscreen has been provided. Just tap a source's viewport to instantly send that input to Program output using the current background transition (if any).

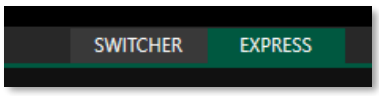


FIGURE 95

To select the current operating mode, simply click either the *SWITCHER* or *EXPRESS* tab provided at right in the horizontal bar immediately above the *Switcher* pane (Figure 95).

SECTION 9.2 SWITCHER ROW BANKS

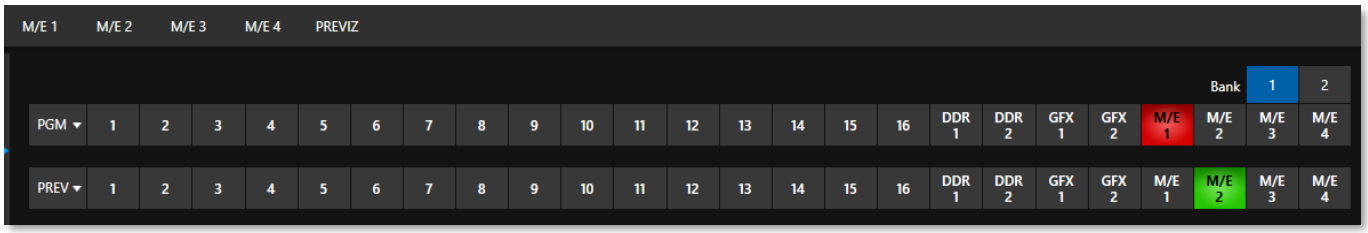


FIGURE 96 (TC1 SHOWN)

In standard *Switcher* mode, two *Switcher* rows labeled *PGM* (Program), and *PREV* (Preview) are shown (Figure 96). Clicking a button in the *Program* or *Preview* row selects the active video source for that bus (note that audio sources can optionally be affected by *Switcher* activity – see Chapter 15 Audio).

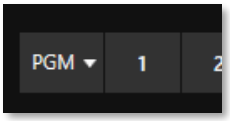
TriCaster's *Program* and *Preview* rows represent all available video source in "banks" of buttons. The number of banks vary according to the number of sources each model supports.

Bank 1 is shown by default. Holding down *Alt* on the keyboard reveals *Bank 2*. On releasing *Alt*, *Bank 1* is re-displayed. Press *ALT + CTRL* to momentarily display *Bank 3* when supported. It's possible to 'latch' *banks*, either by clicking *Bank* buttons on the screen, or by pressing *Tab* to cycle the currently displayed bank.

Hint: The standard Switcher (and M/Es with transitions assigned) show 'selection hint' tags beneath their rows when the selected source is in another bank. Click a tag to jump to the bank the source is hosted in.

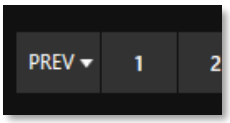
SECTION 9.3 PROGRAM/PREVIEW ROWS

The video source selections in the *Switcher* rows include all external inputs, including video router sources, internal sources (*Media Players* and *Buffers*), and the output from all M/Es.



The *PGM* (Program) row selection determines the dominant video stream of the *Background* (BKGD) *video layer* – that is the 'rear-most' layer of the composition sent to *Program* output.

Other sources may be mixed above the *Background* layer at times as you apply *LiveMatte*, or as portions of an incoming *Preview* row video source appear during a transition.



The *Preview row* appears in standard *Switcher* mode. Selections determine which source is queued up for display in the *Background* layer by a subsequent (BKGD) *Take* or *Transition* operation.

SECTION 9.4 BACKGROUND AND DSK LAYERS

The concept of *video layers* is central to understanding how the *Switcher, M/E* and *Transition* controls relate to one another, and how they combine to form the video seen on *Program* output.

- The *Background* layer (often shortened to simply 'BKGD') is always the base for the video composition displayed on *Program* output.
- *DSK* (Down Stream Keyer, or 'overlay') layers may appear above (in front of) the *Background*.

DSK layers are typically used for overlaying graphics, titles, etc., though they may serve other purposes as well. In addition to BKGD, up to five additional 'primary layers' (varies by model) can contribute to the final *Program* output at any given moment:

- Overlay layers (*DSKs*) are composed above the *BKGD* layer on output. *DSK 2* appears 'in front of' *DSK 1* on *Program Output* – that is, closest to the viewer – and so on in order.
- *FTB* (Fade to Black) constitutes a final overlay layer – one that obscures all other layers when applied.



Recall, too, that the *BKGD* layer itself is often a composite of sub-layers:

- It may include mixed video from both the *Program* or *Preview* rows.
- Selecting an *M/E* as source on *Program* or *Preview* can add many sub-layers to the *BKGD* composition, including the *M/E*'s primary *Inputs* and dedicated *KEY* layers (which are similar to *DSK* layers but being upstream of the main *Switcher*, appear composed in the background layer).

Note: Since M/Es are reentrant, the BKGD layer can at times reach very high numbers of sub-layers.

SECTION 9.5 SELECTING SOURCES

In standard *Switcher* mode, video sources for *PGM* (Program) and *PVW* (Preview) rows are selected individually by pressing buttons on those rows. By contrast, selecting a button on the single row in *Express* mode first places the designated source on the (unseen) *Preview* bus, then immediately switches it to *Program* output.

For *DSK/Key* layers, source selection is made using a drop-down menu above the integrated viewport located in the *DSK/Key* control group.

Hint: Right-click input buttons to select sources from video routers– see Section 3.11.1 (Configuring Routers).

SECTION 9.6 LINKING SWITCHER ROWS

It can be useful to link two (or more) *Switcher* or *M/E* source rows together, so cause them to operate synchronously. *Program* and *Preview* rows and *M/E* source rows all show a triangle beside the row label at left. Click it to open a menu that lets you set up linking.

As you'd expect, rows assigned to the same color groups are linked. A selection made in any linked row updates the selection of all other rows in the same color group to match. Thus Figure 97 shows the *Input A* row for an *M/E* linked to the *PGM* row of the main *Switcher*. The *Ungroup* menu item removes the current row from a group, while *Clear this group* removes all rows from the current group.



FIGURE 97

SECTION 9.7 TRANSITIONS AND EFFECTS

We discussed video layers in Section 9.4. With this in mind, it's easy to comprehend the layout and use of the *Transition* controls. Let's consider the *Transition* controls in the standard *Switcher* layout first.

9.7.1 STANDARD MODE

On the left of this group are the main *Transition* controls, including the *T-bar*. The control groups right of the T-Bar provide configuration and control options for the individual *DSK layers.*

Background Layer Transitions	DSK Layer Transitions

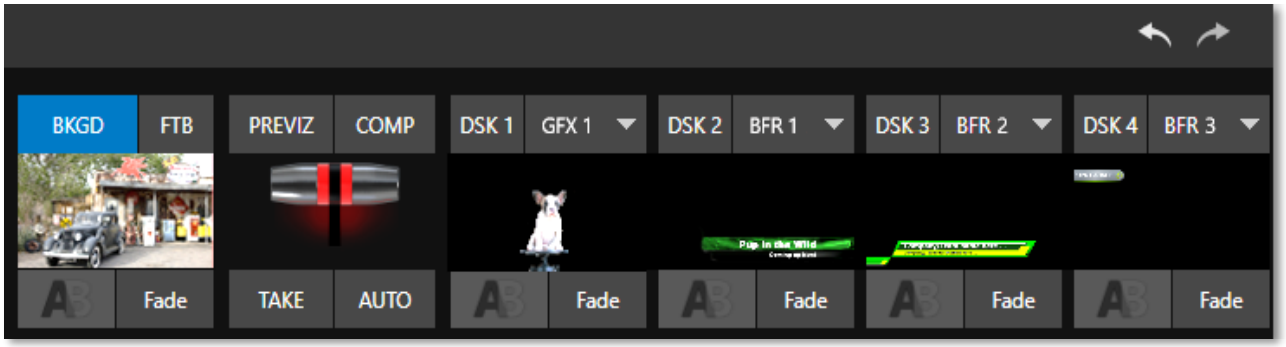


FIGURE 98 (TC1 SHOWN)

DSK Controls



Each *DSK* layer has a live video viewport showing the current source assigned to it (using the menu right above the viewport) and its own transition effect.

Click the transition icon at lower left below the viewport (Figure 99) to reveal a palette of different transition presets (Figure 101) provided for quick selection.

Click an entry in the palette to select it or move the mouse pointer to the "+" sign that pops up for each icon and click to open the *Custom Media Browser.*

FIGURE 99

Hint: The frequently used Cut and Fade effects are always available in the transition palette. As these cannot be replaced, no + sign appears for these icons.

In the *Media Browser*, you can choose from the hundreds of transition effects, or even *Animation Store* effects that you prepared yourself with the supplied *Animation Store Creator* application. The selected effect will replace the current one in the palette. To display or hide the *DSK* video layer over the *BKGD* layer on *Program* output using the currently selected effect, click (or tap) the viewport or the effect name label just below.

Hint: You can halt an unfinished effect by clicking again during the transition. Click it again to continue performing the effect.

Transition Delegates

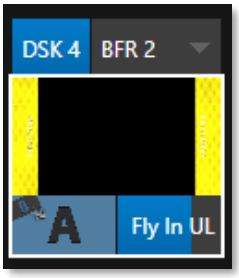


FIGURE 100

You can also control transition progress using the Switcher's *T-Bar* control, at left. The *T-Bar* operates on all *delegated* video layers. To delegate a *DSK*, click its label at upper left (Figure 100) to turn it blue. Clicking it a second time will un-delegate the layer.

The *T-Bar* acts on all delegated layers, including the *Background* video layer. For example, if *DSK 1* is visible, but *DSK 2* is not, when both *DSKs* and *BKGD* are delegated performing a T-Bar (or BKGD AUTO) operation reverses the visibility of the two *DSKs* on *Program* output when the *BKGD* transition occurs.

Transition Timing

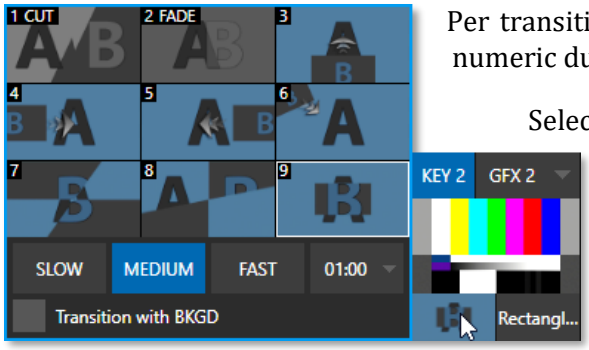


FIGURE 101 (TC1 WITH PREMIUM ACCESS SHOWN)

Per transition timing is set and stored in the effect palette, using the numeric duration control beside the effect icon.

Select transition speeds using the menu below the *Transition Palette*. You can also drag the mouse pointer over the numeric display to set a custom time or click it to enable keyboard entry of the effect duration.

Note: To modify the duration of any key transition, see 14.8.1 Apply to Transitions in the COMPS section.

Hint: The direction of Transitions applied as DSK (and M/E KEY) layer effects automatically alternates. If the first click displays the layer using an effect, the next click removes it using the reverse effect. This 'Ping Pong' behavior is optional for BKGD (Background) layer transitions.

Animation Store Transitions

You can also choose special transition effects called *Animation Stores*. These powerful effects normally include an embedded full color animated overlay, along with sounds for transitioning in and out (the audio level for *Effects* is controlled in the *Audio M*ixer tab below the *Switcher*).

These special *Animation Store transitions* are loaded into the *Transition Palette* in the same way as their less colorful cousins, using the *Browse* feature. A number of *Animation Store transitions* are supplied, but you can generate your own using the supplied *Animation Store Creator* application and custom animation content you have access to or create using art software.

DSK Source Configuration



FIGURE 102

Many more configuration options are available for *DSK*s (and their siblings, *M/E* key layers, too).

To access these settings and features, roll the mouse pointer over the *DSK* viewport, and click the configuration (gear) gadget that appears at lower right (Figure 102).

Hint: Touchscreen users can 'two-finger tap' the viewport to open the Configuration panel.

Doing so will open the *Input Configuration* panel for the source assigned to the *DSK*, but with the addition of a supplemental tab labeled DSK (1-4).

The control groups in this new tab expand to reveal *Position*, *Use Source Tracker* and *Borders, Edges and Shadows* settings.

POSITION (AND CROP)

The *Position* control group includes *Position*, *Zoom*, *Rotation*, and *Priority*. *Position* settings can be toggled on and off together using the switch provided in the group header.

Click and drag on the *Position* button (diamond) to relocate the *DSK* layer vertically or horizontally within the frame.

Drag left or right on either of the two nearby numeric controls to adjust a single axis only.

Dragging the cursor on the *Zoom* button (magnifying glass) affects the apparent size of the overlay. Again, if you drag just one of the associated numeric gadgets you can adjust just one dimension of the corresponding *DSK* layer – width or height.

In similar fashion, drag the pointer over the *Rotation* button with the left mouse button depressed to turn the overlay source on three axes as follows:

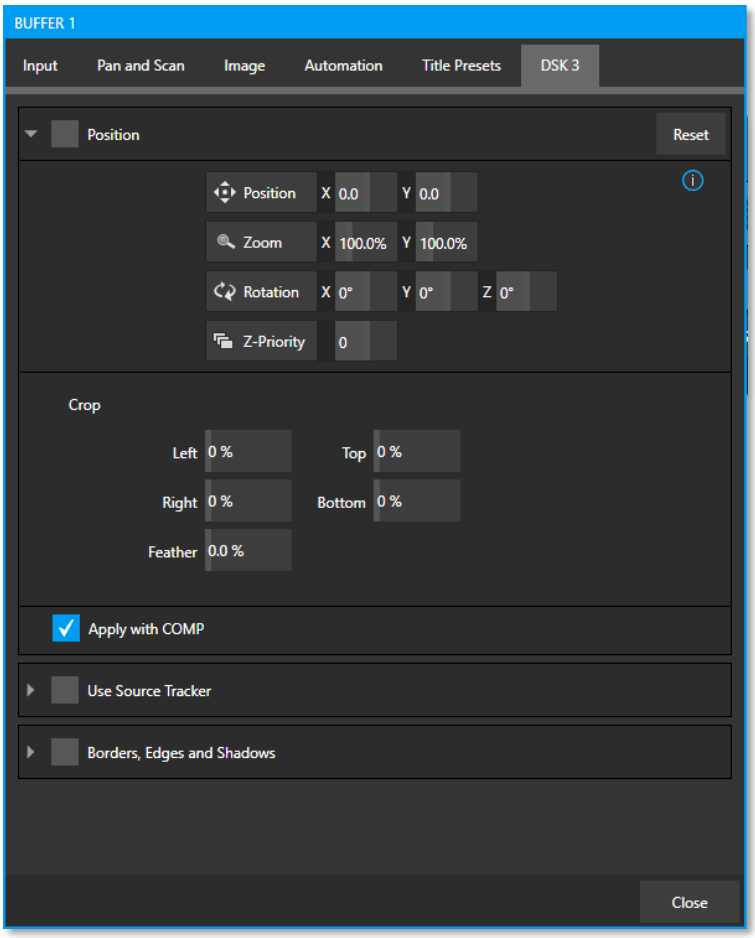


FIGURE 103

- Drag left/right to rotate the source about the Y (vertical) axis.
- Drag up/down to rotate about the X (horizontal) axis.
- Drag while holding *Alt* down to rotate about the Z axis.
- Drag on a single numeric slider or hold down *Ctrl* to constrain rotation to one axis.

Hint: If you click a numeric field (or right-click it), you can type a value into the gadget using the keyboard; press Enter to complete the editing action, or Esc to cancel it).

The *Crop DSK/KEY* controls in this group are similar to those found in the *Input tab*, as discussed back in Section 8.1.1. However, these settings are applied to the *DSK/KEY* layer, without any impact on the source itself as it may be displayed elsewhere in the *Switcher*.

Z-Priority

Normally, *KEY* and *DSK* layers appear in numeric order from 'back' (furthest from the viewer) to 'front'. This if *DSK 1* and *DSK 2* are both displayed and occupy the same position in the frame, the content in *DSK 2* will occlude *DSK 1*.

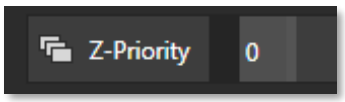


FIGURE 104

The *Priority* setting in *DSK,* and *KEY* layer *Positioning* panels allows you to revise the default layer order on a selective basis. This feature was specially implemented to provide additional flexibility for use with the *Comps* feature. (Varies by model)

DSK and KEY layers automatically appear on the *Preview* and (*M/E Preview*) monitors when the *Position* panel is open (regardless of layer display options).

This allows you to modify a layer's position without the result being inadvertently shown on output.

For example, imagine an *M/E* set up with 4 *KEY*s supplying a quad-box setup for four remote interviewees over a background supplied by the *M/E*. You might want to use *Comps* to zoom the top-left input up to fill the screen while the moderator chats with that person. Normally, *KEY*s 1-3 would always appear *behind* KEY 4 – not what you want at all. The *Priority* feature lets you move any KEY to the front (and the setting is stored in your *Comps*).

The range of *Priority* settings runs from -10 to +10; the default is 0. A layer with a higher index is shown in front of those with lower indices. When two layers have the same layer priority, they are rendered in their natural (*DSK/KEY* layer) order.

Apply with Comp

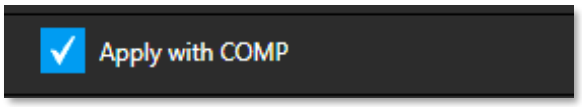


FIGURE 105

We will discuss the powerful *Comp* system a bit later (Section 9.9), but we'll mention it in passing here to highlight the *Apply with Comp* switch provided in the *Position* control group. At the lowest level, *Comps* can be thought of as presets that store complete *Switcher* or *M/E* setups.

Note: 410 Plus and TC Mini require Premium Access subscription to enable the COMP feature.

By default, the settings stored in a *Comp* include the *Position*, *Crop,* and visibility state for each *DSK* or *KEY* layer. Disable the *Apply with Comp* feature if you want to exclude a given DSK/KEY channel from Comp control, handling it manually instead.

Hint: You might find this useful, for example, to ensure that a station ID 'bug' shown over output is not accidentally removed by application of a Comp.

USE SOURCE TRACKER

We discussed the video *Tracker* back in Section 8.1.4). The *Use Source Tracker* feature lets you assign motion data output from the *Tracker* for any video source to modify the position of the current *DSK* or *KEY* layer by selecting it in this menu.

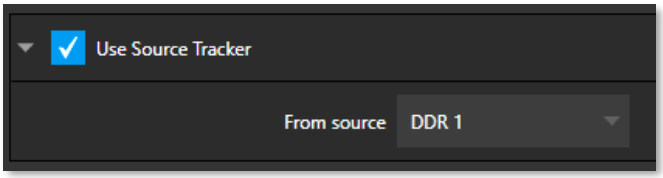


FIGURE 106

Position settings enabled above in the *DSK/KEY* tab continue in force but will be applied relative to *Tracker* output. (For example, *X* and *Y Position* settings entered in the upper part of the panel result in an offset from the co-ordinates supplied by the *Tracker*.)

BORDERS, EDGES AND SHADOWS



FIGURE 107

The *Borders, Edges and Shadows group* also provides each *DSK*, *KEY* and *M/E* layer with three quick access *Border* preset slots (Figure 107).

Hint: Since these are per-layer Position effects and can be controlled – even animated – by Comps, you can use the Borders feature to create custom multi-box compositions in M/Es.

These powerful effects can include full color overlays, backgrounds, matte layers for 'keyhole' effects, and shadows.



FIGURE 108

You can freely scale, position and rotate various Switcher sources, add custom borders, overlays, shadows, and so-on, over custom backgrounds or even live or animated sources – all without special skills or resorting to *Virtual Set Editor*.

In addition to hundreds of supplied borders, you can easily create elaborate custom effects using

Photoshop®. You need merely define a Photoshop format file with three (rasterized) layers. The uppermost layer contains foreground elements (such as a bezel). The next layer is treated as a mask based on opacity and defines the part of the source image that will appear in the result. The 'bottom' layer supplies a background to appear behind transparent parts of the source (as, for example, when *LiveMatte* is applied to a source).

A template PSD file is supplied to assist you to do this. You will find the multi-layer Photoshop file in the Borders folder at C:\ProgramData\NewTek\(*TriCaster*)\Effects\Borders.

Hint: Since the opacity of the mask layer can vary between fully opaque and fully transparent, you can easily prepare soft-edged effects such as vignettes. Also, as foreground and background layers can optionally be empty, a simple opaque shape in the mask layer can serve a variety of imaginative purposes.

TRANSPARENCY

Sources assigned to *DSKs* are often partially transparent. This might be because they are drawn from a *Media Player* (*DDR*) file that includes an embedded *alpha channel*, or because *LiveMatte* or *Crop* options are enabled for the source, or perhaps because a *Network* source includes an alpha channel, or even all of these factors operating together.

In all of these cases, *DSK* layers automatically respect transparency when supplied by the source. The *BKGD* layer and all visible content in lower-numbered *DSKs* will appear through or around sources with transparency as appropriate.



FIGURE 109

DSK layers offer a lot of creative possibilities. You might use *DSK* channels to display a permanent station ID 'bug', superimpose a company logo onto a title page, perhaps to add a 'spinning globe' animation playing in the *DDR* to a lower-third, 'frame' a keyed source composed over a title (Figure 109), or set up many other elaborate effects in this manner.

9.7.2 BACKGROUND CONTROLS



FIGURE 110

BACKGROUND TRANSITION GROUP

Transition controls in this section apply to the *Background* video layer only. In most respects, these tools are identical to the *DSK* transition controls discussed earlier, but there is one difference worth mentioning.

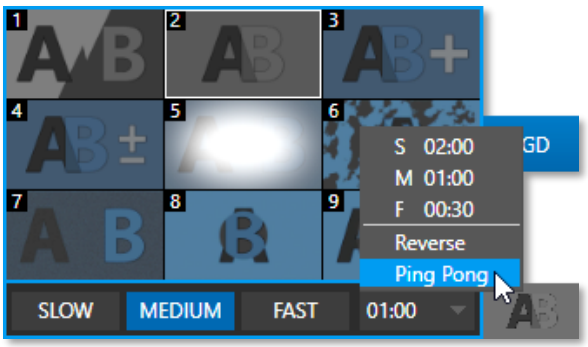


FIGURE 111

The *Duration* menu for the *Background* transition offers two items not included in the similar *DSK/KEY* controls:

- *Reverse* – configures the current transition to run in reverse direction the next time it is applied.
- *Ping Pong* – when enabled, this option causes the direction of the transition to be automatically swapped after each time it is applied.

FTB

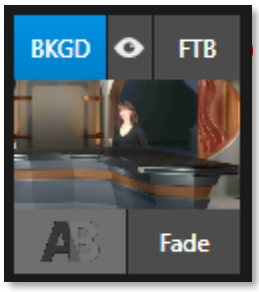


FIGURE 112

Let's discuss the *FTB* feature next. The acronym stands for *Fade to Black*. The result of clicking the *FTB button* will not likely surprise you very much. ☺

FTB offers a convenient method of doing what its name implies – fading *Program output* completely to black. It might help to think of *FTB* as a final video layer added above all others before *Program* output, completely obscuring everything below it.

As a memory aid, the *FTB* button pulses during operation. *FTB*'s fade duration is drawn from the *BKGD* transition setting.

Note: Hold down Shift while pressing the FTB button on a control panel to initiate an FTB operation. Hiding or displaying FTB triggers both Autoplay and Audio Follow Video when enabled for Media Players. It also fades Master Audio to mute when displayed, and back up again when hidden.

TAKE AND AUTO

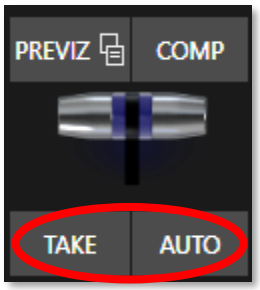


FIGURE 113

Clicking the *Background* layer's *Take* button (keyboard shortcut *Enter*) performs a straight cut for all video layers that are currently delegated.

Likewise, if you press *Auto* (or the keyboard *Spacebar*), the transitions assigned to all delegated video layers are performed.

Hint: You can halt an Auto operation partway by clicking the button a second time during the transition. The operation will be completed the next time you click the button.

T-BAR

The *T-bar* mimics the similar control on a traditional video switcher and allows you to *manually* transition between selected video layers. To use the *T-bar*, pull it downward by dragging it with the mouse pointer. Drag it all the way to the bottom and release to complete a transition; the T-bar then pops back to the top.

Hint: Naturally, when the T-bar is dragged part way, a partial transition occurs. With certain transitions this can be useful for split screen effects.

SECTION 9.8 PREVIZ

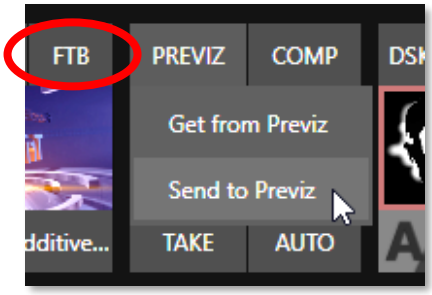


FIGURE 114

The *Look Ahead Preview* viewport above the *Switcher* shows the *outcome* of the currently configured transition before it is performed. *Previz* takes this capability further, allowing you to pre-visualize effects in motion, including T-bar operations.

You can preview any *Switcher* and *M/E* effects (including *DSK/KEY* layers) without fear of disrupting *Switcher* (or *M/E*) output. Create complex compositions in this mode and copy them back to the original M/E (or Switcher) or a different one.

You might use *Previz* to test your currently delegated transitions and sources before applying them. Alternatively, though, you can experiment to your heart's content. Freely change layer sources, modify *Positioner* settings, transitions or effects, layer delegates, test the result of *Take/Auto*, use *T-Bar* or *Zoom* controls with impunity.

Use the *PREVIZ* menu to copy the current settings of the source (*Switcher* or *M/E*) into the dedicated *Previz* pane, located with the M/Es, since it can be thought of as a specialized M/E – one *never* visible on output.

Hint: Use the "M/E Follow" Workspace to monitor your experiments in the Previz pane.

When you arrive at a composition you like, simply select the *Paste Previz* menu item in the desired destination (*Switcher* or *M/E* tab) to send it to the target.

Hint: This allows you to transfer all of the settings very easily for an M/E – say, the left camera angle for a virtual set complete with carefully positioned M/E and KEY layers – to one or more additional M/Es. Then you can simply swap the effect for the new M/Es to add different angles that match the original perfectly.

SECTION 9.9 COMPS AND MEMS

You'll also notice a button labeled *COMP* immediately above the *T-Bar*. Clicking it opens the *Comp Bin*, which provides powerful layer and effect control features.

Note: 410 Plus and TC Mini require Premium Access subscription to enable the COMP feature.

We're going to discuss the *Comp Bin* in full soon (Section 14.8), but at this point we want to distinguish them from *Switcher* MEMs. Bumping the cursor at the left edge of the screen adjacent to the *Switcher* or an *M/E* reveals a *MEM bin* with features that are quite similar. The primary difference between *MEMs* and *Comps* is that the former retain (and apply) all settings in the *Switcher* including source selection.

SECTION 9.10 UNDO/REDO



FIGURE 115

The *Undo/Redo* feature is a very useful innovation that stores multiple undo/redo states. You can easily revert to a prior *Switcher* state, providing another important 'failsafe' feature. Accidents happen.

Undo is great for those times when you've inadvertently changed something with unwanted results but lack time to figure out what went wrong.

The system stores a fresh *Undo* state whenever the *Program* row selection is changed. If you encounter problems and don't have time to think about what may have gone wrong, a click (or keyboard Ctrl + z) can quickly get you back to the prior state.

SECTION 9.11 EXPRESS MODE

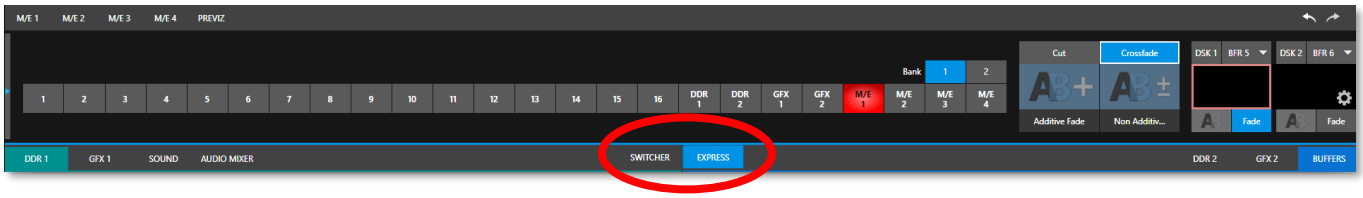


FIGURE 116

As mentioned earlier in this chapter, the *Switcher's* convenient *Express mode* simplifies the process for less complex productions.

To open the *Express* mode *Switcher* view, click or tap the *EXPRESS* tab right above the *Switcher*.

9.11.1 BACKGROUND TRANSITION

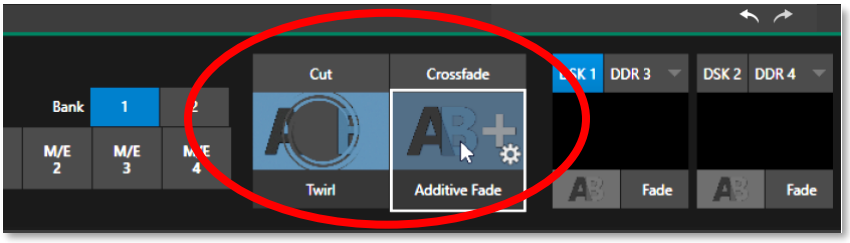


FIGURE 117

Note the quad-selector located between the single *Switcher* row, and the *DSK* controls at right. *Cut* and *Crossfade* mode selectors top this control group. Simply click or tap the *Cut* or *Crossfade* buttons to activate the corresponding *Background transition*.

Just below you will see two selectable transition controls. Tap or click these to activate the effect represented by the icon as the current *Background transition* instead. To open a transition selector to choose a different transition for either of these slots, click the gear that appears at lower right when your mouse pointer is over the icon.

Hint: Although the gear is not visible in a touchscreen scenario, you can still tap the lower right corner of the icon to open the transition bin.

9.11.2 SWITCHING

Having selected the *Background transition*, simply click, or tap the button for the source you wish to send to *Program* output. There is no need to make a Preview row selection first, as you would need to do in the standard (2-row) *Switcher*. The *Background transition* you chose will be applied to display the new source.

9.11.3 DSKS

The two *DSK* control groups at right work just like their siblings in the standard Switcher, but it is particularly handy that you need simply click or tap their viewport to show or hide the associated *DSK* layer.

Chapter 10 MONITORING YOUR VIDEO



The word "monitor" comes from the Latin "monēre", meaning 'to warn', but has taken on additional meaning since Roman times. As a verb, these include such connotations as 'keeping an eye' on something, and 'checking continually'. As a noun, we understand it to mean devices that permit one to do just that.

As you would expect, your NewTek system provides extensive and versatile monitoring – just what is needed to control your live productions. Monitoring features can also warn you of conditions that might affect output quality, as well as providing access to adjustments providing quality control and creative alternatives.

Among others you will find *Proc Amp*, *LiveMatte, Hotspot, Tracking* and *Edge* controls. (To give some of these the attention they deserve, they are treated individually in Section 7.5 and elsewhere.)

SECTION 10.1 INTERFACE AND MULTIVIEW

Really, the *Live Desktop* provides a number of multiview monitor displays – one on the *Live Desktop* (a.k.a., the "Interface"), normally comprising its upper third, and the others consisting of fully independent displays presented on secondary monitor outputs on the rear connector panel (multiview count varies by model).

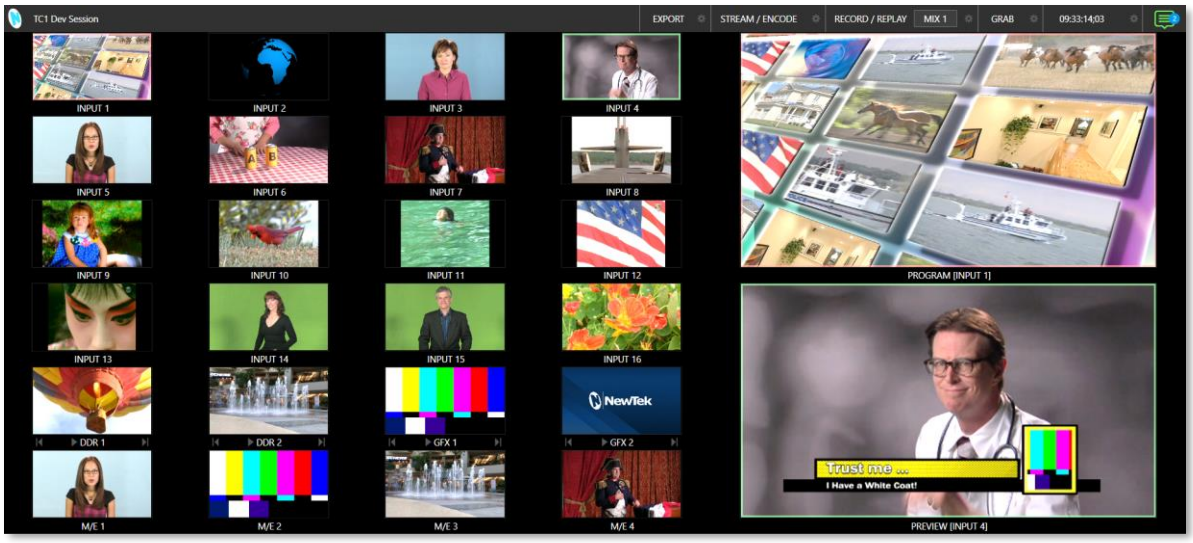


FIGURE 118

SECTION 10.2 LIVE DESKTOP MONITORS

Because the *Live Desktop* provides various control features along with a multiview pane, and controls can consume a greater or lesser amount of the screen, the multiview on the *Live Desktop* is adaptive.

To put this another way, the viewport layout of the *Live Desktop's* multiview pane re-arranges itself as required to make optimal use of the space available.

For example, when tabbed modules (such as the *DDRs*) at the bottom of the *Live Desktop* are fully expanded, the *Program* and *Preview* viewports above are stacked one above the other. On the other hand, if the tabbed modules are minimized, these viewports are side by side.

Note: To learn how to use NDI KVM with multiviews, see Section 5.2 The Home Page.

SECTION 10.3 WORKSPACE PRESETS

The basic layout of all multiview monitoring areas is established by assigning a *Workspace* preset to the screen. To access these presets, move the mouse pointer over the left-hand end of the *Dashboard* at the top of the *Live Desktop* to reveal the *Workspaces* menu.

Four presets, labeled *A-D*, are provided for each connected *Multiview* screen. Select a preset and assign a layout to it using the *Load Default* menu point. Continue to customize the display options for the viewports and recall the entire setup at a moment's notice by reselecting it. (To reset a preset, select it again and reload the default layout.)

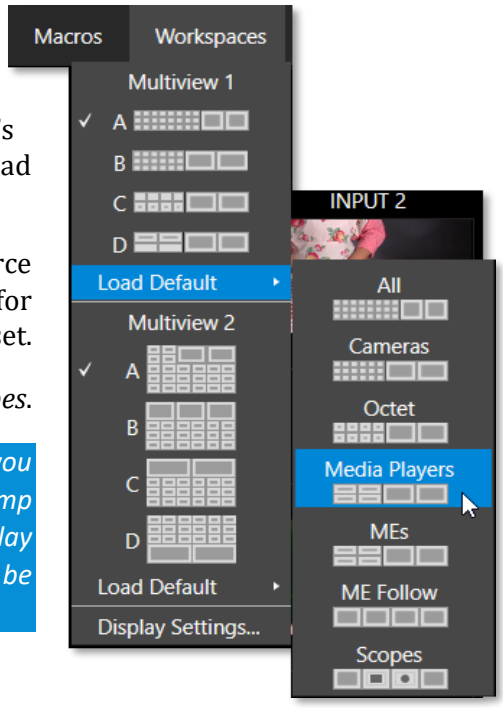


FIGURE 119

Each viewport in any layout offers diverse input or output source options, as discussed in Section 10.5. The settings you select for individual monitors will be retained in the current *Workspace* preset.

Let's further consider an important *Workspace* layout option - *Scopes*.

Note: The Display Settings option in the Workspaces menu lets you choose the Resolution of connected monitors and apply Proc Amp settings to them. Select the native resolution of external display devices for best results. Changing Resolution can cause frames to be dropped, so modifications during live production are discouraged.

SECTION 10.4 SCOPES

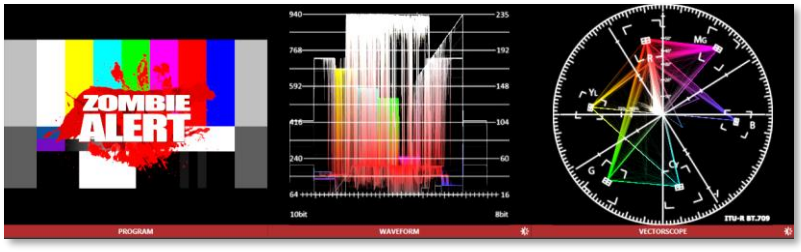


FIGURE 120

Scopes represent a very useful monitoring option, providing *Waveform* and *Vectorscope* displays.

Among other things, these help you to judge *Proc Amp* and *LiveMatte* settings (see Appendix C, Video Calibration).

Note: The Waveform and Vectorscope displays are not a feature of all TriCaster models.

To display the *Scopes* view, select that entry from the *Load Default* options for a *Workspace*.

By default, scopes and the associated monitor refer to the *Look Ahead Preview* composition (including delegated *DSK* channels, or *FTB*), shown at left for reference. Right-click a scope to change the monitored source to the source you wish to view. Adjust the *Brightness* controls in the scope footers, and the trace overlay in full or solid colors using the context menu.

Hint: To use Scopes to calibrate a DSK source independently, first select it as the Preview row source.

Double-click a monitor in this *Workspace* to access *Proc Amp* and *LiveMatte™* controls for the current source.

SECTION 10.5 VIEWPORT OPTIONS

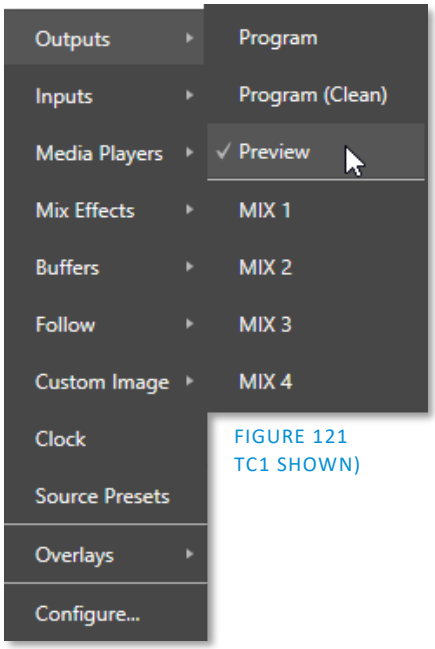


FIGURE 121
TC1 SHOWN)

Right clicking an individual monitor viewport also opens a context menu. The first option group governs the monitor's source.

In addition to external video inputs (including *Network* sources), you can assign the output of *Media Players*; *M/Es*; main *Program* output (including *DSK* channels and effects); *Program (Clean)* without; the main *Switcher*'s look ahead *Preview;* another *Preview* showing *M/E source B* output (*Mix mode* only).

Several special displays are also available. Selecting the *Clock* item replaces the video display with *Event Clocks* showing current time along with countdown style *Start* and *End* clocks. The *Custom Image* feature lets you display a network logo.

A further display you may find useful is the *Timecode Only* option that appears at the bottom of the *Media Players* sub-menu. This displays a time counter showing the current position of the playhead in the *Media Player* (respecting the specified Player's *Warning Colors* option, too).

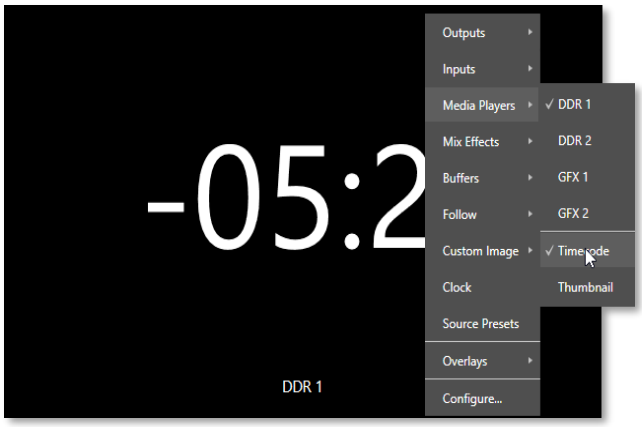


FIGURE 122

Below the basic source selection options in the menu, you'll find another group that provides access to optional *Overlays* for the monitor port.

Available overlays include *Checkerboard* (shows a checked pattern wherever transparency exists in the source); *Title Safe* (note this is a 4:3 format safe margin); *4:3 Safe* (a true 4:3 frame edge boundary), *Center Cross* to help with alignment, and *Show Illegal* and *Show Alpha*.

In addition, you may choose to display *VU Meters* with the source, *Tracking Markers* and *Hot Spot Markers* (see Section 8.1.4).

Long-standing practice when using color bars to calibrate video signal color attributes requires special video monitors with 'blue only' (or 'blue-gun') displays. The *Blue Only* viewport option means you can now use any color monitor for this purpose.

The final *Overlay* option flips the images horizontally, useful for a variety of studio requirements such as talent orientation in greenscreen applications (including *Hotspot* operations).

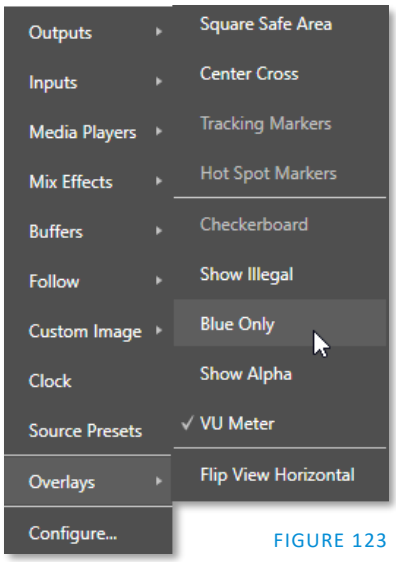


FIGURE 123

Note: Certain Overlay menu options are not suitable for all monitor sources hence are not listed when inappropriate or may not appear on all models.

10.5.1 VIEWPORT PRESETS

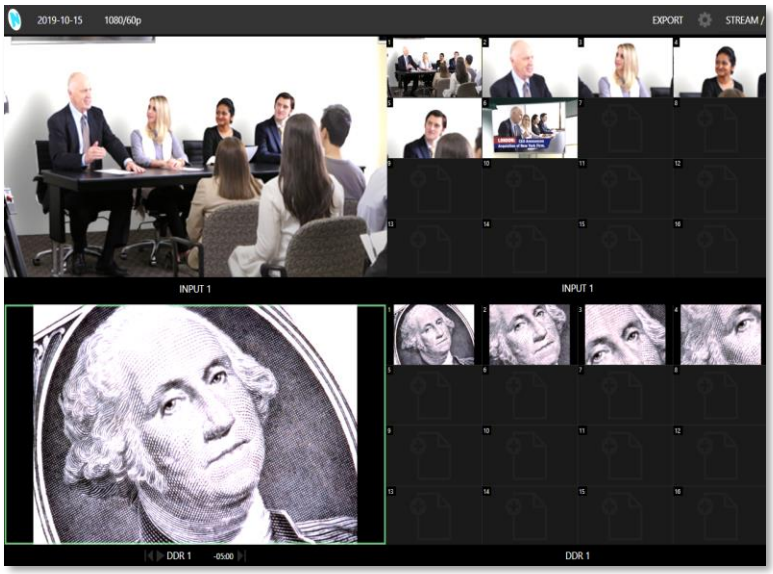


FIGURE 124

From corporate video to reality TV, PTZ cameras are playing an expanded role in modern production. TriCaster gives top billing to your PTZ presets right in its Live Desktop or any connected Multiview.

The viewport context menu option *Source Presets* lets you assign preset controls to any viewport. Large, colorful thumbnail icons represent PTZ presets for robotic cameras, *Pan, and Scan* presets (a.k.a. 'virtual PTZ', requires Premium Access membership), and M/E *Comps* (or zoom presets on systems lacking Comp support).

With a click, or better yet a tap on a touchscreen, your source will gracefully move to its new position (*Pan and Scan* sources can also be set to Cut). Using TriCaster's Multiview workspace options you can create custom layouts providing one-click access to presets for multiple sources of different types.

Hint: Double-click a viewport to quickly open Input configuration using the gear or menu.

10.5.2 CONFIGURE

One final item completes the monitor viewport options:

- *Configure* –opens the *Input Configuration* panel for the corresponding source.

Hint: Double-click a viewport to quickly open Input Configuration without using the gear or menu.

SECTION 10.6 VIEWPORT TOOLS

Viewports provide additional features when you move your mouse pointer over them.



As shown in Figure 125 when the *VU meter* overlay option is enabled, a volume knob (similar to those in the *Audio Mixer*) is shown. Drag this knob up or down to modify the audio source associated with this input.

Hint: When using a touchscreen with the Click Viewports to Show on PGM option enabled, swiping the monitor horizontally (rather than tapping it) will temporarily display viewport overlays.

FIGURE 125

Clicking the *Configuration (gear) icon* for a *Switcher* input, a *Preview* monitor, or *Program*, opens the corresponding *Configuration panel.*

Notice, too, that a *snapshot* icon appears in the label below most viewports. Click this to quickly grab a still image (images grabbed in this manner will obey the *Add grabs to* option in the *Grab Configuration* panel; see Section 19.3).

The viewports for *Media Players* (Figure 126) show handy transport control in the label area – from left to right *Previous*, *Play/Stop*, and *Next.*



FIGURE 126

In addition, a progress gauge is shown in the background to show the playhead position and warning colors as playback nears its end.

Hint: When LiveMatte, Proc Amp, or Crop settings are active for a source, the configuration gear gadget for a viewport is color coded and shown full-time.

SECTION 10.7 PROGRAM MONITOR

The *Program Output* monitor could hardly be more important, hence it's prominent default location at upper-right on the *Live Desktop.*

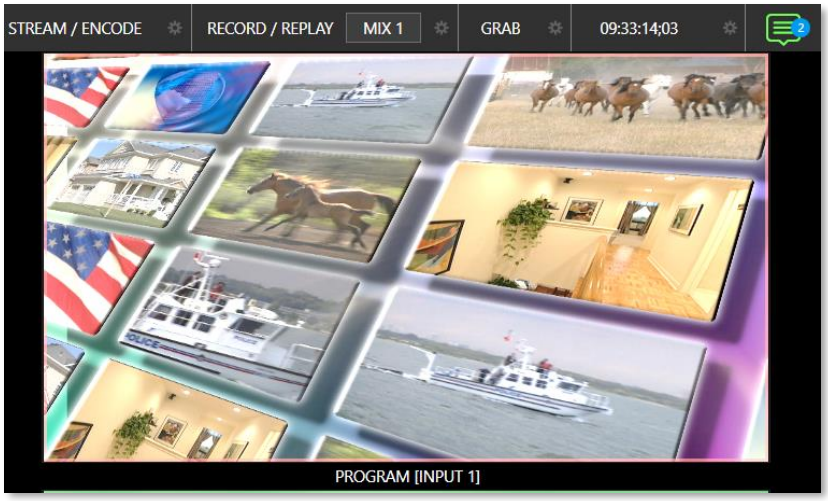


FIGURE 127

Normally, this viewport shows what the *Switcher* is sending to *Program* output at any moment. The display includes the *BKGD* video layer as well as any other video layers (such as one or more *DSKs,* or *FTB*) displayed above it.

Note: By default, Program output is sent to the MIX 1 output, subject to assignments made in the Output Configuration pane. When you move your mouse pointer over the Program monitor, a Configure button (gear) appears at lower right. Clicking this button opens the Configuration panel (see Section 8.2).

SECTION 10.8 LOOK AHEAD PREVIEW

Again, by default, the *Live Desktop* also prominently displays the *Look Ahead Preview* monitor (labeled simply *Preview*).

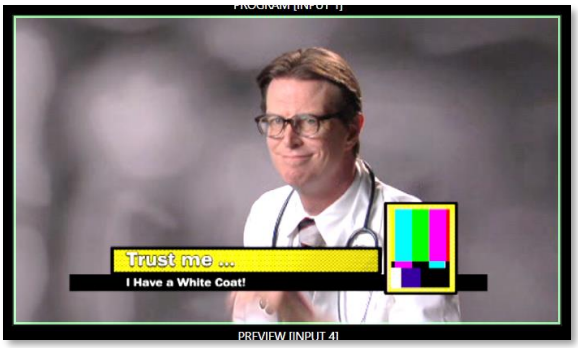


FIGURE 128

The *Look Ahead Preview* is versatile and powerful. Instead of showing just one video source (the *Preview* row selection), it displays what the outcome of a *Take* operation applied to all currently delegated video layers would be.

- Delegating the *BKGD* layer indicates you intend the next transition to swap the *Program* and *Preview* layers. The *Preview monitor* will show the *Preview row* selection as its background.

- When the *BKGD* is not delegated, that layer will not change during a transition. Consequently, in this case the *Preview* and *Program* monitors share identical backgrounds.

- Delegated *DSK layers* are shown above the background on *Preview* according to their current state. That is, if a delegated *DSK layer* is currently displayed on *Program* output it does not appear on *Preview* – since the next transition would remove it.

In other words, 'what you see is what you *will* get' – after performing the next *Take* or *Auto* operation as currently configured. This lets you set up the next shot, check its composition (including titles and overlay positioning), and switch to it with sublime confidence.

M/E Preview and Program

As mentioned earlier, monitor viewports can also be assigned to display the output of *M/E*s. Among other things, this means you can freely assign a monitor as a secondary 'program output monitor' in cases where you are using an *M/E* to supply an auxiliary program mix for independent display. Viewports can be assigned to specific *M/Es* or follow the delegate status (*Outputs >Follow>M/E Program*).



FIGURE 129

Complementing this feature, NewTek live production systems provide *Look Ahead Preview* monitoring capability for *M/Es* as well (Figure 129). The *Viewport Options* menu group *Follow* lists a special *M/E Preview* option for this purpose.

Hint: All viewports assigned as M/E Previews show output from the same M/E. Making an M/E delegate selection updates all viewports when Tabs Follow all Delegates is enabled.

Just like the main *Look Ahead Preview*, the *M/E Preview* respects *Delegate* selections made in the *Transition* section of the assigned *M/E*, showing you the display that will result from the currently configured (*M/E*) *Take/Auto* operation.

Chapter 11 MEDIA PLAYERS & BUFFERS



Media Players permit you to integrate video, stills and title pages into your live presentation. Display media sequentially as a playlist, or on demand. Media Players can play, stop, and advance automatically in response to Switcher operations. Animated buffer effects are perfect for many similar purposes, freeing up Media Players to be used for long form playback.

SECTION 11.1 MEDIA PLAYERS

NewTek live production systems includes a bevy of integrated *Media Players*, providing savings, convenience, and opportunities for automation. *Media Player* controls can be accessed in large, tabbed panes found in the bottom third of the *Live Desktop*, or by in tabs with similar features that appear in the *Input Configuration* panels of *Media Players*.

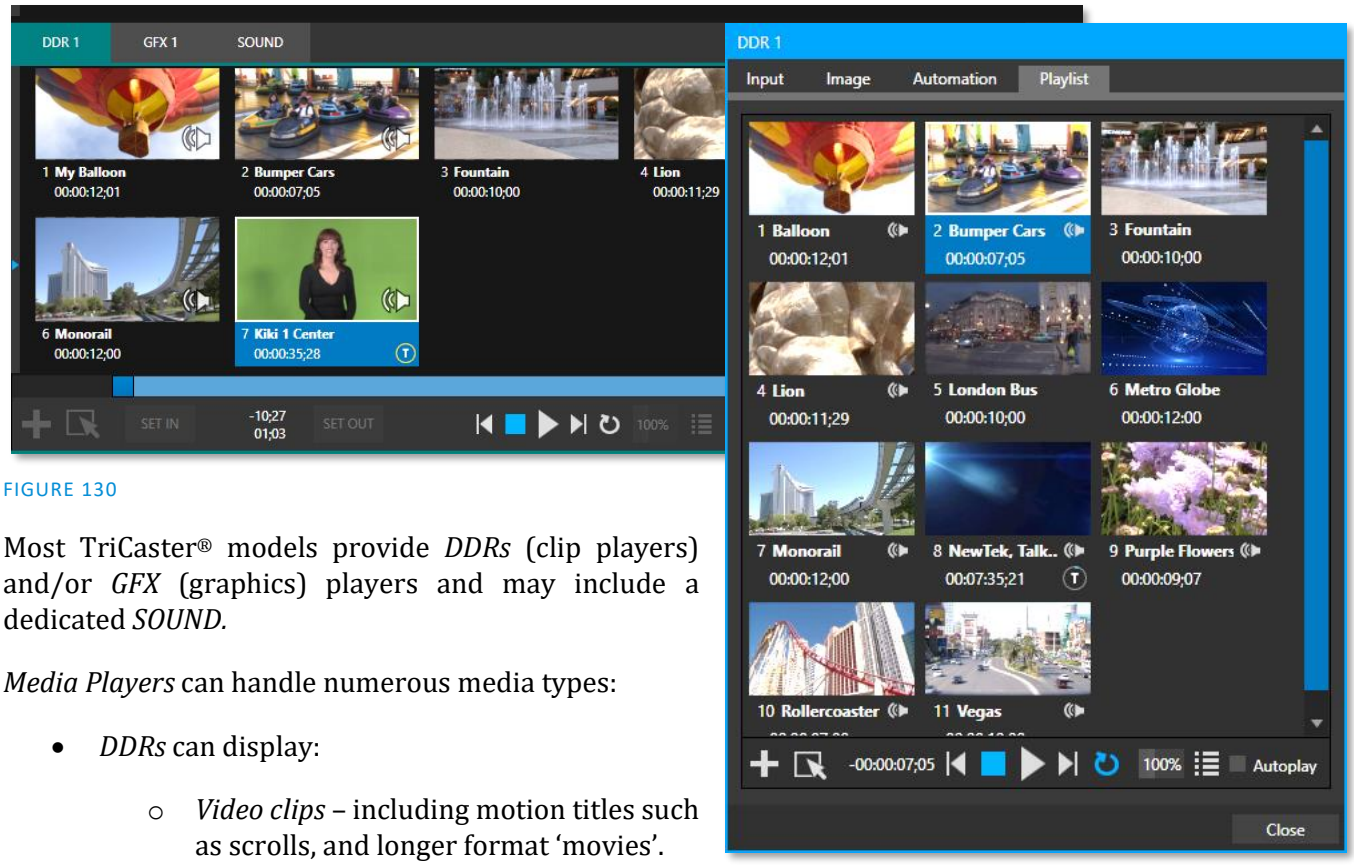


FIGURE 130

Most TriCaster® models provide *DDRs* (clip players) and/or *GFX* (graphics) players and may include a dedicated *SOUND.*

Media Players can handle numerous media types:

- *DDRs* can display:
    - *Video clips* – including motion titles such as scrolls, and longer format 'movies'.
    - *Titles and still images* – editable title pages prepared using NewTek's integrated titling system, CG pages prepared as image files, or other still imagery – photos, graphics, etc.
    - Both *Sound* players and *DDRs* can play standard .wav or .mp3 format audio files.

Hint: DDR is short for "Digital Disk Recorder", a legacy term that – while deeply enshrined as a term referring to a playback system – is technically incorrect since these DDRs don't directly support recording.

11.1.1 PLAYLISTS

The dominant feature of all *Media Players* is a storyboard-style playlist, used to organize content for use during live productions.

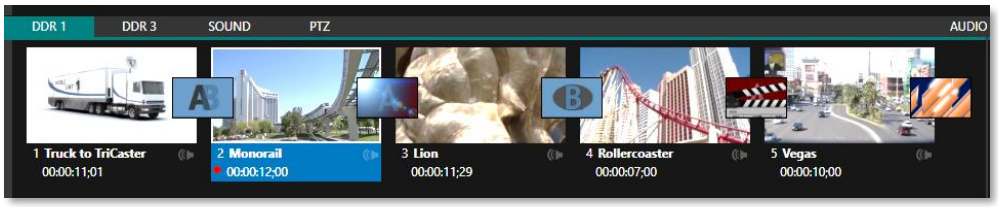


FIGURE 131

This arrangement offers easily visible thumbnail icons for each entry. A scrollbar at right accommodates long playlists when necessary. Icons in the playlist can be re-ordered quickly and easily using the familiar drag and drop workflow. The playlist can even be altered during playback (of course, if the currently playing item is removed, playback stops immediately).

An *Alias* (by default, the item's filename) is displayed below the icon, along with the item's duration.

Hint: The duration shown is the play time after trimming, and thus may be less than the file length on disk. In such cases, the In and Out markers on the Scrub Bar (spanning the width of the playlist immediately below it) show the effect of trimming operations, while the full width of the Scrub Bar depicts the total length of the file on disk.

Clicking an item selects it. The play position is automatically set to the *In Point* on selection. Standard *Shift + click* and *Ctrl + click* multi-selection operations are supported, and all selected items are denoted by a white border around their icon.

When a *Media Player* is stopped, its output to video monitors tracks selection and trimming operations. The current item is the *Media Player's* output, and in consequence appears on monitors dedicated to the player, if any. Of course, only one item can be displayed on output at a time; the frame surrounding the thumbnail icon for the currently displayed item is illuminated. Double-clicking a thumbnail (or clicking the *Play* button) begins playback from the *In Point* of the current file.

Automatic Clip Trimming

Clips (but, for reasons that will become apparent, not still images or titles) in a playlist are automatically trimmed to accommodate the addition of transitions between clips when necessary.

(Otherwise, i.e., if there are no 'un-used' frames to display during a transition, motion will appear 'frozen' during the transition, which is usually undesirable.)

To reset a clip to its full file-length boundaries, press the 'g key (multi-selection is supported, too).

Hint: Double-clicking elsewhere in the playlist pane opens the Media Browser (hold down shift when clicking to open a system file explorer instead of the custom Media Browser).

Note that even still images and static title pages added to the playlist are given a play duration. The default duration for these items is five seconds. Duration can be adjusted on an item by item basis (or as noted earlier, en masse for multi-selected stills or title pages).

During playback, the footer of playlist items illuminates as each is played in turn. When necessary, the playlist pane scrolls to display the icon for the currently playing item. A progress bar is displayed beneath the currently playing thumbnail, and the *Scrub-Bar* knob also tracks playback progress.

Hint: Selection status is independent of which clip is playing. Selected items have a white border in the Playlist pane.

11.1.2 FILE OPERATIONS

- Click the large + (*Add Media*) button at left beneath the playlist pane to open a custom *Media Browser* (see Section 11.1.8). Alternatively, double-click on an empty part of the *Playlist* pane.

  Note: Add Media also supports compatible third-party asset management systems. Hold down the keyboard Ctrl key when clicking the + sign to access these tools.

- Newly added files become selected items in the *Playlist* pane.
- Drag (appropriate type) file(s) from one module's playlist to another module.
- Right-click in the playlist pane to show a menu with context-relevant items from the following list (operations affect selected playlist items):
  - *Cut*
  - *Copy*
  - *Paste*
  - *Remove*
  - *Split at Current Frame*

  - *Audio Level* (clips with sound and audio icons) – note that the default 'per-clip' audio level applied to imported media files can be set in the Dashboard *Options* menu.
  - *Duration*
  - *Speed*
  - *Use Current Frame as Icon*
  - *Angle*
  - *Automation*
  - *Edit Title*
  - *Properties*

  - *Transcode*
  - *Add to Export Media* – see Section 18.3.
  - *Send to > Buffer n* (Still image and title icons – see Section 11.3)
- Standard *Cut, Copy, Paste* and *Delete* keystrokes are supported for playlist entries.
- Un-playable (missing, corrupt, or unsupported) file icons are dimmed.

Hint: Multi-selection is supported for most operations, including Set Duration (applies to Still and Title only).

Most of the clip context menu items are self-explanatory, but let's talk about a couple of them in just a bit more detail.

11.1.3 SPEED

The playlist context menu item *Speed* permits you to give each clip a custom playback speed. It's important to realize that this *Speed* setting is separate from the Media Player's primary *Speed* control, located in the footer, below the *scrub bar*. The latter setting applies to all playlist items.

Both Speed settings are applied during playback. So, for example, if you play a clip with both Speed values set to 50%, the actual playback rate will be just 25%.

11.1.4 MACRO TRIGGERS

We've discussed elsewhere in this Guide (Section 8.1.4) how you can assign macros to any *Switcher* source, including *Media Player*. Beyond this, though, the playlist context menu item *Macro Triggers* allows every item in a playlist – every clip, still image, audio file or title page – to control its own unique macros.

- Any macro you can record or create can be triggered automatically on either playback or end of play for any and every individual playlist item.
- Multi-selection support in the playlist makes it a breeze to assign macros to multiple items.

Hint: You can use this capability, for example, to automatically show titles for certain types of clips and not others, give them different title page types, selectively adjust Proc Amps, or apply LiveMatte keying automatically when needed for only certain items.

11.1.5 TRANSCODE

When clips are added to the *DDR* playlist, their suitability for real-time playback is evaluated. When appropriate, a small (T) icon is added to the entry's label, indicating that the item can be transcoded to a more suitable format.

To transcode the clip, select the *Transcode* option in the clip's context menu. The process will proceed in the background, and the DDR's link to the original file will automatically be replaced when it is complete. Note that transcoding operations support multi-selection.

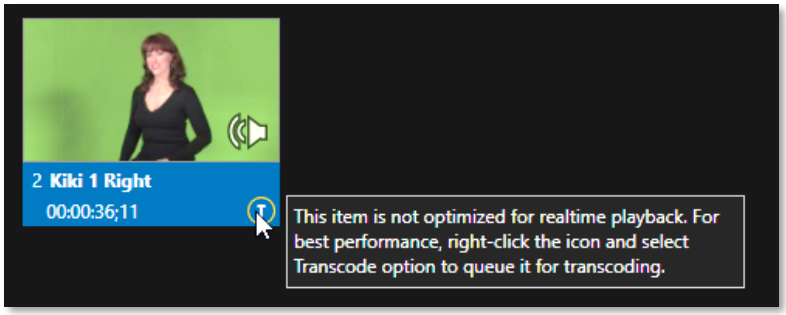


FIGURE 132

11.1.6 PROPERTIES

DISPLAY NAME

The *Properties panel* allows you to edit the *Display Name* of a file in the playlist.

The *Display Name* fields defaults to the filename, but is a local alias, or 'nickname'.

Thus, editing the name does not change the name of the file on your hard drive. Roll the mouse over the icon *display name* to see the true filename and its path.

COMMENT

The *Comment* permits you to supply metadata with the file.

Hint: Both the Display Name and Comment box content for the selected clip are available as DataLink keys, which can in turn be served to live title pages or supplied along with the file to the Publish module.

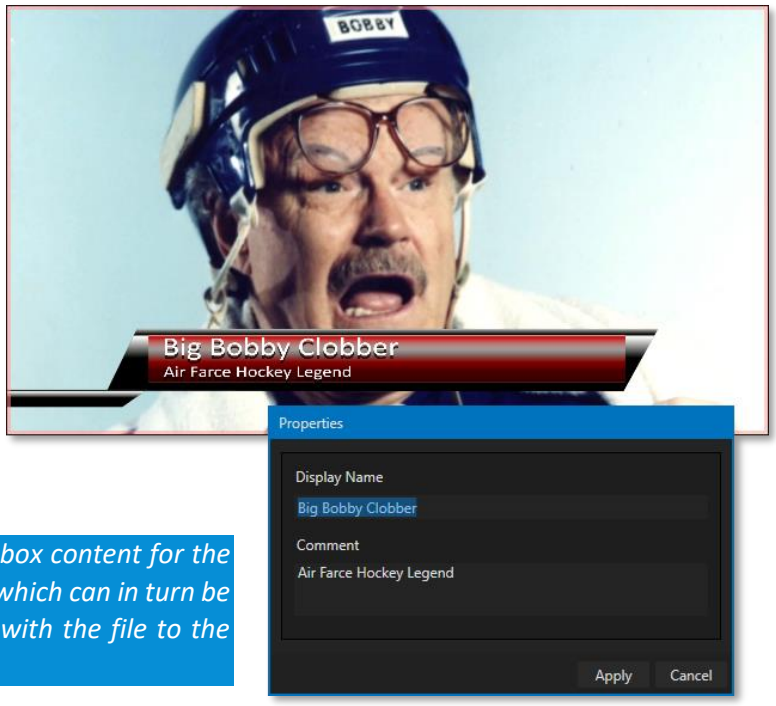


FIGURE 133

11.1.7 TRIMMING CLIPS AND THE SCRUB BAR

Just beneath the *playlist* pane is a full-width *Scrub-Bar*. The width of the *scrub-bar* represents the full run time of the current clip or other media file. Drag the knob to change time position.

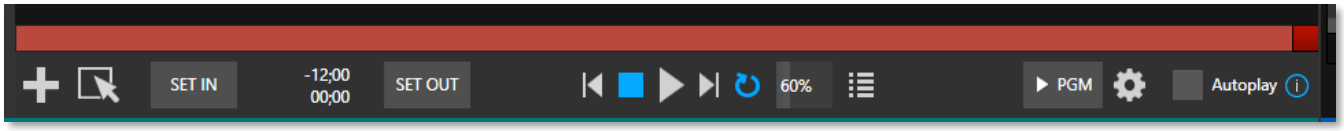


FIGURE 134

In and *Out Points* for newly added Media are automatically adjusted when necessary to accommodate motion when transitions you add require it.

- To reset the file to its full length, press the 'g' key.
- To trim a clip manually, move the knob to the desired frame and press 'i' or 'o' on the keyboard (to set the *In Point* or *Out Point*, respectively).

During playback, the *Scrub-Bar* knob traverses the span between the *In* and *Out Points*. The duration (taking into account trimming operations) is displayed as a countdown in the upper of two timecode fields at left (Figure 134). The lower time display shows embedded clip timecode.

Drag the knob to move quickly backward or forward in the clip. Audio is normally muted during scrubbing; hold down CTRL to un-mute it. Also note that holding SHIFT while dragging the scrub bar knob increases precision.

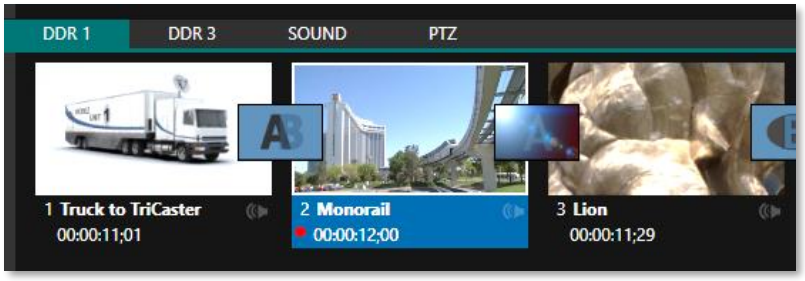


FIGURE 135

It's useful to note that (Quicktime only) clips that are still being captured continue to 'grow' even after addition to a DDR playlist (see Section 11.1.8). These growing clips, featuring the red 'recording' overlay (Figure 135) can be freely extended beyond the bounds of the 'in' and 'out' points they were given when initially added.

It can be very useful to recall that you can easily split clips using either the corresponding context menu item, or the "/" key.

Time-Shifting

By the way, it's possible to use growing clips to 'time shift' your program:

- Initiate Recording.
- Add the captured clip to a DDR
- Press "g" on the keyboard to clear its *Out Point.*
- Trim the *In Point* to taste.
- Assign the *DDR* to an o*utput*.
- Wait some length of time and then begin playing the clip.
- (Of course, all of this could easily be performed by a macro, too.)

Alpha Channel Support

For files with transparency such as 32bit image files, use non-premultiplied (or 'straight') alpha channels in *Media Players* (premultiplied files will not give correct results when overlaid on other imagery).

Hint: Monitors can optionally show a checkerboard pattern behind transparent content.

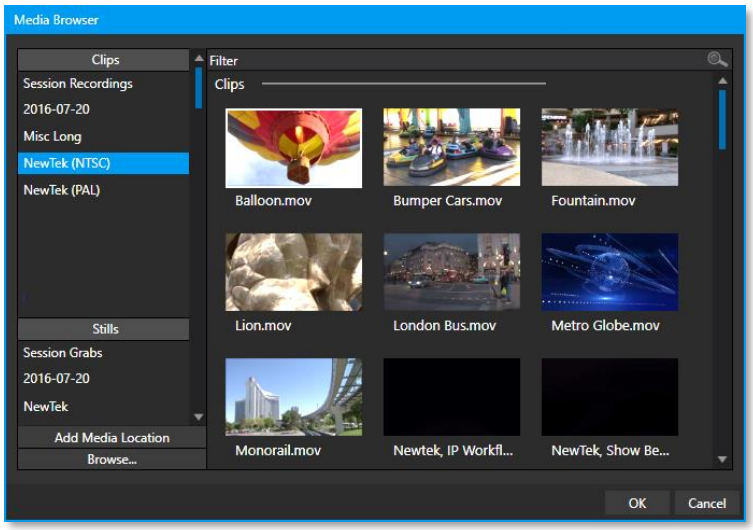


FIGURE 136

11.1.8 Media Browser

The custom *Media Browser* provides easy navigation and selection of content on your NewTek live production system or on the local network.

The *Media Browser* appears anywhere in the *Live Desktop* that you might wish to select content, transitions, or effects for use in your project (such as the *Media Players*, *LiveSet* and *Transitions* sections).

Its layout is principally comprised of two panes on the left and right that we'll refer to as the *Location List* and *File Pane*.

Location List

The *Location List* is a column of favorite "locations", grouped under headings such as LiveSets, Clips, Titles, Stills, and so on.

Session and Recent Locations

The *Media Browser* is context sensitive, so the headings shown are generally appropriate for the purpose for which they were opened.

A list of sub-headings appears under these main headings in the *Location List*. These may correspond to named sessions, or groups of content. When you select a sub-heading, the right-hand pane – the *File Pane* – is populated.

In addition to locations named for your stored sessions, the *Location List* includes two notable special entries. The *Recent* location provides quick access to newly-captured or imported files, saving you time hunting through a hierarchy to find them. The *Session* location (named for the current session) shows you all files captured in the current session.

Hint: Clips that are being actively captured are marked with a red 'record' overlay. These clips continue to 'grow' and can be re-trimmed after their addition to DDR playlists or the Publish Queue.

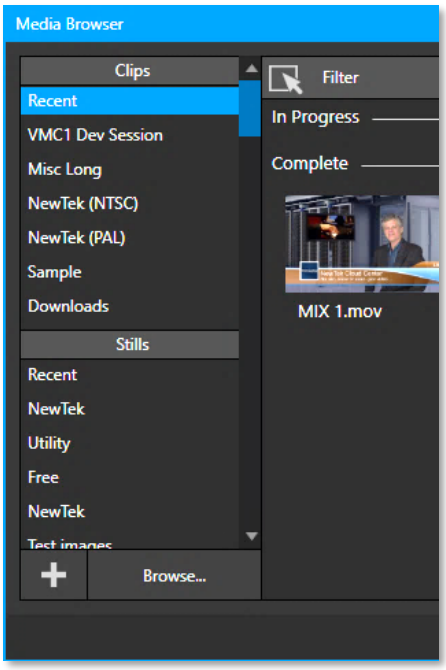


FIGURE 137

Add Media Location & Browse

Clicking *Browse* opens a standard system file explorer, rather than the custom *Media Browser*.

Hint: To jump to the standard system file explorer (rather than the custom Media Browser) from a Media Player, hold keyboard Shift while clicking the Add button.

File Pane

Icons appearing in the *File Pane* represent content located inside the sub-heading selected at left in the *Locations List*. These are grouped under horizontal dividers named for sub-folders, which allows related content to be organized conveniently.

File Filters

The *File Pane* view is filtered to show only relevant content. For example, when selecting *LiveSets*, the browser only shows *LiveSet* files (.vsfx).

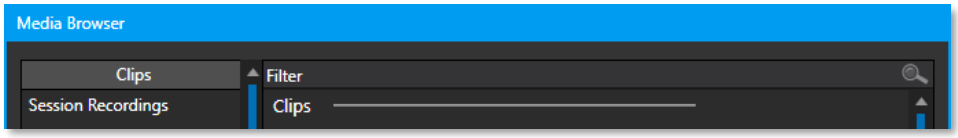


FIGURE 138

An additional filter appears above the *File Pane* (Figure 138). This filter quickly locates files matching criteria you enter, doing so even as you type. For example, if you enter "wav" into the filter field, the *File Pane* displays all content at the current location with that string as part of its filename. This would include any file with the extension ".wav" (WAVE audio file format), but also "wavingman.jpg" or "lightwave_render.avi".

File Context Menu

Right-click on a file icon in the *right-hand* pane to show a menu providing *Rename* and *Delete* options. Be aware that *Delete* really does remove content from your hard drive. This menu is not shown if the item clicked is write-protected.

11.1.9 Player Controls

Transport controls and playback settings are located directly below the *Playlist* and *Scrub-Bar*.

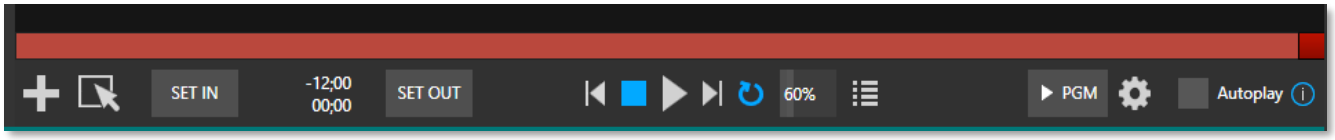


FIGURE 139

Time Display

During playback, the uppermost timecode field beside the transport controls displays the current countdown time for active playlist item or for the entire playlist when the *Playlist* mode button is enabled. (As mentioned earlier, the time show below is the embedded clip timecode.) Left click the field to type in a timecode, then press *Enter* to jump to that point in the file (*or* playlist).

Hint: The time display and scrub bar color provides visual indication that the playback is nearing its end. Ten seconds before the end of play for the current item, the digits in the time display and the scrub bar background turn amber. With only five seconds left, the color changes to red.

Playlist Mode

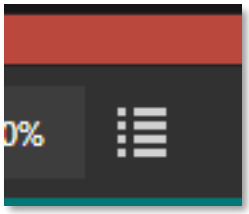


FIGURE 140

Normally, *Media Player* playback *stops* when the *Out Point* of the current playlist item is reached (unless *Loop* is also enabled, in which case playback of the current item repeats until manually interrupted).

Clicking the *Playlist* mode button (Figure 140) tells the *Media Player* to operate in continuous play mode, advancing through the playlist items until the last one has played.

Transport Controls

A simple set of controls beneath the playlist pane provides all playback-related functions:

- **Previous* button – go to previous playlist entry
- *Stop* (clicking Stop when already stopped goes to the first frame)
- *Play*

- **Next* button – go to next playlist entry
- (Not shown) – *Double-click* an entry in the playlist pane to begin playback at the start of that playlist entry

Previous, Next and Presentations

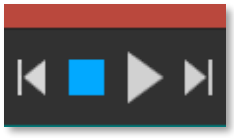


FIGURE 141

It's extremely useful to realize that, since transitions can be added between playlist items, pressing *Previous* or *Next* likewise employs transitions. Whether playback is underway or stopped, and whether the items are clips or stills, you can use *Previous* and *Next* to transition backward and forward between items.

This provides a perfect way to manage presentations using *Media Players*, hence our inclination to refer to this as the "Presentation workflow'. With macros (and perhaps MIDI buttons) driving the presentation, this makes it easy to handle control graphics and video for seminars, to update weather graphics, and more.

Hint: In addition, since transitions support transparency, you can queue up a series of titles in a playlist, display it in a DSK, and transition backward and forward between titles interactively simply using Previous and Next.

Speed

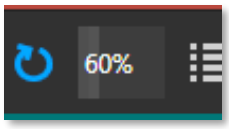


FIGURE 142

The *DDR* supports variable speed playback between 25% and 400% of the normal rate (100%). Speed can even be adjusted *during* playback.

Note: Certain highly compressed video file formats cannot successfully be played back at rates beyond 200%, even though Speed value is set to a higher value.

As is common for numeric input controls in the interface, drag left or right to adjust the *Speed* value, or click the slider to access a direct entry field allowing you to type a value using the keyboard.

Hint: Press Shift while double-clicking Speed to quickly reset to 100% default.

Loop

Enabling *Loop* repeats playback continuously (respecting the *Single* switch state).

Autoplay

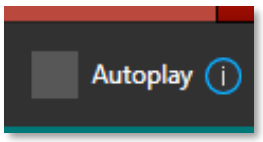


FIGURE 143

When enabled, the *Autoplay* switch has several important effects. First, it initiates playback automatically when the associated *Media Player* is placed on *Program Out* by a (Switcher) *Take* or *Transition* operation either directly (as a *Switcher* row selection) or *indirectly* – such as by being displayed via an *M/E* channel or *DSK* operation.

Second, if player output is displayed on *Program* the reverse *Switcher transition* occurs automatically as the end of play approaches, whether the *Out Point* of the current item for *Single* play or the end of the playlist. (This behavior is optional for M/Es – see Options in Section 14.2 and Section 7.1Section 7.2.)

Note: Unlike Switcher transitions, the DSK 'out' effect does not occur automatically as the end of play approaches.

In either case, when the *Media Player* is in standard operating mode (as opposed to *Playlist* mode), the current play position advances to the next item after playback is automatically stopped.

11.1.10 SHOW ON (…)

Another extremely powerful feature is nestled just to the left of *Autoplay* in the footer of each *Media Player.*

Labeled ▶ *PGM* by default this feature can target *M/E*s as well as the *Program* row of the main *Switcher*. It provides unique playback and display abilities that make instant replay a thing of joy, as well as serving other purposes. Click the configuration button (gear) beside the *SHOW ON* button to display the panel seen in Figure 144.

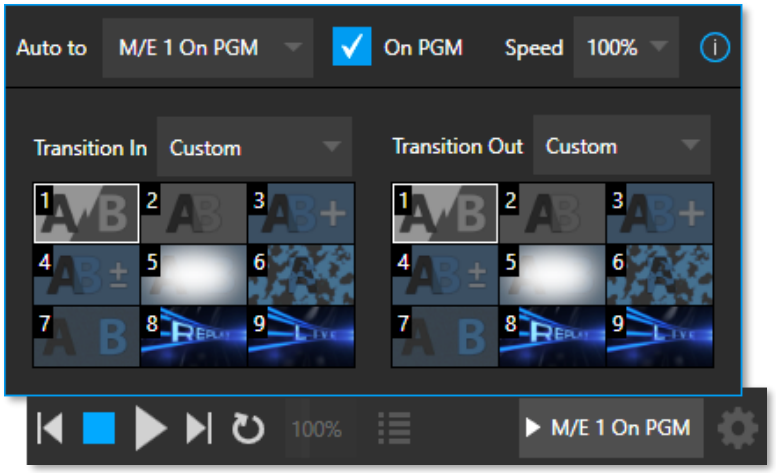


FIGURE 144

The largest part of this panel contains transition bins for custom *In* and *Out* transitions which will be used to display the current clip. Select *Custom* from the *Transition In/Out* menus to activate these bins. Otherwise, you can select *Cut* or *Current* options.

Note that the bin content displayed is synced with the *Background* transition bin for the target video bus, be it *PGM* or a designated *M/E*. Selecting *Current* uses the current selection in the *Background* transition bin of the target bus.

Hint: Unlike other transition bins, these icons do not show a "+" sign gadget on rolling the mouse over them. To replace the effect in slot, modify the content of the Background transition bin of the target you have selected for SHOW ON.

Once configured, clicking the *SHOW ON (…)* button will do the following:

- Swap the current *BG* transition for the main *Switcher* or a designated *M/E* for a custom *Animation Store* (such as "Replay!") or other specified transition.
- Transition the current *DDR* selection in on the main Switcher's *PGM* row, or the *A* row of an *M/E*
- Play the clip (overriding the *DDR's* own *Autoplay* setting, if necessary)

- Transition back to the original program using a custom transition (such as "Live!) when done
- Swap the background transition back to the original selection

Hint: Using Replay complementary features, SHOW ON functionality can be triggered by simply adding a clip (with custom length and speed defined in the Replay menu) from any source being captured to a DDR. Thus, a single button click or numberpad key press can trigger all of this.

M/E ON PGM

In a variation on this operation, the *On PGM* switch, which is available whenever the target is an *M/E*, provides a different mode of operation. In this case, the output of the Media Player is immediately selected as the top row source of the target *M/E*, and the M/E is transitioned in on the main Switcher's PGM (Program) row.

This unique feature allows you to use the main *Switcher* to display the *Media Player* output – including instant replays – with *KEY* layers (such as 'scorebugs') composed above it.

11.1.11 MEMS

Another very useful feature of *Media Players* is the *MEM Bin*, which provides quick and convenient access to stored playlists. *MEM slots* also store the state of various *Media Player* controls.

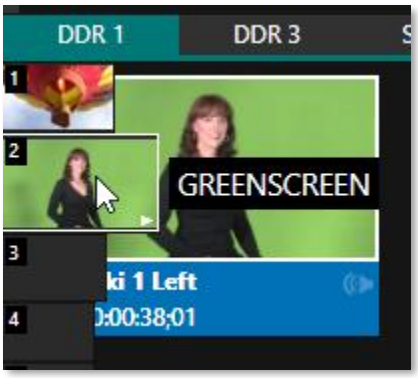


FIGURE 145

To display the bin, roll the mouse pointer to the (nearest) side of the screen in a tabbed *Media Player* or the *Audio Mixer* tab (for *Sound* and *Audio*, *MEM slots* are presented on the left side of the screen only).

When you change playlists by selecting another *MEM slot*, it's almost as though you are accessing another *Media Player*. Use *MEM slots* for quick access to different categories of content for use during a live presentation, playlists prepared for different clients, or for completely different programs you produce.

MEM slots can be named and can also display a small representative image (taken from the first entry in the playlist). As you move the mouse over a *MEM slot* icon it expands, providing an enlarged view of that playlist item's first frame. To populate a new *MEM slot*, simply click a blank icon.

To name a *MEM slot*, right-click it to open a context menu, and select *Rename*. Other menu options include *Delete*, *Export* and *Import* (the file will be saved with the extension '.pst').

PREVIEWING MEM SLOTS

At times you may wish to preview the contents of a different Media Player *MEM slot* without disrupting playback of the current playlist. When a clip is playing, a small white 'play indicator' is shown over the icon for the currently selected entry in the fly-out *MEM slot bin.*

If you select a different *MEM slot* while the current clip continues to play, the playlist bin view updates, but the original item continues to play. The transport controls (*Play*, *Stop*, etc.) at the bottom of the tab remain *dedicated to the *active* playlist – that is, the one actually playing, rather than the one currently being *previewed* in the tab.

To change to the *previewed* MEM slot immediately – ending playback and display of the current item – you can do so by any of the following means:

- Double-click an icon in the *previewed* playlist.
- Or press **Stop* twice, and then *Play* (playback of the active item ends with the first *Stop* command; the second sets the playhead to the start of the current item in the new playlist).

* Normally, pressing *Stop* a second time when a clip is playing resets the playhead to the start frame in the *same clip*. The exception above occurs only when you are previewing the content of a different *MEM slot* during playback.

11.1.12 NETWORK SHARING

Default media file folders (*Clips*, *Stills*, etc.) are maintained for each session. This approach makes it easy to locate items using the *Custom File Browser* and is also convenient for other file management purposes.

The default media locations for the *active* session can be made accessible across your local network. *Share Media Folders and Buffers* in the *File menu* is on by default and allows network clients to update media in the active session, even while live. The following session media locations are dynamically shared:

- Audio
- Clips
- Stills
- Titles
- Buffers

Note: Several 'non-session dependent' locations in the main application folder are also shared. This allows applications such as NewTek's Virtual Set Editor, etc., running on external systems to export directly to the local system. These network shares are unaffected by the Share Media Folders and Buffers setting.

Transferring very large files across a network can be time-consuming and impacts both disk access and network resources.

When these resources are already heavily taxed, dropped frames on streaming or video outputs, or sluggish response to controls may result.

We strongly urge you to gather media assets before starting your live productions whenever possible.

When suitable content is added to these shared folders, the *Media Browser* provides immediate access to it. Simply select the session name (under *Clips*, *Stills*, etc.) in the *Location List* at left to reveal the updated files in the *File Pane* at right.

This is wonderfully convenient but should be approached with a measure of common sense. Network bandwidth has fixed limits. Be judicious when transferring large files while 'live'. You may be using the network for many purposes – including streaming, or NDI video feeds from a 3Play®, LiveText™ and third party software, as well as any unrelated traffic on the network.

On mouse-over, title page icons display a text edit gadget in their lower-left corner (Figure 146).

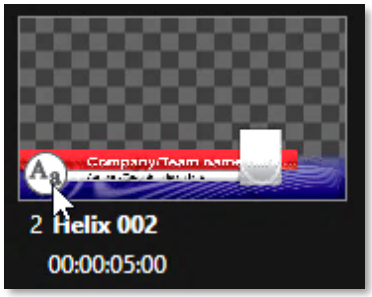


FIGURE 146

Click this button (or select *Edit Title* in the icon context menu) to open the pop-up *Title Page Editor*.

Opening the *Title Page Editor* during playback is permitted, so that *Title Page* content can be edited even during display (changes are detected and shown immediately).

Hint: The panel can be re-sized by dragging its lower-right corner and re-positioned by dragging its titlebar.

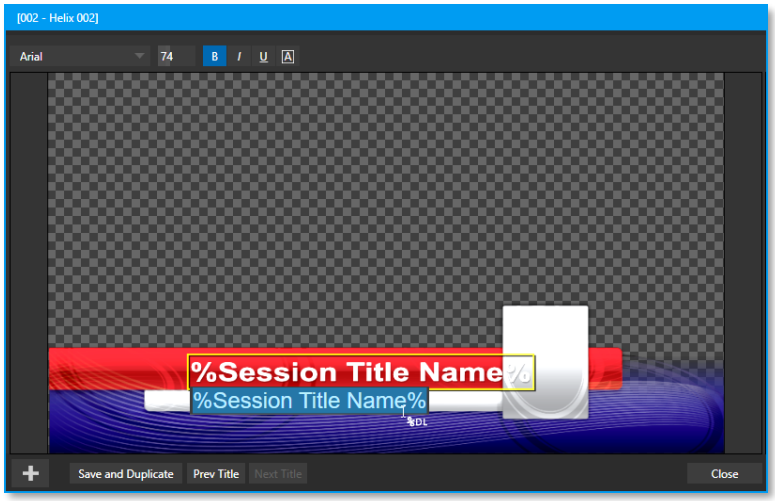


FIGURE 147

When you move the mouse over text in the *Title Page Editor's* preview pane, a white bounding-box appears. If you click once inside the box, it turns yellow (Figure 147), indicating the text object is selected, and a text edit field opens.

Hint: When the box is yellow the text can be nudged either a pixel at a time using ALT + the arrow keys or five pixels at a time using SHIFT+ALT+ the arrow keys.

Press *Enter* or click outside the box to complete editing operations or press *Tab* to advance to next entry field (press *Shift + Tab* instead to jump to the prior text field).

Note that the cursor keys – that is, the left/right and up/down arrows – allow you to navigate between text fields on the current title page. (If the text edit box is open, left/right arrows change the edit point as usual, but up/down closes the edit box, and subsequent cursor key actions move to the next object.)

Hint: A red line under a character or word indicates the spell-checker is questioning its spelling. Right click the word to open a menu suggesting alternatives. Click any entries shown if you wish to update the original.

11.2.1 HEADER TOOLS

The header of the *Title Page Editor* holds an assortment of text attribute controls. These include a *Font* selector menu, numeric *Size* control, and *Bold*, *Italic*, *Underline* and 'ALLCAPS' switches.

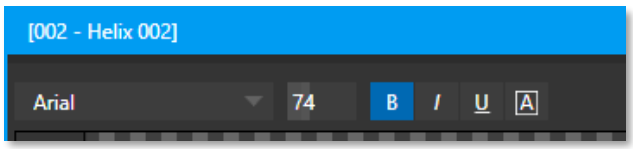


FIGURE 148

11.2.2 FOOTER TOOLS



FIGURE 149

You can click *Close* when finished with the current edit, but often you'll find the *Save and Duplicate* feature handy. Click it to store your edits to the current title page, create a clone of item in the playlist, and load the new page for editing. This is a great way to quickly produce a number of matching pages.

> *Hint: Press Ctrl + s on the keyboard to perform this 'save and duplicate' operation without using the mouse. Similarly, PageUp and PageDown keys perform Previous and Next operations.*

The *Prev* and *Next Title* buttons let you store your changes and move to another title page in the playlist without the tedium of closing the *Title Edit* pane.

STAND-IN IMAGES

Images embedded in *Title Pages* may be locked, or they may be editable stand-ins. When you roll the mouse over an embedded image and a white border is displayed around the image, the image is a *stand-in*. Click a stand-in to open the *Media Browser* and select a replacement image file (hold Shift while clicking to use the system file explorer instead).

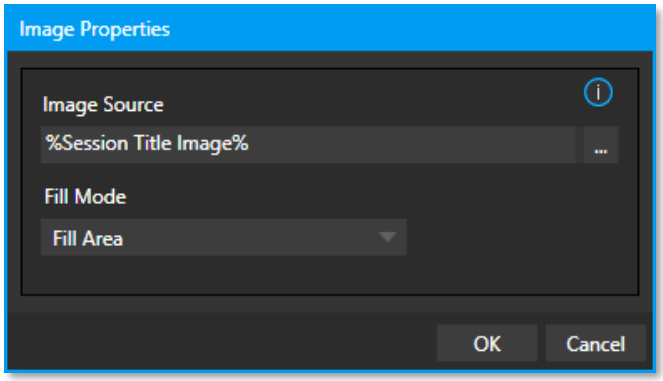


FIGURE 150

If, instead, you right-click a stand-in image, a context menu lets you select one of several optional methods of fitting the source image to its frame. Choosing *Stretch* causes the image to completely fill the frame. *Fill Area* retains the interested image's original aspect, cropping if necessary to fit inside the frame.

Show All Image also retains the original image aspect but fits the entire source image inside the frame (which may result in 'pillar-boxing' or 'letter-boxing'). This menu also allows you to open the *Image Properties* panel (Figure 150). It provides the same set of *Fill Mode* options but adds an *Image Source* box supporting direct entry. The *Image Source* box comes into play in connection with the next (extremely important) topic – *DataLink*.

11.2.3 DATALINK

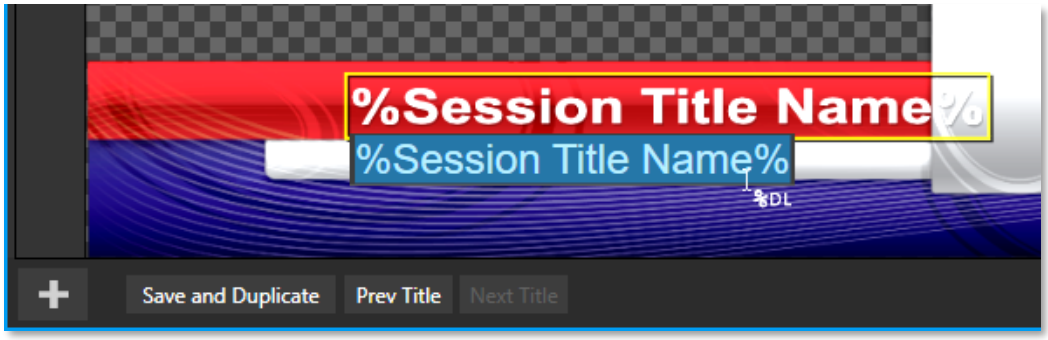


FIGURE 151

Since *DataLink* falls into the general realm of automation and also has access to external sources, complete coverage of its features and capabilities is found in the companion *Automation and Integration Guide* included with this product. We'll mention here, though, that both text and images on title pages accept *DataLink keys* as input.

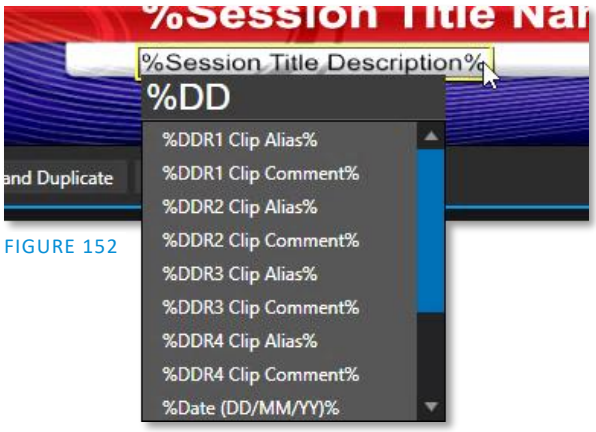


FIGURE 152

The Title Editor tells you which entry boxes accept *DataLink* keys by showing a custom mouse pointer, in the form %DL, as shown in Figure 151.

Making key entry even faster and easier to use, all available *DataLink keys* are shown in the drop-down menu as soon as you enter a % sign into an entry box (*key names* are in the format %*key name*%). If you continue typing, the list shown is filtered to show only relevant key names (Figure 152).

A line of text or image on a title page that has been set to a key name will be automatically replaced by the current value assigned to that key when the page is displayed.

There are endless uses for *DataLink*, and many ways to supply and update values assigned to *DataLink keys*.

For just one example, refer to the heading Configure DataLink Keys in Section 5.3. And do not fail to take advantage of the power and convenience of the DataLink web browser extension, which makes it easy to populate your title pages over the network from a web browser running on virtually any platform.

SECTION 11.3 BUFFERS

The system's powerful *Buffer* implementation provides a large number of alternative graphics and animation sources for *M/Es* (including their associated *KEY* channels), the main *Switcher* and its *DSK* channels. *Buffers* are sometimes even more useful than similar imagery supplied from *Media Players*. The tabbed *Buffers* module (Figure 153) shows icons and controls for fifteen *Buffers*.

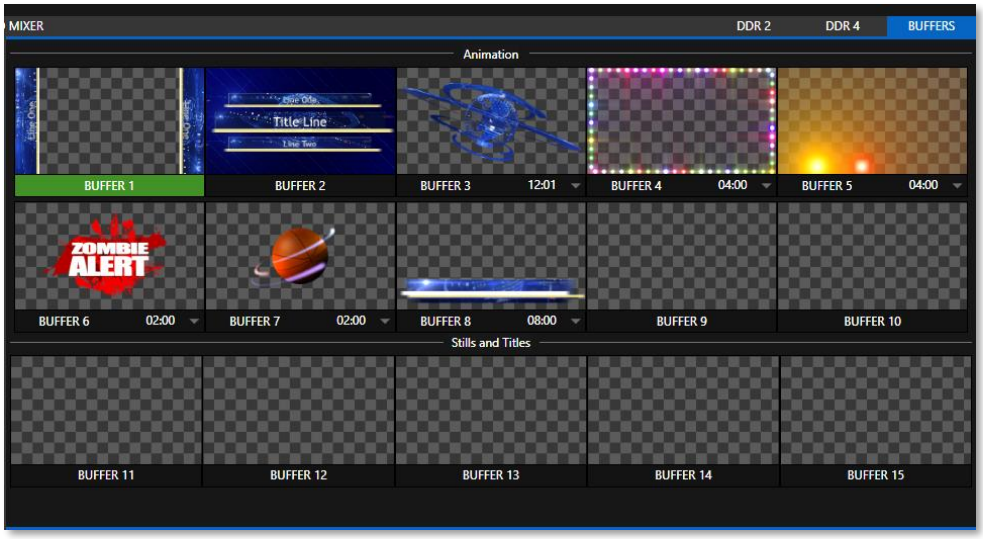


FIGURE 153

Buffers are retained in *Switcher Memory* for immediate recall and display. Using a buffer for a specific *DSK* or *M/E* channel (rather than a *Media Player*) eliminates the risk of accidentally displaying the wrong graphic, as might otherwise happen if the current *Media Player* item selection was not the one intended.

11.3.1 BUFFER TYPES

Buffers support the following media types:

ANIMATION EFFECTS

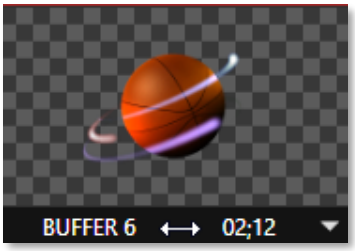


FIGURE 154

These are short duration full-motion video effects created in your favorite graphics or video applications and compiled using the add-on *Animation Store Creator* application.

- *Looping* effects – These animations play repeating endlessly, making them ideal for station ID 'bugs' and the like.
- *Auto-run* effects – These effects auto-run on display following a *Take* or *Auto*. Playback runs once and then holds the last frame.

GRAPHICS

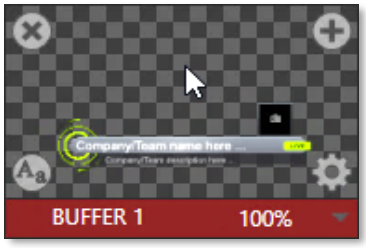


FIGURE 155

- *Images* – 24 bit or 32 bit (with embedded alpha channel) images.
- *Title pages* – editable *title pages*, identical to those served up by the various *Media Players.*
- *LiveGraphics* – (optional) animated graphics and titles.

HTML BUFFERS

Display a live webpage in your TriCaster as a switcher source using HTML in a *Buffer* or bring in live graphics with an HTML outputting graphic renders-based website.

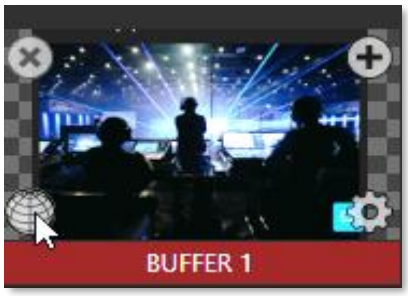


FIGURE 156

- Scaling and cropping are supported using the standard input and key layer configuration tools.
- Control within the webpage over mouse movements, such as clicks, back/ forward, refresh, scrolling and keyboard input.
- Support for web output from CG providers.
- Supports audio, macros, and alpha transparency.

Note: For more information, see 11.3.5 Live Link.

Selection and display of *Buffers* is controlled by buttons on main *Switcher* source rows, *M/E* rows, and similar options in *DSK* and *M/E KEY* source menus. The first ten buffer slots support all animated effect types, HTML web pages, titles, and graphics. The remaining buffer slots are restricted to graphics content, including popular image formats along with *title pages* (i.e., .cgxml files).

11.3.2 SELECTING CONTENT

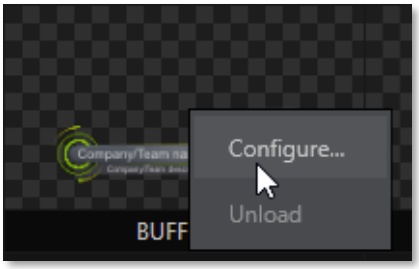
An *Add Media* [+] button appears at upper-right when you move the mouse over a *Buffer* icon. Click this to display the *Media Browser*, and then pick a suitable file to populate that *Buffer*. Alternatively, drag an item from a Media Player onto a Buffer slot.

Or right-click a still image or title page icon in a *Media Player* and choose *Send to* from the context menu (select a specific buffer slot using the hierarchical menu). Note that, this *Media Player* menu item only appears for *still image* formats and *title pages*. *Animation effects* must be complied using the *Animation Store Creator™* add-on application before they can be loaded into buffers.

Note: Generally, Buffers are linked to the original source file on disk. Having added a file to a buffer using the "Send to (Buffer x)" menu, the item can be removed from the Media Player. The buffer link will only fail if the original file is moved or deleted from the hard drive, with one exception: editable title page buffers are fully independent of their original source files.

11.3.3 BUFFERS MENU

Right-click a thumbnail icon in the *Buffers* pane to open a menu offering two items:



- *Configure* opens the standard configuration options, including cropping, color processing, and even *LiveMatte* keying.
- The *Unload* option clears the effect, freeing *Switcher Memory* reserved for effects.

FIGURE 157

When the mouse pointer is over a *Buffer* icon, the small [x] gadget shown in the upper-left corner provides another method of unloading an effect. Likewise, the *Configuration* (gear) icon that appears at lower right opens the *Input Configuration* panel for the *Buffer*.

11.3.4 ANIMATION FEATURES

The thumbnail icon for a buffer with an animated effect created in the *Animation Store Creator* application assigned to it provides several additional features. As mentioned earlier, *animation effects* can be of either *looping* or *auto-run* type (the type determination is made in the *Animation Store Creator* utility when the effect is generated).

Loading either class of effect into a buffer results in a time control being displayed at right in the buffer label.

Hint: Select a Slow, Medium, or Fast preset value from the drop-down menu, drag the mouse left or right over the time to change the current value, or click to enter a number directly using the keyboard.



FIGURE 158

For *auto-run* animation effects, a further control is added to the thumbnail icon when you move the cursor over it. The *Rehearse* button appears at the top-center (Figure 158) Clicking it plays the animation from its first frame through to the last and holds that image.

Hint: In addition to providing a way to preview the effect (by displaying it on the Preview monitor, for example), Rehearse offers a handy way to re-run animated alerts and similar overlays at will. Remember, too, that the Macros feature provides a great deal of useful functionality in connection with Buffers and their display.

Still image *Buffers* have another very valuable ability, discussed next.

11.3.5 LIVE LINK

TriCaster is the first line of products to offer *Live Link.* This feature brings the power of the internet directly into a video switcher. Web page elements can be pulled in any production without a third party application.

HTML WEB BROWSER

The first 10 animation buffers in TriCaster support HTML/WEB Buffers support macros, alpha transparency for HTML5and audio. To begin, click the Buffer's + (add) icon to add or replace a Buffer slot source (Figure 159).



FIGURE 159

This opens the Media Browser, click the Web Browser button as shown in Figure 160 to open an integrated browser. Enter the web page (URL) as seen below to assign to the specified Buffer slot and click ok. It may take a few seconds for the thumbnail to update.

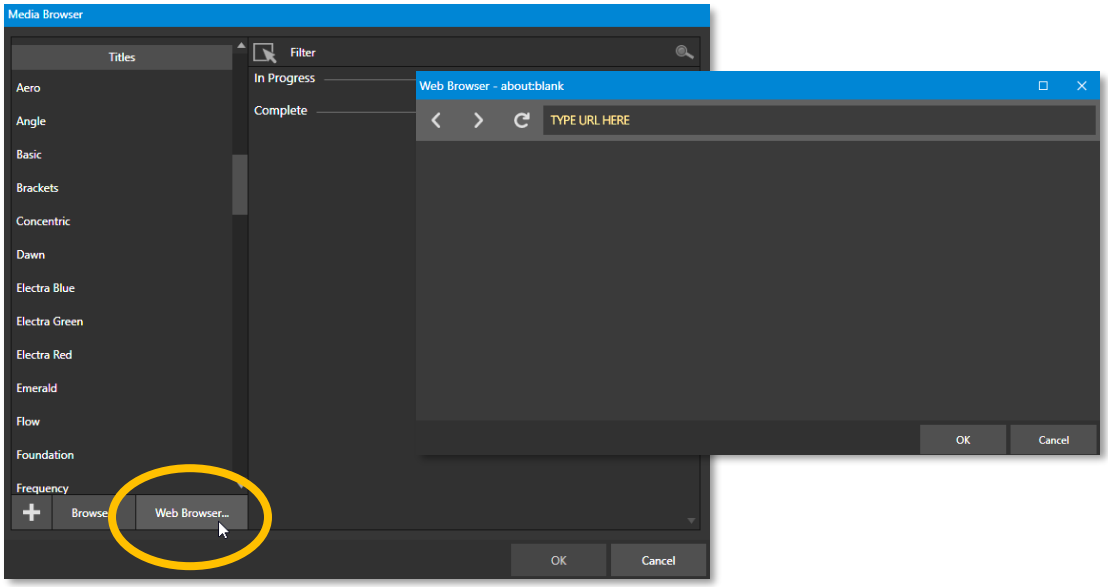


FIGURE 160

Note: You can simply type the name of a web page into the Web Browser and it will automatically enter the correct protocol of the URL.

Another option to assign a web page to a Buffer is to create an 'internet shortcut' URL file by dragging a link from a web browser onto a file folder, much like a shortcut a browser creates. Open the Media Browser, select browse and find your internet shortcut file, click open.

When the web page is displaying in your buffer, hover over the buffer's thumbnail and the *Web Icon* will appear in the bottom left corner of the buffer (Figure 161).

The *Web Browser* can be used to preview the web page. Clicking the web icon will open the *Web Browser* window (Figure 162) allowing you to make changes to the web page. Interaction includes mouse movement/clicks, back/forward, scrolling and keyboard input. The URL being viewed can also be changed via the address field. Once changes are made, clicking OK will close the *Web Browser* window and apply the URL to the *Buffer*.

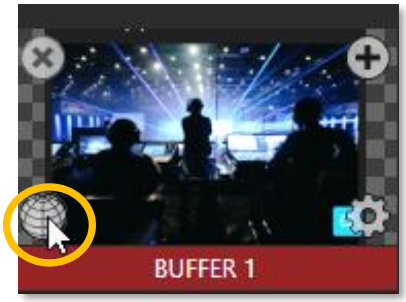


FIGURE 161

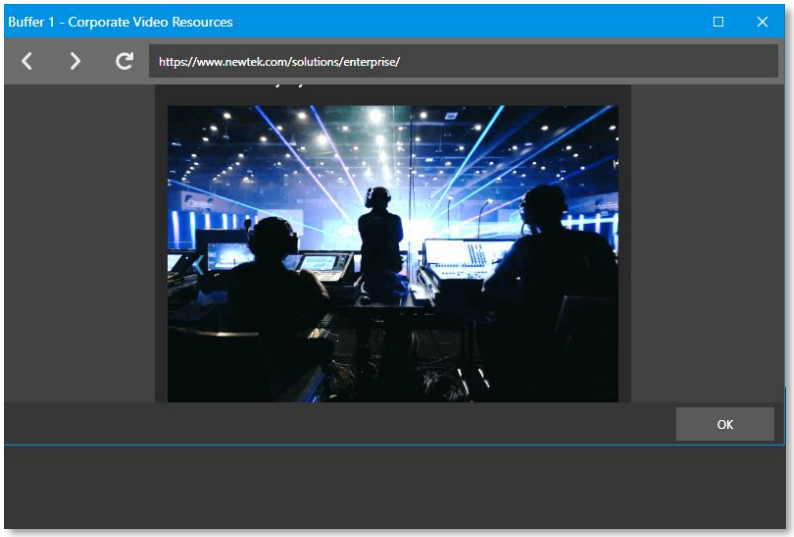


FIGURE 162

Note: When scrolling the Web Browser, you may notice it does not move as smoothly as the output of the switcher, this is due to prioritizing the image on the switcher.

Once you have delegated the buffer to *Preview* or *Program,* you may want to adjust the appearance of the webpage. Many configuration options are available, simply hoover over the buffer thumbnail in the DSK channel and a gear will appear on the lower right of the buffer (Figure 163) click to open the *Buffer Configuration* panel and click on the DSK tab.

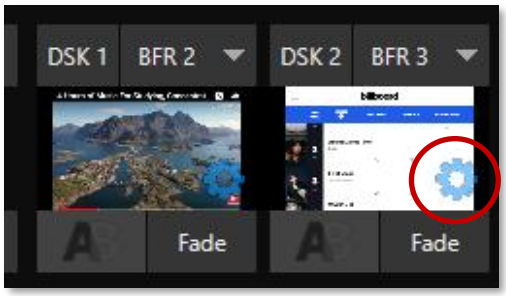


FIGURE 163

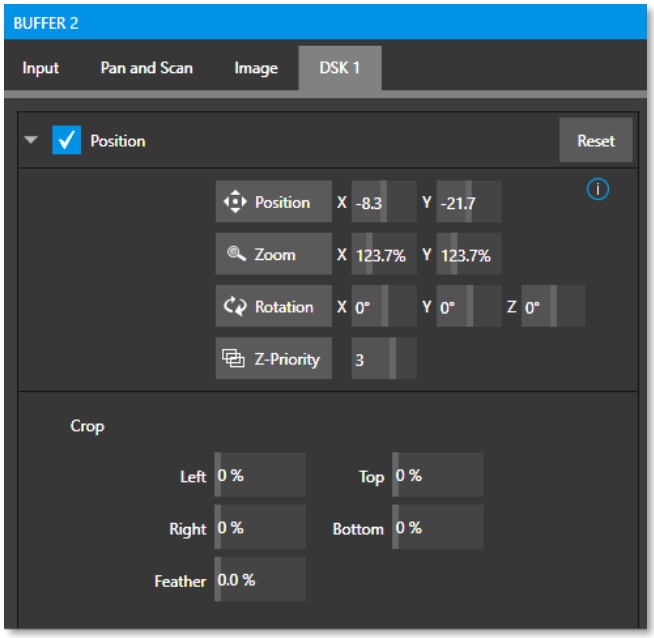


FIGURE 164

The *Position* control group includes *Position*, *Zoom, Rotation*, and *Priority*. *Position* settings can be toggled on and off together using the switch provided in the group header. The *Crop* controls are similar to those found in the *Input Tab*. For a deeper dive into all of the configuration options, see DSK Source Configuration in Section 9.7 Transitions and Effects).

PERSISTENT THUMBNAIL

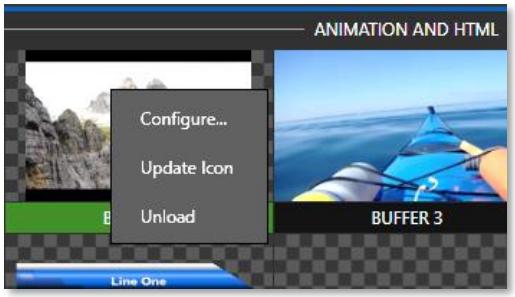


FIGURE 165

When a *Buffer* is assigned to a webpage a thumbnail is created, however it may not always be representative of the webpage. The *Update Icon* feature (found by right clicking on an HTML buffer thumbnail) will create a new 'persistent' thumbnail for the buffer. The thumbnail can be updated repeatedly using this feature. Clearing a *Buffer*, or changing it to another type of content will delete the persistent thumbnail file. If the *Update Icon* feature is not used, the existing post-page dynamic thumbnail will be displayed.

CG BUFFERS

Bring in professional live graphics into your production with an HTML outputting graphic renders-based platform from a CG website. By running the CG site on a separate system, simply copy the URL into an HTML Buffer *Web Browser*. (Here we are using Singular.Live in this example, but you can find multiple CG websites online).

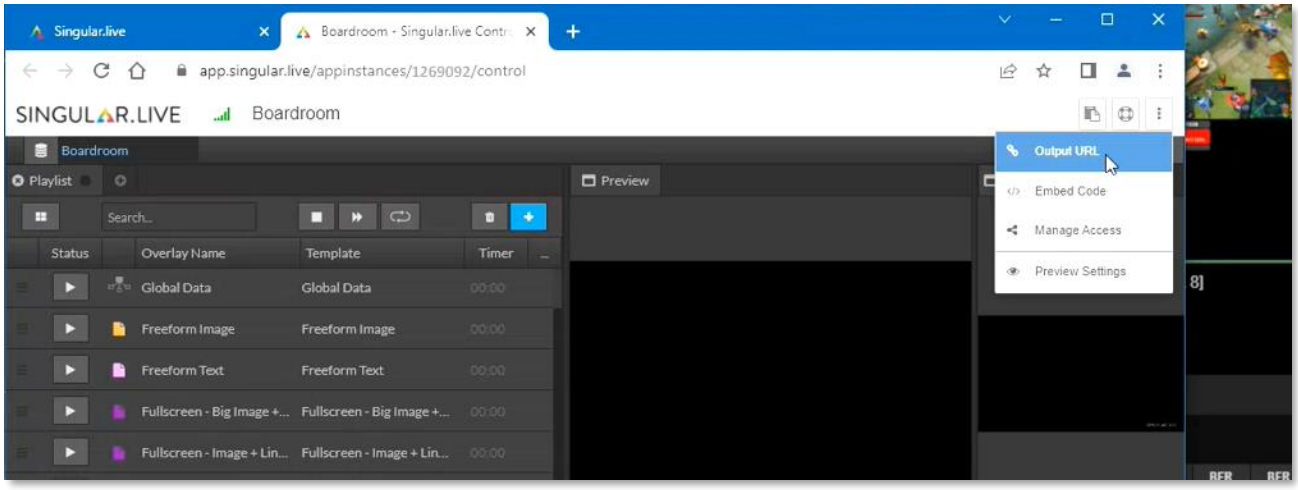


FIGURE 166

Changes made on the CG webpage (on a separate machine) will appear in your live production system in real time. Transparent files are easy to bring into your TriCaster as it sends over the alpha to the render-based platform.

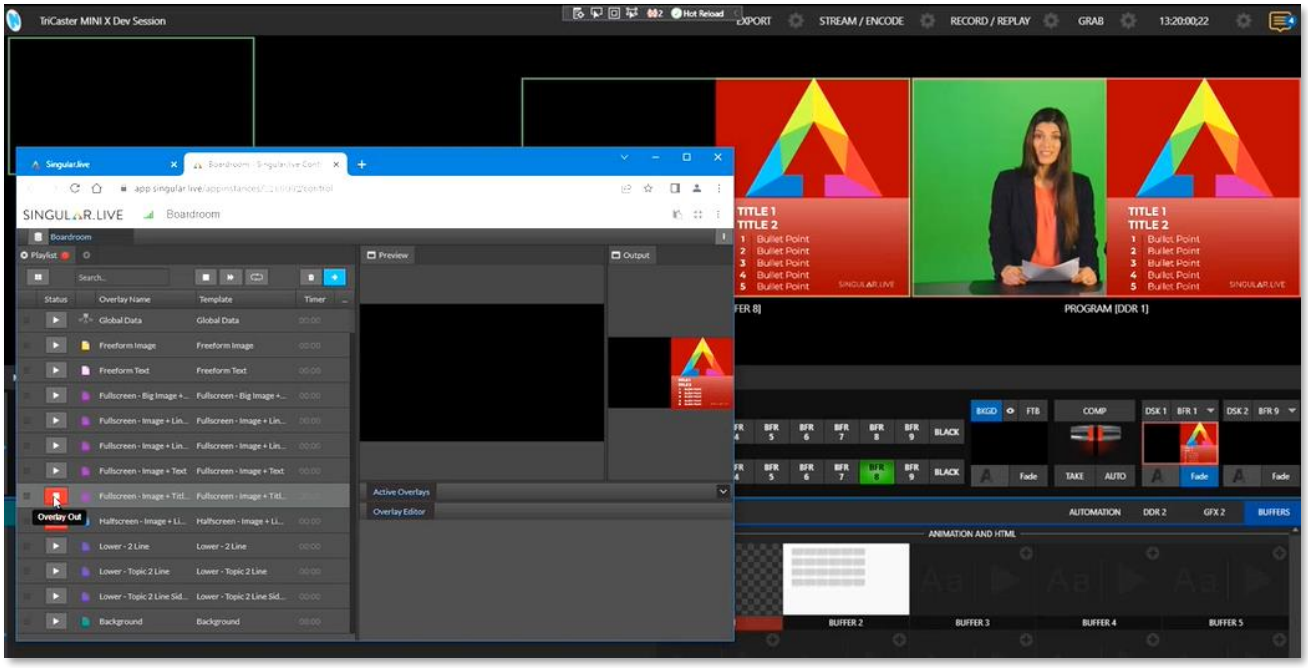


FIGURE 167

11.3.6 BUFFER WATCH FOLDERS

If you wish, you can share the *Frame Buffer* folder, which contains any *still images* used in *Buffers*, across a network. The *Share Media Folders and Buffers* is easily enabled even during a live production using the *File* menu at the left-hand end of the *Dashboard*.

The files which serve individual *still image* buffers are located in clearly named sub-folders of the *Frame Buffer* folder for each session. These folders are arranged as follows:

Sessiondrive:\Sessions*sessionname*\Frame Buffer\Buffer (#)

e.g., D:\Sessions\MySession\Frame Buffer\Buffer 3

The *Frame Buffer* folder for the current session is accessible on the network when sharing is enabled. This allows *still image* buffers to be updated across a network using suitable graphics application (such as Photoshop®).

Note: This special share name assignment is dynamic. Network sharing is activated, and the current Buffer path is automatically updated whenever you enter a session with the option enabled. This ensures that applications on networked systems can remotely access and update buffer graphics for the current production session.

The *Frame Buffer* folder is a "watch folder". When you save an image for a given buffer, the buffer updates even if it is currently displayed, allowing you to refresh overlays instantly across the network.

- Still image *Buffers* are normally stored using the popular 32 bit PNG (Portable Network Graphics) format, but other formats are also supported.
- Specific filenames are not important in the buffer workflow. Actually, multiple media files with different names can reside in buffer folders.
- The *Buffer* always shows the 'newest' file – that is, the one with the most recent modification date.

11.3.7 USING BUFFERS

Creative uses for buffers abound. You'll notice that the sample media content supplied with your system includes a number of different styles of animated buffers – some full screen, suitable for looping backgrounds or similar applications, and others that are suited to overlay, bug, or alert tasks.

Buffers of all sorts can be displayed in the following locations:

- Main *Switcher*
    - *Program*/*Preview*) rows – all 15 buffers are directly accessible in the *Switcher*
    - *DSK* channels – choose a specific *buffer* using the *DSK's* drop-down source menu.
- *M/E banks*
    - Select a *Buffer* on an *M/E* row just as you would for the main *Switcher*.

- *KEY* channels – choose a *buffer* for any *KEY* channel using its drop-down source menu.

Buffers allow abundant use of animation throughout your productions – as virtual set elements, layered graphics overlays, etc., all without tying up precious *Media Players*. (Consider that in addition to the *Buffer* cross-points in the main *Switcher*, *M/Es* also support *Buffers*. Given that M/Es are re-entrant, layering possibilities are nearly endless.

11.3.8 KEYING, PROC AMPS AND MORE

It's worth noting that you can apply *LiveMatte, Proc Amp* and *Edge* (cropping and feathering, when supported) settings to individual *Buffers* by opening its *Input Configuration* panel. Of course, you can also apply *Position* settings, including *Rotation* and *Scale,* in *DSK, M/E* and *KEY* channels.

11.3.9 EDITING TITLES

When a title page (.cgxml file) is loaded into a buffer, the *Edit Title* panel (see Section 11.2) can be opened by clicking the *Edit* gadget (Aa) that appears at lower-left when you move the mouse over the icon. Changes made in the *Edit* Title pane take effect immediately.

11.3.10 BUFFER PRESETS

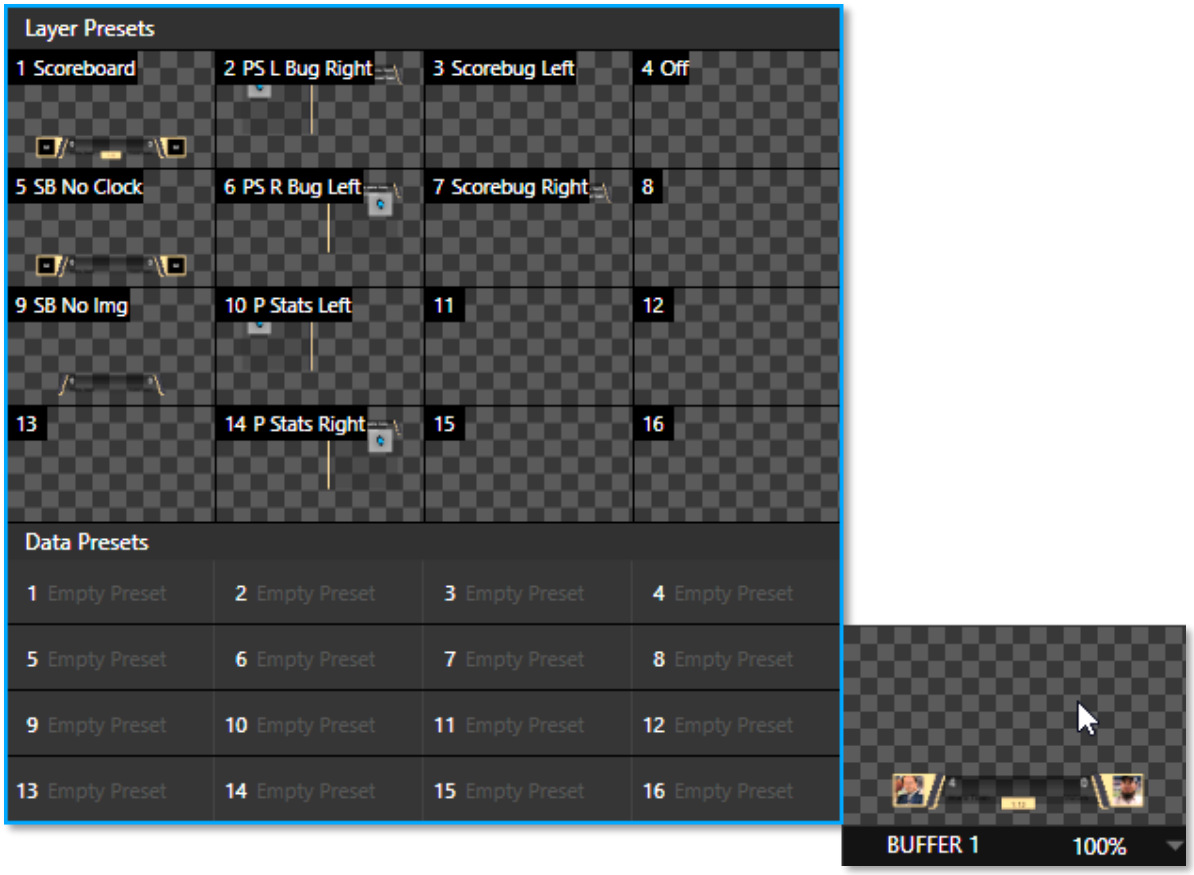


FIGURE 168 (LIVEGRAPHICS EXAMPLE SHOWN)

When a standard title page is loaded into a *Buffer*, clicking its thumbnail icon reveals a list of *Data Preset* slots. Each preset stores the text data and (replaceable) image content link for the title page. A single click recalls a complete data set and immediately updates the page.

This is incredibly useful, of course, because you can (for example) store the names, player numbers, images and the like for the members of a sports team and recall these immediately with a click (or by executing a macro). And because the text values can include DataLink key names, it's even possible for statistics on a title page for a given player to be updated in real-time from external sources or text, xml or CSV files in a watch folder.

Hint: If the Buffer contains a LiveGraphics effect, a set of thumbnail icons depicting Layer Presets is also shown. Selecting a preset allows you to dynamically change from the current animated state to another. More information about LiveGraphics usage is provided in Appendix: A.4 LiveGraphics

Chapter 12 PTZ CONTROL



Once primarily used in security applications, robotic or 'PTZ' (pan, tilt, zoom) cameras are appearing on the production scene in ever increasing numbers. The PTZ implementation makes it easy to operate multiple (supported) cameras from the Live Desktop or a control panel.

Any external *Switcher* input can be configured as a PTZ cam, controlled directly from the *Live Desktop* or using a NewTek control panel. In addition to pan, tilt and zoom control, you can control *White Balance* settings, *Focus*, *Iris* (or 'brightness'), and *Animation Speed* ('travel speed') settings for your PTZ cameras. A convenient and very visual *PTZ preset* system is included, too, allowing you to 'lock in' your shots and access them quickly.

SECTION 12.1 INPUT CONFIGURATION, PTZ TAB

All of the controls and features just mentioned are located in the *Input Configuration* panel, specifically its first tab, which is labeled simply *Input* (Figure 169 and Figure 170).

12.1.1 CONNECTING

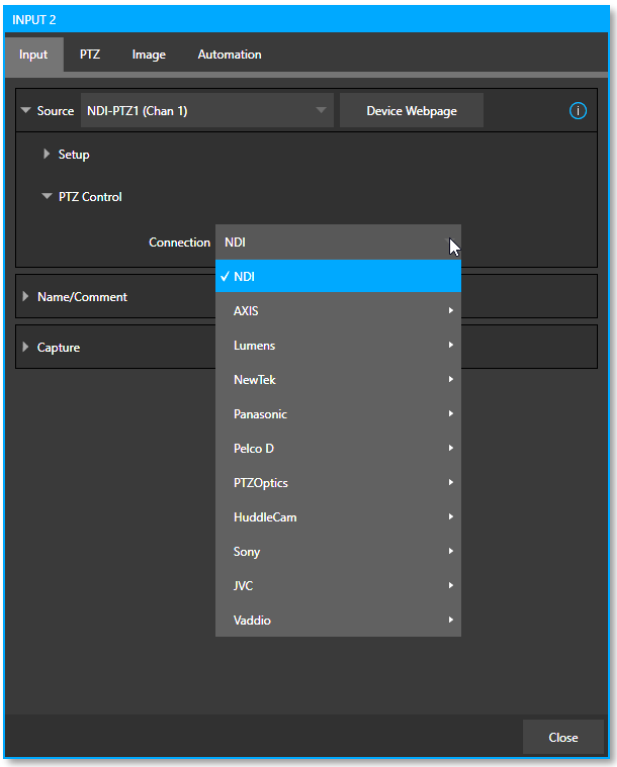


FIGURE 169

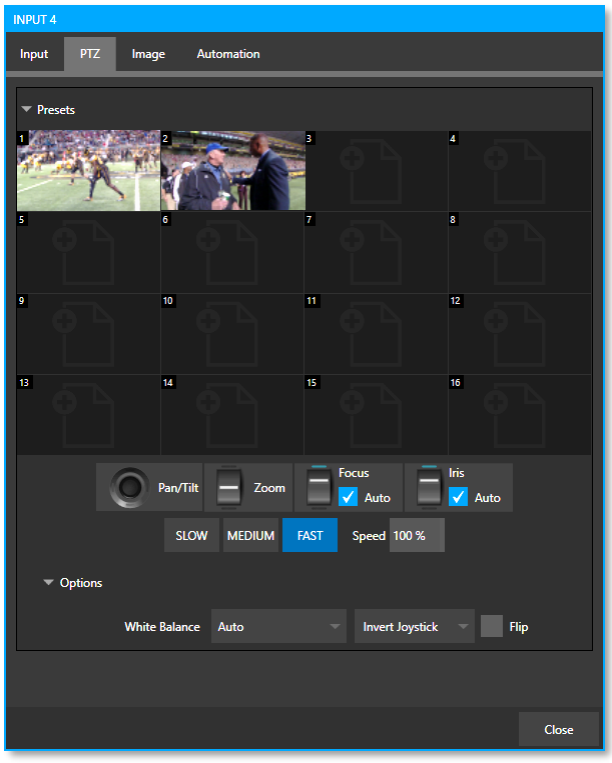


FIGURE 170

A few steps are required before you can control a PTZ camera.

1. First, connect the camera's output to a *Switcher* input – see Section 8.1.

2. Next you must configure the control connection to the camera by selecting its type.

    - Since the default *Connection* type in this group is *NDI*, you can skip this step for an NDI camera, which eliminates all of the settings you would otherwise need to configure.

    - For non-*NDI* sources, use the *Connection* menu to choose the correct PTZ protocol for your device, and continue to enter other data as required for that protocol.

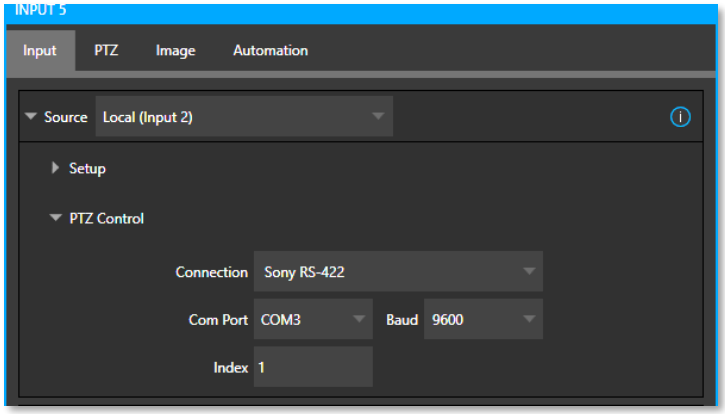


FIGURE 171

Having taken these steps, you are ready to expand and use the *PTZ Presets* control group in the same panel, discussed next.

12.1.2 PTZ OPERATIONS

In this group, a set of manual *Pan/Tilt, Zoom, Focus* and *Iris* controls sits just beneath a large *PTZ Preset* bin. Drag the mouse on these controls to make manual adjustments.

Speed controls, including *SLOW*, *MEDIUM* and *FAST* presets along with a numeric speed control allow you to modify the speed with which presets are applied.

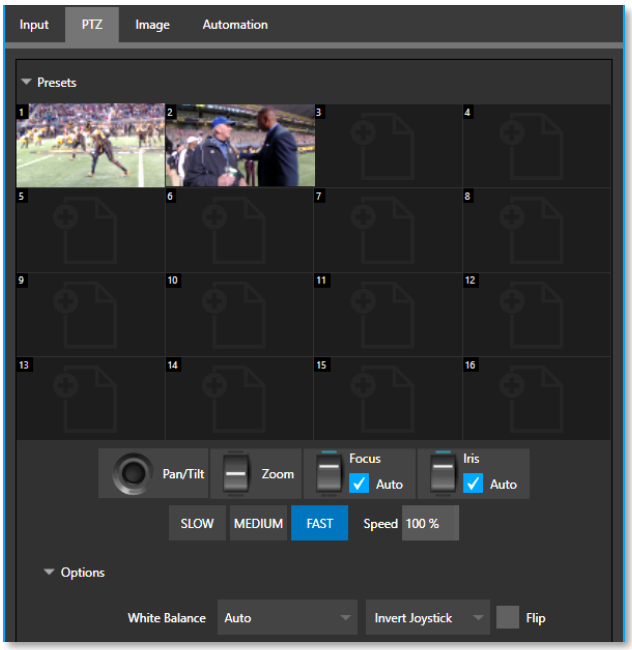


FIGURE 172

OPTIONS

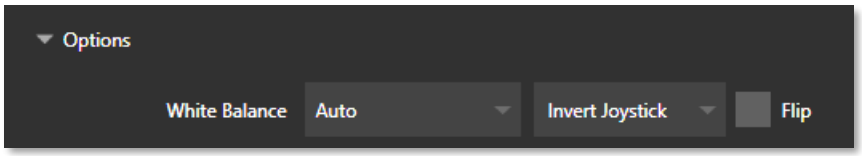


FIGURE 173

Expand the *Options* control below the PTZ speed group to access *White Balance* options (which may vary based on the camera model connected) and an Invert menu that lets you reverse the effect of joystick operations.

Note: Invert settings affect the related controls both in the Live Desktop and on hardware control panels.

12.1.3 PRESETS

The *Preset Bin* shows sixteen thumbnail icons for the current *PTZ camera*. Click a preset to select it, and the camera automatically begins moving to the new position.



FIGURE 174

To configure and store a preset:

1. Use the *Position, Zoom* and *Focus* controls mentioned in the previous section to navigate to the desired camera angle, etc.

2. Then move the mouse over the preset icon you wish to store (or update) and click the *Snapshot* (camera) gadget that pops up at upper-right corner of the icon.

   Hint: Hold Shift when clicking the Snapshot icon to update the representative thumbnail image without modifying the preset already stored in that slot.

3. (Optional) Click the *Configuration gadget* (gear) to open a Properties dialog that lets you assign a different *Alias* and *Comment* to each preset. (These entries also provide values for *DataLink* keys that can be used in the usual ways.)

Hint: See also Section 10.5.1, Viewport Presets, to learn how to display and use presets in your multiviews.

12.1.4 PTZ AND THE CONTROL PANEL

Pan, tilt, zoom control, and preset selection for connected robotic cameras are also directly supported on some NewTek hardware control panels. See Chapter 21, Control Panel for details.



Although its controls are deceptively simple, the LiveMatte™ feature employs powerful chromakeying technology capable of extremely high-quality results. Used alone or in conjunction with DSKs, M/E Overlays and LiveSet features, you will find LiveMatte can play a 'key' role in your live productions.

As we mentioned earlier, chromakeying – or simply "keying" – is used to combine images by eliminating a portion of a foreground image (effectively cutting a digital 'keyhole' in it) to reveal another background. This method is also used to insert talent seamlessly into virtual sets via *LiveSet*.

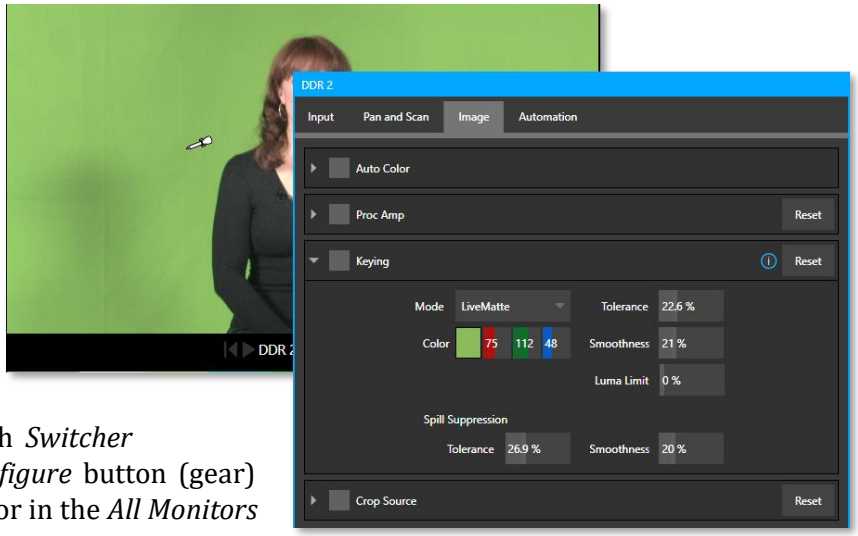


FIGURE 175

LiveMatte controls are located in an expandable group in the *Image* tab of the *Input Configuration* panel for each *Switcher* source. To access them, click the *Configure* button (gear) that appears above an onscreen monitor in the *All Monitors* tab.

The method by which part of the image is defined as transparent is generically referred to as chromakeying, for its dependence on the color values (chrominance) of the video stream. (LiveMatte's mature algorithms far exceed typical chromakeying techniques to provide real-time results, but for our discussion it's not necessary to get into all of the details; suffice to say it works very well and is easy to configure.)

Hint: Crop controls in the Input Settings tab can serve as a 'garbage matte' tool for chromakey sources.

SECTION 13.1 UNDERSTANDING KEYING

Chromakeying has become an essential tool in video and film production. Typically, foreground footage is shot in front of a blue or green screen, and then that background color – the *key* color – is treated as transparent, allowing another image to be inserted.

For example, when you see a tv meteorologist in front of a weather map, that person is almost certainly posed in front of a green screen. The background is 'keyed out', to be replaced by computer generated imagery.

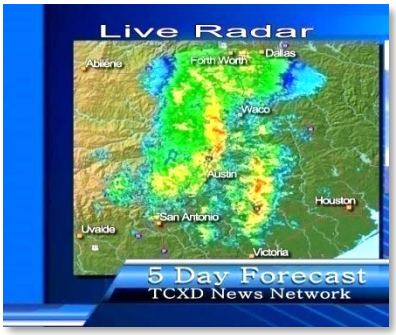


FIGURE 176

Of course, if you choose poor settings, foreground areas may inadvertently be cut away as well. Or some areas that should be transparent may be only partially keyed. Good keying often requires judicious balance between 'too much' and 'too little'. Let's consider the tools provided to help you achieve a great result.

SECTION 13.2 MATTE

The term *Matte* refers to a black and white representation defining the transparent (background) and opaque (foreground) parts of an image during compositing.

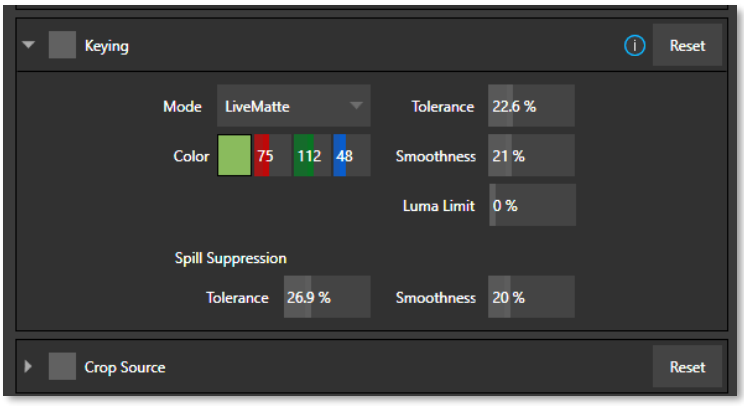


FIGURE 177



FIGURE 178

Portions of the matte that are grey are treated as semi-transparent, which is very useful in progressively smoothing edges between foreground source material and inserted background imagery.

LiveMatte supplies a digital version of this traditional tool. As you would expect, controls in this group allow you to define and adjust the matte for the corresponding video input.

Note: Premium Access feature LiveMatte ULTRA gives you the highest quality chroma keying for virtual sets and other compositing applications on all inputs.

13.2.1 COLOR

Initially, *LiveMatte* removes a specific color from the foreground image. This color is chosen using the *Color* button. To choose this key color, click on the *Color* sample box and keep the mouse button depressed. Drag the *eyedropper* tool over one of the video monitors to choose the color you wish to *remove* and then release it. The neighboring 'color well' is updated to show the color selected.

Hint: Enable the Lumakey switch to disregard hue and base the effect solely on luminance.

13.2.2 TOLERANCE

No physical greenscreen is *perfectly* comprised of one color. Wrinkles, folds and shadows along with the seemingly inevitable uneven lighting result in difference. For this reason, *LiveMatte* supplies a numeric slider labeled *Tolerance* just beneath the *Color* picker.

The *Tolerance* setting allows you to broaden the range considered as the key color, including more 'near-neighbor' colors to be included in the matte. A low tolerance removes only color values close to the primary or key color. As you raise the tolerance, you extend the range of values on either side of the primary color that will be treated as transparent. This allows you to deal with those imperfections we mentioned.

On the other hand, it may be that there is (usually unplanned for) detail in the foreground that is somewhat similar to the key color. Reducing *Tolerance* may allow you to prevent unwanted holes appearing when the subject opts to wear his St. Patrick's Day tie.

13.2.3 SMOOTHNESS

Smoothness defines a further tolerance factor, and a very useful one. We want our keyed foreground to blend smoothly into the background – rather than to stand out in hard relief like a postage stamp or decal. *Smoothness* serves this purpose, by defining a falloff zone of partial transparency. Don't overdo it though, as aggressive settings can cause the foreground to become unnecessarily 'muddy'.

13.2.4 LUMA LIMIT

When working with poorly lit backgrounds (or poor-quality footage), the color *Tolerance* range separating the foreground (talent) from the background can be extremely narrow.

This problem can be aggravated by the subject's choice of clothing, or when there are harsh shadows. There is often a strong chroma component (and associated chroma noise) in dark foreground areas. The 'noise' may be partially or completely transparent when tolerances are critical. Because the noise varies over time, 'holes' in the foreground can result, and even worse these may flicker on and off from one frame to another.

LiveMatte's *Luma Limit* control makes it possible to overcome this issue. In essence, it restricts the chromakey operation based on luminance (brightness) values. Dark foreground areas which typically cause the problems just described normally have quite different luminance values from the background color, which is usually brightly illuminated. In simplest terms, problem areas of this type can be decisively 'pulled' back into the foreground by pre-filtering the chromakey effect around a luminance threshold.

Generally, try to set up the best key you can *before* raising the *Luma Limit* from its default value of zero (no effect). Then gradually raise the limit until you are pleased with the result.

SECTION 13.3 SPILL SUPPRESSION

The term 'Spill' refers to key color unintentionally reflected or 'spilled' onto the foreground subject. For example, a little green spill often appears on the shoulders of someone in a greenscreen shot.

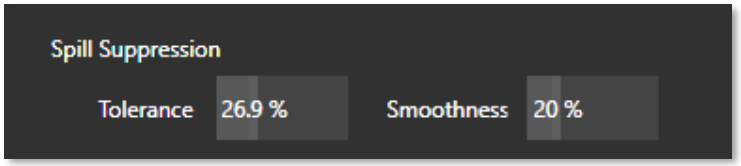


FIGURE 179

The *Spill Suppression* controls let you remove key color spill in your scene by reducing the amount of that color in the foreground, where it doesn't belong. The net result is that the impression of spill color is eliminated, or at least reduced to the point where it is not objectionable.

Use the *Tolerance* and *Smoothness* controls under *Spill Suppression* in similar fashion to the controls by the same name discussed earlier. Endeavor to subdue spill without *overdoing* it, which could result in an unsightly gray fringe around offending edges of your foreground.

SECTION 13.4 COMPOSITING

When you enable (and configure) *LiveMatte* for an input, the onscreen monitor for that input shows the source keyed over a checkerboard pattern (when the Checkerboard option is selected in *Overlays* for the monitor.)

If you select the (*LiveMatte*-enabled) input as *Input A* in an *M/E* tab in *LiveMatte mode*, the keyed source is overlaid on sources in lower input rows. You will see the composite result when the output is assigned to either the *PGM* or *Preview* row.

SECTION 13.5 FINE TUNING

You'll find *LiveMatte* easy to configure with a little experimentation – but a few handy workflow tips follow below.

You may find it useful initially to turn *Smoothness* off or nearly so. Likewise begin with a low value for *Tolerance* – perhaps just 5-10, or so. Put the video source on *Preview* or *Program Output* before you do so, to provide a larger view to help you assess your settings.

Pick your primary *Color*, but – before releasing the mouse button – slide the eyedropper around to different parts the background. Watch the monitor as you do so to see how the area of transparency is affected by different Color choices. Release the mouse when you find the color that produces maximum results. It's often preferable to pick an 'average' color from a location fairly close to the boundary between the background and foreground regions.

Now you can start to ramp up *Tolerance*. Bring it up slowly until most of the background color has been eliminated, cutting away most of the background to within a few pixels of the foreground/background boundary. Now raise *Smoothness* to fine tune that edge region, and you're nearly done.

Before considering your settings final, make sure to test the result using a moving source. This will sometimes reveal that overly aggressive settings cause small 'blocks' of pixels in the edge region to appear to snap on and off during motion - as they either qualify or disqualify for inclusion in the resulting matte. (A little reduction in *Tolerance* and increase in *Smoothness* will usually resolve this problem.)

Hint: It can be useful to zoom in using Position controls when fine tuning LiveMatte.

SECTION 13.6 LIGHTING FOR LIVEMATTE

We'd like to offer a few suggestions here to guide you in preparing your set. The single most important aspect of 'pulling a clean key' is lighting. The lighting should be even and diffuse. Bright 'hotspots' and shadows create different shades on the wall, and overexposed areas lack sufficient color for clean keying. (It is not how *much* light you have on the key wall, but how *evenly lit* that wall is.) Naturally, you want to keep your green (or blue) screen clean and free of wrinkles, ripples, folds, tears, or other blemishes, as well.

Second, the distance from your talent to the screen behind can make a profound difference in key quality. When the subject stands too close to the key colored background, the key color reflects back onto the subject, creating a green or blue fringe that is difficult to remove. If you have available space, move your subject farther away from the wall.

When good distance is out of the question, you can improve things somewhat by placing lights above and behind the talent, lighting them from behind with a complimentary color filter over the light to 'cancel out' unwanted reflection (for green use a magenta filter; for blue, orange or amber.

Don't overdo back (or top) lighting, however. The limited dynamic range of the camera means there will be little useful color data in badly over-exposed highlights. This can make it next to impossible to separate fringe zones (such as hair detail) from the background (especially when this is also overexposed).

SECTION 13.7 CROP SOURCE

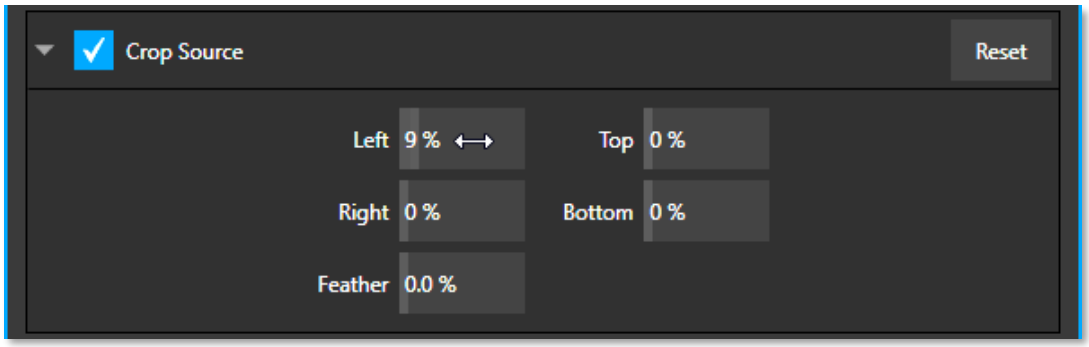


FIGURE 180

We discussed this feature earlier, but wanted to bring it up again in our discussion of *LiveMatte.* It is common for unwanted items to remain after chromakeying.

Common examples include microphones or lighting fixtures dangling from above, or perhaps a harsh crease, blemish or tear in the background screen. *Crop Source*, located in the *Image* tab just below *LiveMatte*, can serve as a 'garbage matte' to remove this sort of intrusion.

Chapter 14 MIX/EFFECT (M/E) TOOLS



M/E banks provide truly awesome production power and convenience. Pre-configure multi-layered compositions and switch them as easily as you would to any single input or use an M/E to control a special purpose sub-mix. This is also where NewTek's real-time virtual set technology, called LiveSet, is applied.

We introduced *M/Es* (Mix/Effect banks) way back in Section 2.5.9, but it's time for us to look at these extremely powerful tools in greater depth.

SECTION 14.1 OVERVIEW

The *Mix Effects*, labeled *M/E 1, 2* and so on, sit just above the main *Switcher* on the *Live Desktop*. Click an *M/*E tab (label) to expand or collapse the corresponding *M/E.* When expanded, *M/Es* occupy the area of the *Live Desktop* between the monitors and the main *Switcher*.

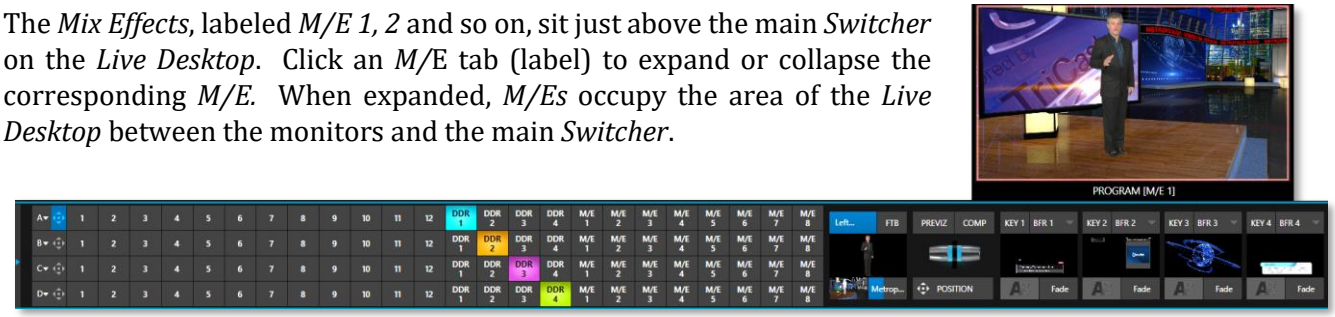


FIGURE 181

*M/E*s are presented individually in tabbed panes, each corresponding to a button in the main *Switcher.* The number of *M/Es* available varies by model, either four or eight.

As you would expect, selecting an *M/E* button on the (main *Switcher*) *Program* row displays the output from the corresponding *M/E* on *Program Output*. Likewise, punching an *M/E button* on the *Preview* row cues up that *M/E* bank's output for an upcoming *Take* or *Auto* operation. This makes it easy to *Take* or *Auto* directly to, from, or even between *M/Es* with a single click.

M/Es are re-entrant, meaning *M/E* buttons also appear on source selection rows and *KEY* channel source menus inside the *M/E* panels themselves. This is an exceptionally powerful feature, and one offering endless creative possibilities.

Note: Self-referential reentrancy (i.e., re-assigning a given M/E as one of its own sources) is not supported. However, you can often mimic effects of this sort by using multiple channels in another M/E .

SECTION 14.2 M/E MODES

At first glance, an *M/E* panel in its default operating mode ('mix', or transition) is scarcely distinguishable from the main *Switcher*. However, each *M/E* actually offers two *different* operating modes:

1. *Mix* (the default mode): A secondary switcher layout, with controls and options that are very similar to the main *Switcher*.

2. *Effect* mode: The *M/E* is configured for effects, including virtual set operations.



FIGURE 182

The *M/E* mode is automatically established based on the type of effect you load as its *Background* effect.

Effect selection is done in the usual way using the *Media Browser*.

Click the + sign gadget that appears at upper right when the mouse is over the thumbnail icon for the *Background* effect.

For the most part, you will initially see very little difference in the *M/E* panel when you change modes.

- In either mode, source button rows labeled *A* through (B or *D*) are arranged at left.

  The number of layers shown varies according to the effect selection you make, from two effect layers to four.



FIGURE 183

- On the right are four *KEY* control groups. In most respects these are identical in appearance and practice to the *DSK* controls located in the main *Switcher*.

- Even the central control group mimics the main *Switcher*, with its *Transition* controls and options, *T-bar* and so on.

Autoplay and the M/E

One notable point regarding an *M/E* in *Mix* mode and the main *Switcher* involves the *Autoplay* feature (see Section 11.1.9).

To avoid undesirable consequences for *Media Player* content aired on the all-important main *Program* output, *M/E's* in *Mix* mode trigger *Autoplay* operations within the same *M/E* only.

As well, a switch in the Dashboard *Options menu* toggles *AutoPlay*'s triggering of '*Auto* out' transitions.

14.2.1 MIX MODE

Really, an *M/E* in *Mix* mode *is* a switcher:

- Input rows labeled *A* and *B* behave just like the main Switcher's *Program* and *Preview* rows
- *Transition* controls work in the usual manner
- *KEY* channels stand-in for *DSK*s and behave similarly
- *M/E* output can be routed to primary outputs and *Record* module

14.2.2 EFFECT MODE

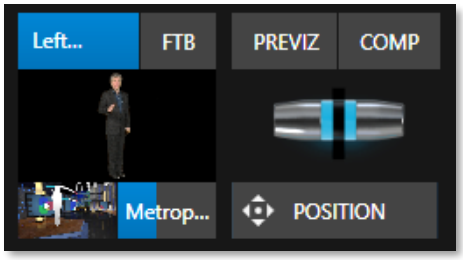


FIGURE 184

Even casual scrutiny reveals some (outwardly) subtle differences in the *M/E* control configuration when a *LiveSet* is loaded as the *Background* effect selection (Figure 184), as follows:

- The *Take*/*Auto* buttons located beneath the *T-bar* and *Transition icon* are replaced by a *Position* button.
- As required, as many as 4 input rows (*A, B, C*, and *D*) may be shown in *Effect* mode.
- *Positioner* controls appear for these input layers.

Let's consider the reasons behind these changes in the interface. An *M/E* in *Effect* mode allows preparation of a composite of two or more video sources, whether for direct output, or as a source for the main *Switcher*, or as an input for other downstream channels (including other *M/E*s).

Even in *Mix* mode, an *M/E* provides access to effects – including *Position* and transition effects (including *Animation Stores*) and animating *KEY* layers via the *Comps* feature. In *Effect* mode, however, an *M/E* asserts its real-time compositing and effects prowess more aggressively.

SECTION 14.3 THE T-BAR

In a mix effect, the *T-Bar* and associated controls match the main *Switcher*. It's different in an *M/E* displaying a *LiveSet* effect, however. In this mode, dragging *the T-bar* vertically adjusts the virtual 'camera distance' for the active *LiveSet* between 0% and 100%.

The *Duration* control works like similar numeric fields elsewhere in the *Live Desktop*: drag to adjust the value, click to type directly into the field using the keyboard, or press (keyboard) Shift and double-click to restore the default value. The drop-down *Duration* menu offers several convenient presets as well as a *Cut* option.

Hint: The maximum duration for an animated zoom is 30 seconds.

SECTION 14.4 INPUT POSITION CONTROLS



Position controls for all appear to the left of all input rows. Click this button to open the input's *Position* panel. These controls replicate those discussed previously, under the sub-heading DSK Controls in Section 9.7.1.

FIGURE 185

As mentioned, in *Effect* mode an M/E may support up to four input layers. The *M/E* doesn't *transition* between *A* and *B* in *Effect* mode. Instead, effects of various types are applied to the selected video inputs.

Let's consider the effects in the *Default* group as examples:

Click the + sign shown when you move the mouse to the effect icon located beside the effect duration. This opens the *Media Browser*. Select the effect group labeled *Default* under the *LiveSet* location on the left. With the exception of *Advanced Tracking* effects, these effects are straightforward compositing effects involving multiple video layers. *Effect* output (i.e., the *background* prior to *KEY* overlays) is the sum of all input layers.

If the source assigned to input *A* is fully opaque, any content in the layers below is hidden. When input *A* is partially transparent, the source assigned to input *B* is blended into the *M/E* background layer, and so on.

Hint: Don't overlook the fact that the input Position controls, including Borders, let you create very elaborate compositions even with these 'simple' compositing effects.

The output of active *KEY* layers is then added to the effect output before passing the combined result onward as the final *M/E* output.

ADVANCED TRACKER

As we mentioned, effects can be 'simple' compositing effects, like most of the *Default* group, or more advanced. Before considering NewTek's virtual set system (a.k.a, LiveSet), let's talk about some of the other effect types. Effects can vary widely in their types, from relatively simple utilities effects to image processing and advanced compositing effects.

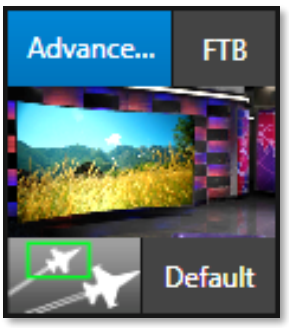


FIGURE 186

For example, we mentioned that one member of the Default group is unique.

The *Advanced Tracking* effect takes three video sources (hence is supplied only with TriCaster models that support 4-layer M/Es) to produce a result that would otherwise require the use of an additional *M/E*.

Set up this effect as follows:

1. Click the label above the *Effect* icon and use the *Media Browser* to select the *Advanced Tracking* effect from the *Default* group.
2. Add the clip named *Tracking Example.mov* (NewTek>Green Screen group) to the playlist for *DDR 1*.
3. Enable *Loop* mode for *DDR 1*.
4. Add the clip named "*Bumper Cars.mov*" (NewTek>Clips group) to *DDR 2*, set it to *Loop* as well.
5. Add an attractive full frame graphic to the *DDR 3* player.
6. Select *M/E 1* on the main Switcher's *Program* row, to make it easy to view the result of the following steps.

7. In the *M/E 1* tab, select *DDR 1* on the input *A* row.
8. Select *DDR 2* as input *B*.
9. Select *DDR 3* as input *C*.
10. Double-click the monitor for *DDR 1* to open its *Input Configuration* panel.
11. Continue to configure both *LiveMatte* and the *Tracker* for the video clip in *DDR 1*:
12. In the *LiveMatte* tab, click *Reset* to update the keyer settings to their defaults, and enable the *LiveMatte* switch at upper left.
13. Use the *Scrub* bar under the playlist in *DDR 1* to advance through the clip until the colored card is visible in the frame.
14. Switch to the *Tracker* tab, click the *Color* picker (eyedropper) keep the mouse button held down, and drag the pointer over the color card and release to assign that color to the *Tracker* for *DDR 1*.
15. Boost the *Tolerance* setting to 34%.
16. Press *Play* for both *DDRs*.

Let's take a moment to review our progress, before completing setup steps:

On the *Program* monitor, you should see the talent clip overlaid on the image from *DDR 3* (*LiveMatte* is turning the green pixels in the *DDR 1* clip transparent). You'll also see imagery from *DDR 2* displayed wherever the (originally) orange card appears in the frame.

What's happening is that the *Advanced Tracking* effect is applying the values from the (DDR 1) *Tracker* for a secondary iteration of *LiveMatte.* Our *LiveMatte* settings cut away the green, revealing the *C* layer behind. Afterward, the orange color range is also keyed out, revealing the *B* source through the transparent region.

Up to this point, the effect takes advantage of the *Tracker* color values, applying them as a secondary keyer – but we haven't yet done anything with the actual *motion data* the *Tracker* is supplying. Let's do so now.

17. Click the *Position* button for input *B* to open the *Position Panel* for that layer.
18. Select *DDR 1* in the *Use source Tracker* menu.
19. Enable *Follow Tracker* (Figure 187).

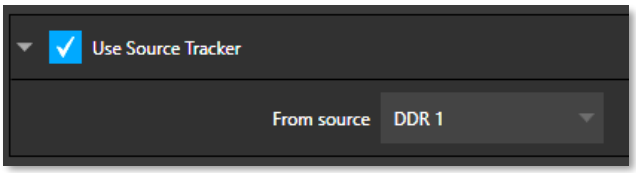


FIGURE 187

The result on your *Program* monitor should look much like Figure 188; full motion video appears wherever the orange card appears in the foreground clip. This is the standard setup for the *Advanced Tracking* effect, though it's possible to use it in different ways too.

Further Notes: Advanced Tracker 2 provides much improved compositing. (The original effect is provided for legacy purposes but might also produce a better result in rare cases where a source has embedded transparency). Among other benefits, the newer effect performs spill suppression at the edges of the tracked region. Using the size (etc.) parameters of the tracker, the region being tracked can be made slightly larger to taste, to moderate this effect.



FIGURE 188

Now would be a good time to test the effect of the *Scale*, *Rotation,* and *Aspect* controls in the *Tracker* tab for *DDR 1* (remember you can double-click the *DDR 1* monitor to open this panel).

UTILITIES



FIGURE 189

Effects can take other forms as well. We've looked at the *Default* effects group; now let's consider *Utility* effects.

If you were following along in the previous section, replace the current effect in *M/E 1* with the *Show Alpha* effect from the *Utilities* group.

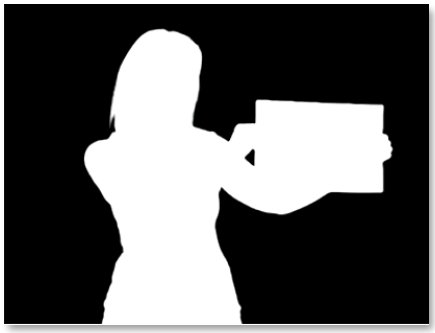


FIGURE 190

Applying this effect immediately causes the display on the *Program* monitor to update, showing the content of the alpha channel for input *A* (*I*nput *B* is ignored).

The current input *A* source is keyed, so the effect displays black on *Program* out wherever transparency exists in the foreground, white for full opacity, and shades of gray for in-between blends.

With this in mind, it won't be hard to guess what *Show Inverse Alpha* does. In contrast, the *Show Color* effect in this group passes the full color output of *LiveMatte prior* to being multiplied by the alpha channel.

(It might seem as though this would be identical to the original source, but you may notice subtle differences. This is because of the *Spill Suppression* processing.)

Let's look at another of the effects in the *Utilities* group, *Color Correction*. Replace the current effect with the *Color Correction* effect. You'll notice that M/E 1's output on the *Program* monitor is now rendered in monochromatic grayscale. Drag the T-Bar down to affect the *M/E*'s color saturation. Click the mouse on the *Position button* below the T-Bar and drag to modify *Hue*.

Finally, the *Make Legal* effect ensures the output of an M/E is within broadcast signal tolerances.

3D

The *Anaglyph (Red, Cyan)* effect found in the *3D* category is a special purpose tool.



FIGURE 191

The anaglyph method of displaying 3D imagery depends on stereo video inputs that are filtered and composited into a single output stream.

In turn, this combined stream resolves into 3D when viewed through special glasses with red and cyan (blue-green) filters for left and right eyes respectively. TriCaster provides easy access to anaglyphic technology by means of the *Anaglyph* effect. The effect combines 2 video inputs selected in an M/E. 3D output can then be switched easily like any other source. No complex configuration steps or tricky control panel operations are required.

Photoshop Blend

The effects in the Photoshop Blend folder apply well-known blending modes to the A layer in the M/E as these are blended with the B layer. The resulting compositions can serve many purposes, such as adding animated 'bokeh' style overlays using DDR clips or adding interest to still overlays such as vignettes or titles.

We've considered the *Default* and *Utility* effects. Let's move on to a more glamorous species, the *virtual set*, presented as *LiveSet* effects.



FIGURE 192



FIGURE 193

LiveSet is one of NewTek live production system's most powerful tools and can dramatically enhance production. With it you can achieve the look of a large, sophisticated studio setting (Figure 193) within a very small studio space (Figure 192), all without the need for external equipment.

Broadly speaking, setup of a *LiveSet* effect is much like the *Default* effects previously considered (see Default Effects, Section 14.2.2). A typical *LiveSet* consists of a greenscreen shot (usually input *A*) with *LiveMatte* applied composited into a virtual set. *LiveSet* adds the foreground and background for the scene, and additional video inputs may add to the effect in various ways.

Hint: Most virtual sets require LiveMatte settings to be applied to Input A. Other inputs may also require keying, depending on the design of the virtual set.

To select a *LiveSet*, click the effect icon in the M/E's *BKGD* at lower-left control group to open the *Media Browser* (Section 11.1.8).

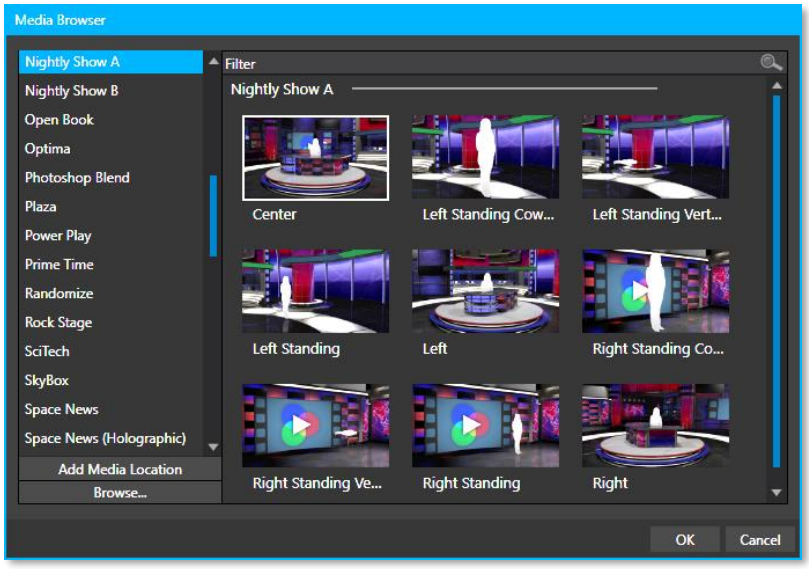


FIGURE 194

The *Location List* of the *Media Browser* lists any installed *LiveSet* groups under the heading "LiveSets". Select an entry beneath to show thumbnail icons in the Browser's *File Pane* (Figure 194) shows the content of the *NewTek* location under the *LiveSets* heading).

INPUT POSITION



FIGURE 195

We discussed *Positioning* controls for *M/E* video inputs previously (Section 14.4). It's worth adding here that *Position* options do affect the scale, rotation and position for *LiveSet* video inputs. You can often use *Positioning* controls to achieve a 'good fit' and natural appearance of talent or another source appearing in your virtual sets (greatly reducing the need to fuss with physical camera positions).

Hint: The Align group of LiveSet effects is specially provided to make it easier for you to adjust cameras and position talent on your physical set to suit the design of typical virtual sets.

14.6.1 HOLOGRAPHIC LIVESETS

A special variant of LiveSet effects are referred to as 'holographic'. These effects can be amazingly lifelike and convincing, and are relatively easy to create.



FIGURE 196

Holographic LiveSet effects are loaded into an *M/E* in the same manner as any other effect. Simply move the cursor over the effect icon and click the + sign (*Add Media* button) that appears to open a *Media Browser*, then choose the effect you wish to load (several examples are included with your system). Adjust the current view for holographic *LiveSets* in similar fashion to standard effects using the *T-Bar* (*Zoom*) and associated *Positioner* controls.

The *Comp Bin*, discussed shortly, allows you to store and apply your favorite compositions.

Preset adjustments made using the mouse vary slightly for holographic effects. For a standard LiveSet effect, dragging the mouse left, right, up or down changes the camera position in the frame. The right-mouse button zooms in or out. In a holographic LiveSet, right-mouse operations are the same. However, dragging the mouse on the canvas modifies camera *rotation,* rather than position.

Hint: New holographic effects, like standard LiveSets, can be created using the optional Virtual Set Editor application. A demo version of this utility is installed on your system, and its instruction manual can be located using the Help link on the Home page TriCaster's Launch screen.

SECTION 14.7 KEY CHANNELS



FIGURE 197

In *almost* all respects, the *KEY* channels in *M/E* panes match the *DSK* channels found in the *Switcher's* main *Transition* section. Unlike the *DSKs*, though, they constitute a 'pre-main *Switcher'* sub-layer. This means that *KEY* channels are applied *before* the composition is sent to the *Switcher* (or another *M/E)*. Thus, content in a *KEY* channel appears beneath anything displayed via the (*Switcher*) *DSK* channels.

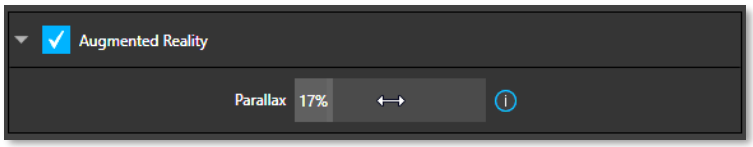
Likewise, *KEY* channel selection and *Position* controls largely work just like their *DSK* cousins, discussed earlier, with two notable exceptions. We'll consider these exceptions next.

14.7.1 KEY LAYERS AND AUTOPLAY

It's worth noting that the behavior of *Autoplay* for *Media Players* selected as sources for *KEY* channels conforms to the way it works for other *M/E* sources. That is, newly displaying a *Media Player* with *Autoplay* enabled in the *A layer* or a *KEY* layer for an *M/E* will trigger playback, but – by default – at the end of play the 'out' transition (and subsequent advance to the next playlist item) does not occur.

This default behavior can be overridden by checking the *Options* menu item *Enable Autoplay Out on M/Es*.

14.7.2 AUGMENTED REALITY



In one other unique and powerful departure from *DSK* features, the *Positioner* for *KEY* layers has an added feature labeled *Augmented Reality* (Figure 198).

FIGURE 198

Note: The Augmented Reality feature is for use in M/Es that are assigned to effects (such as LiveSets), and has no effect when a Mix effect (transition) is loaded as the Background effect for the M/E.



FIGURE 199

Any *KEY* layer with the *Augmented Reality* switch enabled is treated differently from a normal KEY layer in several respects:

- First, it does not merely appear *above* the main *M/E* layer composition you configure at left, as a typical *KEY* channel would. Instead, it is treated like another main layer added above the standard M/E layer rows.

- Thus, when you zoom or pan the *M/E*, the *KEY* layer zooms and pans right along with it, making its content appear as though it were embedded in the scene (Figure 199).

  (This lets you effectively add one or more virtual layers to a *LiveSet* composition at any time, with complete control over positioning within the composition.)

- With the associated *Parallax* setting at 0%, the *KEY* source is locked to the background formed by the layers below it in a 1:1 relationship. When the 'camera viewpoint' changes, the *KEY* layer moves in exactly the same amount and direction as the background.

Hint: You can use this ability to 'pin' a graphic element into a LiveSet.

- Raising the *Parallax* value modifies the motion of the *Augmented Reality KEY* layer during panning and zooming, making it appear closer to the camera than subject matter behind it. This enhances the impression of three dimensional depth.

Finally, note that the *Tracker* feature can also be used along with *Augmented Reality* and *Parallax* to produce uniquely dynamic motion graphic compositions.

SECTION 14.8 COMPS

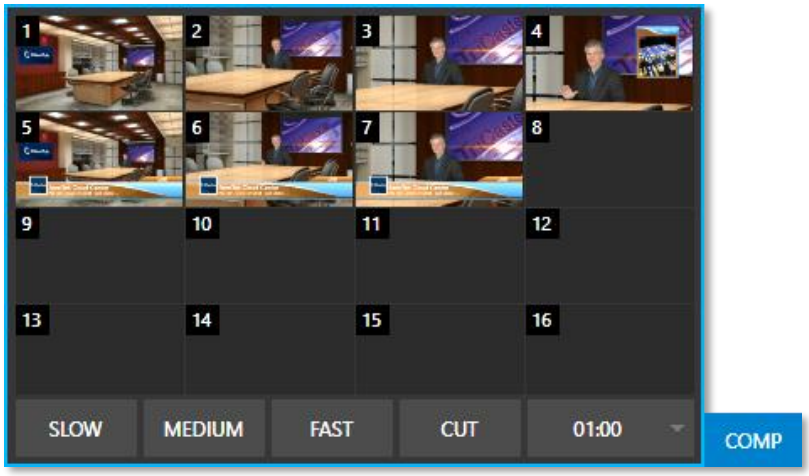


FIGURE 200

Different 'virtual camera' positions, along with other *M/E* attributes, can be stored in the *Comp Bin* associated with each *M/E*. In particular, *T-Bar* and most *Positioner* attributes for all layers in the module are stored in a *Comp* and are re-applied when you click the *Comp* icon later. This includes such things as cropping and edge-feathering performed using *Positioner* settings (layer source selections are not stored, nor are *Border* or *Tracking* settings.

Note: 410 Plus and TC Mini require Premium Access subscription to enable the COMP feature.

14.8.1 APPLY TO TRANSITIONS

Apply to transitions overrides the set for the individual Keys to match the *COMP* speed. For example:

- COMP mem1 takes Key1 and Key2 on
- Key1 has manually set speed of 1:00
- Key2 has manually set speed of 2:00

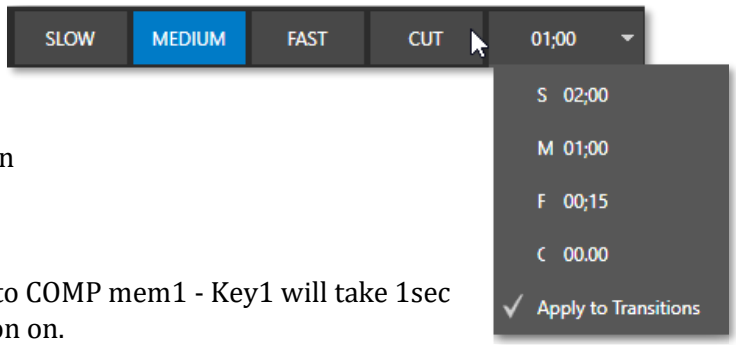


FIGURE 201

If you have COMP set to Med (1:00) and switch to COMP mem1 - Key1 will take 1sec to transition and Key2 will take 2sec to transition on.

If you do the same thing but have *Apply to Transitions* enabled, both keys will come on in 1sec time.

14.8.2 MANAGING COMPS



FIGURE 202

Having prepared a composition you wish to keep, storing a corresponding *Comp* is simply a matter of clicking the *COMP* button above the *T-Bar* to open the *Comp Bin*, and clicking an empty position. An image grabbed from output of the module is displayed to represent the *Comp*.

If you later wish to revise a *Comp*, you can do so either by rolling the mouse over it and clicking the 'snapshot' icon shown at upper-right (Figure 202) or by right-clicking the icon and selecting *Update* in the context menu that appears (Figure 203).

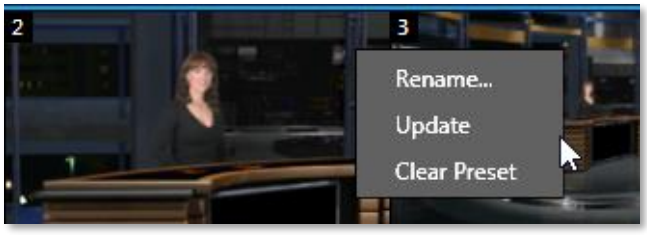


FIGURE 203

The context menu also allows you to *Rename* a *Comp*, update it, or clear it entirely.

14.8.3 ANIMATION

Making a selection in a *Comp Bin* changes the current composition of layers displayed by the module to the new one. Changes can be immediate or animated over time. The timing controls in the footer of the *Comp Bin* determine the duration of the move from one position to another, while transition effects for layers are governed by their individual effect durations.

Hint: The main Switcher also hosts a Comp Bin. However, LiveSet effects are not supported in this case.

It's worth noting that, since *T-Bar* states are stored and applied by *Comps*, transition effects can be applied by selecting a *Comp*.

Let's discuss an example:

- Suppose *KEY 1* is a lower third type title overlay and has a 'fly on' type transition assigned to it.
- *Comp 1* was stored with *KEY 1* not visible.
- *Comp 2* was stored with *KEY 1* hidden.
- Click *Comp 1*, then – a moment later - *Comp 2*.

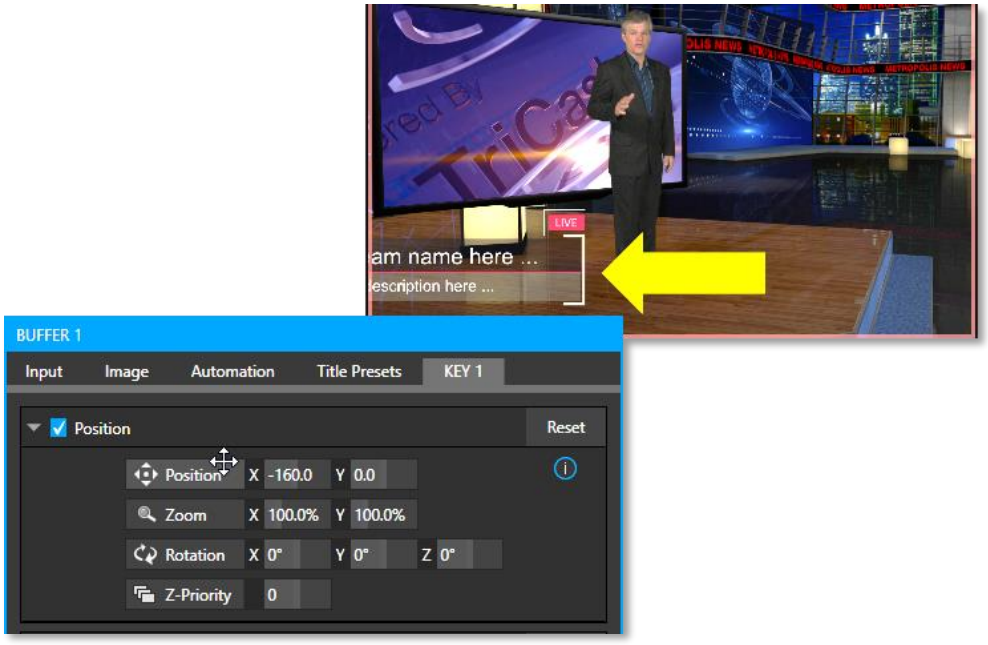


FIGURE 204

The result is that *KEY 1* will animate in and out according to the state stored in each *Comp*.

Actually, *Comps* can apply transitions to multiple layers at one time with a single click. Animation between the current layer states and settings is not limited to the effects provided by transitions, however. Let's consider a different example.

- Select *Comp 2*, ensuring that KEY 1 is visible.
- Use the *Positioner* controls for *KEY 1* to slide the lower third title off the page, completely hiding it from view.

- Store a new *Comp*.

  Switch back and forth between these two *Comps* and you'll notice that animating the layer's position of the layer has effectively allowed you to create a custom transition. Experiment with other settings, such a Z or Y axis rotation and you'll begin to see just how much power *Comps* give you.

Using these and other settings to animate the various video layers, very complex compositions can be introduced into your production with a single click in the *Comp Bin*.



Less than 100 years ago, movies were silent. We've come a very long way since "The Jazz Singer" (1927, Warner Bros.), and great audio now plays a huge role in video production. NewTek live production systems provide an extensive set of professional quality audio tools, which we'll explore in this chapter.

External audio connections and basic configuration were touched on back in Sections 3.5.1 and 3.7.1. A tabbed pane labeled *Audio Mixer,* found just below the main *Switcher* presents more precise control over individual audio sources and outputs.

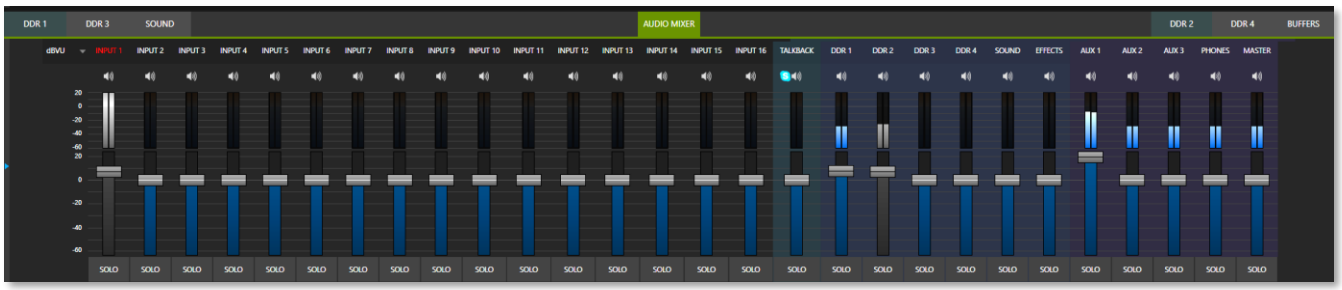


FIGURE 205 (TC1 SHOWN)

Compact sub-panels in this pane provide configuration and control for individual audio sources and also audio outputs as follows, from left to right:

- *External* audio sources
    - Controls for audio *INPUTS 1-(number varies by model)*.
    - *TALKBACK* – a special source for Skype TX (and Live Call Connect on supporting models.)
- *Internal* sources – *Media Players*, and *Effects* (sound embedded in *Animation Store* transitions).
- *Stream* – controls streaming output to the web.
- *Aux 1 to 3* (TC Mini X supports 1 Aux) – controls for *Aux* audio busses.
- *Phones* – volume control for the system's headphone output.
- *Master* – controls the primary audio bus.
- Audio level control for individual recorders are provided elsewhere.

NOTE: For models with two or more backplane analog outputs, the connectors carry the first two channels assigned to the Master 1 and AUX 1 busses (except older models with quad connectors, which carry four).

SECTION 15.1 AUDIO SPECIFICATIONS

Analog audio conforms to SMPTE RP-155. The maximum input/output level is +24 dBu. Nominal input level is +4 dBu (-20dBFS), and the sample rate is 48 kHz. Levels above 0dBVU are shown in red in the *VU meters*, to caution you that overly high levels can result in clipping in recordings.

SECTION 15.2 HEADPHONES

By default, headphones connected to the ¼" stereo *Phones* jack carry the first two channels of the audio signal from the bus designated *Master 1* – that is, the same audio carried by analog output connectors marked as *Ch. 1* and *Ch.2* in the *OUT 1* group on the system's backplane.

The *Headphone* output is also affected by *Solo* switches located at the bottom of each control group in the *Audio Mixer*. When *Solo* is enabled for one or more sources – or outputs – *only* the soloed sources are sent to the connector. (See *Solo* in Section 15.7.2 for more information on this feature.)

SECTION 15.3 VU METER CALIBRATION

VU (Volume Unit) *meters* are located right above the *Volume* control sliders throughout the *Mixer*. The calibration of the *VU meters* can be changed to suit your preference.

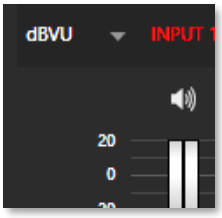


FIGURE 206

A menu at left beside the *Input* labels opens a small menu (Figure 206) offering three options as follows:

- *dBVU* – most familiar to users of typical analog audio mixers
- *dBFS* – dB 'Full Scale' – the digital standard; see the heading Audio Headroom in Section 3.12
- *dBu* – based on a voltage of 0.775 VRMS (a shy scale rarely seen in public, supplied for completeness, comparison, and the amusement of audiophiles)

SECTION 15.4 EXTERNAL SOURCES

Columns in the first set of control groups are numbered as *Input 1-(varies by model).* Each of these can be assigned to any available audio source – whether analog (line level) sound supplied to rear panel connectors, SDI embedded audio from one of the four SDI inputs, available NDI source, or other system audio source (including network audio sources like Audinate's Dante™), with appropriate drivers.

**Note: Dante support requires an inexpensive user license from Audinate.*

You may choose to think of these audio sources as being associated with the same-numbered *video* inputs in the nearby rows on the rear connector panel. This linkage, though the default, is not strictly enforced, however. You can connect directly to any external audio source in the *Advanced Configuration* panel (see Section 15.10). Also, for reasons of your own, you may well prefer to treat various audio sources as independent of the nominally associated video input. The *Follow* (audio follows video) features play an important role in this context – see the sub-heading Follow Program Video in Section 15.10.2.

15.4.1 CONNECTION TYPE



FIGURE 207

Naturally, only one connection can be active for a given audio input at any moment. To access the *Connection* menu, move the cursor into the label of an input, and click the *Configure* (gear) button that appears just at right. The *Advanced Audio Configuration* panel will be shown.

The drop-down *Connection* menu at the top of this pane allows you to assign any one of the supported sources connected to the system to this *Audio Mixer* control column.

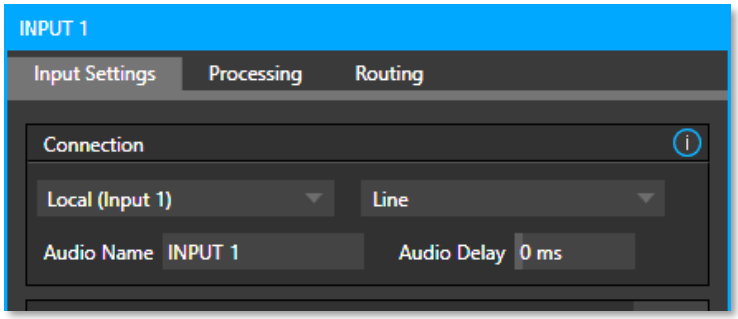


FIGURE 208

- *Local*
    - Physical inputs on the system's backplane or faceplate listed, usually as *Input #*, but in some cases as "Mic" or "Line".

      On some models, local sources support different connection types, as determined by a menu at right in the same group. This option typically defaults to *Auto-detect*, but depending on model may include *Line, Mic, or Embedded* (which is the correct setting for audio included with an SDI or NDI video connection).

    - Dante sources (network audio from systems supporting this protocol from Audinate).

    - *Skype TX Caller 1, 2* (sound from these two special input types, further discussed in the next sub-heading).

- *Follow (Video Source)* – this is the default selection and causes the control column to follow the same numbered video *Switcher* input.

- All available NDI audio sources.

Note: Channels 1 and 2 from Master and Aux 1 are always placed on Dante output channels 1-4, respectively.

15.4.2 NDI KVM AUDIO

NDI KVM sends audio through the default Windows Playback device at the time NDI KVM is launched. You can change what audio is being sent to NDI KVM by changing your default Windows Playback device and then rebooting. To learn more about NDI KVM, see Section 5.2 The Home Page.

Note: Available as a feature for all 7-3 or higher TriCasters that have Windows 10.

SECTION 15.5 LOCAL SKYPE TX CALLERS AND MIX MINUS

The default *Connection* option for external *Audio Mixer* inputs is *Follow Video Source*. When an audio input set this way is assigned to a Local>Skype TX Caller channel, the audio control group is automatically assigned to govern incoming audio from that remote Skype caller.

It is not necessary to use an *Aux* audio bus to configure a special audio 'mix minus' to return to the remote Skype caller in this case. The return audio for Skype TX is handled automatically, ensuring that (except when the *TalkBack* feature is engaged) the remote caller will receive a special mix comprised of the *Master* mix with the remote caller's sound removed.

Note: These special a/v inputs are based on the professional Skype TX broadcast platform and require the use of its dedicated control application. Alternatively, you can connect directly to NDI a/v output from a dedicated NewTek TalkShow Skype TX unit, or the standard 'consumer' Skype client configured for NDI output using any Switcher input. See Appendix B: Skype and Skype TX for more information.

SECTION 15.6 TALKBACK

The Audio Mixer input labeled *TALKBACK* serves a special purpose, providing a way to converse off-air with remote Skype (or Live Call Connect callers, on supporting models) without intruding into your live program). You can choose what audio source to supply for *TalkBack* purposes from a variety of input types, as discussed in the previous sections.

As mentioned earlier, by default the *Connection* option for an external *Audio Mixer* input assigned to a Skype TX channel allows the corresponding control group to govern incoming audio from that remote Skype caller. In this case (that is, when an audio control is 'listening' to incoming audio from a Skype TX channel), a new button labeled *TALK* appears beside the group's SOLO button.

When the *TALK* button is lit, audio you supply via the *TALKBACK* input (typically a microphone connected to one of the inputs on the system's backplane, or perhaps the system *Stereo Mix* supplying audio with sound from a 1/8" motherboard audio input) is sent to the remote caller, temporarily replacing the normal mix-minus sound that remote caller would otherwise hear. At the same time the Mixer sends incoming sound from the remote caller to its *Headphone* output, enabling you to have a two-way conversation off-air.

Hint: You will want to take steps (such as by enabling Mute, or perhaps Follow Program Video) to prevent sound from the remote caller being sent to your live audio mix during TalkBack conversations.

SECTION 15.7 COMMON CONTROLS

Many important features and optional settings are common to most source types, and some even appear for outputs. Let's review these before continuing.

15.7.1 MUTE

Mute switches for inputs and outputs appear as speaker icons located just above in the main *Mixer* panel. A single switch controls multiple channels, as appropriate for that source. Enabling *Mute* removes the sound from that source from all downstream audio mixes and outputs.

Hint: Muted sources still show signal activity on the VU meters, but levels are drawn in gray rather than full color. This is also true for sources with Follow set that are not currently audible on output.

One important exception to *Mute* operation involves recording. The IsoCorder feature lets you capture any MIX a/v output - i.e., the primary output or outputs (varies by model), or directly from hardware audio and video inputs with matching numbers. That is, the audio recorded with the video is taken from the audio input having the same number as the video input. In this latter case, the captured audio is routed directly to the recording module *prior* to most adjustments in the *Audio Mixer* – including *Mute*.

15.7.2 SOLO

Solo implementations and options vary widely in the audio industry, but broadly speaking, all variants provide very useful functions. The *Solo* feature offers remarkable flexibility without overly confusing complexity.

Consider a few basic design concepts:

- Enabling *Solo* for a source sends its (post-fader) sound to the *Headphones* output and removes all other sources from that output.
- *Solo* has no impact on audio mix (es) sent to any other output.
- This *Solo* feature is normally what it called 'exclusive Solo' (or 'X-Or' type). This means that enabling *Solo* for a given source disables all other *Solo* buttons.
- It is possible to use what is called 'Solo latching', ganging multiple sources for *Solo* output. Hold down the Ctrl key and click additional *Solo* buttons to add or remove their respective audio contributions from the latched *Solo* group.

AUDITIONING AN AUDIO SOURCE

It can be very useful to be able to preview one or more audio sources, doing so *without* allowing the test sound to be audible on *Program* output. Typically, this need arises in connection with testing microphones or other audio sources that will be used in the production.

To audition an audio source in this manner:

1. First *Mute* the source, removing it from primary outputs.
2. Then enable *Solo* to hear it on the *Headphones* output.

SECTION 15.8 INTERNAL SOURCES

Besides external audio sources, sounds played from internal storage volumes (including removable media such as external hard drives or 'thumb' drives) via the *Media Players* (*DDRs*, etc.) can be added to the output mix.

15.8.1 MEDIA PLAYERS

Video and audio-only files in *DDR* playlists, along with audio files in the *Sounds* player, may contain one or more audio channels. At most, *Media Players* output the first four audio channels of multiple channels; additional embedded channels are ignored. Other options and controls in these sub-panels are similar to those provided for external audio sources.

15.8.2 EFFECTS (TRANSITIONS)

This control group governs the sound embedded in *Animation Store Transitions*. The remaining control groups in the *Audio Mixer* are dedicated to various audio outputs. We'll come back to them in Section 15.9, but before we do so, let's drill further down into more advanced audio options and tools.

SECTION 15.9 OUTPUT AND PRIMARY BUS CONTROLS

As has been discussed, the *Mixer* on most models support four primary audio busses – *MASTER* and *AUX 1-3*. Each of these is represented by its own control group in the *Audio Mixer* output section, and regulates sound sent to physical connectors or to 'logical outputs'.

Hint: Shift + double click Volume knobs to restore their default values (0dB).

Settings in all of the control groups in this section take effect downstream from all audio sources, further modulating and processing audio sent to outputs as the *AUX* and *MASTER* mixes, for recording, and for Internet streaming.

Secondary audio busses:

Beyond the primary busses mentioned here, the system maintains a large number of secondary internal busses.

For example, the *Solo* switch for each input (and output) is a 'send' that adds sound to a 'Solo bus'.

Likewise, the IsoCorder™ module (on supporting models) permits discrete recording from the unmodified audio input associated with any single video source; this constitutes up to eight additional audio busses.

15.9.1 HEADROOM NOTES

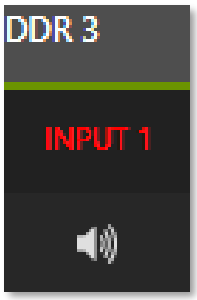


FIGURE 209

In digital audio systems, signal levels that exceed maximum values are uniformly assigned the maximum value, a condition known as "clipping". Clipping inevitably results in annoying audible issues.

Worse, over-modulation that may not be apparent while listening during live production may nonetheless appear in recorded files. This is often true even when levels *appear* to be below the ceiling level (0dBFS, the maximum allowable digital level).

Hint: When clipping has occurred, the label for the problem channel turns red briefly, as seen in Figure 209.

Due to this problem, digital audio system designs customarily allow substantial 'headroom' above the benchmark 'alignment level', making over-modulation much less likely. Often this allowance seems high to those familiar with analog audio systems; headroom levels between 18 and 24dB are not uncommon in professional digital audio realms.

Important Note: Front panel inputs on TC Mini (only) have lower headroom and will clip at -12 dB FS.

You can apply level control to suit your own preference in this regard, using the separate *Record* (and *Stream*) level controls discussed shortly. For example, levels set at -20dBFS in the *Record Configuration* panel approximate typical professional practice. This has no impact on levels at the system's audio outputs, and all but ensures clipping in recorded files will be avoided.

Advanced users can thus record files conforming to regional standards or personal preference, substantially reduce the possibility of audio clipping in recorded files, and even adjust the level on the fly if necessary.

The main point to remember from all of this is that for digital audio recording "less is often more". When it comes to levels, by all means go as high as necessary – but it's equally practical to go no higher than necessary.

Hint: The Audio Mixer also provides Compressor/Limiters for each input and output. These can also be invaluable in defeating clipping due to over-modulation.

15.9.2 STREAM

Level controls for the stereo audio that accompanies *Streaming* outputs are provided in the *Output Configuration* panel (see Section 8.2).

The controls for all inputs (including internal audio sources) as well as the *Effects*, *Stream*, *Aux* and *Master* output groups include a configuration button shown when you move the mouse over the input label.

The familiar 'gear' icon opens the advanced *Audio Configuration* panel. We touched on this panel briefly when we discussed selecting and configuring *Connections* for external audio inputs. The *Audio Configuration* panel (Figure 210) offers many more important features and controls, however. Let's explore these now.

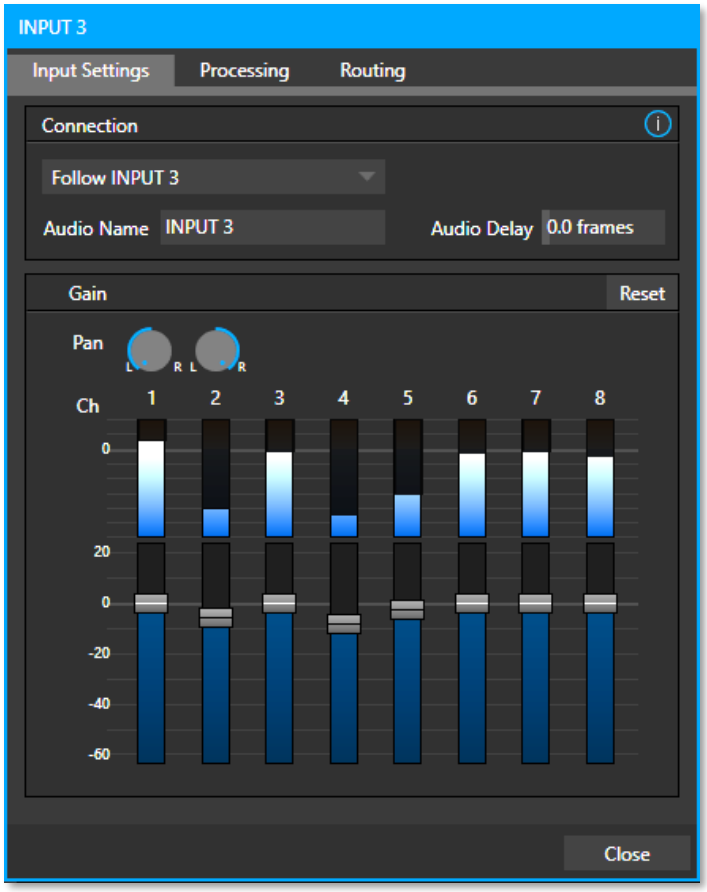


FIGURE 210

15.10.1 INPUT TAB

AUDIO DELAY

Audio and video arriving at inputs in sync will *maintain* sync throughout the system to output or recording. However, you should note that *upstream issues* can cause video to arrive at system later than the corresponding sound.

To mitigate this sort of external problem, the Audio Mixer provides an adjustable *Audio Delay* feature.

E.g., many cameras support simultaneous digital and analog audio output. In-camera processing can delay digital a/v output, resulting in analog audio output actually leading the digital output by a meaningful measure.

GAIN

On selected models, and usually for sources set to *Mic* input type, *Gain* knobs may appear in the *Input Settings* tab to allow you to compensate for microphone variances.

PAN

The *Audio Configuration* panel also provides *Pan* controls. *Pan* is a very useful feature; it adjusts *placement* of sound from source audio channels on the stereo channels comprising the audio mix(es). Using *Pan*, you can place all or part of *channel 1* onto *channel 2*, and vice versa.

- When *Pan* is set to the extreme left position for *channel 1*, its audio is sent exclusively to the first channel for the *Input 1* group.
- Centering the *Pan 1* knob splits the sound from *Input 1* equally onto *channels 1* and *2*.
- Sliding *Pan* for *channel 1* fully clockwise results in that source only being audible on *channel 2*.

Pan also modulates the sound levels on the left and right channels so that the overall volume neither rises nor drops as a result of adjustments.

Hint: "Pan" is not the same as "Balance". The balance control in a stereo system varies the relative level of the left and right channels, but sound from the left channel will never come out of the right speaker, or vice versa (Pan does permit this).

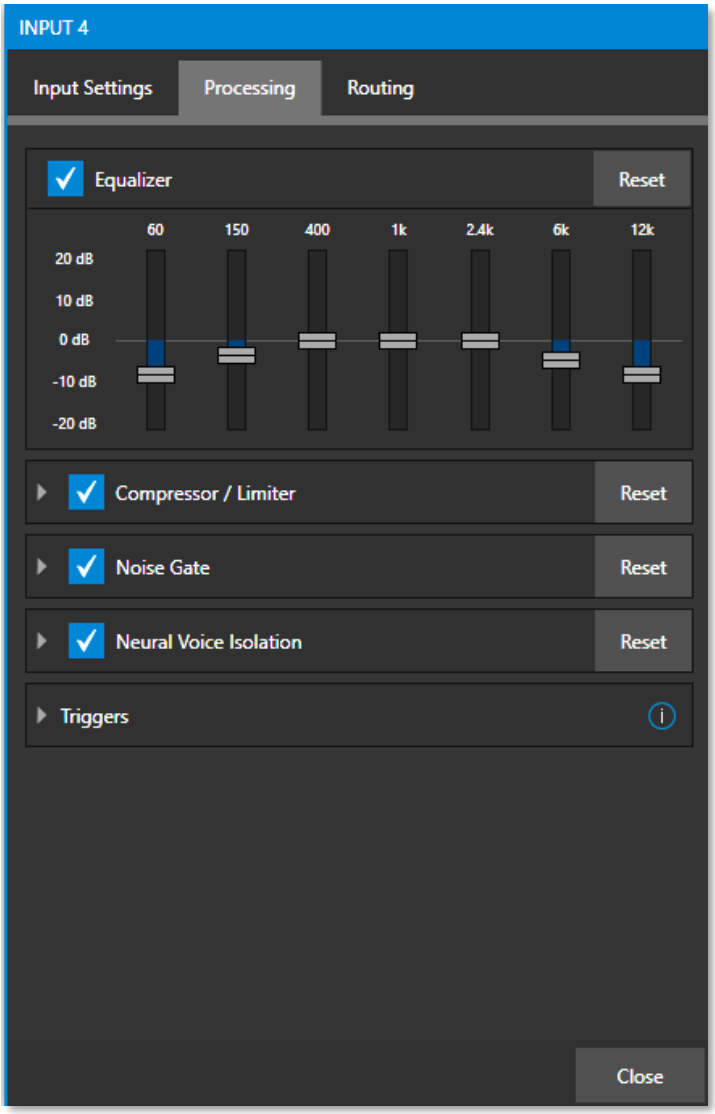


FIGURE 211

15.10.2 PROCESSING TAB

The second tab in *Audio Configuration* is named *Processing*, and likewise holds very valuable features.

EQUALIZER

The seven-band equalizer allows you to 'shape' sound to taste, accommodate sources with different acoustic characteristics (say, mismatched mics), minimize feedback or roll off unwanted parts of the audio spectrum. Enable or disable the *Equalizer* using the switch beside the label above its control group. The vertical sliders attenuate or boost the tonal range centered on the frequency shown at the top. The effect applied falls off gradually as sound draws closer to neighboring frequencies on either side. Click *Reset* to return all sliders to 0dB.

Hint: Naturally, reducing or increasing the level of one or more tonal bands affects the overall output level as well. This may call for you to trim the main level setting for the affected input or output.

Compressor Limiter

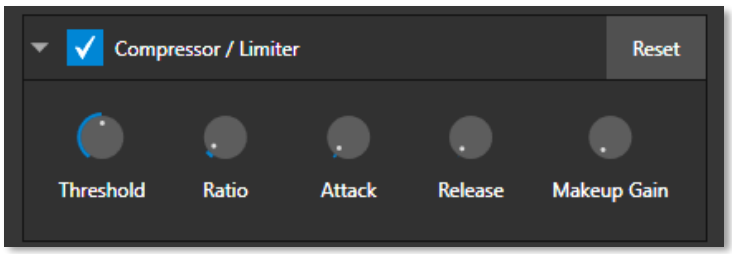


FIGURE 212

The *Compressor/Limiter* is capable of preventing clipping (see Section 15.9.1) from unexpected peaks or transients and making talent sound better than they do in real life, bringing voices, music and other audio sources into an optimal dynamic range. Being able to do this independently for each output too is icing on the cake, especially for Internet streaming, as it ensures correct levels at any time.

Compressor … Limiter – what's the difference, anyway?

Compression and limiting are not really different processes, but rather a matter of degree and perceived effect. Compression, ideally, takes the form of a subtle, almost imperceptible modulation of the sound level to bring it into a more pleasing and convenient range. A limiter is applied more for the purpose of managing, even 'crushing', unwanted spikes and transients.

That distinction aside, a limiter is essentially just a compressor set to a high ratio and, generally, a fast attack time. Audio engineers typically consider 'compression' with a ratio of 10:1 or more as 'limiting'.

Threshold

Sound above the set *Threshold* level will be compressed; the amount of compression and the manner in which it is applied are both dictated by the other settings.

Ratio

A *Ratio* of 4:1 means that if input level is 4 dB over the threshold, the output signal level after compression will be just 1 dB over the threshold. The gain (level) is reduced by 3dB. Very high ratio settings are the reason the word "limiter" is part of the title for this feature.

The highest ratio setting will effectively reduce any signal that would rise above the threshold all the way down to the threshold level (with the exception of a brief period during a sudden increase in source loudness, as dictated by the *Attack* setting).

Attack

Attack is also in milliseconds. The setting represents the amount of time it takes for the gain to change by a specified amount.

It would not be grossly incorrect to think of this setting as changing the slope of a graph depicting how aggressively the compressor pursues the target value (defined by applying the *Ratio* setting to the amount the signal surpasses the *Threshold*). Shorter values are more aggressive, while longer values are more subtle (and tend to be less noticeable to the audience).

Release

Release is like *Attack* in many ways but refers instead to the speed with which the compression effect is removed as a source signal falls back on its own so that it no longer exceeds the *Threshold*.

Gain

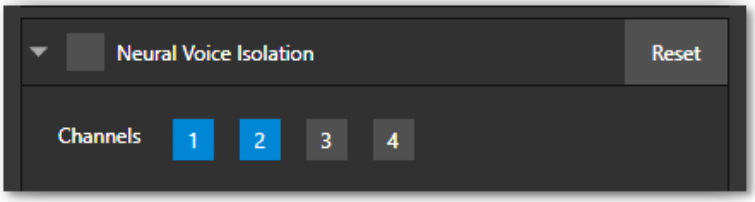
Naturally, compression impacts the overall output level of the source or output. The *Gain* control allows you to compensate, bringing the post-compressor/limiter signal back to a comfortable nominal range.

Hint: Different circumstances call for different Attack and Release strategies. For example, much less aggressive settings could work nicely for vocals, but fail badly when applied to a snare drum. Many websites provide suggestions on establishing the best compressor/limiter settings for different environments.

Noise Gate

The *Audio Mixer's* advanced options panel also includes a configurable *Noise Gate* for each audio source. This lets you ensure that unwanted low-level sounds are prevented from inadvertently intruding into the mix.

Neural Voice Isolation



To enable/disable noise reduction, check the Neural Voice Isolation box and select your channel(s). AI audio can be individually selected for each channel of an input.

FIGURE 213 (TC1 SHOWN)

Triggers

Several different per-input automation features are found in the *Processing* tab.

Follow Program Video

Enabling *Follow Program Video* options for an audio source directs it to track switcher operations affecting the related video source.

Audio for sources with *Follow Program video* enabled in the *Audio Configuration* panel is automatically removed from mixed outputs until one or more specified video sources are actually displayed on *Program Output*.

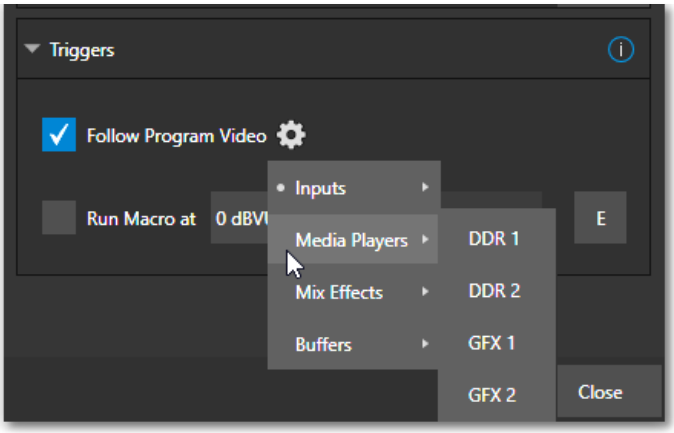


FIGURE 214 (TC1 SHOWN)

Hint: When the corresponding video source is not displayed on output, the audio source's VU meter level is displayed as a grayscale.

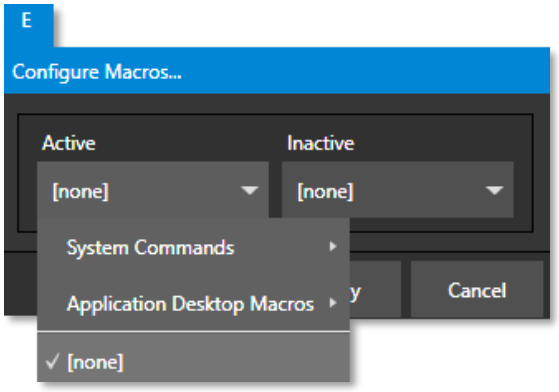


FIGURE 215 (TC1 SHOWN)

RUN MACRO AT

The nearby *Run Macro at* (value in dB VU) is part of the *Audio Mixer's* powerful automation toolset. Click the *E* (Event) button to assign macros to run when the sound level for the input passes the threshold audio level (transients such as a brief cough are filtered out).

In this manner you could, for example, automatically perform a 'hands-free' camera switch to show someone who begins speaking, and then automatically switch back again when he stops.

Note: Not included on some models.

15.10.3 ROUTING TAB

A main tab labeled *Routing* appears in the *Configuration* panel for all sources (Figure 216). The controls in this group determine output routing of the various channels supplied as inputs to the various output mix busses (*MASTER, AUX 1*, etc.) Let's discuss what an audio bus is and its uses before proceeding.

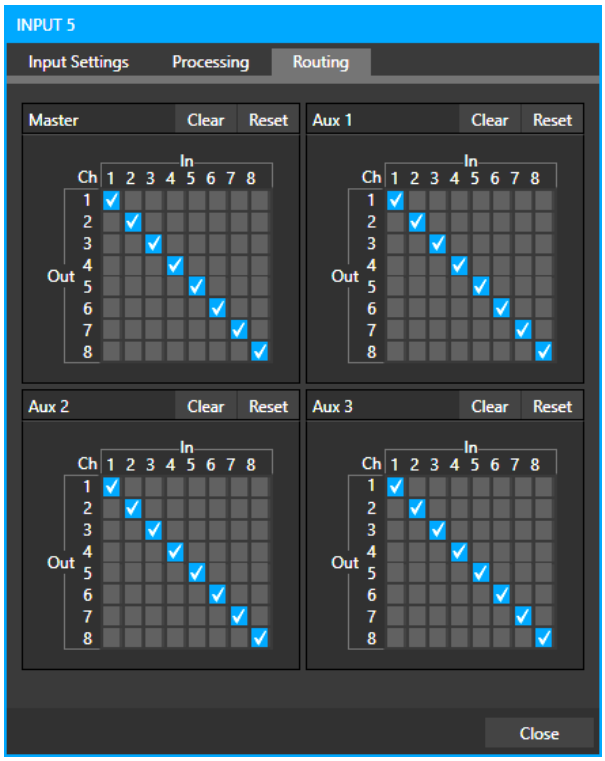


FIGURE 216

BUSSES AND OUTPUTS

Consider a very basic audio mixer. Its main audio signal path, from input to output, is properly called the 'master bus.' Sound supplied to one or more inputs is placed on this master bus (in the jargon of audio processing, this is called a 'send'), which ultimately flows to output connectors.

Slightly more advanced mixers often provide more than one 'send' for individual inputs. For example, the sound from all inputs may be sent to the master bus, comprising the 'master mix'. A different mix, sometimes called a 'sub-mix', might also be created by sending certain signals to a secondary ('auxiliary', or 'Aux') bus.

Hint: A secondary mix, prepared on an Aux bus, can serve many purposes. For example, you might wish to record a mix with all sound from talent microphones but that excludes any sound effects or music.

Let us summarize what we have learned so far: A 'send' pipes audio signals from an input to a discrete pathway called a 'bus'. Multiple sends can be used to place sound from a given source onto one or more internal busses.

What else should we know?

Each audio bus is discrete. Each can be directed along different output paths. And even when the blend of signals it carries is otherwise identical to another bus, it can be *processed* separately. Thus, its levels, equalization, and compressor/limiter settings can be unique.

The *Audio Mixer* provides four primary *audio busses.* These are identified in the *Audio Mixer* as:

- *MASTER*
- *AUX 1, 2 and 3*

The *Audio Mixer* provides controls for each of these busses, allowing you to manage levels and signal processing. It is important to understand the distinction between *busses* and *outputs*. Now that we understand the former, let's consider the latter.

An *output* may be physical, or virtual – i.e., it may involve a connector on the rear panel, or not. For example, audio recorded internally does not require an output connector. Likewise, it may initially be analog or digital.

Note: Analog outputs 1 and 2 are permanently assigned to MASTER and AUX 1, respectively. In contrast, digital (or 'embedded') outputs are configurable in the Output Configuration panel.

Sub-Mixes and 'Mix Minus'

At times you may require specially configured audio mixes. For instance – some installations call for sending audio from one or more internal sources (such as a *DDR* or the *Sounds* player) to a secondary distribution system. Alternatively, you may want a 'clean' output from one or more sources for use apart from the main primary output mix.

Specialized sub-mixes of this latter sort are often referred to as 'mix-minus,' since one or more sources are deliberately subtracted from the main program. Mix-minus capabilities can be invaluable for productions like 'phone-in' shows. The remote caller needs to be able to hear the interviewer; but if you simply send the primary mix back to him, he is forced to endure a late-arriving echo of his own voice. Needless to say, this would be confusing and undesirable.

Suppose your interviewer is speaking into a microphone connected to channel 1 of *Input 1*. The audio from your interviewee is routed into *Channel 2*. You could easily supply both to your *Master* bus for your program output needs, but remove channel 1 from *Aux 1*, and remove channel 2 from *Aux 2* to provide mix minuses to send back to the interviewee.

This approach eliminates annoying echoing, feedback and the like. Meanwhile, both participants can be heard on the main *Program* output. Also important, independent control and signal processing is provided for each part of the pipeline.

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MIX MINUS FOR EXTERNAL TALKSHOW® DEVICES

The *Routing* tab provides four 4x4 (TC1) matrix routing panels for each input, allowing for more sophisticated mixes than the example above. A single NDI output can thus provide all of the mix-minus needs for two Talkshow VS4000 systems.

Let's consider a simpler example – configuring unique mix minus audio for return to a single VS4000.

The example assumes that you have assigned *Switcher* inputs 13-16 to receive the four individual TalkShow sources. We will use video *MIX 2* to supply *Program* video for return to each TalkShow caller. And we will assign *AUX 1* as the *Audio* source for *MIX 2*, assigning a unique (mono) mix minus to each of its four channels to supply return audio for each caller.

- In the *Output Configuration* panel, assign *Aux 1* as the *Audio* source for *MIX 2*.
- In the *Audio Mixer*, open the audio configuration pane for *Input 13*.
- Access the *Routing* tab and click the *Clear* button above the *Aux 1* routing matrix.

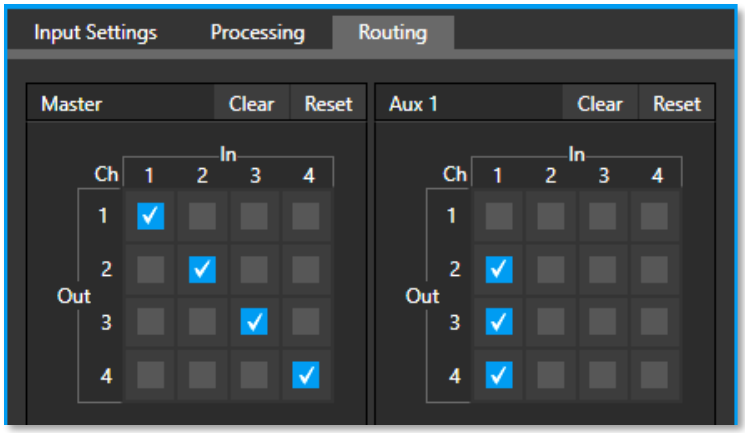

FIGURE 217

- Checkmark channels 2, 3 and 4 in the column below *In 1* (see Figure 217). This routes sound from the first incoming Skype caller to all *Aux 1* output channels *except* channel 1.
- Open the audio configuration pane *Input 14* and, in the *Routing* tab, clear the *Aux 1* matrix.

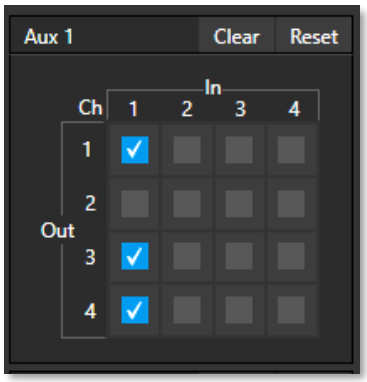

FIGURE 218

- This time, checkmark channels 1, 3 and 4 in the column below *In 1*. This routes sound from the second incoming Skype caller to all *Aux 1* output channels *except* channel 2.

- Repeat the steps above for audio inputs 15 and 16, omitting the *Aux 1* checkmarks under *In 1* for channels 3 and 4, respectively.

That's it – you've got the perfect mix minus configuration for return to your four Skype callers, using a single NDI output.

SECTION 15.11 SUPPLEMENTAL OUTPUT DEVICES

On specific TriCaster models and versions, two additional menus are provided at the bottom of the *Routing* tab, under the heading *Supplemental Output Device*.

The left-most menu in this group lists any add-on output devices detected by the system, and also a list of multichannel audio-only NDI outputs options.

For example, 'transmit' channels from Audinate's Dante network audio protocol will be listed here if you have installed Dante Virtual Sound Card software. Or, in similar fashion, you may have installed AES67 drivers.

The audio connections on the motherboard are also listed here.

Making a selection result in the sound from source being sent to the corresponding audio channels of the designated output.

Note: Advanced Audio I/O is also a feature in Premium Access, see A.8 Audio Mixer

Note: Apart from the AUX and Master mixes, routing or mixing is not applied to supplemental outputs. Each source channel is mapped to the corresponding output channel in 1:1 fashion, limited by the number of channels the output supports (e.g., a stereo output will always transmit channels 1 and 2 from the source).

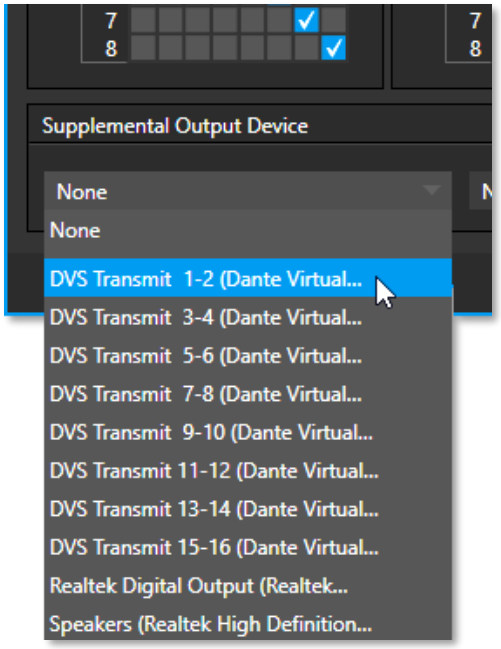

FIGURE 219

SECTION 15.12 MEMS

Roll the mouse to the left edge of the screen in the *Audio Mixer* to show its *MEM* bin. Audio *MEMs* work just like their counterparts in the *Media Players* (see Section 11.1.11). *MEMs* are a convenient way to quickly store and recall audio steps and settings for different venues, productions, and users.



Macros smooth out your workflow, reduce complex operations to a single button press, and make it easier to produce sophisticated programs. They provide many opportunities for both workflow streamlining and creative applications. (As well, macros can reduce or eliminate embarrassing operator errors.)

One of the hardest things about live switching is keeping up with the action. We're only human, limited as to how fast our fingers can move, recall and perform important sequential steps, and so on. Macros are the answer to that dilemma. Record any sequence of events as a macro and play it back with one click. Alternatively, trigger it with a keystroke, control panel operation, or *HotSpot*.

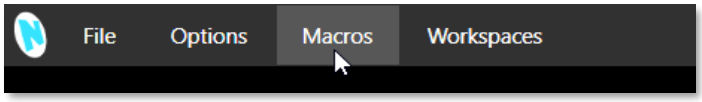

FIGURE 220

Macros can do almost anything; Preload and play content, modify audio settings, automate complex switcher sequences, or perform synchronous operations. The compelling usefulness of macros justifies the prominent *Macros* menu placement in the *Dashboard* at the top of the *Live Desktop*.

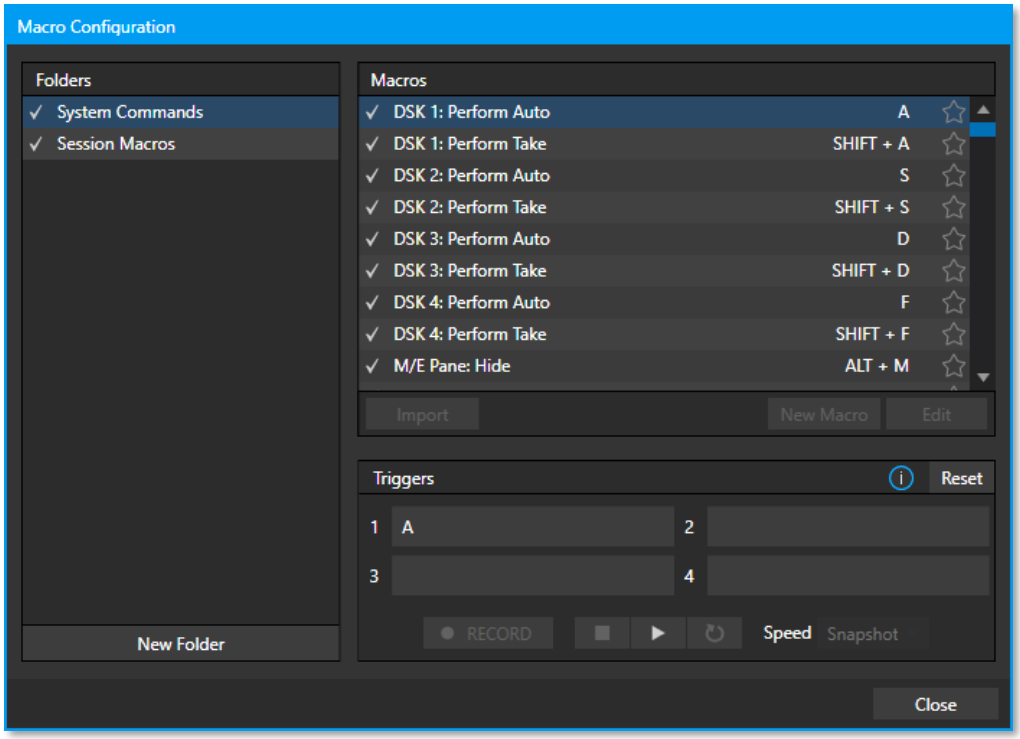

FIGURE 221

Click *Macros* to show a menu containing a *Configure Macros* item. This opens a large panel that allows to you create, organize, and even edit macros.

SECTION 16.1 CREATING MACROS

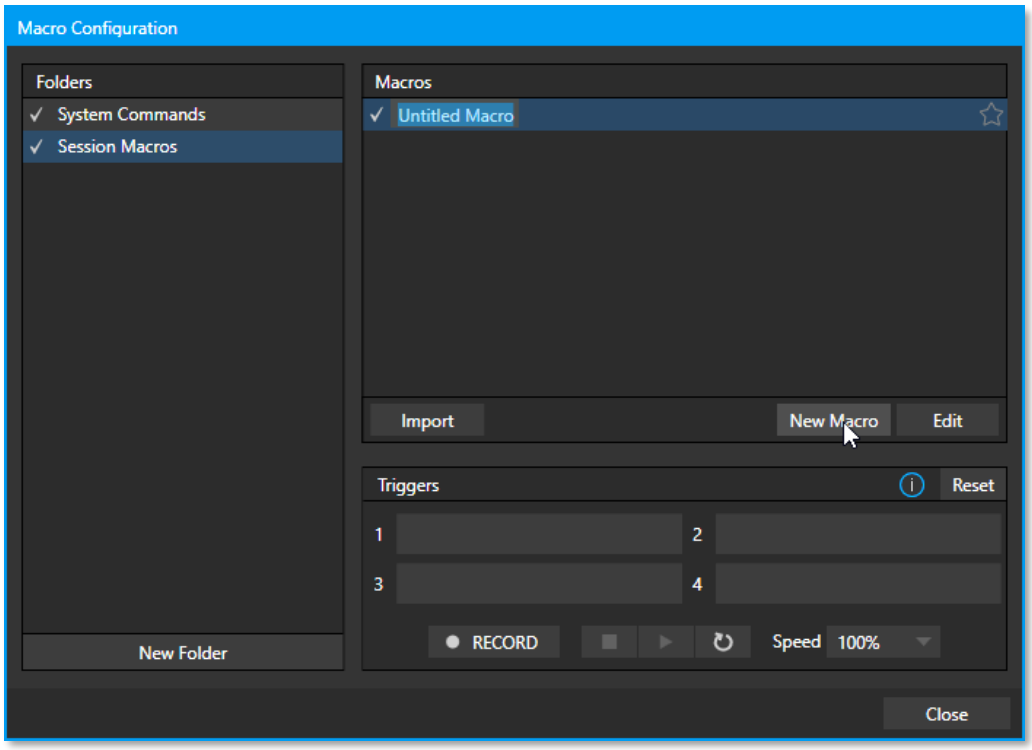

FIGURE 222

Creating a new macro is simple. Select a folder in the *Folders* column at left to contain the new entry (or add one, using the *New Folder* button below), then click the *New Macro* button below the *Macros Bin* at right.

Continue to define the macro by clicking the *Record* button at the bottom of the panel, and then just go ahead and perform the sequence of operations you wish to include in the macro. You can use mouse, keyboard, and *Control Panel* operations when doing so.

When finished, click the *Stop* button to complete recording. Test the new macro by clicking the *Play* button. You'll notice that an animated bar in the background of the macro entry in the list tracks playback progress. Of course, you can modify the playback rate using the menu next to the *Record* button. You can even set macros to loop using the button at extreme right.

16.1.1 SPEED AND SNAPSHOT MODE

The Speed menu lets you modify the playback rate of your macro. One option in the *Speed* menu bears explanation: When you choose *Snapshot* as the macro's speed, you essentially force it to jump to its end result as fast as the system can get there. *Snapshot* mode is very useful for macros that configure the system to a particular state.

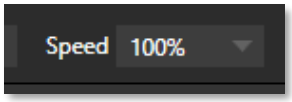

FIGURE 223

One example would be when you want to instantly reconfigure *M/Es* with different virtual sets for a scene change; or perhaps you want to quickly disable *LiveMatte* for all *Media Players* at once. The possibilities are endless.

Hint: You can record a macro that includes other macros. Depending on your order of operations, you may need to re-highlight the newly recorded macro in the list to show its Stop control (to end macro recording).

16.1.2 TRIGGERS

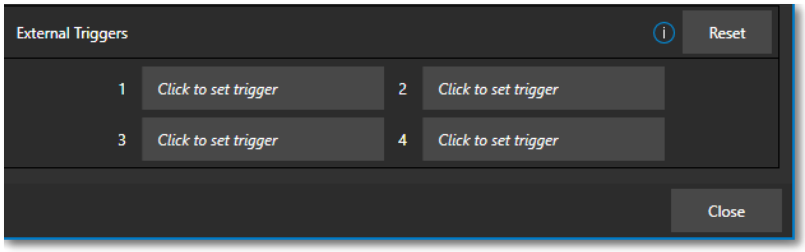

FIGURE 224

The Triggers controls located near the bottom of the Macro Configuration panel allow you to configure one or more ways to launch macros. For example, select a macro, click in one of the Trigger boxes, and then press a suitable keyboard shortcut to assign it to that macro.

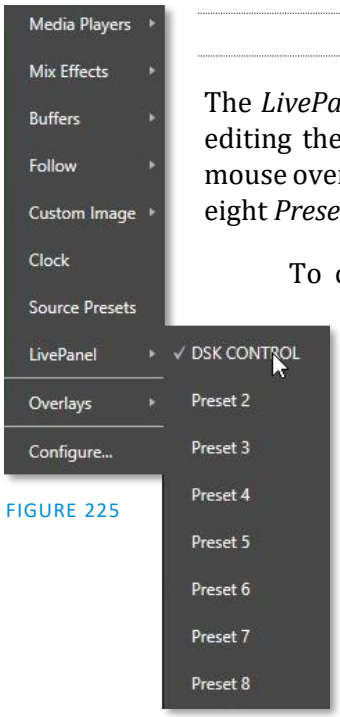

FIGURE 225

16.1.3 LIVEPANEL BUTTONS

The *LivePanel Buttons* add the convenience of not only presetting macros, but the ease of editing them as well, all without ever leaving the user interface. Simply right click your mouse over any viewport to display the context menu, hover your mouse over *LivePanel* and eight *Preset* options will appear as shown in Figure 225.

To configure the buttons, right-mouse click over the viewport showing the preset buttons (Figure 226) and select *Configure* from the context menu. In the *Configure LivePanel Buttons* panel you can edit the size of the buttons, styling properties, the color of the buttons and/or text, and more (Figure 227).



FIGURE 226

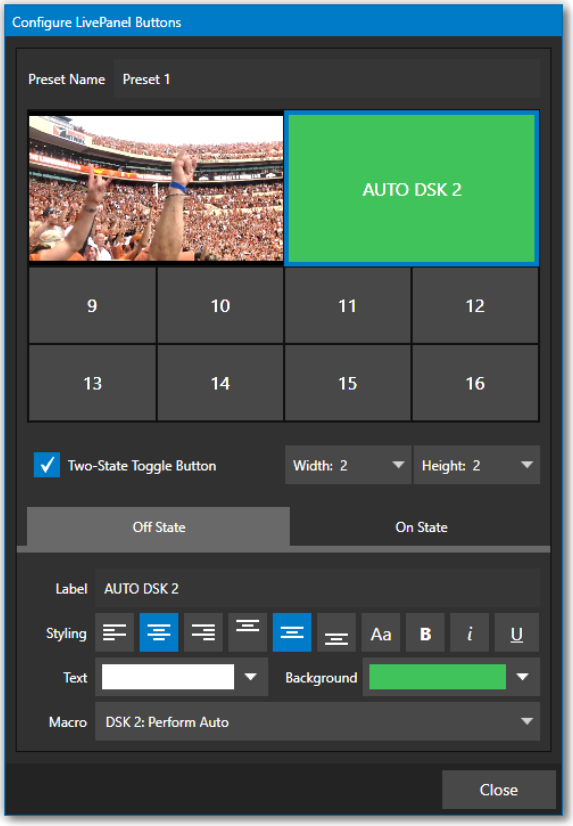

FIGURE 227

In the *Configure LivePanel Buttons* panel you can select the *Width* and *Height* of your buttons, (changing the size will 'absorb' other buttons, but they will not lose their properties). There is a *Two-State Toggle Button* checkbox to give you the ability toggle on/off your macro with just a push of a button.

Just below the Two-State Button field, is the *Label* section and *Styling* options. Not only do you have many background color choices, but also an option to *Choose Image,* which can be helpful to remind yourself of what is on your viewport. In the Macro field, you have the option of using *System Commands* or *Application Desktop Macros* from the pull down menu.

SECTION 16.2 MANAGING MACROS

The *Macro Configuration* panel has management features such as folders, rename, clone, and hotkey assignment, as well as *Import* and *Export* (use these to copy macros to other units, and for backup).

Hint: Premium Access membership unlocks additional and very useful import/export file format options for macros, including JSON, Excel (.XLSX), and even a working Javascript (.js) example.

16.2.1 SESSION MACROS

It's easy to keep macros designed for use with a specific production organized and accessible, thanks to the *Session Macros* folder in the *Macro Configuration* panel. Macros in this group are exposed within that session only (or new ones based on it, if the operator uses template sessions).

Note: Please refer to the accompanying Automation and Integration Guide for full details, including a discussion of the integrated Macro Editor.

SECTION 16.3 AUTOMATION

We have discussed automation features elsewhere in this Guide, notably in Sections 8.1.4, 11.1.1. Please refer to the accompanying *Automation and Integration Guide* for additional discussion of these powerful features.

Chapter 17 STREAM/ENCODE



Live webcasting has dramatically altered the broadcast landscape. Information can now be shared among audiences around the world with very small transmission costs. The live streaming market provides many creative and profitable opportunities. When it comes to taking advantage of this new medium, your NewTek live production system places you in the forefront of all the excitement.

SECTION 17.1 INTRODUCTION

Encoding for a/v streaming and other purposes involves a wide variety of attributes. At times, too, account login details are required for your streaming service or CDN (Content Delivery Network). Further, you may maintain multiple streaming service accounts for different purposes, as well. In addition, you may capture encoded video files for other purposes.

TC's *Streaming Configuration* panel supports the creation and configuration of all of the information and settings you are likely to need in this context.

SECTION 17.2 CONFIGURATION

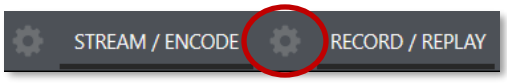

FIGURE 228

To open the *Streaming Configuration* panel (shown in Figure 229), click the *Configure* button (gear) at right of the *Dashboard*'s large *STREAM/ENCODE* button.

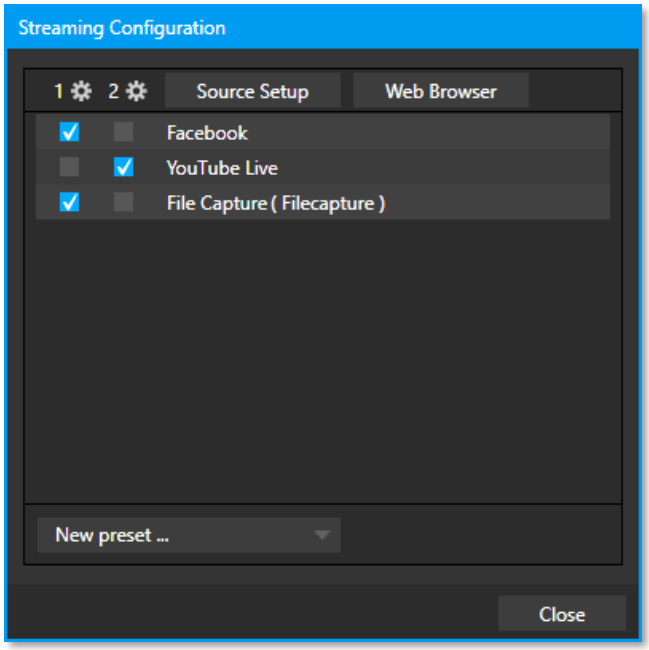

FIGURE 229

17.2.1 SOURCE SETUP



FIGURE 230

To assign video and audio sources to either of the two streaming encoders, click the *SOURCE SETUP* button in the header of the *Streaming Configuration* panel (Figure 230). Doing so opens the *Output Configuration* dialog, where you can continue to choose audio and video sources and adjust audio volume as shown in Figure 231.

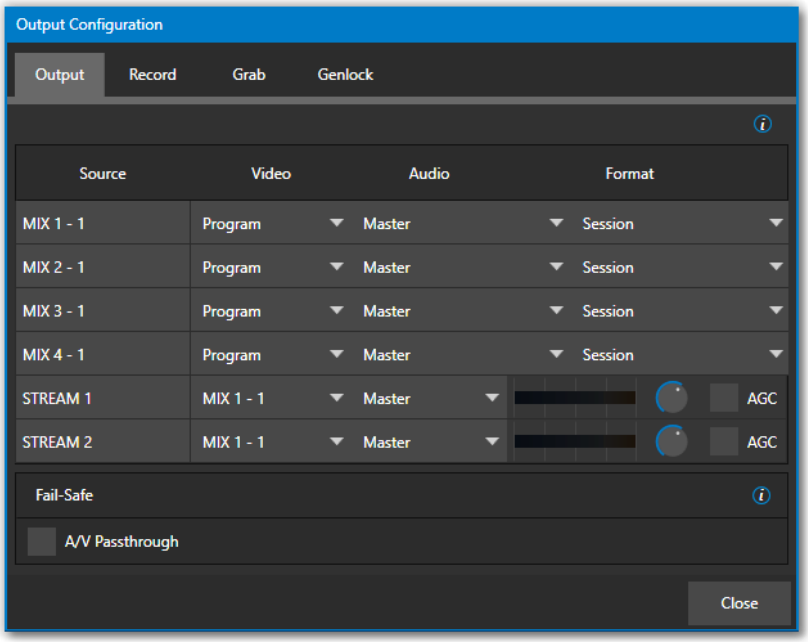

FIGURE 231

17.2.2 THE WEB BROWSER

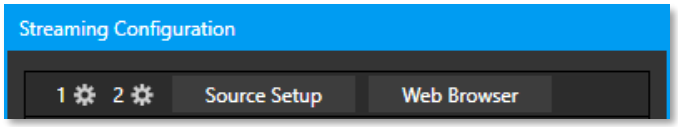

FIGURE 232

The *Web Browser* button in the header of the *Streaming Configuration* panel does what you would expect, opening a web browser. For convenience when working with web streams or your content delivery network account. We do not recommend general purpose web surfing during live operations.

Hint: If the web browser is hidden from view because a Live Desktop operation took precedence, you can re-use this button to bring the browser window to the front again.

17.2.3 CONFIGURING ENCODERS

Settings for the two encoders are configured in the *Configure Encoder* dialog (Figure 234). Open this dialog by clicking the configuration (gear) icon for either encoder at left in the header of the *Streaming Configuration* panel.

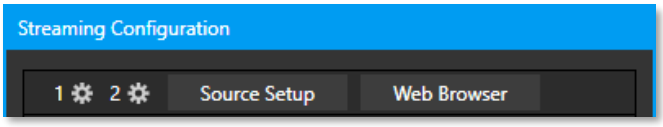

FIGURE 233

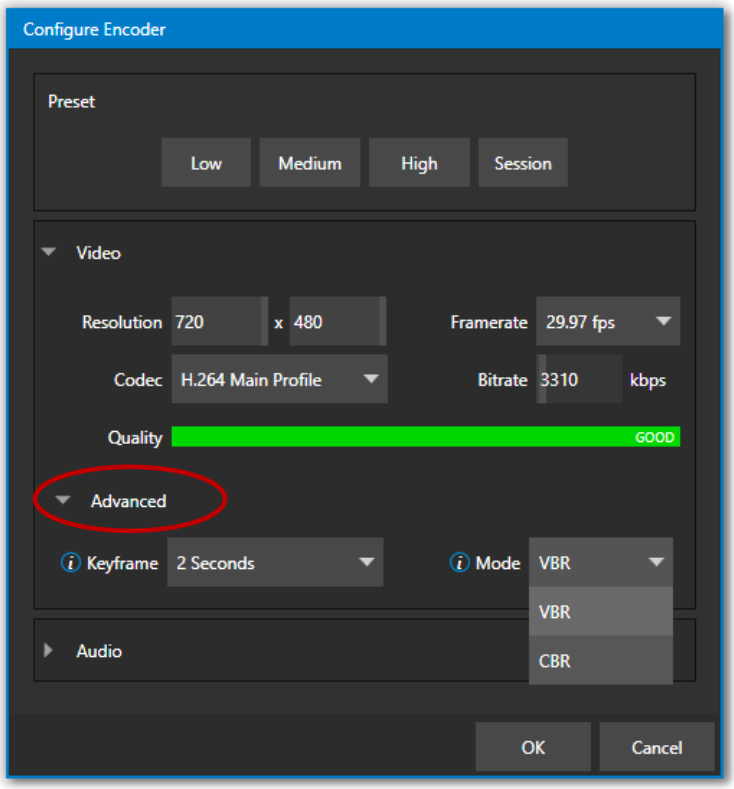

FIGURE 234

Select an encoder *Preset* (such as *Medium* or *High*), or manually configure custom settings using controls in the *Video* and *Audio* control groups below. The *Codec* menu in this panel allows you to select from a number of H.264 profiles as well as HEVC.

Under the twirl-down *Advanced* menu you will see two options for *Keyframe* and *Mode*. *Keyframe* provides an encoder keyframe rate in (1 to 5) seconds and to the right an *Encoder Mode* option offers (constrained) variable bitrate (VBR) and constant bitrate (CBR).

Hint: With constant bit rate vs variable bit rate video, CBR is best for live streaming encoding, and VBR is best for on-demand videos.

If you choose to enable a preset whose target requires different encoder settings, TriCaster will identify potential conflicts and a yellow 'bang' will appear as shown in Figure 235. Hoovering over the bang opens a pop up that will provide recommended encoder settings.

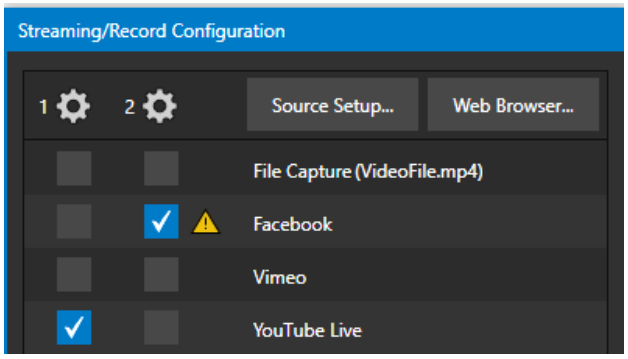

FIGURE 235

The information for a given CDN or other encoder target is also retained in a *preset* (e.g., Facebook, YouTube Live, etc.) New presets are added to the *Streaming Configuration* panel using the *New Preset menu* at left in the footer of the panel.

Hint: A default File Capture preset allows you to capture output from either encoder to a file.

On the left in this panel are two columns of checkboxes; these allow you to send the output from either *Encoder 1* or *2* to the presets at right.

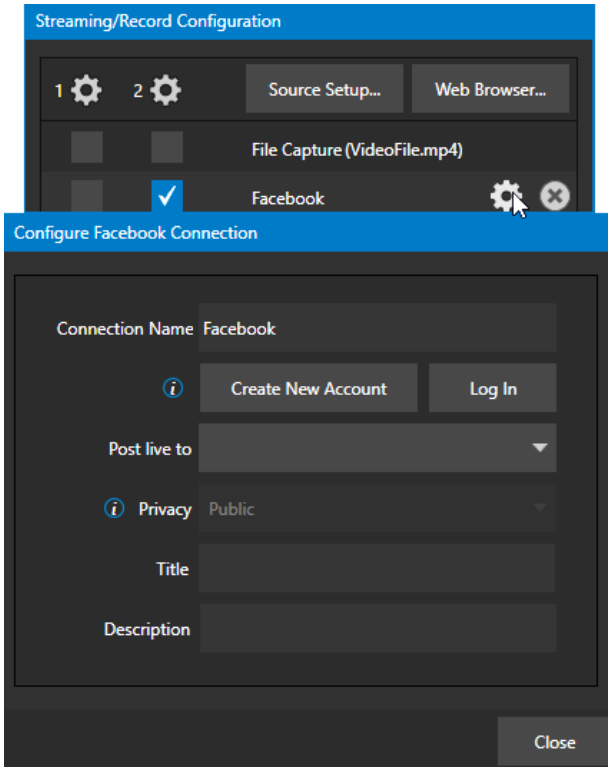

FIGURE 236

If you move the mouse pointer over a *Preset,* two new gadgets are shown at right (Figure 236). Click the familiar *Configure* gear to open a suitable dialog. It may invite you to enter your account credentials for a site and *Sign In* or provide suitable controls for other relevant settings that are required. Or, for a *File Capture* preset, you can choose the path for encoded file output.

Not surprisingly, clicking the little (x) gadget instead will delete the *Preset*.

Note: A yellow triangle 'bang' is shown next to a preset if a preset whose target requires (or prefers) different encoder settings. If you hoover over the 'bang' a message will alert you if the configuration of an encoder assigned is non-standard and will recommend an encoder setting.

17.3.1 CUSTOM PRESETS

In addition to the many recognizable names listed in the *New Preset* menu, you will observe a menu item labeled *Custom*. The dialog this selection opens allows you to enter the details typically required by generic streaming services.

In some cases, a CDN (Content Delivery Network) service may provide you with an XML file containing the recommended configuration settings related to your streaming account. (The *Import Settings* button in the Custom Connection dialog can be used to load this file, supplying the necessary values for streaming via the service automatically.)

SECTION 17.4 INITIATING THE STREAM

When you are ready, initiate streaming to the *Preset* targets you have check-marked in the *Streaming Configuration* panel by clicking the *STREAM/ENCODE* button in the *Dashboard* at the top of the *Live Desktop* panel. (The button will display elapsed time during streaming/encoding.)

SECTION 17.5 CAPTURING THE STREAM

To archive a live stream file as it is created by an encoder, simply configure and checkmark a *File Capture* preset for that encoder.

SECTION 17.6 STREAMING STRATEGIES

One of the best approaches when beginning (to stream your productions) is to establish a relationship with a commercial streaming media provider. A good provider can guide you past firewalls, provide public addresses for everyone to view your stream, and provide no end of valuable guidance.

And it may not be as expensive as you think (costs vary based on considerations such as how many viewers you expect, how much web bandwidth you use each month, and so-on). Some services based on an advertising model will even host your stream free.

17.6.1 ON DEMAND OR LIVE STREAMING?

Not all 'streaming' is 'live streaming.' The difference is similar to i) watching a television program you previously recorded at a time convenient for you, or ii) watching a live event.

On demand streams are stored on a server (often supplied by an external service provider), ready to be transmitted whenever a viewer wishes. Live streams are available at the time they are broadcast, such as during a live concert or event.

ON DEMAND HOSTING

The *Record* module permits you to capture your productions to a local hard drive. The resulting files can be hosted on a network later, so viewers can connect whenever they like. If you have the resources available, you can host the video yourself – but if many people will likely want to view your production, you will likely avail yourself of a service to stream it on your behalf.

Ideally, 'on demand' streaming video begins to play on request after a few moments. (Letting the stream get a bit ahead of the client playback device is called 'buffering' and helps ensure smooth playback). This stands in contrast to other types of online video distribution which requires the viewer to completely download the video file before he can begin play. Given a sufficiently high speed connection between host and viewer, they may well be able to enjoy a seamless viewing experience without stuttering or other issues.

LIVE STREAMING

Live streaming is a growing international market, and one you may well wish to serve. This form of streaming is a somewhat more demanding implementation. Rather than record a file and deal with it later, live video is transmitted over the network (effectively in real-time, give or take a little 'time in the pipe' as it were.)

Delivering a good quality stream requires that you consider both your network connection capabilities and that of your viewers. Also, to ensure reliable delivery, you will ideally have some idea of the size of your audience.

Naturally, streaming video is highly compressed to reduce bandwidth demands and make it available to a wider group. The decision as to which encoding format to use for your live stream is up to you or – in some cases – your client. Here are some things to consider:

- Some corporate and institutional network administrators opt to support one or another format exclusively. (Check with your IT department to find out if this affects your decision).

- *RTMP and RTSP* combined have a very wide installed user base, and work well across multiple platforms (PCs, Macs, Linux, etc.).

- SRT is an open source protocol that is managed by the SRT Alliance. It can be used to send media over unpredictable networks, like the Internet. More information about SRT can be found here - https://www.srtalliance.org.

RTSP STREAM DECODING

The processing demands from high-quality video applications and devices have increased in the last few years. As video content continues ever-expanding, technology evolves to handle the demand. Beginning with TriCaster version 7-4 dated January 2021 and later, TriCaster will take advantage of GPU hardware acceleration for all stream decoding.

Unfortunately, some streams are simply incompatible with the GPU decoder. We recommend that the originating stream vendors look to solve the compatibility and take advantage of modern GPU decoding. We also understand that users of TriCaster may not have that option and must wait for vendor development cycles.

As a workaround, if a stream is found to be incompatible, you can append the URL with a command that instructs TriCaster to not use hardware acceleration.

(optional components are enclosed in square brackets)
rtsp://\[username\[:password\]@\]ip_address\[:rtsp_port\]/server_URL\[?param1=val1\[&param2=val2\]...\[&hw_accel=false\]\]

For example, the original URL of:
rtsp:// stream_IP_address.com:554/myStreamserver

Would change to:
rtsp://stream_IP_address.com:554/myStreamserver?**hw_accel=false**

Bandwidth Considerations

You'll often hear the term 'bitrate' in connection with streaming. This expression refers to data throughput per second (generally measured in Kilobits per second, or Kbps.) You could think of this as being like water flowing through a hose. You control the 'faucet', because you get to choose the *streaming Profile* setting in the system's *Configuration* panels. However, you don't own the 'hose' – or, at least, not the *entire* hose.

Once the stream leaves your immediate environment, even if you can supply good throughput locally, bandwidth may be constricted elsewhere along the transmission path. The level of Internet traffic can impose limits, but another major factor is the sort of connections your viewing audience may have.

Consider an example scenario: Even though you know that most of your audience is going to connect to your program using (relatively slow) wireless devices, you use a very high outgoing bitrate – thinking that this will surely be enough to fill the need. The fact is, though, a high bitrate actually ensures their experience will be poor.

The client player tries to play at the specified bitrate, but (in this example) the wireless bottleneck impedes flow. It is as if you connected a fire hose on your end, giving them a suitable high capacity nozzle for their end – but in the last stage of flow, the stream must pass through a small garden hose. Sadly, the stream will be quite insufficient, and output from the 'nozzle' (the client player) will falter badly.

For reliable performance, try to ensure the potential upload bandwidth from your system to the net is around twice the bitrate you choose. You *can* broadcast at a rate closer to your actual ceiling, but reliable performance cherishes headroom.

Also consider the expected download abilities of your viewers. Ideally, a safety margin 1.5 times the stream's bitrate is desirable. This may mean you need to consider using a lower resolution, or lower framerate for your stream – but doing so when required will generally deliver a smooth result and is the wise course. (Nothing inclines viewers to turn away quicker than a stuttering, start and stop stream. See "Speed Tests" in Section 17.8.1 for some useful resources.)

17.6.2 STREAMING MEDIA PROVIDERS

Using a commercial streaming media provider (sometimes referred to as a Content Delivery Network, or simply 'CDN') bypasses otherwise high-bandwidth requirements for the encoding computer. When you have made arrangements for a streaming media provider to distribute your stream, the encoder only needs enough bandwidth to get a single a/v stream to the provider. All end users connect to the *provider* to view the stream.

Most streaming providers have access to massive bandwidth (and often, with very little notice, they can scale up your allotment to meet a temporary need.) Since your local bandwidth is really only used for uploading a single stream, you can send a high quality stream, secure in the knowledge that it will not degrade as soon as a second viewer attempts to see it.

Hint: A helpful way to find a good streaming service provider is to ask other members for recommendations in NewTek's online discussion forums.

SECTION 17.7 PRODUCTION AND CAPTURE CONSIDERATIONS

If you're not intent on live streaming, but wish to capture a live switching session, you would likely record at full resolution using the *Record* button (rather than *Stream*). The high quality captured files can then be used later in a *DDR*, or perhaps be transferred to another computer (even on a different platform) for external processing or editing.

> *Hint: an external hard drive to transfer the files between systems, or simply transfer them across a local network.*

You can always convert these files to a streaming file format if you later decide you'd like to supply them for 'on demand' Internet viewing. This lets you retain best quality right through to final output. When you eventually encode for streaming, you can choose settings that best suit the intended audience and streaming environment.

At the very least, if (perhaps to save conversion time) you capture video for web distribution, it's best to capture it at least at the size that you intend for final output. This helps ensure satisfactory video quality for your viewers. When video is compressed (as it invariably is for web viewing) you can lose important detail; compressing a full-screen video down to a quarter or a sixteenth of its size is a lesson in humility!

OTHER FACTORS

Other variables to keep in mind when you're creating video for the web are contrast and motion. During video encoding for web distribution, a fair amount of video information and detail can be lost. For this reason, good lighting of your source video is essential.

Also, web streaming doesn't handle detail, transitions and motion all that well -- so your best shots should be close up, and without a lot of movement. Too, audio from cameras and camcorders is rarely as good as that from external microphones. You should at least use a clip-on lavaliere microphone, if not a directional or shotgun microphone to be sure you record only the audio you really want. Finally, for high quality streaming, consider using a 720p session, even when your cameras may be SD and interlaced (there is no particular benefit to working in SD when your goal is a smaller streaming output.

SECTION 17.8 DIAGNOSTICS AND TROUBLESHOOTING

As technologies go, video streaming is still in its adolescent phase, at best. There are a lot of different standards and diverse environments to consider. You have the necessary tools, but there are still some teething problems you may encounter. This section will point you in the right direction to overcome them.

17.8.1 TESTING YOUR STREAM

When it comes to using your system in a professional live production environment (i.e., your bread and butter depends on getting it right, and now - not tomorrow), failure to test beforehand is not merely unwise - it can be professional suicide.

You should already be aware of the need for redundancy in a professional environment (you didn't bring just one camera, did you?) As reliable as any device may be, Murphy's Law has not been repealed … so you plan for this, bringing the appropriate equipment, such as uninterruptable power supplies, backup recording

devices (there's no shame in having a VCR backing up your digital record – 'low tech' still has a place in the grand scheme.)

But you also need to perform onsite testing, to ensure your live stream is working well before 'zero hour.' No-one will thank you for excuses, no matter how brilliantly they point the finger at forces beyond your control.

1. Set up and enable a test stream.

2. You can use the integrated web browser to scrutinize the stream, but you should probably confirm using an external system, too.

Success at this point does not necessarily mean you're done. You may be able to see the stream locally, but can someone outside the local environment connect to it over the Internet? The best way to find out is to have someone at a remote location verify that your stream is streaming properly. If it is, great! Otherwise, keep reading…

TESTING WITH PING

Before your stream can be seen - whether on a local intranet or the Internet - client computers (or your service provider) need to be able to establish a network connection with your local system and it's encoder.

Ping is a humble but effective tool to ensure the basic connection exists, thus it can help you with streaming, *iVGA* and *LiveText* connection issues, too (and it works just fine in a multi-platform environment!)

Ping sends a small set of data packets to the target host (IP number), then 'listens' for an echo response in return. Ping estimates the round-trip time in milliseconds, records any data losses, and displays a summary when finished.

Bottom line, if you can't 'ping' your target, your connection has problems (the problem might be as simple as a bad cable connection). To issue a ping, you need know the IP number of the target computer.

Finding the target IP number
For Windows XP®

1. Select *Run* from the Windows® *Start Menu* (look in the *Settings* sub-menu if it is not listed at the top level).

2. Type "cmd" (without the quotation marks) into the dialog, and press *Enter* on the keyboard.

3. In the command shell that opens, type "ipconfig" (without the quotation marks) and press Enter again.

4. The *IP Address* for the *system* will be reported in the window, along with other data.

For Windows Vista® (or later)

1. Type "run" (without the quotation marks) into the *Search* field, then press *Enter* on the keyboard.

2. Type “cmd” (without the quotation marks) into the dialog, and press *Enter* on the keyboard.

3. In the command shell that opens, type “ipconfig” (without the quotation marks) and press *Enter* again.

4. The *IP Address* for the system will be reported in the window (listed next to “IPv4 Address”), along with other data.

To find the IP Address for a system running OS X®

1. Click the Apple icon on the upper left on the Desktop and select About *This Mac.*

2. Click *More info …* in the panel which opens.

3. Click *Network* in the *Contents* column at left.

4. The IP number for the system will be listed in the right hand pane.

Issuing a Ping

Ping is a command line program and must be run from a command shell on the issuing computer. To open a command shell and send a ping, follow the procedure below that applies.

Windows®

1. Repeat the steps you performed above to re-open a command shell.

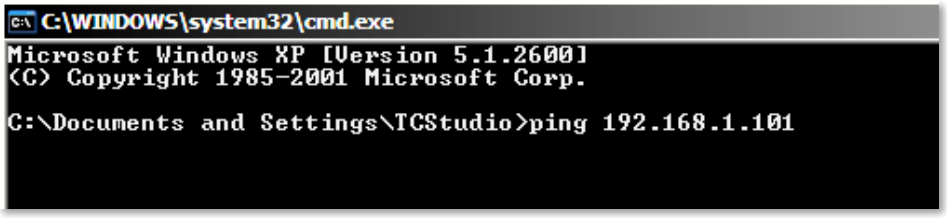

FIGURE 237

2. Type “ping” (without quotes) followed by a space and the target IP number, as in the image below – then press Enter.

3. Ping will go to work, and in a moment or two begin reporting results. A ping failure (indicating a network problem) will look like Figure 238. A success ping will display a report like Figure 239.

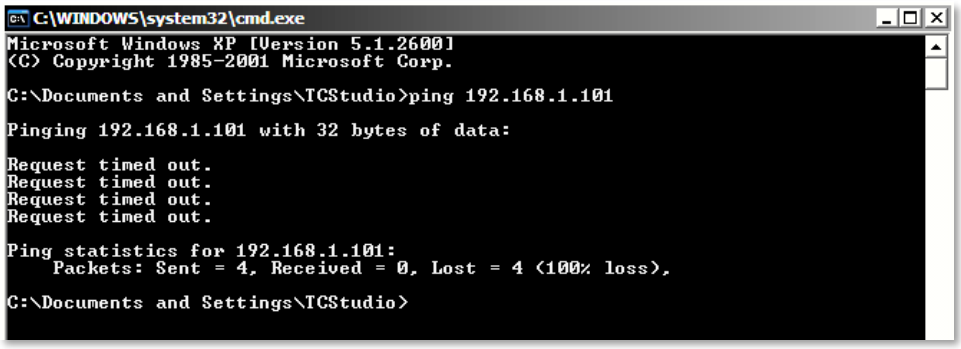

FIGURE 238

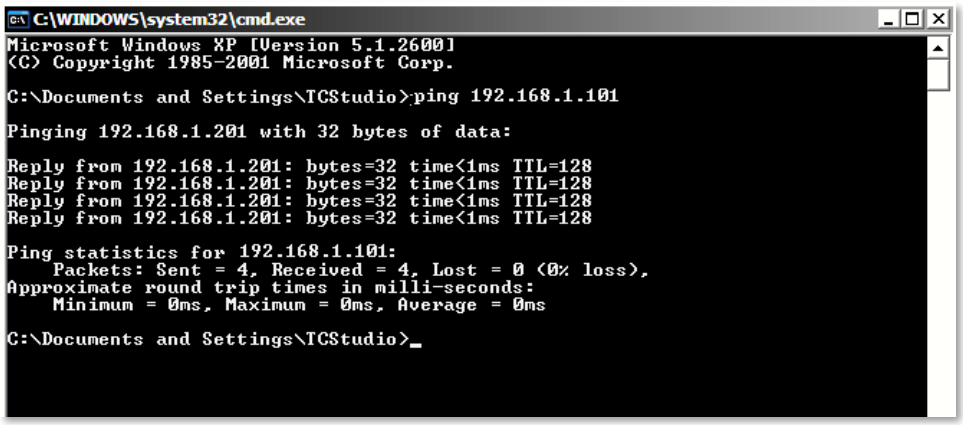

FIGURE 239

Apple OS X®

For a system running Apple's OS X®:

1. Double-click Terminal in the Applications\Utilities folder.

2. Type the following command into the Terminal (without quotations) and then add the IP number, and press *Enter*:

"ping –c 4 *ipnumber.*"

(So, for example, you might type: ping –c 4 192.168.1.101)

The response will be similar to the Windows® example described above. Again, a ping failure indicates a problem with the network connection.

17.8.2 SPEED TESTS

Are you sure your upload bandwidth is adequate to the bitrate you've set for your stream? Why not test and make sure. Again, a number of websites provide free speed testing. These will give you a basic idea of what your local bandwidth really is. One site which provides a list of online speed test resources is: http://www.dslreports.com/speedtest?more=1

17.8.3 WHERE IS THE PROBLEM?

With regard to streaming issues, don't overlook the fact that your NewTek live production system is just one of the pieces of the puzzle. There are many others that are just as important. One useful thing to try is to check the streaming file. Archive the streaming output file locally, and then examine it to see if it has any problems. This file corresponds exactly to what the encoder is sending the downstream server. In cases of sync problems, low frame-rate problems, audio popping problems, etc., if it's an encoding issue, the problem will be seen in this file. On the other hand (if the file looks good), then the issue has to be after the encoder (perhaps a network problem or CDN configuration mismatch).

Chapter 18 EXPORT



The Export feature allows broadcasters to publish clips and stills from events like syndicated sports, entertainment, or news programming to social media sites even while the live action and capture continues. Networks, corporate users and others with sophisticated website and distribution needs can deliver content moments after events occur for all manner of timely applications.

SECTION 18.1 OVERVIEW

In today's broadcasting world, a single program feed is often inadequate, inappropriate, or both. More and more viewers ingest media from multiple sources, even simultaneously. A live (and lively) online presence is critical for many productions with little or no traditional broadcast following. Publishing supplemental content such as backstage feeds, locker room interviews, pre and post-game chatter, etc.), via such popular Internet sites as Facebook®, YouTube®, Twitter®, etc. provide many opportunities for brand extension and monetization. In addition, the *Export* feature supports both transcoding and distribution to local or networked storage for archival or post production purposes.

Briefly, once you create presets for your social media accounts and other publishing targets, the *Export* tools in the *Live Desktop* make it quick and easy to distribute selected content to multiple sites even while production and recording is still underway – just perfect for concerts, galas and sport events.

SECTION 18.2 EXPORT MENU

The *Export* feature's user interface conforms in large measure to *Stream*, which we just discussed. Click the *Configure* gear next to the large *Export* button in the *Dashboard* at the top of the screen to open the menu (Figure 240).

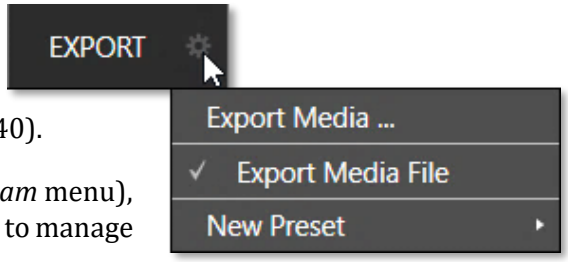

FIGURE 240

At the top (where you would see *Web Browser* listed in the *Stream* menu), is an *Export Media* item. This opens the panel which allows you to manage media files you intend to export. We'll discuss this panel soon.

18.2.1 PRESET LIST

Below the *Export Media* menu item is a list of any presets you have configured as *Export* targets. (Before you actually create any presets for yourself, this list shows only the default *Export Media File* entry, a transcoding preset which cannot be deleted.)

Notice that each preset listed in the menu can be checked or un-checked. When you add media files to the *Export Bin* (by any method), the check-marked entries determine which *Export* targets are *automatically* assigned to them (you can also manually modify the presets for each item in the *Bin* at any time).

Hint: When the mouse pointer is over a preset in the Export menu, two gadgets are shown at right; the familiar gear allows you to modify the preset, and the (x) will remove it from the list.

18.2.2 NEW PRESET

Let's consider the *New Preset* menu item. Click this to display a sub-menu listing various supported *Export* targets (such as Twitter®, or Facebook®). Select an item here to open a dialog that lets you create a custom preset that will then appear in the list discussed just above.

For most external sites (i.e., social media sites or ftp sites), the dialog requires you to enter account credentials. Typically, you will need a *user name* and password for your social media accounts, as well as FTP servers (credentials are tested when you press *OK*, and will report an error if a problem exists).

18.2.3 SOCIAL MEDIA SITES

Export can publish media to Facebook, Twitter, YouTube, and many more sites and services. Other connections may be supported as it becomes possible to do so.

18.2.4 TRANSCODE, SMTP, AND FTP

The *Transcode, FTP* and *SMTP* options let you handle various file conversions and publishing to local (or networked) storage volumes, or even as email. These are very useful output alternatives, effectively providing live export methods that do not force you to wait until production ends. This can be invaluable for collaboration, whether local or remote.

Transcode exports provide options to re-encode video in different formats before sharing. Select suitable options for your target device or application. For SMTP, replace the dummy email server entries with those of your own mail service.

18.2.5 WATERMARKING

To avoid unauthorized of use private or copyrighted media, you may want to add a watermark before exporting it to public sites. The *Watermark* feature in the footer of the various *Export* preset configuration panels allows you to select a suitable overlay image.

The image you select will be composited onto exported video or still image files. It should normally be a 32bit still image file (supported formats include popular formats such as PNG and Targa) that positions the watermark correctly in the frame taking into account the resolution and aspect of exported files.

SECTION 18.3 EXPORT MEDIA

Having discussed configuration of export accounts, let's move on to look at live operations. In the Dashboard's *File* menu, select the *Export Media* item to open this panel (Figure 241), which allows you to manage the list of clips and still images you wish to export.

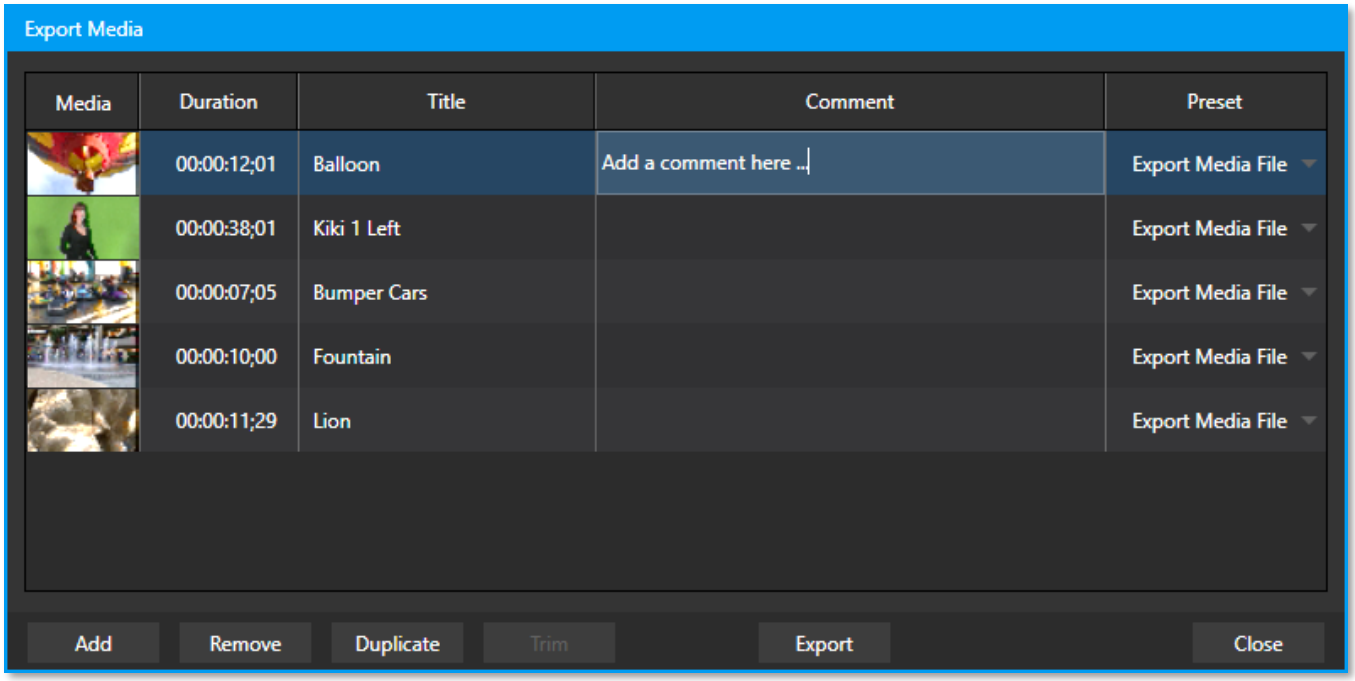

FIGURE 241

The features of the *Export Media bin* are powerful, but not hard to grasp. Click the *Add* button in the footer to open a *Media Browser,* which you can then use to select (and multi-select) content you wish to export. You can choose items from your current session or another location. These files will be added to the bin, but they will not be exported at this point.

Hint: You can Add and even Upload files that you are currently recording, even before pressing Stop. These files will be found in the virtual Session Recordings folder the Media Browser shows for the session.

18.3.1 METADATA

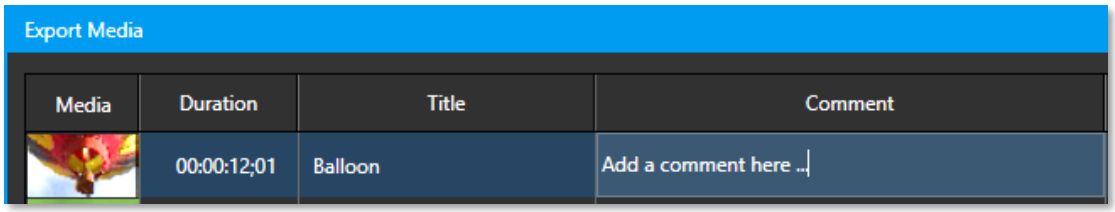

FIGURE 242

Information is displayed for each media file added, including the file name (or 'alias', in the case of files added from a *Media Player* playlist, as we will discuss later), *Duration*, and *Preset* (depending on settings, multiple entries pointed at different destinations may be added in one operation).

The *Comment* column allows you to add remarks that will be sent along with the upload to sites that support this. Click in this column to enable keyboard entry or navigate to it and simply start typing. Press *Enter* or click elsewhere to end editing. Similarly, type in the *Title* column entry to change the title supplied for the file to social media accounts but note that this has no effect on *FTP* or *Transcode* preset operations.

18.3.2 PRESETS

The *Preset* column provides a menu allowing you to change the export preset or even add multiple targets for each individual item in the bin. A checkmark beside a preset indicates the target is active.

Of course, *Preset* selections can vary from one item in the *Bin* to the next. Obviously, if no checkmarks appear here, the entry on that row is not fully configured, and will be ignored by the *Export* processor.

18.3.3 LIST MANAGEMENT

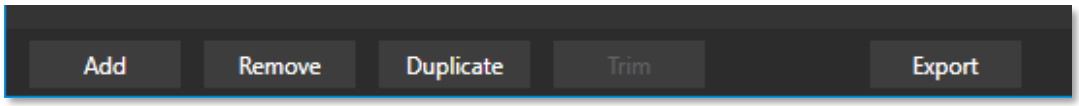

FIGURE 243

We touched on the *Add* button in the previous section. Three other nearby features help you manage your *Bin* entries.

- *Remove*, as you'd expect, deletes entries from the *Bin*, doing so without any effect on the source files.
- *Duplicate* clones selected entries. You may prefer this way of publishing an item to multiple targets (over adding multiple checkmarks to the *Preset* column for a single entry) at times.



FIGURE 244

For example, the encoding settings for one target may involve longer processing than you want to allow at the moment. Using a duplicate entry, you can defer processing that entry until a more convenient opportunity.

- Click the *Trim* button in the footer to open a trimmer pane (Figure 244) that allows you to set the *In* and *Out Points* for clips you plan to share (some file formats do not support trimming).

  Clips that are added while still being captured can be re-trimmed to take advantage of file 'growth'.

Hint: Checkmark the Still Frame switch to select a frame and convert it to a JPEG image file on upload.

18.3.4 THE EXPORT BUTTON



FIGURE 245

Also located in the footer of the *Export Bin*, the *Export button* is a toggle; that is, like the light switch in your foyer, it has two states – on and off.

When lit, the *Export processor* is activated, and is either watching for qualified entries *Bin* entries to appear for exporting, or actively processing those that are 'ready to go'. (Conversely, of course, no light, no go …)

Note: The footer Export button is linked to the larger Dashboard Export button, which does the exact same thing.

18.3.5 OTHER 'ADD TO' METHODS

Let's handle the final details you need to become a social media maestro. It seems obvious that manually managing the minutiae of exporting could intrude into the already hectic life of a switcher operator. Live production already demands a lot of attention.

Using *Add* in the *Export Bin* panel, entering comments, etc., would be quite a distraction. For this reason, Export makes it as simple as possible to share your media, as follows

Once you have configured your *Export* presets, check-marked one or more in the *Export* menu, and decided whether to add checks to *Stills*, *Clips*, or both in the *Auto Queue* menu, you have eliminated a good deal of the fuss. But we can do better yet – in two ways:

- You can flexibly add both stills and clips to the *Export Bin* with a single click, keystroke or button press. You can also add items from the playlist of a *Media Player*, or directly from the *Grab* and *Record* features (see the heading File Operations in 11.1.1).

- Second, you can even automate the matter of adding custom titles and comments. *Grab, Record* as well as the *Media Players* all support individual custom *Names* and *Comments*, which will supply the corresponding metadata for your *Export Media* additions.

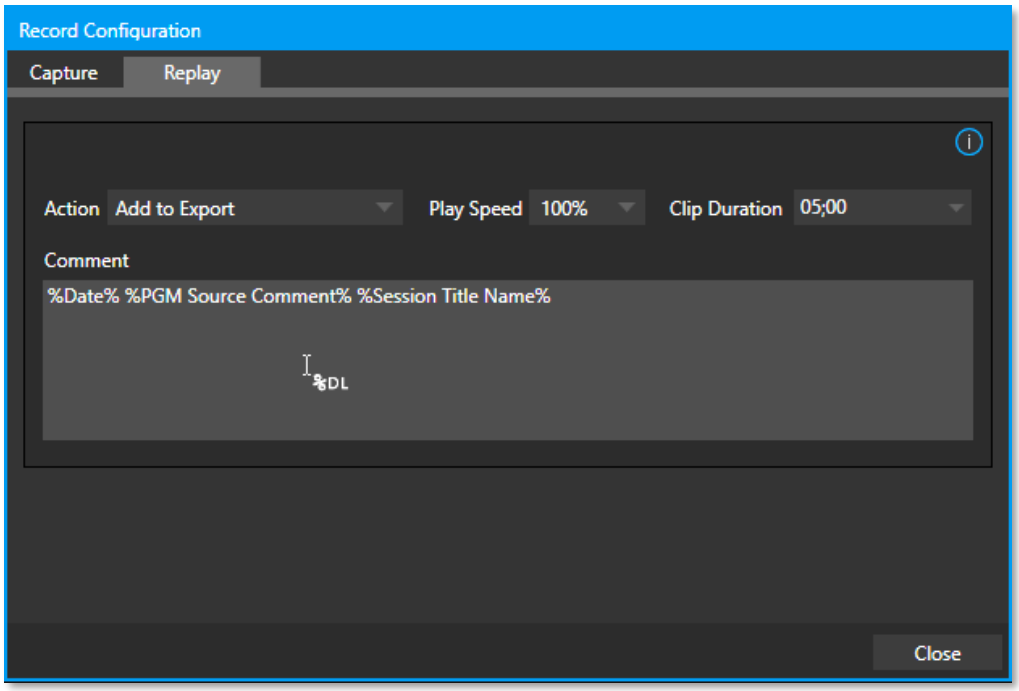

FIGURE 246

Better still, the *Name* and *Comment* fields in *Grab* and *Record* support *DataLink* (compare Section 11.2.3). This lets you automatically supply unique and meaningful information to social media sites along with your *Export* uploads. You can even mix *DataLink* keys with literal text, to produce comments that embed things like the current time, the current score of a game, or the name of the person on camera at the moment into coherent sentences (Figure 246).



You will often want to capture video clips from external sources, as well as to record your own live productions. Similarly, it can be quite useful to be able to grab stills from Program output for use in the current production. This chapter will provide everything you need to know about this topic.

SECTION 19.1 RECORD

NewTek live production systems provide a great deal of flexibility when it comes to capturing your program, selected elements of it, and a wide array of internal and external sources (with embedded timecode).

NewTek's IsoCorder technology delivers powerful recording capabilities. (The number of sources you can capture at one time varies by model, software version, and of course also requires adequate storage media speed.)

As TriCaster's primary outputs are configurable, you can use them to capture *Program*, *Program (Clean),* individual *Switcher* sources, *M/Es*, and more.

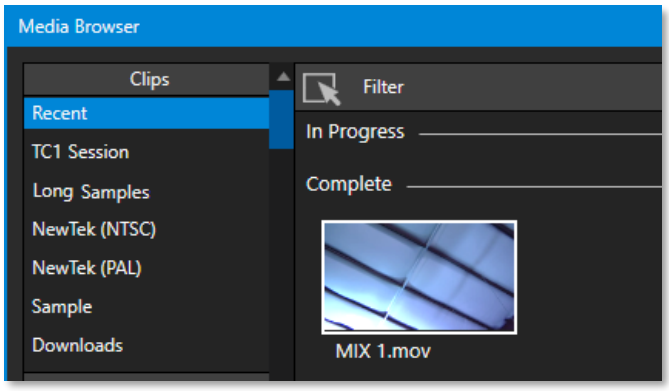

FIGURE 247

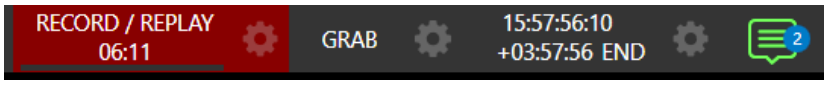

FIGURE 248

Recording is easily enabled and disabled by clicking the large *RECORD* button in the *Dashboard* (Figure 248). During capture, a nearby time counter tracks the length of clips recorded with the current base filename, and a horizontal VU meter beneath the button assures you that you are capturing audio.

Note: It is not necessary to interrupt recording to add a clip that is being captured to a DDR playlist or the Publish Bin. Clip icons show a red 'recording' indicator on clips currently being captured in playlists, the Publish Bin, and in the Media Browser.

19.1.1 RECORD CONFIGURATION

Of course, before you begin recording, you'll want to determine *what* to record, *where* to record it to, and so on. To support IsoCorder's flexible ability to capture almost anything, settings and controls for recording are provided in the individual *Input Configuration* panels as well as the *Output Configuration* pane. Click

the *Configure* button (gear) for the control panel of the source you wish to configure to access these settings.

Let's review the features and settings found in these control groups.

19.1.2 CAPTURE CONTROLS

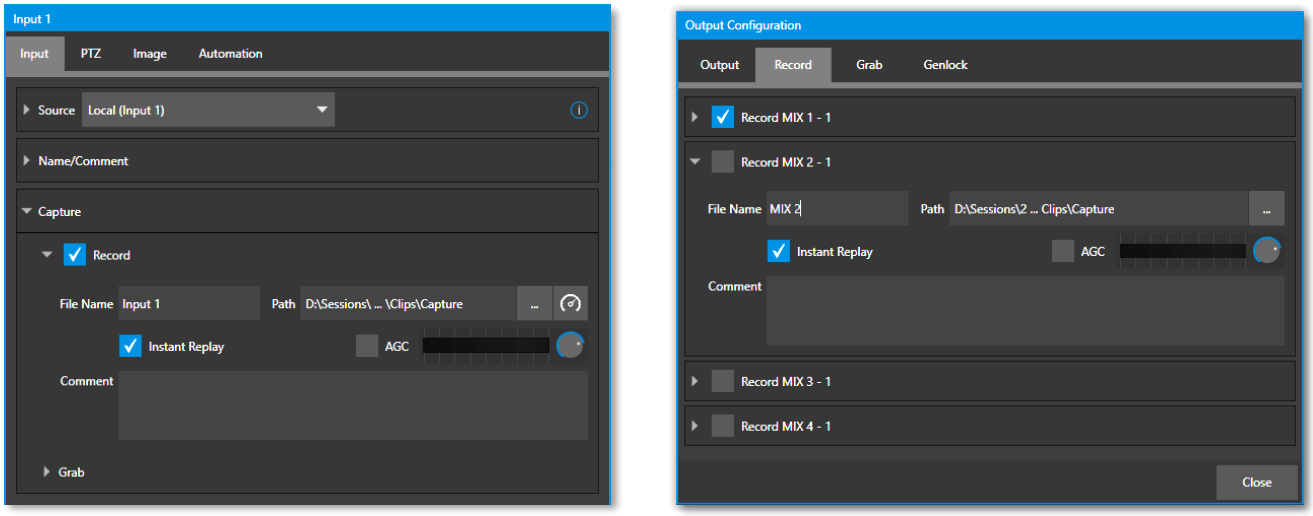

FIGURE 249

Whether you are setting up a recorder for a video input or output *Mix*, the *Capture* control group features are the same.

- A switch at the top is used to enable or disable the recorder
- Filename and path text boxes appear just below.
- A convenient *Drive Speed Test* button appears to the right of the *Path* field. Click it to open a utility that lets you evaluate the speed and capacity of your storage volumes.

Note: The same source cannot be selected for multiple recordings. For example: "IN 1" cannot be selected as the source for two recorders.

FILENAME AND COMMENT

IsoCorder uses the source name to supply the default filename for each recording (names are numerically incremented automatically as well), but these can be edited. Conveniently, NewTek's DataLink key system allows you to insert dynamic values from real-time production sources into the filename.

For example, every recorded or grabbed file can automatically incorporate a date stamp, identify the input selected on the *Program* row at the time of capture, and so on. This is useful not only in locating files from specific sources later, but also when posting media to social media services using the *Export* feature.

Note: IsoCorder captures a low resolution 'preview' file along with the high-quality recording. We do not recommend deleting or moving these supplemental files when using the recordings on a NewTek product, as doing so will result in higher resource usage during live production.



FIGURE 250

The *Comment* entry can likewise use *DataLink* values, and in turn can be used to provide metadata to title pages that refer to the captured clip's comment.

PATH

Click the three dots at right beside the *Path* field to select from available storage volumes as targets for the recording.

> *Caution: It is recommended that any single drive be tasked to capture one or two video sources at most. A warning message is displayed if you exceed this number when assigning Destination settings. You are allowed to exceed this limit, however, when you are confident that very fast volumes are capable of handling the load.*

AUDIO LEVEL

The *Audio* Level control lets you set the volume independently for each source you capture and feature a convenient AGC option (Automatic Gain Control).

FILE FORMAT

IsoCorder records a high-quality Quicktime file. (You can use the *Transcode* function in *Export* to supply files in a number of different formats, when necessary.)

> *Hint: Download free NewTek codec packs for Windows® and Apple® computer platforms from the Downloads page on NewTek's Support website. TriCaster's record format is also supported by the NDI file plugin for Adobe Premiere included with the free NDI Tools bundle.*

SECTION 19.2 REPLAY

Not too surprisingly, the *Replay* switch in each *Capture* control group enables instant replay features for individual recorders. Before considering how to actually perform a replay, let us examine the *Dashboard* menu *Replay* options, which affect its playback settings.

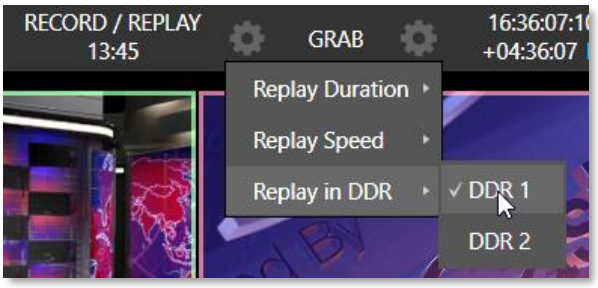

FIGURE 251

- *Replay Duration* – determines the length of replay clips added to the *DDRs*
- *Replay Speed* – set the playback speed for clips added to the *DDR* using the replay workflow
- *Replay in DDR* – select a DDR as the target for replay clip playback

19.2.1 INSTANT AND DEFERRED REPLAYS

The method of triggering a replay varies depending on whether your want to replay a clip captured from a *Mix* (output) or directly from a *Switcher* input.

19.2.2 SWITCHER SOURCE

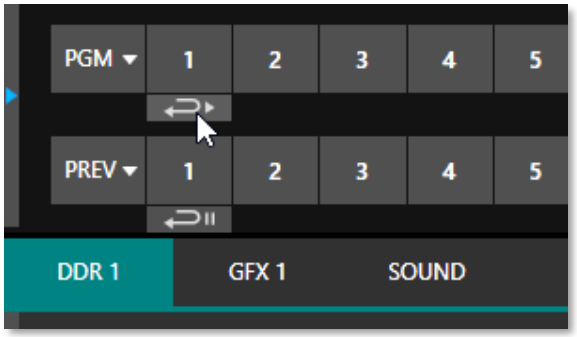

FIGURE 252

When the *Record* and *Replay* switches in the *Capture* control group for a *Switcher* source are both enabled, special replay controls are shown beneath its buttons on the *Program* and *Preview* rows of the *Switcher* (Figure 252).

Click the replay button beneath the *Program* row to trigger an instant replay using the DDR's *Show On* (PGM) feature and settings. (Or hold down CTRL and click the larger Switcher button itself to do the same thing.)

The similar button beneath the *Preview* row is even more useful; it adds the replay clip to the *DDR*, and leaves it selected, but does not play it on *Program Out* immediately. When you are ready to insert the replay clip into your program, press the keyboard *CTRL* key and the *Spacebar*. This will trigger the *Show On* (PGM) feature for the DDR currently assigned to replay duties. This workflow lets you defer replay playback until a more appropriate moment.

19.2.3 MIXED OUTPUT

Since outputs do not appear on the *Switcher* rows, the methods above do not apply. Instead, simply press a number pad key from 1-4 to trigger an instant replay from the corresponding output (Mix 1-4) recorder.

Hint: It is possible to assign an NDI output from the system to one of its own inputs if you prefer to use the same method as described earlier for your output replays.

SECTION 19.3 GRAB

At times, all you really want to capture is a still image from the current *Program Output* video stream (or perhaps, an input). This is the purpose of the *Grab* function.

Grab is represented by a large button in the *Dashboard* at the top of the screen, and smaller grab (camera) icons which appear at upper-right on *Switcher* source viewports. The former grabs stills from MIX outputs (when enabled individually), while the latter grabs an image from specific *Switcher* sources.

THE GRAB MENU

Click the *Configure* button (gear) next to *Grab* in the *Dashboard* at the top of the *Live Desktop* to choose a target *Media Player* for grabs. Otherwise, input and output grab configuration options are very similar to those described above for recording.

Note: De-Interlacing is automatically applied to avoid a 'comb' effect caused by inter-frame motion in fielded sessions.



Your TriCaster ships with a huge number of stylish title template pages that can be edited even while live, as discussed in Section 11.2 Editing Title Pages. Many include replaceable images imbedded in them. This chapter explains how you can create your own custom title pages.

Of course, you can create static titles and graphics in Adobe Photoshop® or other popular graphics and paint applications, and display these as images in (for example) a *DSK*.

However, you will often find it useful to create, instead, an *editable* title page in Photoshop that, once loaded and compiled by TriCaster as a native CGXML file, works just like those supplied with your NewTek system. The text remains editable, and embedded images can be marked replaceable too.

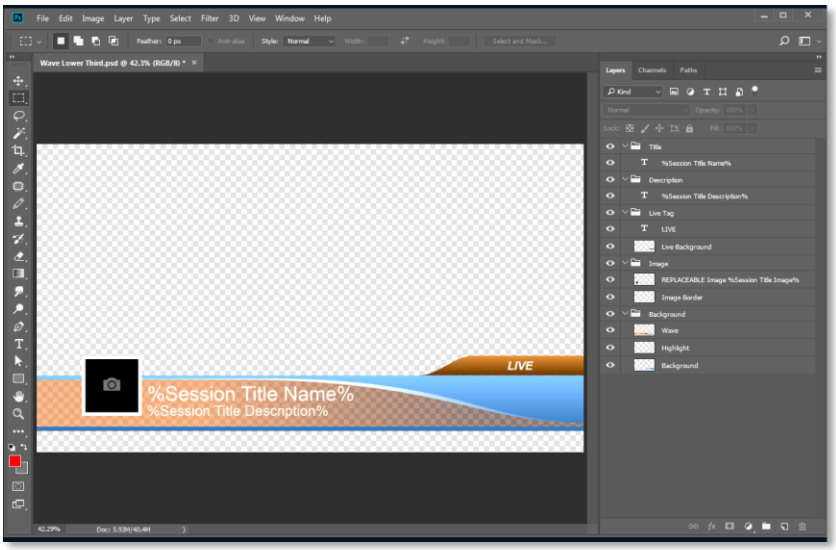

FIGURE 253

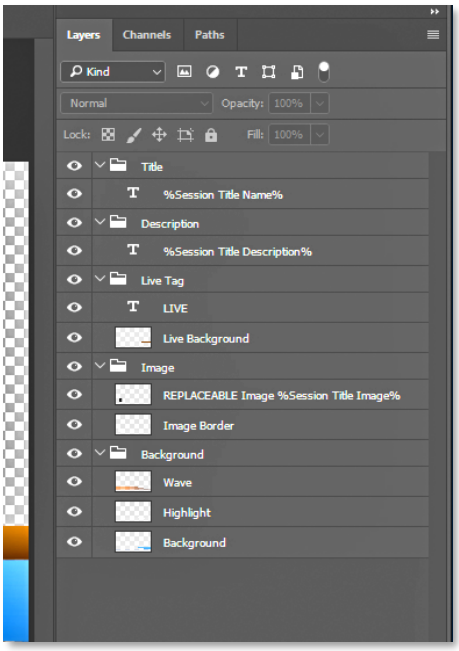

FIGURE 254

To make an image replaceable, simply add the string "REPLACEABLE" to the layer's label in Photoshop. You can even assign a *DataLink* key to the layer in the same fashion – naming the layer in the format "REPLACEABLE %twitterpic%", for example (without the quotation marks, of course).

As mentioned above, when you load the PSD into a *Media Player*, then open it in the *Title Editor*, the text is editable, and placeholder images can be replaced. And it gets even better if you load the file into a *Buffer*.

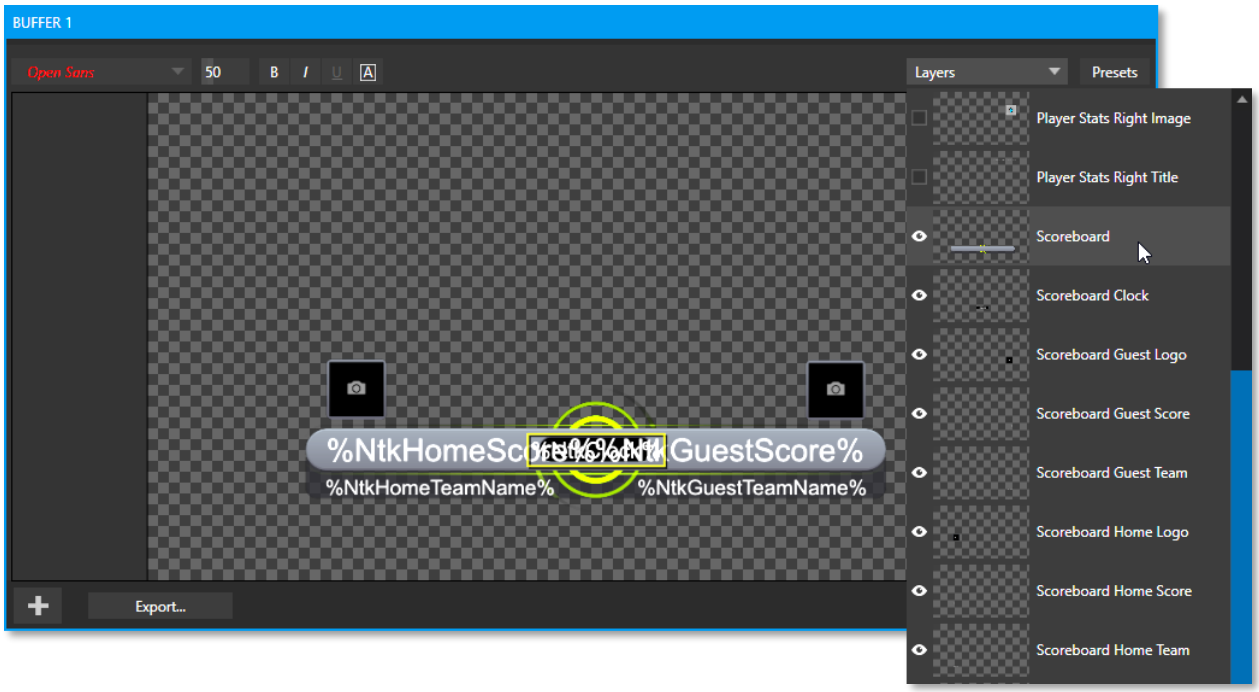

FIGURE 255

In that case, the *Title Editor* will show both *Layer* and *Data* presets, just like when you load a *LiveGraphic* title page, and store the result in a preset. Having done this, you can selectively hide or display different layers (or layer groups) of your Photoshop composition with a click or tap using the *Buffer* preset system.

In this manner (using *Layer presets*), a single title page can be used to display a whole theme pack of CG elements, and likewise (using *Data Presets*) a single title page can be updated to show individual player statistics for a whole team, and so on – all with a single click.

PART III (CONTROL PANELS)

Your Live Production system can be taken to new levels of convenience and functionality with the addition of a supported external hardware control panel, described in these Chapters.

Chapter 21 CONTROL PANELS



This chapter introduces the control panels offered by NewTek, helping you to see how they complement your system and bring added ability to your production setup. The discussion also covers how to properly connect your live production system to the control panel.

NewTek Systems provide unrivalled live production power. With a matching control panel, all that power is right at your fingertips.

SECTION 21.1 CONTROL PANELS 2 & 4 STRIPE



FIGURE 256

These two similar control panels have been prepared for use with TC1, TC1 Pro, and TC2 Elite. In large measure the functionality provided, and workflow is identical, regardless of which you use. NewTek's 4-Stripe control panel is a large and powerful 'four-stripe' unit, delivering precise control over your program, allowing you to produce your show quickly and confidently. NewTek 2-Stripe is its more compact sibling. If you are looking for replay action, check out Section 21.5 NewTek's TimeWarp, an instant replay control panel to mark, replay and manage highlights.

Note: NewTek 4-Strip Control Panel is compatible with TriCaster 2 Elite, TC1 and TC1 Pro.

21.1.1 CONNECTION AND CONFIGURATION

Simply connect the control panel unit to the same *network your NewTek live production system is on. Both control panels require a standard, 3-prong AC power connection.

** The control panel and your NewTek system should be connected to the same subnet.*

You will need to pair a control panel with a specific live production unit to control, as described next.

Button Backlighting

It is possible to modify the illumination level for the control panel buttons as follows:

- Press the LAYER SELECT B and D buttons together and keep them pressed down.
- Press one of the buttons number 1-3 in the PGM row of the first stripe to select low, medium, or high button illumination levels, and release the B and D buttons.

Pairing Systems and Panels

To allow you to manage these control connections, a *NewTek Control Panels* configuration utility has been included in the list of *Add-Ons*.

1. Click the *Add-Ons* button on the *Home page* in the *Launch* pane to show the list of installed complementary applications.

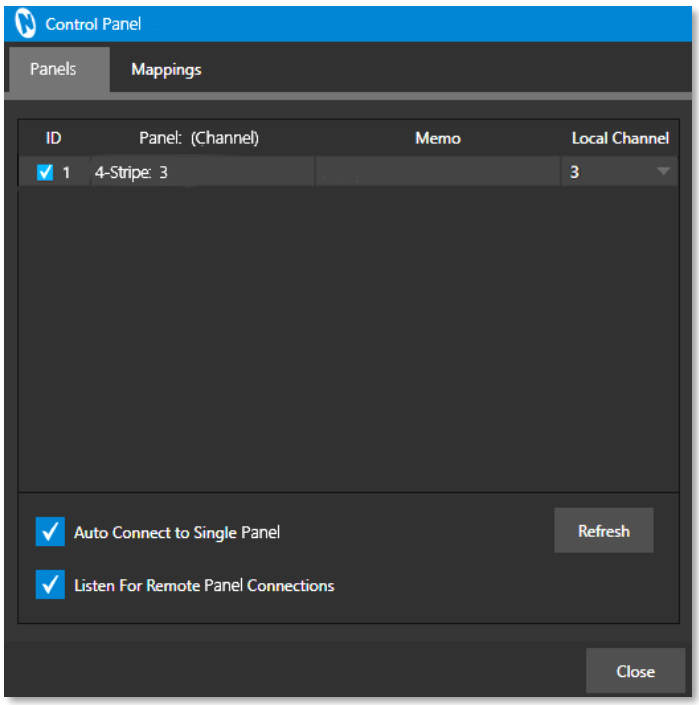

FIGURE 257

2. The utility will automatically identify, and list qualified control panels it finds on the network.
3. Each panel discovered is listed in a numbered row. The ID number for the row is not permanently associated with a particular panel and may change as panels are added to or removed from the network. The ID number does serve a very useful purpose, however.
4. Once you identify the panel you want to use, simply checkmark it in the list to claim it for the local system (the steps in the next sub-heading, Setting the Channel, will complete the communication connection to the panel).

5. You can also enter a brief description ("BillyBob's 4-stripe") into the *Memo* field, for later reference.

6. Finally, notice that a *Local Channel* menu is provided for each panel – or more accurately, for each *echelon, or* two stripe pair on the panel. Let's discuss this detail a bit further.

7. *Auto Connect to Single Surface* is checked by default, but if you have several TriCasters working in your production you may want to uncheck this option.

8. *Listen For Remote Surface Connections* is also checked by default, when enabled this will tell TriCaster to 'listen' for control panel data.

Setting the Channel

The *Channel* menu controls just one of two related channel settings – this one (on the local host), and another channel used by the control panel itself. These combine to let you connect to and control alternate live production systems.

Hint: You might think of the control and system channels as being like the channel settings of two 'walkie talkies' (2-way radios). For two-way radios to connect, both units must be on the same channel. Similarly, the channel selection displayed in this software pane tells the local unit to communicate with the selected (check-marked) control panel on the channel you choose. Of course, the control panel must also be set to the same channel for successful communication.

The *NewTek Control Panel* utility identifies the channel each control panel is on by a number from 1-8 after the colon in the *Panel: (Channel)* column. Normally, you can simply set the *Local Channel* to match this value (a 'bang' is shown if the channel the panel is set to does not match the *Local Channel*).

If you find it necessary to modify the channel the *control panel* is set to, proceed as follows:

9. Hold down the **SHIFT*, *CTRL* and *ALT* buttons on the control panel at the same time for a couple of seconds to enable channel select mode. The left-most LCD display in the first stripe in the echelon updates to show channel selections, and a button in the PGM/A row lights to show the current channel. Tap another button in the row to change the selection.

   *For the 4-Stripe Panel, you must repeat this operation in order to match the second echelon's channel setting to that of the first. Press and hold the *number pad* buttons labeled 1, 2 and 3 in the third stripe (rather than *SHIFT*, *CTRL* and *ALT*) in this case; then make your channel selection using the A button in the PGM/A row of the third stripe.

With these settings you can, for example, set one system to listen a certain control panel on channel 1, and set a different unit to listen to the same control panel on channel 2 – then easily go from controlling one system to controlling the other by updating the panel channel setting.

21.1.2 CONTROL SCHEMA

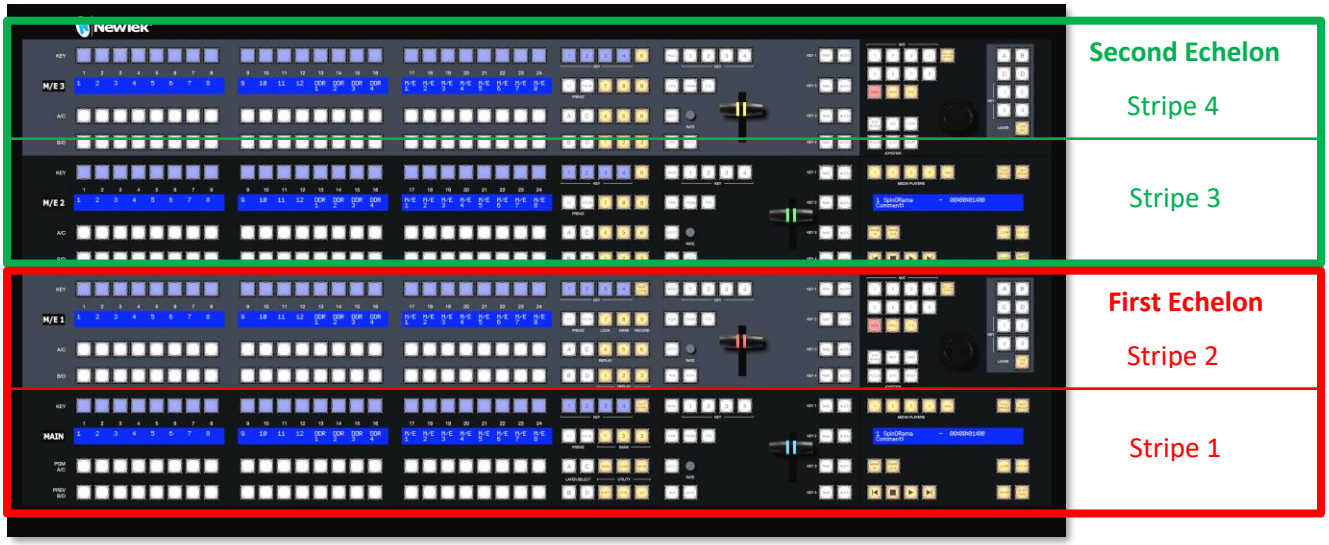

FIGURE 258

Generally, you can think of the various control groups provided as being organized into horizontal 'stripes'. In turn, two stripes are paired together in upper and lower echelons, as shown above.

STRIPES AND ECHELONS

Broadly speaking, the control layout of all stripes is quite similar, and the second echelon is nearly identical to the first. However, the first echelon is unique in providing several common controls (e.g., SHIFT, ALT, BANK, etc., conveniently locating these right under your hands at rest.

This being so, it's not hard to see that the first echelon – that is, the one nearest the operator – can be considered dominant, even vital, while the second echelon plays a supporting role.

We'll cover the functions assigned to these controls in due course but, for now, let's continue our exploration of the control panel topography by looking at stripe organization, and the distinctions between odd and even stripes.



FIGURE 259

CONTROL COLUMNS

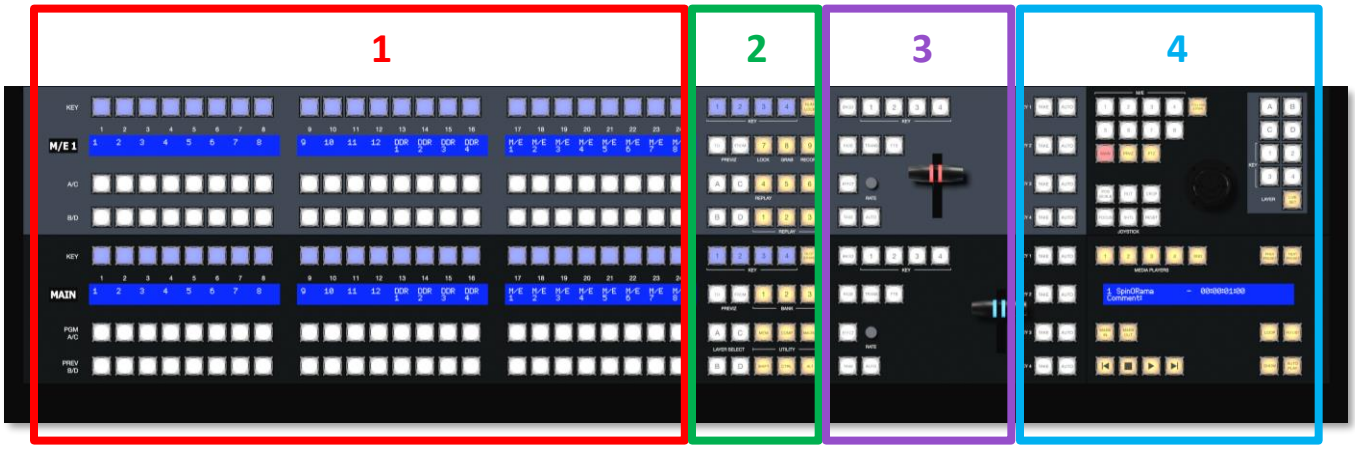

FIGURE 260

Controls in each horizontal stripe can be grouped into the following four columns:

1 – **Selection**: choose video sources

2 – **Command**: control operations and options

3 - **Layers & Effects**: transitions and layer visibility

4 - **Joystick & Media**: layer position and *PTZ* control, plus *Media Player* control

In the sections that follow, we'll look at each of the functions of controls in each of these columns more closely, but first, let's sidestep briefly to talk about displays.

DISPLAYS

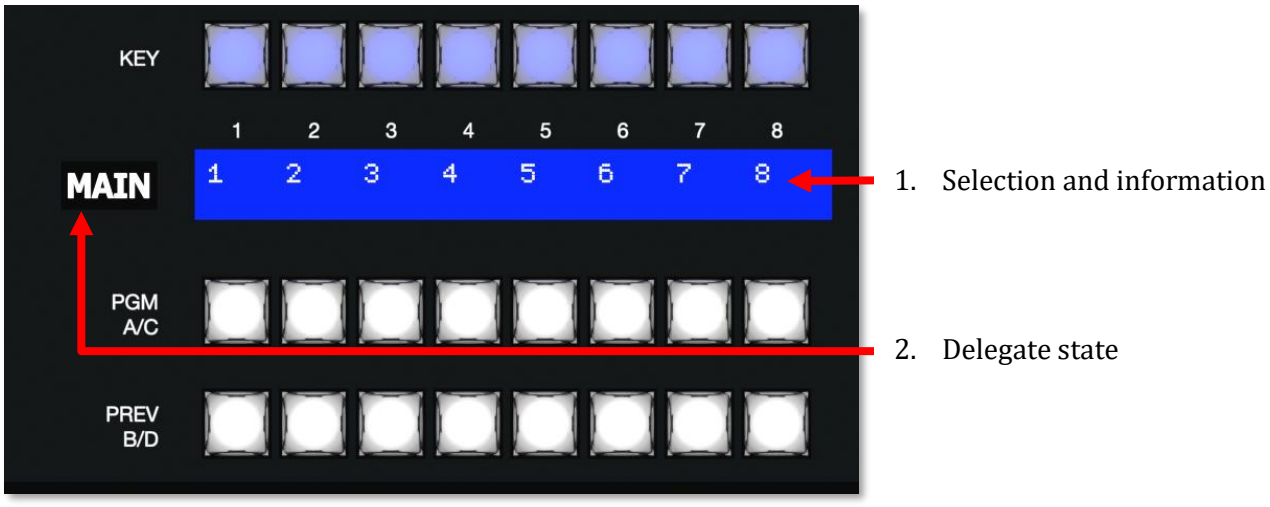

FIGURE 261

Both control panels feature helpful indicators and system feedback by means of illuminated displays.

1. An OLED display positioned just left of each stripe normally shows the delegate state for the associated stripe. For example, it may show that the stripe has been delegated (or 'assigned') to control the Main switcher, one or more M/Es, or one of its supplementary routed output.

2. The blue LCD panels spanning each stripe just below the *KEY* row show labels identifying the selection that would result from pressing a button in the same column.

Hint: The numbers 1-24 are silkscreened above the LCD panels as a further aid when making selections.

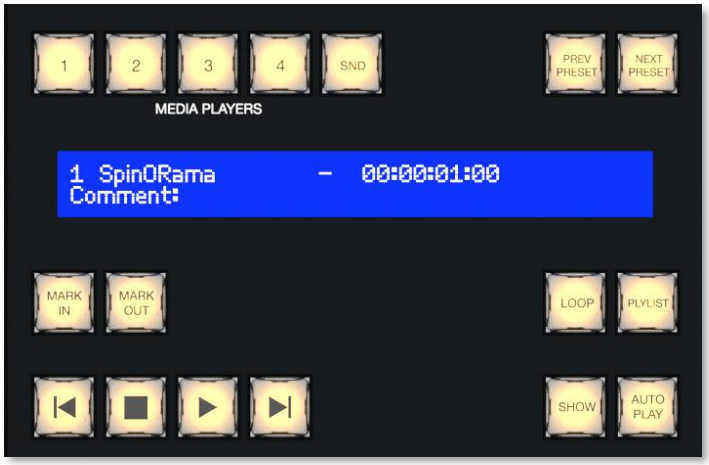

FIGURE 262

3. Another LCD strip appears in the *Media Players* group at right in the first stripe (and third, for 4-Stripe).

Item 1 above raises the question, "How do I delegate a stripe to control the desired module?" Let's go on to talk about this, beginning by discussing what "delegating" means in the context of a control panel.

21.1.3 PRIMARY COMMAND GROUP

We saw earlier that the second column of buttons in each stripe provides access to important control operations and options.

The *Command* group in the *first stripe* (nearest the operator) has some unique features that actually govern other sections of the overall control panel. We'll refer to this as the *primary Command group*. Among these special controls are several that we can describe as 'delegate' buttons.

For example, consider the four buttons labeled *KEY* in the top row of this group.

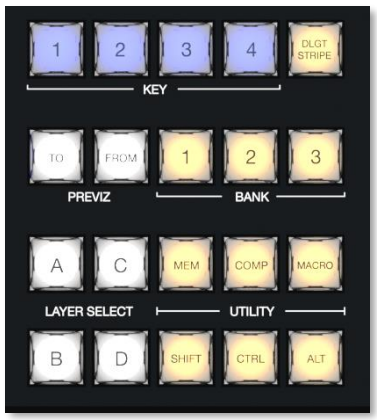

FIGURE 263

KEY

Pressing one of these buttons, labeled 1-4, 'delegates' or assigns the buttons in the 24-button *KEY* selection row at left in the same stripe to govern the active source assigned to one or more KEY (or DSK) layers.

Hint: Delegate buttons usually, though not always, support multi-selection.

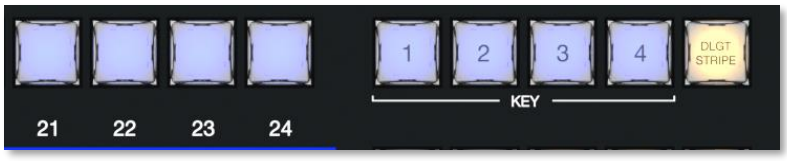

FIGURE 264

DLGT STRIPE

The remaining button on the topmost row of the *primary Command group* is labeled *DLGT STRIPE*, which is an abbreviation of 'delegate stripe'.

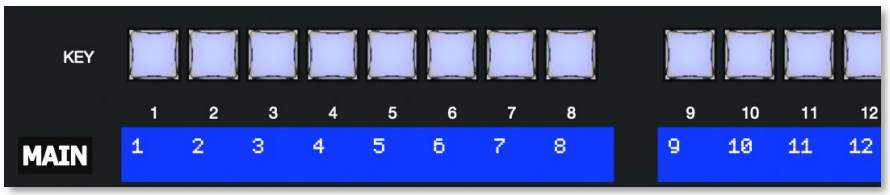

FIGURE 265

When you press and hold *DLGT STRIPE*, the LCD displays in *each* stripe update to show the names of the available switcher busses (*MAIN, M/E 1, 2, etc.)* and MIX 1-4. In this state, press one or more buttons in the PGM/A row beneath and release the *DLGT STRIPE* button to assign the stripe to the designated bus or busses.

BANK

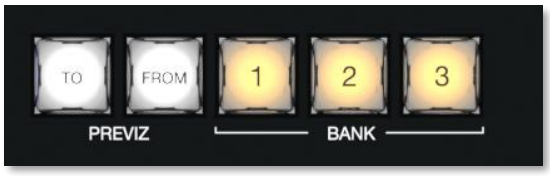

FIGURE 266

Another set of delegate buttons sits in the second row (counting from the top) of the *primary Command group*. This group is labeled *BANK*. As you know by now, the *Switcher* crosspoints of TriCaster systems are organized in banks comprising between 16 and 24 columns (varies by model).

Similarly, *Switcher* sources are presented in banks on Stripe model control panels. (The constituent sources of Switcher banks on the panel may deviate from the interface because the button count is different.) Press the desired *BANK* button – 1, 2 or 3 – to determine which group of sources is currently delegated to the *Switcher* rows in all stripes. The displays above the selection rows will update accordingly.

Note: For reasons that should be obvious, Bank buttons do not support multi-selection.

SPLIT BANKS

Ordinarily, the *Switcher* and *M/E* row bank assignments for all stripes on the panel match. So, for example, if the *Main Switcher* is showing *Bank 1*, all other stripes likewise display *Bank 1*. It is possible, however, to lock individual stripes to specified *Banks*.

To do so, hold down the *ALT* and *CTRL* buttons on the panel together, which will cause the LCD displays to list *Banks 1, 2,* and *3* (Premium Access membership only) in the first three *Switcher* columns. Press the *KEY* row button above the display for the desired stripe to select the Bank it will present thereafter.

Stripes delegated to a particular *Bank* in this manner do not update when you press the *Bank (1-3)* buttons in the *Primary Command Group*. To restore normal behavior, hold down *ALT* and *CTRL* again, and notice that the *KEY* row button for the currently assigned bank lights. Press this button again to extinguish it, and the stripe will once again follow the primary *Bank* button assignment.

PREVIZ

There are more delegate buttons, but before moving on to consider them, let's complete our consideration of the second row of the *primary Command group*. This brings us to the *PREVIZ* group.

TriCaster's powerful *Previz* feature was described earlier in this Guide (Section 9.8). We've also seen, in Section 21.1.3 , that we can delegate a stripe to control the various features *Previz* provides.

Note: Not a TC Mini feature.

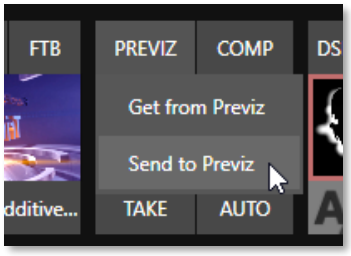

FIGURE 267

TO AND FROM

Two buttons labeled *TO* and *FROM* in the *PREVIZ* group on the 2 or 4-Stripe control panels complete the support for this feature by providing access to the "Send to Previz" and "Copy from Previz" functions (presented in the *Live Desktop* interface by the *PREVIZ* and associated 'clipboard' buttons located just above *T-Bars*.

Note: To and From (Previz) buttons are found in the Command groups for all stripes.

- **TO** – Copies the selections and settings of the bus delegated to the corresponding stripe to *Previz* (for a stripe delegated to multiple switcher busses, *TO* uses the settings of the first delegate only).

- **FROM** – Copies the current *Previz* settings to back to the delegated busses for the corresponding stripe. Note that *FROM* does support multi-delegation, allowing you to copy the current *Previz* setup back to multiple busses). Finally, as a reminder, note that *FROM* will update the sources for *DSK/KEY* layers, but will not affect the main row source selections of the target busses.

UTILITY

MEM

When the *MEM* button is held down, the first 9 columns in the displays of all stripes update to list the names of *MEM*s for the busses delegated to the individual stripes. Punching a button in the selection row below a *MEM* name recalls the corresponding preset for the bus assigned to the stripe.

> Note: F*or multi-delegated stripes, only the first delegate is affected*

Holding *CTRL+MEM* then pressing and releasing a button in the *PGM/A* row beneath will store it into the corresponding MEM for the bus assigned to the stripe.

COMP

When the *COMP* button is held down, the first 16 columns in the displays of all stripes update to list the names of *COMPs* for the busses delegated to the individual stripes. Punching a button in the selection row below a *COMP* name applies the corresponding preset to the bus assigned to the stripe.

> *NOTE: In the case of multi-delegated stripes the COMP names displayed represent the first delegate only.*

To store or update a *COMP*, hold down *CTRL* + *COMP*, then press a button in the selection row below the display for the desired stripe. To clear a *COMP*, hold down *ALT* + *COMP*, then press a button in the same selection row.

MACRO

To assign a macro to *any* button, first select the desired macro in the *Macro Configuration* pane in the user interface. Click a box in the *Triggers* control group at the bottom of the panel, to enable "Listen" mode, then hold down the *MACRO* button, punch the control panel button you want to use for the macro, and release the *MACRO* button. (See also Section 21.1.4, NUMBERPAD.)

When the *MACRO* button is held down, the names for any macros assigned to buttons in the (PGM/A/C) row immediately beneath the selection area displays are shown. Punching the button below a macro name triggers the corresponding macro.

> *Hint: To clear an assigned macro from a button, hold down Ctrl with the Macro button, the press the (lit) button you wish to clear.*

SHIFT, CTRL, ALT



FIGURE 268

These buttons provide support for extended features and future expansion.

Note: Among other things, CTRL and SHIFT are used in connection with instant replays (see the Replay heading in Section 21.1.4) and Buffers (see 21.1.7).

LAYER SELECT (A/C, B/D)

Some TriCaster models let you configure M/Es with effects supporting up to four primary sources (along with KEY layers). The control panels, however, offers just *two* primary source selection rows, *PGM A/C* and *PREV B/D*.

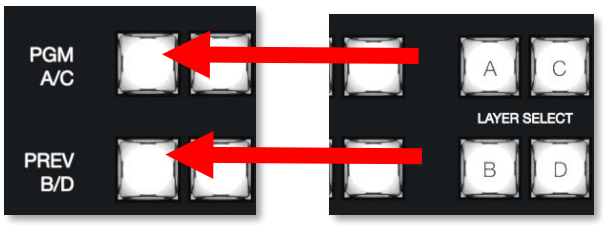

FIGURE 269

In cases where more than two selection rows are required for a given *M/E*, use the *LAYER SELECT* buttons to delegate the upper or lower selection rows to the layers you wish to control.

Hint: If you reduce the number of layers required by an M/E (by loading a different effect) the control panel will automatically revise the LAYER SELECT delegate state to match.

21.1.4 SECONDARY COMMAND GROUP

The *Command* control group in the second stripe (counting from the stripe nearest the operator) also has unique functions, which is why we will refer to it as the s*econdary Command group*.

While discussing the *Primary Command Group* in 21.1.3, we reviewed the functions of the *KEY* delegates, *PREVIZ* buttons, and the *LAYER SELECT* (A/C, B/D) buttons. Let's now consider the remaining items in this section.

NUMBERPAD

Unlike the *primary Command group*, the *secondary Command* group includes a numberpad. We'll discuss basic number input functions soon but, first, observe that certain buttons in the numberpads have labels below them identifying alternate functions.



FIGURE 270

NUM LOCK

Therefore (in contrast to additional numberpads provided on the 4-Stripe panel in particular), the 0 button in this numberpad is replaced by *NUM LOCK*. Not surprisingly, when *NUM LOCK* is lit all numberpad buttons perform simple numeric input. When *NUM LOCK* is off, however (as it is by default) number buttons with alternate labels perform their secondary operation. Let's discuss these now.

LOCK (7)

With *NUM LOCK* off, this button lets you lock or unlock other control panel buttons. Pressing *LOCK* lights all currently locked buttons. While the *LOCK* button is lit, pressing any other control panel button toggles its locked/unlocked state, preventing unintentional changes.

GRAB (8)

Pressing this button (with *NUM LOCK* off) triggers the software's main Dashboard *GRAB* button.

> *Hint: The main GRAB feature grabs stills from selected primary (MIX) outputs, as configured in the interface. To grab other Switcher sources (excluding M/Es), hold down the CTRL button on the control panel while punching any KEY row button for the desired source.*

RECORD (9)

Pressing this button (with *NUM LOCK* off) triggers the main Dashboard *RECORD* function. You should be aware that, to prevent unintended interruptions in recordings, you must hold *SHIFT* while punching *RECORD* on the control panel to stop recording.

> *Hint: To alert you to this safety measure, SHIFT flashes if you press RECORD alone during capture.*

REPLAY (1, 2, 3, 4)

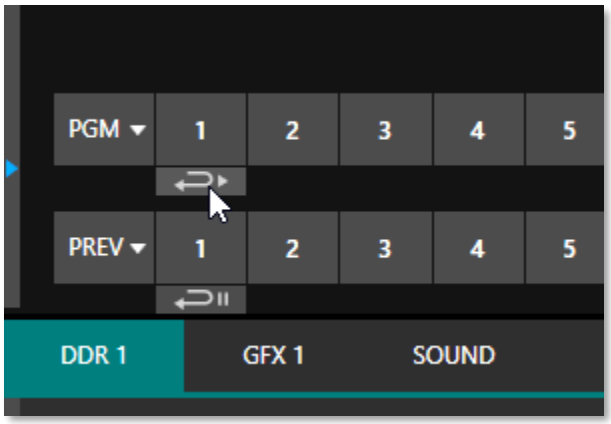

FIGURE 271

Recent editions of TriCaster software provide powerful instant replay workflow for any source with a recorder assigned to it.

When a Recorder is assigned to a source in its Input Configuration panel, and you also enable the associated Instant Replay switch, special replay buttons appear below the corresponding *Program* and *Preview* row buttons in the Live Desktop *Switcher.*

Stripe control panels provide the same functionality as follows:

- To perform an instant replay from a *Switcher* source, hold down the *CTRL* button while punching the *PGM* A/C row button for the source. Double the length of the replay by holding down *SHIFT* along with *CTRL*.

- Or defer playback of the instant replay as follows:

    - Simply add the replay clip to the *DDR* playlist by clicking the source's *PREV B/D* row button (rather than the *PGM* row button) with *CTRL* (or *CTRL + SHIFT*) held down.
    - Then, when you're ready to trigger the instant replay, press *CTRL + AUTO* to initiate the DDR's *Show On* operation.

This powerful workflow is ideal for replays from individual *Switcher* inputs. However, the four *MIX* outputs (which typically includes Program output as MIX 1) do not appear on the *Switcher* button rows – so another method is required in this case:

- Press a button numbered *1-4* in the *Secondary Command Group* (with *NUM LOCK* off) to trigger a replay from the corresponding (*MIX 1-4*) recorder.
- Hold down *CTRL* when doing the above to defer playback of the replay clip.
- Add *SHIFT* to either of the above to double the length of the replay clip.

Hint: If you execute an instant replay operation while another replay is incomplete, the newer replay angle will replace the former one on output and the duration of the replay will be extended.

NUMBERPAD (NUM LOCK ON)

Having covered the alternate (NUM LOCK off) numberpad button functions, let's consider the value of the *Numberpad* in connection with running macros.

Any macro can be triggered by pressing a three-digit number sequence on any of the *Numberpads* on the control panel. Simply open the *Macro Configuration* panel in TriCaster's *Live Desktop* and select a macro from the list; click a *Listen* box at the bottom of the panel, then type a three digit number, such as 123.

Each *Numberpad* on the control panel is treated independently. Thus, the very same numeric entry can trigger different macros from the *Numberpads* in different stripes.

For 4-Stripe, which has three *Numberpads*, this means you have direct access to nearly 3000 different macros.

Hint: If you start to enter a number, then change your mind, simply press any button outside the number pad to cancel the entry.



FIGURE 272

21.1.5 LAYERS & EFFECTS

The controls in third column (all stripes) govern transitions and layer visibility for the various video busses.

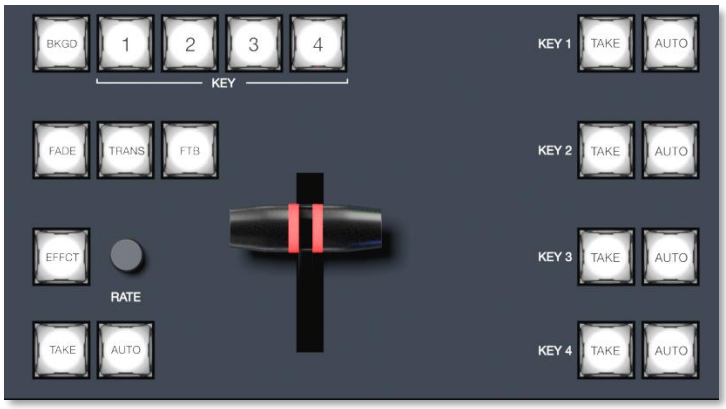

FIGURE 273

BKGD AND KEY 1-4



FIGURE 274

These delegate buttons determine what video layers the main controls directly below (*TAKE*, *AUTO*, *T-Bar*, etc.) will affect. Multi-selection is supported, so, for example, if you select both *BKGD* (Background) and *KEY 1*, then press *AUTO* for a stripe delegated to the *Main Switcher*, a transition is applied to both the *Background* layer and *DSK 1*.

FADE & TRANS

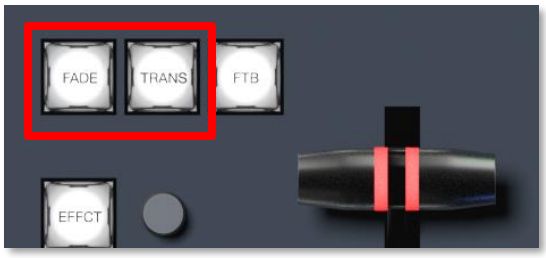

FIGURE 275

These two buttons provide a quick way to control the *Transition Bin* selection for the delegated switcher layer(s).

- Pushing *FADE* offers a quick and convenient way to select the standard *Crossfade* transition.
- Push the *TRANS* button to activate the last-used transition for a video layer (or layers).

Hint: For new sessions, TRANS jumps to the transition following Fade in the effect preset bin.

The *FADE* and *TRANS* (Transition) buttons are mutually exclusive; selecting either cancels the other, and only the currently active button remains lit.

FTB

To perform a *Fade to Black* operation, press *SHIFT* + the *FTB* button (the SHIFT button is required as a safety measure, since FTB is a somewhat dangerous operation). Revert to normal output by pressing *FTB* alone.

Hint: The duration of the transition to and from black is derived from the BKGD transition duration setting.

EFFCT (EFFECT)

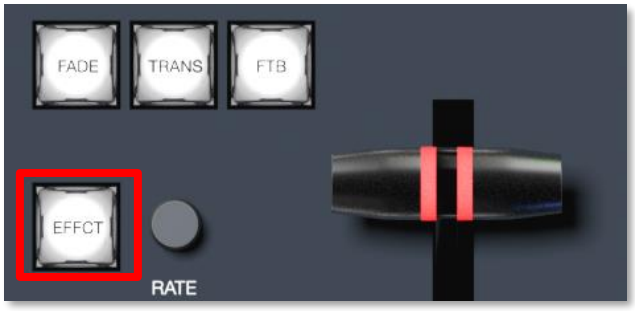

FIGURE 276

Hold down the *EFFCT* button to cause LED display columns at left to show the names of effects currently assigned to presets in effect bin for the currently delegated layer of the *Switcher* bus assigned to the stripe.

In the case of multi-delegated busses or layers, the display lists the content of the first effect preset bin only, and selection will only affect that delegated layer.

RATE

Rotate the nearby *RATE* knob to modify the transition timing for delegated layers. Or press the knob to cycle through the standard *Slow*, *Medium,* and *Fast* presets.

TAKE & AUTO



FIGURE 277

The *TAKE* and *AUTO* buttons perform a cut or transition respectively, affecting only the currently delegated video layers.

T-Bar

The T-Bar is perhaps the most recognizable component of a professional video control panel, and arguably one of the most important. Stripe panels provide standard functionality by this means, along with exceptional system feedback. Obviously, you can pull the *T-Bar* to manually modify the progress of a transition between delegated video layers. The T-Bar can also be used to zoom M/Es configured with LiveSet virtual sets.

Illumination

The *T-Bar* employs colorful illumination to provide feedback and status updates based on your control panel selections and operations. The lighting schemes applied to *T-Bars* controlling both *M/Es* and *MAIN* video layers reinforce traditional button illumination in a way that soon becomes instinctive, and which provides unparalleled confidence in use. The following tables provide a color code for your convenience.

M/E Transitions

1. For an *M/E* with a transition assigned as the *Background* effect, control panel T-Bar illumination conforms to the color scheme of the *M/E tabs* on the *Live Desktop*.

M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8
Turquoise	Teal	Blush	Apricot	Sky Blue	Pink	Chartreuse	Hot Pink

2. If *BKGD* is delegated alone, the *T-Bar* color is as shown in the table above, identifying which *M/E* is delegated to the stripe. (When multiple *M/Es* are delegated, the first selected delegate determines the color.)

3. This color is at its brightest when the *PGM/A* source (effectively the *Program* row for a transition type effect) is fully displayed. As the *T-Bar* is moved (or *AUTO* is pressed) to begin a transition, the color gradually dims until the effect is complete. At that point, it pops back to full brightness, just as the onscreen *T-Bar* returns to the top of its stroke.

4. In a mixed delegate situation (*BKGD* along with one or more *KEY* layers) the *T-Bar* is lit medium blue and conforms to the *BKGD* behavior described above.

5. If one or more *KEY* layers are delegated without *BKGD*, the *T-Bar* color is purple. When the *KEY* layer (or, for multi-*KEY* selections, the first *KEY* layer) is fully displayed, *T-Bar* lighting is at its brightest. Removing the layer dims the illumination.

Main Transitions

1. Just as you would expect, the *T-Bar* uses industry-standard red/green color coding for *Program* and *Preview* rows.

2. *DSK*-only operations result in the *T-Bar* being lit in purple, similar to *M/Es*.

3. Mixed mode (*BKGD* plus *DSK* delegates) result in blue illumination, after the fashion of *T-Bar* behavior previously described for *M/Es*.

This brings us to the fourth and final column of the Stripe control panel – Joystick & Media control.

21.1.6 MEDIA PLAYERS

Let's explore the details of the *MEDIA PLAYER* control group (depending on your control panel model, there may be one or two such control groups).



FIGURE 278

DELEGATES

The *MEDIA PLAYERS* buttons determine which players are governed by operations in this group. Multi-selection is supported.

PREV PRESET/NEXT PRESET



FIGURE 279

These two buttons let you cycle backwards or forwards respectively through existing presets for the delegated *Media Player.*

DISPLAY

The top line of the *Media Player* display shows the filename, countdown timer and if available, timecode for the current playlist selection. The lower line contains any comments you have attached to the file (using the clip context menu item, *Properties*).

MARK IN/OUT



FIGURE 280

Click these buttons to set the *In point* or *Out point* for the current playlist item in delegated players to the current frame.

Hint: Press SHIFT with the button to reset the specified end point to its full limit.

LOOP AND PLYLIST



FIGURE 281

Click these buttons to toggle the *Loop* and *Playlist* modes for the delegated players.

TRANSPORT CONTROL



FIGURE 282

- |◀ (Previous Item) – Press this button to go to the previous playlist entry in delegated *Media Players*. (The selection cycles to the last playlist entry when necessary.)
- ■ (Stop) – Push once to end playback for delegated *Media Players*; push a second time to return to the start position (this operation respects the *Single* setting for individual *Media Players*
- ▶ (Play) – Push to initiate playback for delegated *Media Players*.
- ▶| (Next Item) – Push this button to go to the next playlist entry in delegated *Media Players*. (The selection cycles to the first playlist entry when necessary.)

SHOW AND AUTOPLAY

The *SHOW* button triggers the matching *SHOW ON* feature in the footer of TriCaster's *Media Players*. Likewise, the *AUTOPLAY* button toggles the eponymous *Media Player* option.

21.1.7 BUFFERS AND TITLES

TriCaster supports both static title templates (.CGXML file format) and animated LiveGraphics (.livegfx file format) title pages in its *Buffers* module. In turn, these title pages respectively support one or both of two different types of presets – Data Presets and Layer Presets.

Data Presets store text strings and image file links and allow you to quickly update those aspects of a title page on demand. *Layer Presets* are still more powerful, and allow you to hide or display layered various graphic elements comprising your LiveGraphics title page using predetermined per-layer animation (for more about LiveGraphics, including how to author your own dynamic title pages, please refer to Appendix A.4 LiveGraphics.

To access these features from your 4-Stripe control panel, you must first delegate a specific *Buffer* slot containing the target graphic you wish to control. To do so, hold down *SHIFT + MEM* and punch the button on the *PGM A/C* row at left corresponding to the desired *Buffer*.

Having delegated a *Buffer* as just described, hold down *SHIFT + MACRO* and punch the button on the *PGM A/C* row at left that corresponds to the *Data Preset* you wish to recall. Or hold down *SHIFT + COMP* instead, to invoke a *Layer Preset* using the same selection method.

Note: For more information on LiveGraphics, see Appendix: A.4 LiveGraphics.

21.1.8 JOYSTICK

The Stripe control panel joystick provides a very versatile input mechanism.

In considering its applications it is important to realize that, unlike the *Layers and Effects* control groups at left, the *Joystick(s)* located in the panel's right-most column can optionally operate completely independently from the stripes at left.

Thus, while *T-Bar* operations (for example) are always directed to the video busses delegated to the stripe they are in, *Joystick* manipulations can affect any *M/E*, a *PTZ* (Pan, Tilt & Zoom) camera, or even a *Media Player*.



FIGURE 283

- The specific target of *Joystick* operations at any moment is determined by a set of *Joystick delegate* buttons, outlined in red above.
- As appropriate, this selection is further refined by buttons in the *Layer* group at right, outlined in blue above.
- Finally, the nature of the operation performed on the target is determined by a set of *Control Mode* buttons at lower left, outlined in green above.

Let's consider the primary *delegates* first.

DELEGATES

FOLLOW PREVIEW

Probably the most useful joystick delegate mode is *Follow Preview*. You will probably not be surprised to learn that, when enabled (as is the default in new sessions) the joystick assignment tracks your Main > Preview (*PREV*) row selection.

Since the *Live Desktop* normally displays a large *Preview monitor*, this makes setting up exactly the shot you want for the upcoming source queued on *Preview* the proverbial 'no-brainer'. Or, to quickly modify the framing of a bunch of PTZ cameras, or a series of M/Es, just select them one after another on the *PREV* row and adjust to taste.

*Hint: To open the Input Configuration panel for the source currently selected on the Preview row to adjust its settings, simply tap the * (asterisk) key in the keyboard numberpad.*

Of course, the joystick has several other delegate modes, discussed next, but the default *Follow Preview* mode is very useful, and can be easily restored from any other mode by pressing the *PTZ* and *RESET* buttons together.

FOLLOW STRIPE

Pressing this *Joystick delegate* button restricts the behavior of the *Joystick* in a manner many are used to from using 'traditional' control panels. That is to say, *Joystick* operations will always be directed to the video bus(ses) assigned to the same stripe. As mentioned though, NewTek's Stripe panels offer greater versatility and control options. It's possible to quickly redirect control to any suitable target without interrupting *Switcher* operations on neighboring stripes.

M/E 1 – M/E 8

These buttons provide a quick and convenient way to delegate *Joystick* operations to one or more selected *M/Es* (the number of M/Es varies by TriCaster model).

MAIN

Punch *MAIN* to direct delegate *Joystick* operations to the *Main Switcher*.

PRVZ

This button delegates *Joystick* operations to TriCaster's convenient *PREVIZ* video bus.

PTZ

SOURCE SELECT

Depending on the TriCaster model and feature set, PTZ (pan-tilt-zoom) style joystick operations are not limited to 'real' PTZ cameras. Static cameras, *Media Players*, and *Buffers* are among the different source types that may benefit from 'virtual PTZ' functionality. And of course, M/Es have similar capabilities courtesy of *COMP* and *Positioner* features.

For this reason, you can delegate <u>any</u> source that is qualified for *Joystick* control on your system as follows: Hold down the *PTZ* button and press the desired *KEY* row button at left in the same stripe as the *Joystick.*

Press an M/E button (1-8), MAIN, or FOLLOW STRIPE to reset the Joystick to the corresponding operating mode.

PRESETS

In addition to manually controlling the PTZ camera with the *Joystick*, of course, you will often want to store and recall *PTZ presets*.

- To store a new preset for the currently delegated camera, or to update an existing preset, hold down the *PTZ* button and press a button numbered from 1-16 in the *A/C* row at left in the same stripe.

- To recall a preset, hold down the *PTZ* button and press a button numbered from 1-16 in the *B/D* row at left in the same stripe.

LAYER DELEGATES

As mentioned above, some *Joystick* delegate modes let you further refine the target for your manipulations. For example, when your primary delegate is *MAIN*, joystick operations can be applied to the *DSK 1, DSK 2, DSK 3* or *DSK 4* video layers. The *LAYER* delegate group determines which one will be affected.

Specifically, the *KEY* buttons labeled *1-4* direct joystick control to *DSK 1-4* when *MAIN* is selected as the primary delegate, or *KEY 1-4* for an *M/E*. Similarly, when an *M/E* with a *LiveSet* selected as the *Background effect* is delegated, the *A, B, C* and *D* buttons allow you to target the individual *Positioners* for the main *M/E* layers (*A-D*).

Finally, the *LIVE SET* button targets the position and zoom settings for a virtual set.



FIGURE 284

CONTROL MODE

Let's turn now to buttons that govern the *Joystick* operating mode.



FIGURE 285

POS/SCALE

- Move the *joystick* horizontally, vertically, or diagonally (as viewed from above) to move delegated video source(s) on its X and Y axes.
- Twist the *joystick* clockwise to scale delegated source(s) up, or counter-clockwise to scale down.

Hint: When multi-delegate selections are active for the Positioner, adjustments are generally relative to the current state for individual delegates, as opposed to absolute.

ROT (ROTATE)

- Move the joystick horizontally (as viewed from above) to rotate delegated sources on the Y axis.
- Move the joystick vertically to rotate delegated sources on the X axis.
- Twist the joystick clockwise/counter-clockwise to rotate delegated sources on the Z axis.

CROP

- Twist the *joystick* clockwise (as viewed from above) to crop delegated sources inward on all four edges, maintaining the original aspect ratio.
- Twist the *joystick* counter-clockwise to reduce cropping of delegated sources on all 4 edges.

- Move the *joystick* horizontally to crop only the left edge of delegated sources.
- Move the *joystick* horizontally with the *joystick button* pressed to crop only the right edge of delegated sources.
- Move the *joystick* vertically to crop only the top edge of delegated sources.
- Move the *joystick* vertically with the *joystick button* pressed to crop only the bottom edge of delegated sources.

FOCUS

When the primary *Joystick Delegate* is *PTZ*, enable *FOCUS* to modify *Joystick* operations as follows:

- Pressing the *Joystick button* enables *Autofocus*.
- Rotate the joystick to adjust the camera's focus setting (which will naturally disable Autofocus).

SHTL (SHUTTLE)

Push *SHTL* (Shuttle) to delegate the *joystick* to shuttle the *Media Player(s)* currently selected in the *MEDIA PLAYERS > DELEGATE* group. (Again, the other joystick mode buttons cannot be multi-selected with SHTL.)

- To *shuttle* delegated *Media Players*, move the joystick horizontally (as viewed from above).

Note: You can zoom multiple LiveSets simultaneously when these are delegated together, just as you can also shuttle several delegated Media Players.

RESET

Despite its location, *RESET* is really an action button (not a *Joystick* mode). Press it to restore all position settings for currently delegated source(s) to their defaults. (This is also why *RESET* does not stay selected when pressed, nor does it change the current *Joystick mode*.

Hint: When SHUTTLE is delegated, delegated Media Players are reset to the starting point of the current item (or playlist). And when delegated to an M/E with LIVE SET enabled in the LAYERS group, the LiveSet is reset to its default positioning.

When the *MEM* button is held down, pressing a button between 1 and 9 in the selection rows at left causes corresponding operation in the *MEM* bin for the delegated M/E as follows:

- Pressing a button in the DSK/KEY row recalls the corresponding *MEM*.
- Pressing a button in the PGM/A row stores or updates the corresponding *MEM*.
- Pressing a button in the PREV/B row clears the corresponding *MEM*.

SECTION 21.2 CONTROL PANEL: TC 8000

For use with this software version, the TriCaster 8000 CS button map conforms precisely to the control panel described in the previous section.

Note that the *NewTek Control Panels* applet, launched from the Add-Ons menu in TriCaster's *Startup Screen,* lets you modify the default *Switcher row* button mapping (Figure 286). You can either remap *Switcher* row buttons individually or import a map conforming to the original 8000 CS configuration.

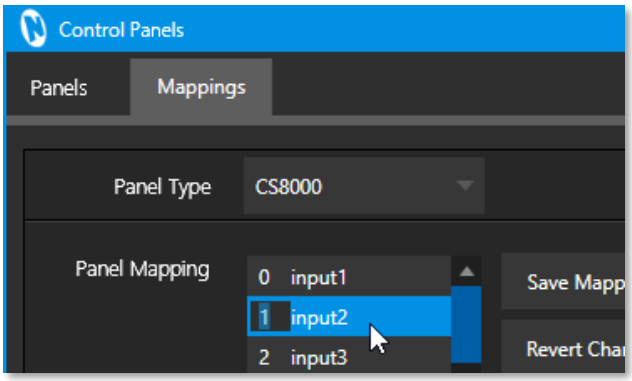

FIGURE 286

21.2.1 CONNECTIONS & POWER

Or course, since the 8000 CS connects to TriCaster by a USB cable, the details related earlier regarding network connection and assignment for the Stripe panel are not relevant. Simply connect the TriCaster control panel unit to your TriCaster using the USB cable supplied. There is no need to install drivers or configure the software. Recognition of the control panel is automatic.

OTHER POWER CONSIDERATIONS

TriCaster 8000 CS requires an AC power connection, in addition to its USB control connection. We recommend that if you *must* operate the control panel at greater distances from the TriCaster than recommended above, you first connect it to a powered USB hub by a short USB cable, in turn connecting the USB hub to one of TriCaster's USB ports.

Important Note: So-called USB extenders are not recommended, having proven less reliable than long USB cables with powered hub, as discussed above. Each added connector in the circuit introduces 'reflections' that degrade the signal. A control panel may seem reliable for some time, but then fail unexpectedly. (If this should happen, disconnecting and reconnecting the control panel may temporarily restore functionality).



FIGURE 287

The Flex control panel is the ideal complement to supporting live production systems. It delivers new levels of control and usability while maintaining a convenient, compact footprint. In addition to Media Player and overlay controls, innovative PTZ and live switching features, Flex also provides extensive audio control, including integrated audio connectors. And it supports more extensive and user-friendly customization than any of our prior control panels.

In this chapter, we'll first explain how to connect and configure your new control panel, then continue to dig into its powerful controls and features.

21.3.1 CONNECTION AND CONFIGURATION

Here at the basic steps needed to get you up and running with your new control panel.

- Connect the Flex control panel to your local network.
- Connect AC power to the control panel.
- Find the Flex control panel's IP address.
- Enter the Flex unit's IP address into the URL field of a web browser of another a device on your network to access the configuration webpage.
- Check that the most recent firmware is installed.
- Confirm that your live production system software version includes Flex support.
- Choose a target system to control and connect to it.

For some people, the bullet points above below will suffice. For the rest of us, though, this section will now continue with more elaborate details about each step.

Note: This equipment must be powered using a 3-prong connection.

SAFETY

Warning: Risk of Electrical shock. Disconnect all power sources before servicing.



This Protective Earth (ground) symbol identifies terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or terminal of protective earth (ground) electrode.



This indicates that the equipment must be powered using 100 to 240 Volt Alternating Current.

Replacement fuse: 3A 250 V AC DC Fuse Cartridge, Glass Holder 5mm x 20mm, Slow Blow

CABLE CONNECTIONS

To begin, please connect your Flex control panel unit to your local network. In normal operation, this would be the network your live production system is connected to, but this isn't a requirement for initial setup (such as updating firmware or similar administrative tasks).

Hint: In normal use, the control panel and target live production system should be on the same subnet. Otherwise, for more sophisticated network environments, note that Flex also supports NDI Discovery Server.

Afterward, supply power to the Flex unit using the AC cord provided. After a few moments, Flex will complete its boot process, and briefly display the currently installed firmware version number.

Note: DHCP is enabled on Flex by default, so (assuming your network has a DHCP server) the unit will automatically connect to your LAN. If your installation requires static IP addresses, you can set this up later using the Flex configuration webpage.

FLEX CONFIGURATION WEBPAGE

Your Flex panel has a built-in webserver, which it uses to provide additional configuration settings and tools you can access in the web browser of another device (such as a laptop or tablet) on the same network.

Note: Together, the webpage described here and the panel's integrated control features host all necessary Flex configuration. (The control panel utility provided in the Add-Ons menu described in other sections of the User Guide does not support Flex.)



FIGURE 288

To access this webpage, first press the SHIFT, ALT and BANK buttons on the control panel simultaneously. This will display the unit's local IP address above the program (PGM) buttons. Enter the IP address into the URL field of a web browser on your LAN to open the local Flex configuration webpage (Figure 289).

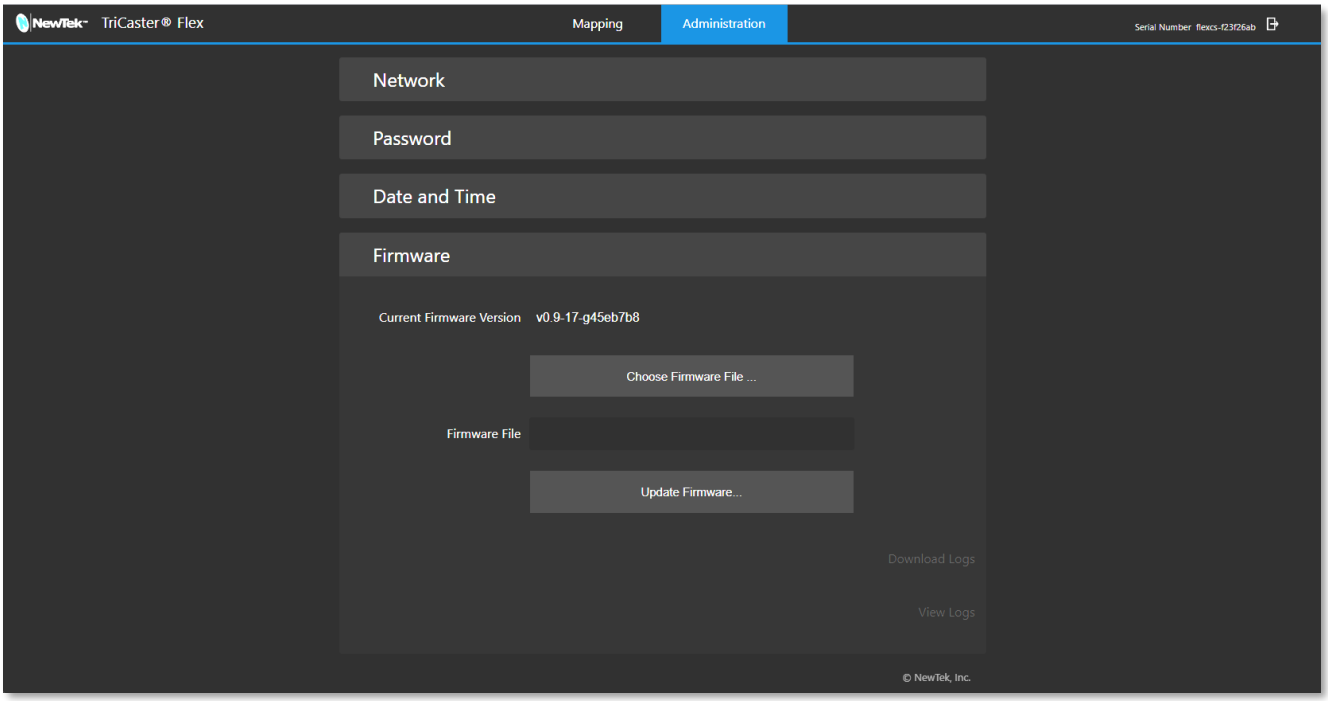

FIGURE 289

The first time you visit this webpage you'll be guided to create *User* and *Password* credentials to continue. Having done that, it's a good idea to check whether newer firmware has been released before continuing. On the Flex webpage's *Administration* tab, expand the *Firmware* control group to locate the Current Firmware Version number.

LATEST VERSIONS

Then, visit Newtek's Support>Downloads page to see whether a newer Flex firmware version is available. If so, download the update and then click Update Firmware on the Flex webpage to install it. (The webpage provides instructions and status messages to guide you during the process, which can take several minutes.)

With current firmware installed, the Flex panel is ready to connect – but there's one more consideration: Obviously, your live production system must be compatible with Flex, and needs to have a software version that includes Flex support installed (TriCaster version 8-0, or newer). As required, update your system in the usual manner (see Section 3.3.1, Updates, and the heading System Utilities in Section 5.2.4 in this User Guide).

CHOOSING A TARGET



FIGURE 290

At this point, you're almost ready to connect your Flex unit to your live production system.

With one or more supporting live production systems connected to the same network, open a live session; this notifies the Flex control panel that a suitable target is available. Open TriCaster Flex's *Utility* menu (SHIFT + ALT + SET) and observe the four options that appear in the LCD display on the left (Figure 290). Notice the buttons that light up just above each of the options, press the first lit button above the word *Connect* to choose an available target system to connect to. Other options are *Restore* software, *Reboot* the control surface or *Done* to exit).

Hint: To go straight to the connection menu press Shift + Alt + Replay.



FIGURE 291

Notice that the Play (▶), Previous and Next buttons (|◀ and ▶|) in the Media player controls light up (Figure 291). This is to indicate that you can use these buttons to navigate through a list of qualified systems when several are detected. To further help identify these systems, their individual IP addresses are also shown in the blue LCD panel to the right, above the firmware version (Figure 292).

Press the flashing green Play button (▶) to select a target from the list, telling Flex which live production system you wish to control. This will also close the Utility menu.



FIGURE 292

Note: Flex cannot connect to more than one live production system at a time.

You're all set: The Flex display will update to show the button names of any switcher inputs you have configured in your live production session. If you wish, you can continue to use the tools provided on the Mapping tab of the Flex webpage to customize the order of source buttons in different banks on the Flex panel (see the heading labeled Mapping Tab in Section 21.3.3)

21.3.2 TRICASTER FLEX WEBPAGE

We briefly touched on the Flex configuration webpage when discussing initial setup and configuration. In this section, we'll take a more in-depth look at its features.

ADMINISTRATION TAB

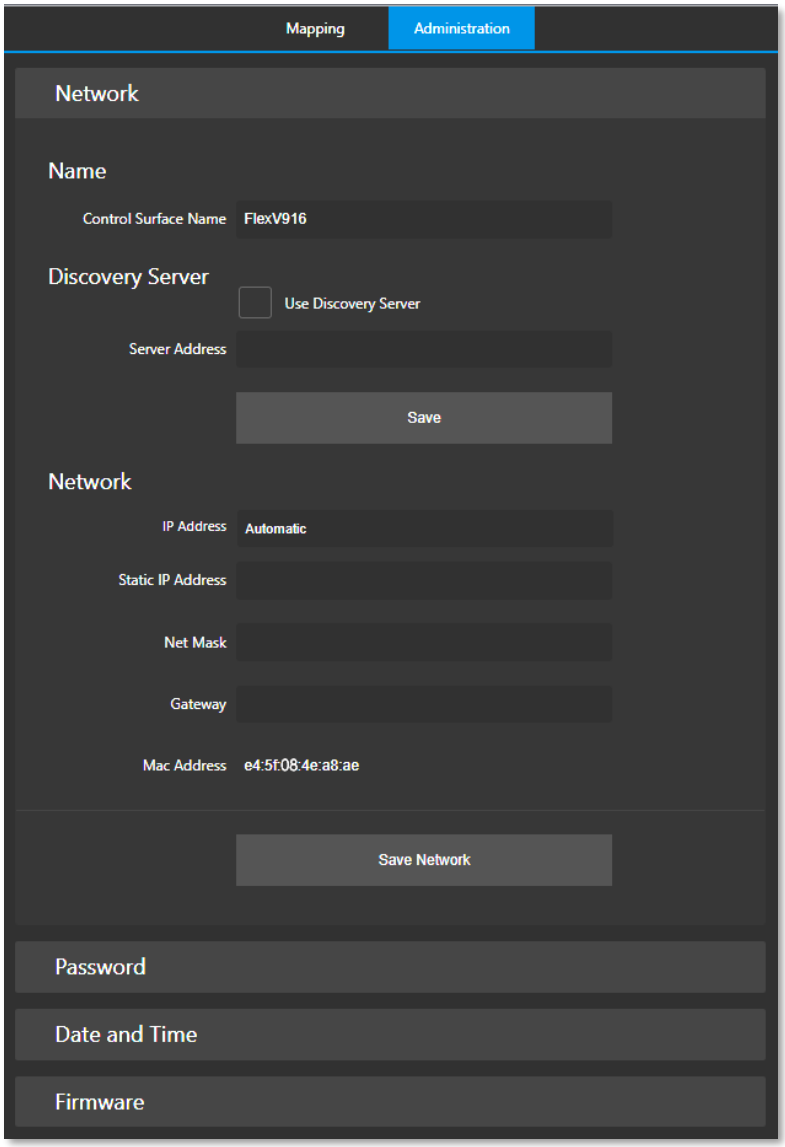

FIGURE 293

The *Administration* tab contains all necessary network settings, divided into groups nested under collapsible 'accordion' widgets. The *Control Panel Name* field initially shows your unit's Serial Number, but you can replace this a name of your choosing (the serial number remains visible at the top of the TriCaster Flex webpage).

To connect via an NDI Discovery server, checkmark the *Use Discover Server* simply box, and add your server's IP address in the provided field. Additional *Network* settings, such as *IP Address*, *Static IP Address*, *Net Mask*, *Gateway*, and *Mac Address* are provided in this control group, too.

NOTE: If no DHCP server is detected when FLEX is connected, it automatically fails over to a default static IP address. After a restart, Flex will attempt to search for DHCP again.

Change the IP Address Mode in the Network setting group to supply a 'permanent' static IP address if this is needed. Click the button below to *Save Network*. A pop-up message will appear to confirm network changes.

PASSWORD

Expand the *Password* control group to enter the password of your choice (twice). Click *Update Password* to confirm your choice.



FIGURE 294

DATE AND TIME

The *Date and Time* controls allow you to chose from several different methods for setting the date and time, using the combo box widget. Click on the *Set Date* drop-down menu to choose between *Automatically*, *Using NIST Time Server,* or *Manually*.:

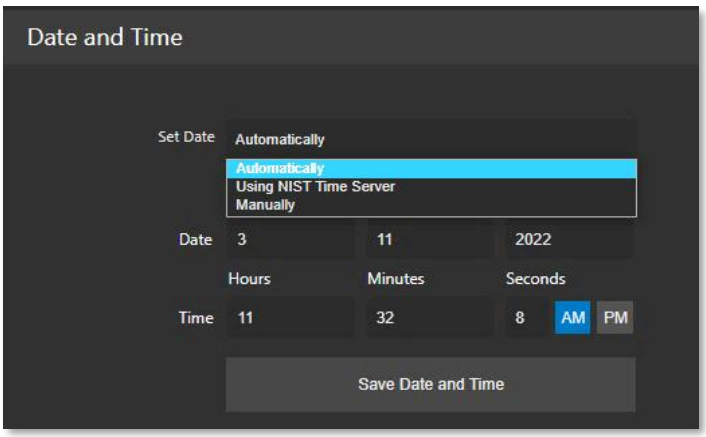

FIGURE 295

The default option is *Automatically,* will allow the system to set the time. Be sure to click *Save Date and Time*.

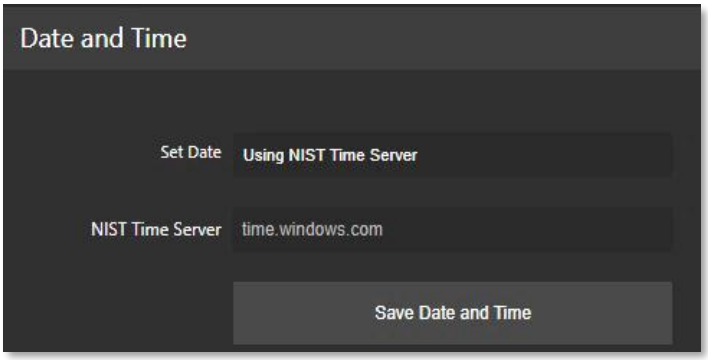

FIGURE 296

Using NIST Time Server uses the complex suite of algorithms that is defined in the NTP (Network Time Protocol) specifications to ensure that clocks on computers throughout a network are as accurate as possible. Once complete, click *Save Date and Time.*

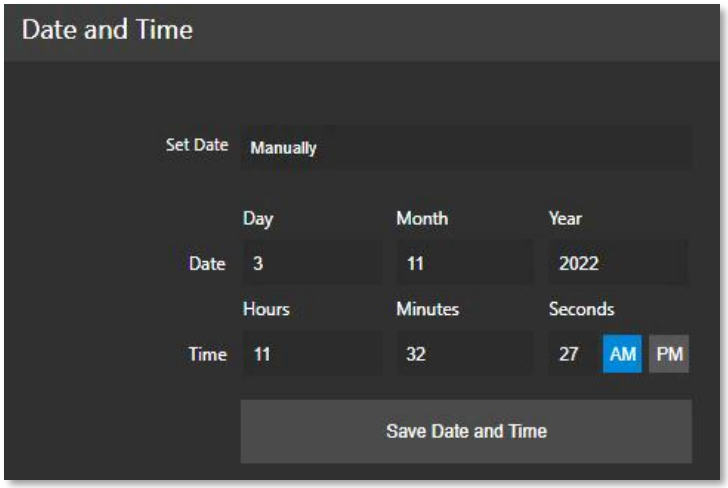

FIGURE 297

A *Manual* option is offered for those who need it. Once completing your entry, click *Save Date and Time.*

FIRMWARE

In the *Firmware* panel, the *Current Firmware Version* is displayed with options to *Choose Firmware File* and *Update Firmware* as discussed in Section 21.3.1, under Latest Versions.

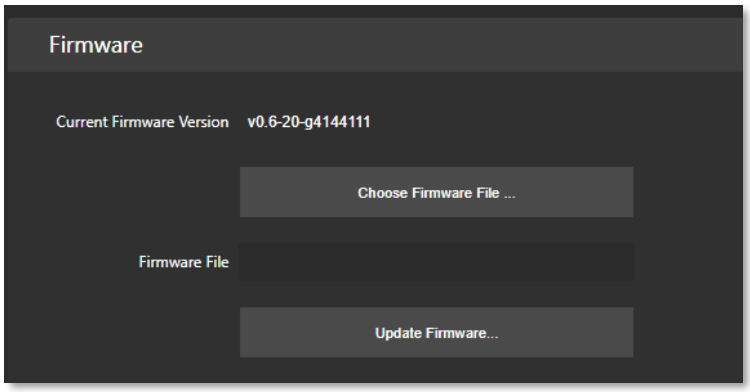

FIGURE 298

21.3.3 MAPPING TAB

The *Button Mapping* configuration panel displays a graphic of the Control Panel you are editing. The *Bank* buttons let you to determine which sources are in which button bank. Choose the button map appropriate for the Product you wish to control using the menu at the top of the page.

The number of banks shown on the webpage reflects the product you select. For example, Figure 299 illustrates the web interface when you chose "TC Mini X/ Mini 4K/ TC 410+"; this option provides controls for mapping *Bank 1* and *Bank 2*. Figure 300 displays the drop-down menu offering more options such as TC1, TC1 Pro and TC2Elite (see 21.3.5 Switcher for more information assigning *Banks*).

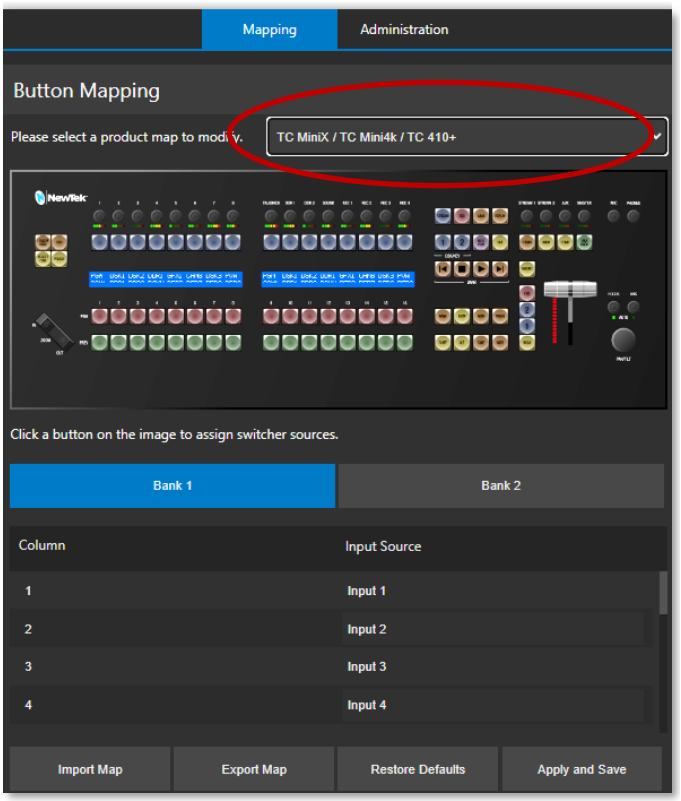

FIGURE 299

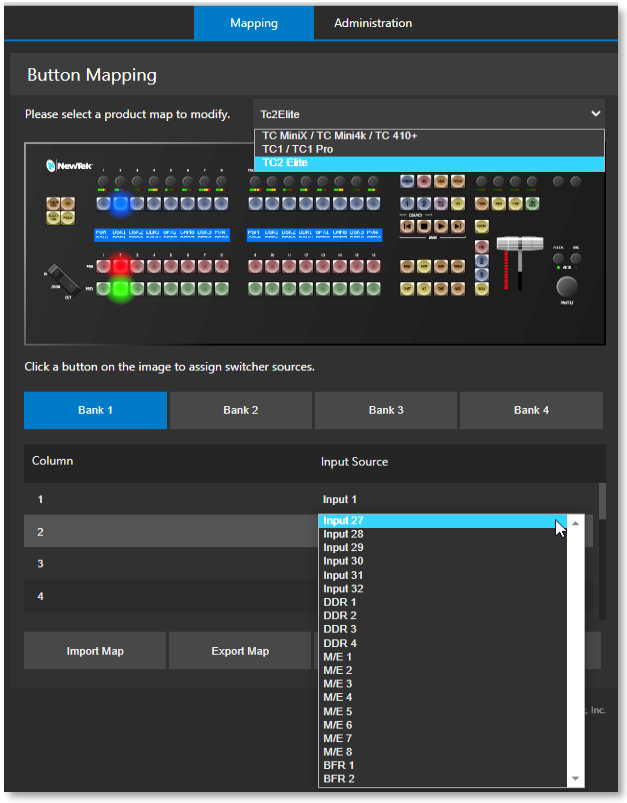

FIGURE 300

Clicking on the Input Source column will open all the available inputs to choose from to map your control panel as you wish (Figure 300). As you make your selections, the buttons light up on the graphic of the control panel in the UI. When done, click *Apply and Save;* a pop-up will appear to confirm success (Figure 301).

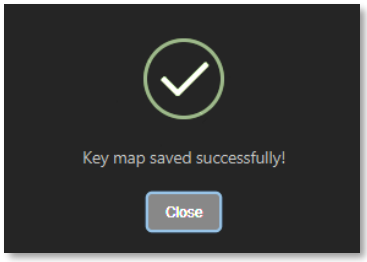

FIGURE 301

Note: If the Control panel is connected to a TriCaster when Apply and Save is clicked, the control panel must reconnect. Afterward, the control panel will automatically load the Bank profile corresponding to the model connected.

Import/Export Map and *Restore Defaults* buttons perform just as you would expect by importing/exporting map configurations and resetting to default. In this manner, you can easily switch between mapping configurations you have prepared in advance and stored for different productions or other purposes.

If you prefer to *Restore Defaults*, you will receive a confirmation message (Figure 302) stating the restore was successful. After clicking *Apply and Save* your TriCaster Flex will restart with the new mappings applied.

Hint: Clicking the Mapping Tab's Restore Defaults button will restore the working configuration for the key map currently displayed on the Webpage - only.

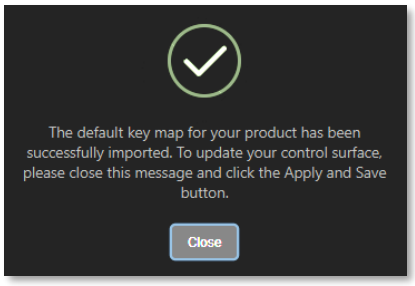

FIGURE 302

21.3.4 CONTROL LAYOUT



FIGURE 303

The various control groups are organized into groups as the following:

1 – Switcher
2 – Display
3 – DSK/KEY Row
4 – Audio Connections
5 – Qualifier & Action Group
6 – Media Group
7 – T-Bar
8 – Mini Joystick, Focus and Iris
9 – Zoom/Joystick Delegates Group
10 – Zoom rocker

- Yellow buttons typically work as qualifiers and require another selection to do anything.
- Amber buttons are action buttons, and immediately perform an operation, setting or selection.
- Button illumination brightens when the button is pressed (or are in an On/Selected state).

DISPLAY

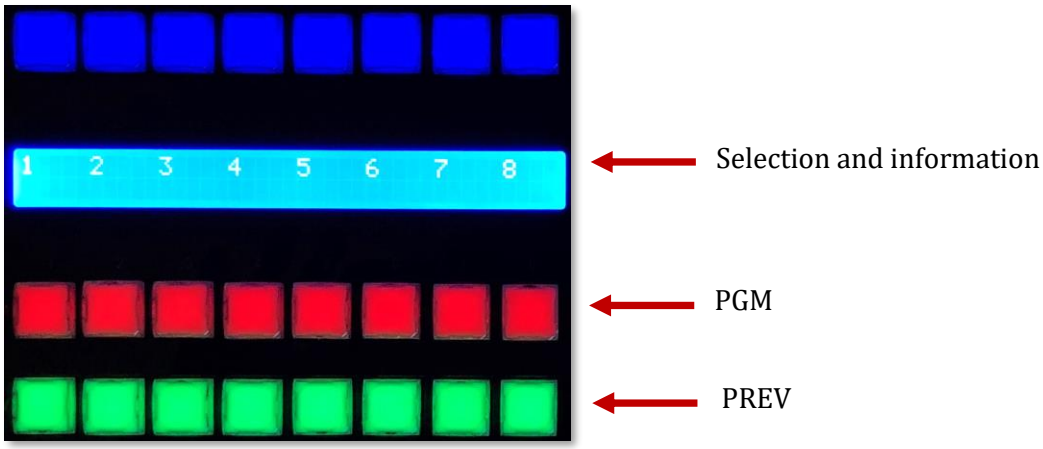

FIGURE 304

TC Flex control panel features helpful indicators and system feedback by means of illuminated displays.

- The blue LCD panel just below the *KEY* row shows labels identifying the source selection that would result from pressing a button in the same column.
- PGM/PREV – A/B row lighting color follows the UI colors for the delegated bus (Switcher or M/E).

21.3.5 SWITCHER

BANK

The *Switcher* crosspoints of TriCaster systems are organized in banks comprising between 8 and 32 columns (varies by model).



FIGURE 305

- Holding down BANK shows the opposite BANK in the LCD panel temporarily (on release, Flex reverts to the original Bank).
- Add SHIFT to cycle backwards.
- Double punch BANK to latches to the new Bank.

Hint: For models with 3 or 4 BANKS, double punching repeatedly to advance can be tedious. As an alternative, press ALT + BANK to pick a Bank directly using the Program row.

The default Switcher mapping by model is shown below:

TriCaster Model	Bank 1	Bank 2	Bank 3	Bank 4
TC Mini X TC Mini 4K TC 410 Plus	Input 1-8, DDR 1-2, GFX 1-2, M/E 1-4	Buffer 1-15 BLACK		
TC1/ TC1 Pro	Input 1-8, DDR 1-2, GFX 1-2, M/E 1-4	Input 9-16, DDR 1-2, GFX 1-2, M/E 1-4	Buffer 1-15, BLACK	
TC2 Elite	Input 1-8, DDR 1-4, M/E 1-4	Input 9-16, DDR 1-4, M/E 5-8	Input 17-32	Buffer 1-15, BLACK

DSK/KEY

Pressing the DSK/KEY buttons, labeled 1 and 2, delegates or assigns the buttons in the 16-button *KEY* selection row to the left to the corresponding DSK/KEY layer(s) for the current bus (MAIN or M/E (1-n).

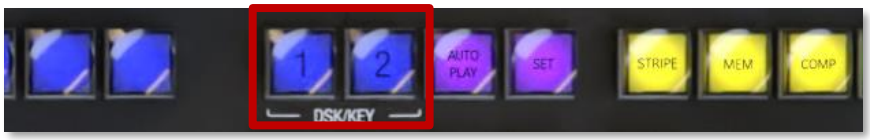

FIGURE 306

Row delegates for DSK/KEY 3 & 4:

- Press SHIFT + 1 to toggle DSK3/Key3 (the DSK 1 button pulses slowly when DSK 3 is delegated. If *both* DSK/KEY 1 and DSK/KEY 3 are delegated, the button pulses faster).

- Press SHIFT + 2 to toggle DSK4/Key4 (the DSK 2 button pulses slowly when DSK 4 is delegated. If *both* DSK/KEY 2 and DSK/KEY 4 are delegated, the button pulses faster).

STRIPE



Holding down the STRIPE button allows the Switcher and Transition control groups to be delegated to MAIN, M/E 1-n, (varies by model) or *Pre-Viz* using the LCD display and PGM row buttons.

FIGURE 307

MEM AND COMP



When the *MEM* button is held down, the first 9 columns in the displays update to list the names of *MEM*s for the bus(ses) delegated to the stripe. Punching a button in the selection row below a *MEM* name recalls the corresponding preset for the bus assigned to the stripe.

FIGURE 308

When the *COMP* button is held down, the first 16 columns in the display update to the list the names of COMPs for the delegated buss(es).

- To clear a MEM/COMP, press a button (1-16) in the DSK/KEY row.
- To recall a MEM/COMP, press a button (1-16) in the PGM/A row.
- To store (or update) a MEM/COMP, press a button (1-16) in the PREV/B row.

21.3.6 PTZ CONTROLS

Depending on the TriCaster model and feature set, PTZ (pan-tilt-zoom) style joystick operations are not limited to 'real' PTZ cameras. Static cameras, *Media Players*, and *Buffers* are among the different source types that may benefit from 'virtual PTZ' functionality.

The current Zoom/Joystick delegate state is fully independent of the Stripe Delegate (and is always based on either FOLLOW PREV or SOURCE).

FOLLOW PREV

Follow Preview is probably the most useful joystick delegate mode. You will likely not be surprised to learn that, when enabled (as is the default in new sessions), the Zoom/Joystick delegate state tracks your current PREV row selection.



FIGURE 309

SOURCE

This button is an alternative to *Follow Preview*.

- While SOURCE is pressed, the PGM row button for the current selection is lit (only sources in the current Bank are shown; change banks if necessary to access other sources).

- Naturally, pressing a different button delegates the Zoom/Joystick controls to control the new source.

LAYER



FIGURE 310

The LAYER button delegate modes let you further refine the target for your Zoom/Joystick operations.

Depending on the controlled source type, the LAYER display shows a list of controllable layer options. The layer list shown at any time varies both by selected source type and by product, but will be comprises of appropriate entries from those listed below:

- BKGD
- DSK 1
- DSK 2
- DSK 3
- DSK 4
- LAYER A
- LAYER B
- LAYER C
- LAYER D
- KEY 1
- KEY 2
- KEY 3
- KEY 4

NOTE: The Main DSK layers are not available when the Zoom/Joystick controls are delegated to a specific Switcher source by either the FOLLOW PREV or SOURCE buttons. To reveal these layer options for selection, first double-punch the Source button, then press the LAYER button.

PRESET



FIGURE 311

In addition to manually controlling the PTZ camera with the *Joystick*, of course, you will often want to store and recall *PTZ presets*.

- Hold down to list presets on the LCD at right.
  - To clear a preset, press (1-16) in the KEY row.
  - To recall a preset for the delegated source, press a button (1-16) in the PGM row.
  - To store (or update) a preset, press (1-16) in the PREV row.

ZOOM ROCKER

This control works as you'd expect: Zoom in and out by rocking forward and backward.

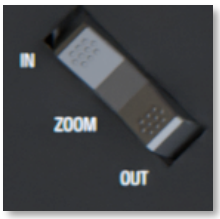

FIGURE 312

21.3.7 PAN/TILT



FIGURE 313

The Mini-joystick pans/tilts delegated PTZ Cameras/

FOCUS/IRIS KNOBS

These knobs sit to the right of the joystick, push to toggle auto-focus or auto-iris (exposure). The LED is lit when AUTO is enabled for FOCUS or IRIS.

21.3.8 TRANSITIONS

The Delegate buttons determine which players are governed by operations in this group. Multi-selection is supported.

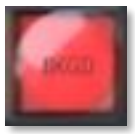

FIGURE 314

- Delegate buttons (BKGD, (DSK/KEY) 1, (DSK/KEY) 2. Press SHIFT with button 1 or 2 to delegate DSK/KEY 3 and 4, when supported.

Hint: Double-punch any delegate button to remove perform an AUTO on the corresponding layer. (To perform a TAKE instead, assign CUT as the layer's transition effect.)

FTB



FIGURE 315

To perform a *Fade to Black* operation, press *SHIFT* + the *FTB* button (the SHIFT button is required as a safety measure, since FTB is a somewhat dangerous operation). Revert to normal output by pressing *FTB* alone.

- SHIFT flashes if FTB is pressed without it.
- FTB pulses slowly while on.

FADE & TRANS



FIGURE 316

These two buttons provide a quick way to control the *Transition Bin* selection for the delegated switcher layer(s).

- Pushing *FADE* assigns Crossfade as the effect for the currently delegated layers.
- Push the *TRANS* button to activate the last-used (non-Fade) Transition effect to the currently delegated layers.

RATE



FIGURE 317

Press the RATE button and the LCD display will show SLOW - MEDIUM – FAST options for the effect assigned to the selected delegate(s); use PGM row buttons to select.

21.3.9 T-BAR

The T-Bar is perhaps the most recognizable component of a professional video control panel, and arguably one of the most important. The T-Bar can manually be pulled to modify the progress of a transition between delegated video layers. An LED in the nearby vertical row displays the percent of completion of the current effect.

- LEDs light progressively from top-to-bottom or bottom-to-top depending on the direction the T-Bar must travel to complete the currently delegated effect.



FIGURE 318

TAKE & AUTO

The *TAKE* and *AUTO* buttons perform a cut or transition respectively, affecting only the currently delegated video layers.

Hint: To quickly TAKE/ AUTO any individual layer, double punch its Layer Delegate button.

- Double-punch BKGD-> auto Background
- Double-punch 1 -> auto DSK 1
- Double-punch 2 -> auto DSK 2
- Shift + double-punch 1 -> auto DSK 3
- Shift + double-punch 2 -> auto DSK 4
- For an individual Take, set the layer's effect to CUT (effect bin slot 1)

21.3.10 AUDIO FEATURES

BACKPLANE CONNECTIONS



FIGURE 319

From left to right you will find ports for DISPLAY, 2 USB, and the ETHERNET port These are followed by line level inputs for TALKBACK, MIC, and PHONES (headphones). Lastly, two pairs of line level AUDIO IN and two pairs of AUDIO OUT connectors are provided.

VOLUME KNOBS



FIGURE 320

TriCaster Flex has taken audio features to the next level. In most control panels, operating the audio mixer requires you to access the UI in your live production system. A helpful new implementation of *Volume Knobs* on TriCaster Flex (at the very top of the control panel) give you fingertip access to control audio levels for *Audio Mixer* inputs and output busses as follows:

- IN 1-8
- TALKBACK
- DDR 1, 2
- SOUND
- REC 1-4

Hint: The LCD list other Switcher sources with recording enabled when you hold down REPLAY.

- STREAM 1, 2
- AUX
- MASTER
- MIC and PHONES
- MUTE/UNMUTE
- VU Meters (LED colors follow the UI meters, with the last (RED) LED reserved to indicate clipping).
- SOLO (For sources supporting Solo, press ALT and the associated Volume knob to toggle Solo mode).

In addition to adjusting the volume levels, push a *Volume Knob* to toggle mute/ unmute the channel. Record options have enable/ disable AGC (audio gain control) without having to go into the Output Configuration panel to make those changes.

TALK BACK

The button input labeled *TALK BACK* serves a special purpose, providing a way to converse with remote callers off-air (i.e., without intruding into your live program).

- *TALK BACK* is a PTT button (Push-to-Talk)
  - Hold it down to activate the *TALKBACK* feature, sending the audio source designated in the UI to all Mixer connections with *TALKBACK* capability.
  - Double-punch *TALK BACK* to lock it ON (the button will pulse light in this state).

21.3.11 STREAM, CAPTURE AND REPLAY

STREAM & RECORD

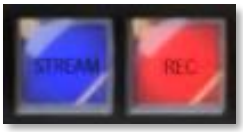

FIGURE 321

- *STREAM* - Push to enable or disable TriCaster's live streaming feature.
- *RECORD* - Pressing this button enables TriCaster's *Record* feature.

Note: As a safety measure, pressing the REC button when recording is underway does not stop recording. Instead, the SHIFT button flashes to reminds you that you must hold it down at the same time as pushing REC to end recording.

GRAB



FIGURE 322

GRAB is a qualifier button:

- Hold down GRAB and punch a PGM row button to grab the associated source.
- To grab from Mix 1-(4 or 8, varies by model), punch the corresponding numbered button in the PREV row.

REPLAY



FIGURE 323

Hold down REPLAY to list Instant Replay enabled sources by name on the LCD display.

- The LCD(s) will list the enabled *Switcher* sources starting from the left, followed by any recorders enabled in the *Record* tab in Output Configuration panel.
- Punch the PGM row button for the desired recorder source you wish to show on as an instant replay.

Note: Instant Replay uses the Show On feature of the DDR designated in the Replay Configuration menu. As such, the replay clip can be shown on PGM or an M/E, or even an M/E on PGM.

- Or defer playback of the instant replay as follows:
  - Add the replay clip to the DDR playlist without playing it by clicking the source's PREV B/D row button (with REPLAY held down).
  - When you're ready to trigger the instant replay, press SHIFT + AUTO to initiate the replay DDR's 'Show On' operation.
- In either case above (instant or deferred replay), double the length of the replay by double-punching the recorder's button.

MACRO

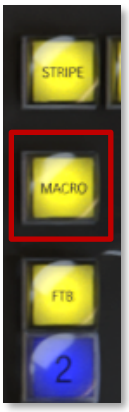

FIGURE 324

- On TriCaster's *Live Desktop*, open the *Macro Configuration Editor* (See Chapter 16 Macros and Automation).
- Select the macro you wish to assign in the onscreen lister.
- Click the mouse in the *Listen* field at bottom left.
- Hold down the *MACRO* button and press a suitable button on the control panel.

Hint: To clear an assigned macro from a button, while holding down MACRO, double-punch the button you wish to clear.

21.3.12 MEDIA PLAYER GROUP

This control group provides convenient control over TriCaster's most important Media Player functions and configuration options.



FIGURE 325

SET

Press to show (from right to left):



FIGURE 326

- MEM names for slots 1-12, LOOP, DDR 1-2, and Sound in the displays at left. (PGM row buttons light to show the current selections when SET is pressed).
- Punch a button in the PGM row at left to:
  - Delegate the MEDIA group controls to the media player specified.
  - Or to apply a MEM (1-10) to the currently delegated media player
  - Or to Toggle Loop mode

AUTO PLAY



FIGURE 327

Click button to toggle *Autoplay* mode for the delegated players (button is lit when Autoplay mode is on).

PLAY, STOP, PREV & NEXT



FIGURE 328

- PLAY - Push to initiate playback for delegated *Media Players*.
- STOP - Push once to end playback for delegated *Media Players*; push a second time to return to the start position. (This operation respects the *Single* setting for individual *Media Players)*
- PREV - Press this button to go to the previous playlist entry in delegated *Media Players.* (The selection cycles to the last playlist entry when necessary.)
- NEXT - Push this button to go to the next playlist entry in delegated *Media Players*. (The selection cycles to the first playlist entry when necessary.)

This control panel replaces earlier models designed primarily for use with TriCaster Mini models. The update brings label changes and adjustments to functionality to match the current software.

Hint: Older Mini panel models will also work with the new generation system and software but will follow the labeling scheme shown in Figure 329.

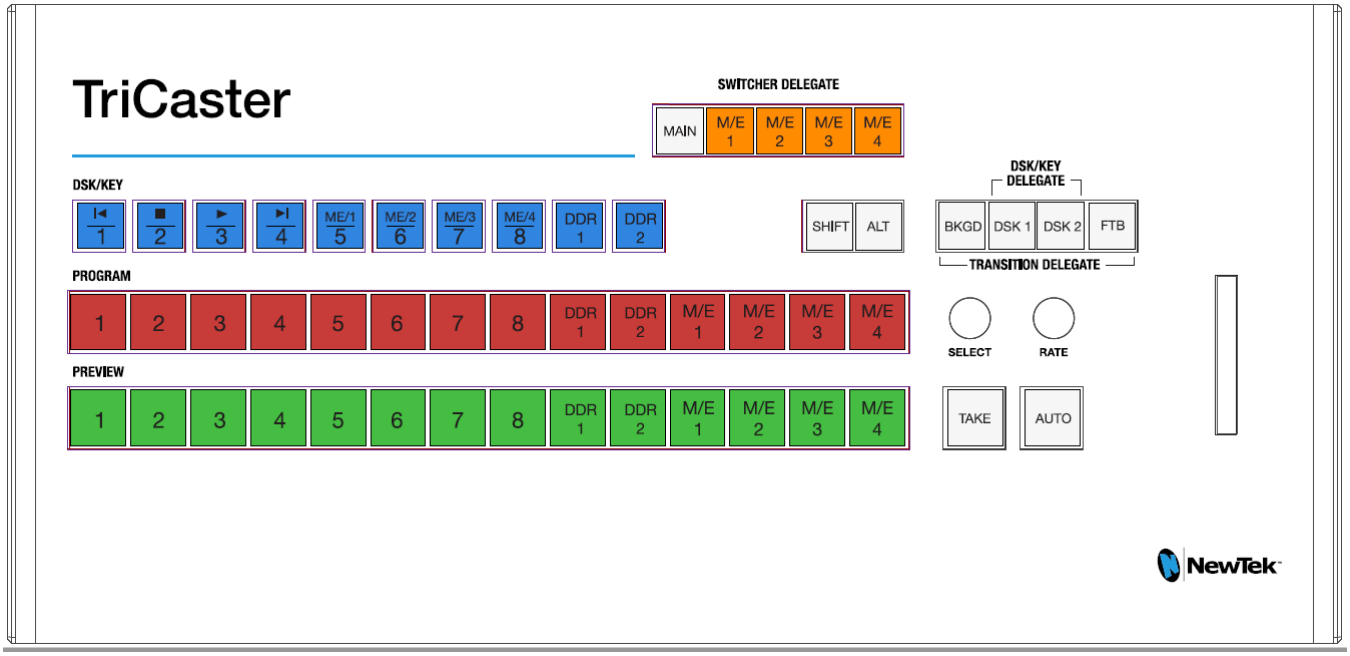

FIGURE 329

- When SHIFT is pressed, DSK/KEY row buttons execute their secondary function (shown above on the button label), as follows:
    - The first four DSK/KEY row buttons, when 'shifted', provide Media Player transport control.
    - To delegate these operations to a specific Media Player:
        - Hold SHIFT + ALT together, and punch DDR1 or DDR2 in the same row
    - The next four DSK/KEY row buttons, when 'shifted', select M/Es 1-4.

- Holding down ALT while making a PROGRAM, PREVIEW or DSK/KEY row selection addresses sources from the second *bank* of Switcher sources, in the order listed below:

BFR 1	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	M/E 1	M/E 2	M/E 3	M/E 4	BLACK



This chapter describes the functionality supplied by the TimeWarp control panels offered by NewTek, helping you to see how they deliver convenient replay and Media Player control to your production setup.

This chapter discusses the use of NewTek TimeWarp control panels (in two variants). Both models (TriCaster® 860TW and its predecessor, TW-42) add convenient slow motion instant replay to the already potent capability of your TriCaster system.



TriCaster 860TW has the same profile as TriCaster 460 CS and TriCaster 860 CS. Of course, it delivers the same precise control over TriCaster's instant replay recording and live playback when used alone. The TW-42 model, though designed for use with earlier TriCasters, continues to provide great functionality.

For the most part, both TimeWarp models have similar controls, with similar labels, and perform in much the same manner. For that reason, in the discussion which follows we will focus on the newer TriCaster 860TW, simply giving you a friendly heads-up whenever we discuss an item where TW-42 varies from its newer sibling.

TW-42 NOTES Wherever items of special interest to TW-42 users appear in this chapter, they will be flagged in the same manner as this paragraph.

21.5.1 22.5.1 CONFIGURING TRICASTER

1. Connect a suitable video source to a camera input on your TriCaster live production system.
2. Select that source on the Switcher's *Program* row.
3. Open TriCaster's *Record Configuration* panel and set the Primary Source (typically to the Program option).
4. Select a suitable encoding format for the captured files.
5. Use the *Add to* menu in the *Primary Recording* controls to assign the recorded clips to either DDR 1 or 2.

21.5.2 OVERVIEW

TriCaster 860 TW is quite straightforward to use, especially true if you are already familiar with common TriCaster controls and features. In this section, we'll discuss each part of the control panel, explaining how the various controls operate and what effect they have, revealing a few little tricks that you may find helpful along the way.

TimeWarp provides convenient control over two Media Player's as well as the recording of sources configured for capture.

For convenience, related controls and buttons are grouped together on the control panel. We will discuss the features and operations supported by each group in the pages that follow. The layout includes the control groups listed below (as shown in Figure 330).

- DDR Delegates
- Edit group (modify playlist content)
- Play Speed (T-bar and presets)
- Mark (replay clip creation buttons)
- ALT and Qualifiers (which modify the operation of other controls)
- Record toggle
- DDR options
- Preset (DDR Playlist)
- DDR Transport (clip playback and position controls)



FIGURE 330

Let us take a closer look at the members of each control group and their purpose.

21.5.3 DDR DELEGATE



FIGURE 331

Much of the functionality of your TriCaster 850 TW relates to clip playback, navigation, and the like. These are essentially *Media Player* functions, controlling one or another of TriCaster's *DDRs*.

The first two buttons in this group (*DDR 1* and *DDR 2*) basically delegate the other controls to the service of the *DDR* named (TriCaster 300 is, of course unique in having just one *DDR*).

Note: These buttons only relate to TriCaster 850 TW operations, and do not interact with the Switcher (or TriCaster 855 CS) delegate buttons.

The third button in this group button is *not* a delegate button (nor is it a radio button). The *DDR 1/DDR 2* button is a toggle switch. When enabled, it tells the control panel to apply *DDR Transport* control group operations to both DDRs (see 21.5.11).

The DDR 1 and DDR 2 buttons are 'radio button' controls. This means that they operate just like the 'Favorite' buttons provided on a car radio to let you jump to a preset station.

Pressing a button produces an immediate change of state, and your selections are mutually exclusive.

TW-42 NOTES There is no corresponding *DDR 1/DDR 2* button on TW-42. Multi-delegating DDRs is not supported with this control panel.

21.5.4 EDIT GROUP



In general, these buttons operate on selected playlist content in the currently delegated *DDR* (see 21.5.3).

- *Remove* – Push to remove currently selected entries from the delegated *DDR*'s playlist (selected items are not deleted from the hard drive, however).

TW-42 NOTES The *Remove* button is labeled *RMV* on TW-42.

FIGURE 332

- *Copy* – Push to copy currently selected playlist items into the Paste buffer.
- *Paste* – Push to insert Paste buffer content into the playlist of the delegated DDR
- *Esc* – close any popup dialog or text entry item.

Hint: These four buttons are also 'action buttons' – that is, pushing one of them has an immediate effect (but unlike a radio button, the operation is complete on release, and does not remain in force).

TW-42 NOTES There are no *Copy, Paste or Esc* buttons on TW-42.

21.5.5 PLAY SPEED



FIGURE 333

As you would expect, the speed preset buttons in this group (marked *25%, 33%, 50%, 75%* and *100%)* govern the playback rate of the active *DDR*.

Speed preset buttons are mutually exclusive and establish a playback *mode.* They do not initiate playback; rather, the playback speed you choose is applied when subsequently press *Play*.

(If a *DDR* is already playing, pushing a speed preset button alters the current playback speed immediately.)

Hint: If you use an onscreen speed control to change to a new playback speed, the control panel button selection state follows when possible (in cases where no button corresponds exactly to the newly established speed, no preset button will be illuminated).

The speed *T-Bar* works in similar fashion to the preset buttons but provides a smoothly variable approach to setting playback speed.

TW-42 NOTES There is no *Speed T-bar* on TW-42.

21.5.6 MARKING GROUP



FIGURE 334

The *IN* and *OUT* buttons in this group allow you to indicate the *In points* and O*ut points* for events you wish to record for later replay.



FIGURE 335

(MARK) IN

Pressing *IN* performs several related functions. First, remember that TriCaster must be in *Record* mode for any instant replay marking purpose.

For this reason, if you happen to push the *IN* button before enabling recording, it is enabled automatically (illuminating the interface Record button just as if you had pressed it on the screen).

With *Record* active, an *In Point* is set for the current clip that will eventually be stored (when you press *OUT*) in the currently delegated *DDR* (see 21.5.3 DDR Delegate).

Hint: Actually, the IN button can also be thought of as a 'reset In Point' function. Pressing it updates the In Point, discarding any incomplete clip (i.e., one for which an Out Point had not been set. The partially recorded data up to that time is simply dropped (and is not added to the DDR playlist).

ALT + IN

A *different* operation results when you hold down *ALT* (see 21.5.7) at the same time as you push *IN*. This operation updates the *In Point* of the active clip in the currently delegated *DDR* to the frame currently displayed.

TW-42 NOTES This feature is supported on TW-42 as well.

Hint: This represents a non-destructive edit of the playlist clip, equivalent to dragging the trim handle at the left-hand end of the DDR scrub bar.

(MARK) OUT

Pushing the *OUT* button likewise performs a short series of several actions:

- An Out point is assigned to the primary clip
- If the *Add to* switch is enabled in the *Record Configuration* panel, the clips is added to any targets configured in the associated destination menu (new clips are added to the end of the playlist)

Note: This is a non-destructive operation. Rather than actually chopping the file, recording continues without interruption, and an instance of the file is added to target playlists.

ALT + OUT

A *different* operation results when you hold down *ALT* (see 21.5.7) at the same time as you push *OUT*. This operation updates the *Out Point* of the active clip in the currently delegated *DDR* to the frame currently displayed.

Hint: This is a non-destructive edit of the playlist clip, equivalent to dragging the trim handle at right-hand end of the DDR scrub bar.

ONE BUTTON MARKING

Another handy method of creating clips for instant replay is referred to as 'one button marking'. With *Record* enabled, watch for notable events, and simply press *OUT* whenever one occurs (no need to press *IN* beforehand in this case). This creates a new clip with an *Out Point* at the current frame, automatically setting the *In Point* to achieve the *Duration* set in the *Record Configuration > Replay tab*.

21.5.7 ALT AND QUALIFIERS



FIGURE 336

For ergonomic reasons**,** *ALT* is in a special location by itself just below the *Play Speed* control group. It, along with *SHIFT* and *CTRL* (Control) are what are termed 'qualifiers buttons', in that (like their keyboard equivalents) they qualify or modify the outcome of operating some other control.

We have discussed one use of *ALT* in 21.5.6; see also 21.5.8. At the time of writing *SHIFT* and *CTRL* are reserved for as yet unspecified future purposes.

21.5.8 RECORD



FIGURE 337

It's probably no surprise at all that pressing the *REC* (Record) button enables TriCaster's own *Record* feature. It's worth mentioning though, that *REC* is not a simple toggle button (as it is on the user interface). Simply pressing *REC* again does *not* turn *Record* off.

Recording is such an important function; we are sure you agree you don't want anyone to be able to accidentally disable it.

For this reason, you must use *ALT + REC* (hold down *ALT* while pushing *REC*) to turn recording off. This makes disabling recording a very deliberate operation, and not one that is at all likely to have been unintentional (as perhaps by some hapless passerby coming in contact with the control panel while looking over your shoulder).

TW-42 NOTES There is no *REC* button on TW-42. Even so, pushing the *Replay* In button will automatically enable *Record*.

Also, you can add a five second clip from the Primary record source to all current Add to targets by pressing *SHIFT + REC*.

21.5.9 DDR OPTIONS



FIGURE 338

The *LOOP*, *SINGLE* and *AUTOPLAY* buttons toggle their namesake features for the currently delegated *DDR*.

TW-42 NOTES There is no *Loop* or *Autoplay* button on TW-42. While there is no *Single* button either, TW-42's *Sel* (Select) and *List* buttons turn *Single* mode on and off for the current *DDR*.

21.5.10 PRESET (DDR PLAYLIST)

"P" is for "preset" … or "playlist" if you prefer. However, you choose to view it, the buttons labeled *P1 – P4* allow you to quickly access any of the first four *playlist presets* for the currently selected *DDR*.

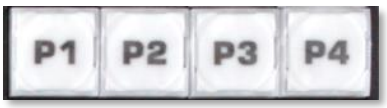

FIGURE 339

TW-42 NOTES Preset selection is not supported by TW-42.

21.5.11 TRANSPORT (CLIP CONTROLS)



FIGURE 340

This group of controls provides a variety of convenient clip transport and navigation tools. The dominant feature is a large, smoothly operating *Jog Wheel*.

This oversize knob permits you to traverse the current clip in the delegated *DDR* in frame-accurate increments.

The *Jog Wheel* can be a real boon when coupled with the *ALT + IN/OUT* method of trimming already captured clips (21.5.6), or can allow you to review an event by scrubbing through it manually even while it is displayed live.

The *Jog Wheel* is supplemented by the nearby *Fast Jog* button. Press this control to toggle a high-speed jog mode, which skims through the clip at eight times the normal rate.

TW-42 NOTES The *Jog* wheel on TW-42 works similarly but is augmented by an outer *Shuttle* ring that can be used to move quickly through a clip or playlist.

The other buttons in this control group are labeled with familiar VCR-style icons, and work as follows:

- *Previous (Clip)* – Push to highlight the prior clip in the playlist of the delegated DDR.
- *Stop*
  - Push to end playback at the current frame.
  - When already stopped, push again to go to the first frame of the current clip (or playlist, when *Single* mode is off for the *DDR*).
  - Push *Alt + Stop* during playback to jump to the end of the current clip.
- *Play* – Push to play the current clip in delegated DDR, beginning at the current frame.
- *Next (Clip)* – highlights the next clip in the playlist of the delegated DDR.

TW-42 NOTES

- Press *ALT + Next* to jump the play head 1 sec. forward from its current position in the clip.
- Press *Alt + Prev* to jump the play head 1 sec. back from its current position in the clip.

21.5.12 TIPS AND TRICKS

- *Multi-angle capture* – TriCaster's IsoCorder technology supports multi-source capture. Although TimeWarp initially adds and controls the *first* recording channel to the designated DDR, the clip context menu in the DDR playlist allows you to selectively display concurrent angles.

- *Audio Control* – Remember that you can reduce (or *Mute*) the audio for replays individually using the local playlist pane audio controls in a *DDR*, or with the *DDR* level controls provided in TriCaster's *Audio* tab(s).

- *DSKs* and *LiveSets* - TriCaster provides a great deal of creative versatility in connection with instant replays. For example, a *DDR* with replay clips that is assigned to the *Overlay* channel of an *M/E* can be quickly displayed or hidden (with its own transition effect). And, of course, something similar can be achieved with *DSK* layers. Or you could use a double-box LiveSet to show a replay alongside on-camera commentators.

- *Clip Organization* – It can be helpful, at times, to use the *MEM slot* options in the *DDR* to collate clips for different purposes.

PART IV (APPENDICES)

Certain topics which benefit from in-depth coverage are in this section, along with cross-references and concluding with a keyword index; Appendix F: lists all shortcut keys.

APPENDIX A: PREMIUM ACCESS FEATURES



NewTek's optional Premium Access program is your 'backstage pass' to the latest power user tools and features from NewTek's industry–leading developers. The benefits of membership are already substantial and, best of all, will continue to accrue as further innovations are added to super-charge your workflow and take your productions to new heights of visual excellence

A.1 INTRODUCTION

Currently available for TriCaster® TC1 and TriCaster Mini X owners, membership in the Premium Access program gives you unlimited access to a growing list of cutting-edge tools and technology. Let's consider them one by one beginning with one of the most exciting developments of all.

A.2 LIVE STORY CREATOR

This powerful advanced feature delivers numerous and powerful benefits. At the lowest level, you might use it simply as a very convenient and useful teleprompter for your show's talent. Coupled with the NDI Studio Monitor included in the free NDI Tools bundle, this is a great feature. There is a great deal more to Live Story Creator, however: Live Story is first and foremost a powerful natural language automation system.

OVERVIEW

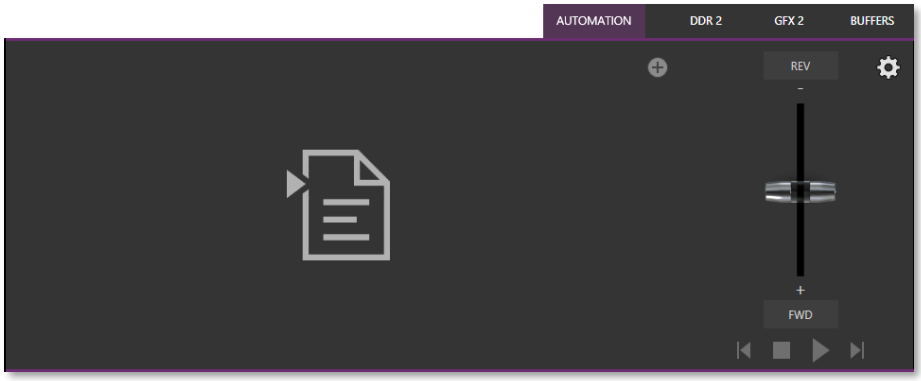

FIGURE 341

When you first open the new *Automation* tab, located at right below the main *Switcher* (near *Buffers*), you'll see the empty script pane and some (rather lonely looking) controls at right (Figure 341)

Click or tap the (+) plus sign gadget below and to the right of the tab to open a *File Explorer*. Here you can navigate to a location where you have previously stored a .docx file such as those created in Microsoft Word (or compatible software with similar features). Figure 342 illustrates the result. Let's discuss a few of the Live Story interface controls and features before continuing.

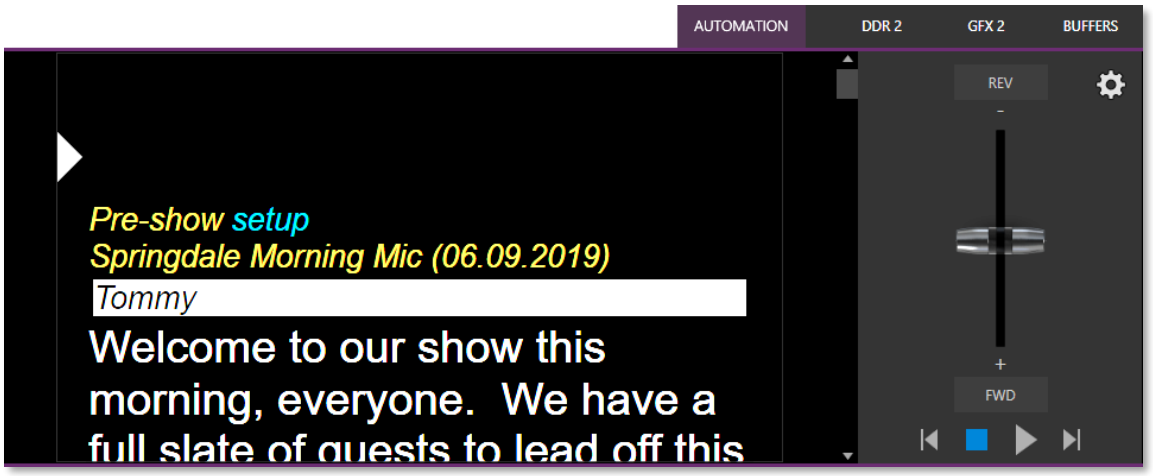

FIGURE 342

Examining the tabbed Live Story panel from left to right, you'll see:

- An (x) gadget at upper left. Click this to unload the current script (.docx file).
- The eyeline control is a white caret (triangle) control that can be dragged up and down to adjust the position of the similar eyeline indicator on a teleprompter display.
- The script pane, or canvas, displays the content of the .docx document, as interpreted by Live Story.
    - Colors and font styles have special meaning:
        - Generally, text shown as yellow and italicized is not meant to be read aloud.

          For example, in the image above, the first line ("Pre-show setup") is used to issue a command to TriCaster to place Black on output before the show begins. The line has Word's *Subtitle* style applied to it, indicating it is not intended to be read aloud. Live Story shows this in yellow italics.

          You'll notice though, that the word "setup" is blue in the script pane, despite also being in *Subtitle* style in the document. This is because the command we inserted to cause black to be shown on output is in a comment applied to this word in the document.

          Blue identifies commented text in the document, and comments can be used to issue commands (we'll discuss all of this in more depth shortly).

          Hint: Move the mouse pointer over blue text in the script pane to see a tooltip showing how Live Story Creator has interpreted your comment.

          Notice that the show's title ("Springdale Morning Mic") is displayed in yellow, too. Live Story recognized this as the SHOW TITLE because the *Title* style is applied to this text in the document.

- Document styles can trigger corresponding actions, too. For example, the *Title* style can automatically display a specially prepared LiveGraphic™ animation to introduce your show – all without any manual intervention.

Note: The SHOW TITLE animations require the latest LiveGraphics content to be installed. The Broadcast templates in the updated content include a special Show Open preset specially prepared for this purpose.

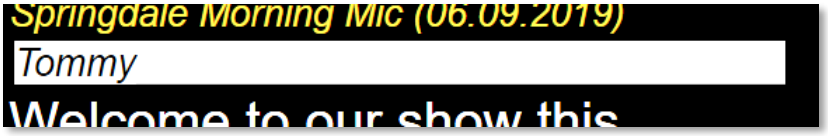

FIGURE 343

- In similar fashion, the document style *Heading 3* denotes a CUE, used to introduce someone who will be speaking next. CUEs are show in inverted color, black text on a white background (Figure 343).

  Like the *Title Style*, CUEs can also automatically trigger TriCaster operations. For example, if a *Switcher* input name matches a name in the CUE, that source will be placed on output, and a title identifying the newly introduced talent will be shown. (After a few moments, the title is automatically removed.)

- Text meant to be read aloud is shown in a large white typeface.



FIGURE 344

- Live Story's operating controls are located in a small panel just right of the script pane (Figure 344).

  This *Control Panel* is dominated by a vertical *Speed* control. You can modify the scroll rate during playback or traverse the script backward or forward by dragging the *Speed* bar up or down.

  Transport controls below the *Speed* bar include *Stop* and *Play*, as well as *Previous* and *Next Segment* buttons.

Hint: Divide your show into different segments identified by applying the Heading 2 style to lines in your .docx file.

- Click the familiar gear gadget in the upper-right corner of the *Control Panel* to open Live Story's configuration panel (Figure 345).

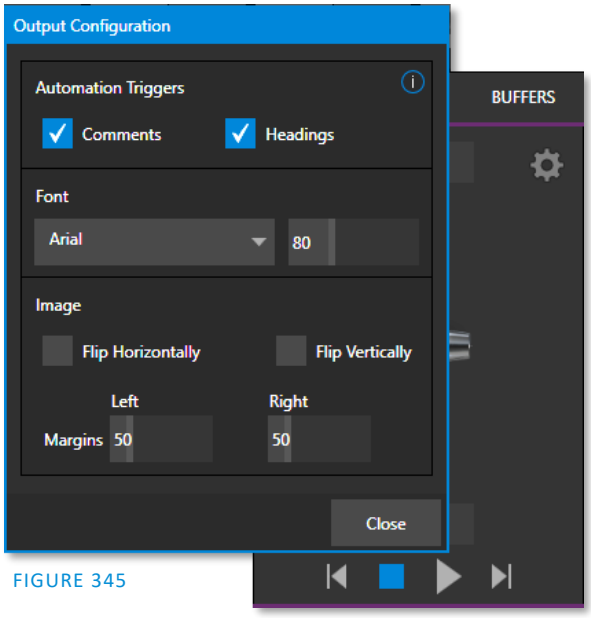

FIGURE 345

- The two switches in the *Automation Triggers* toggle automation in response to *Comments* or *Headings* (styles) applied in the .docx document.

  When both switches are off, Live Story does not process automation commands, and operates as a simple teleprompter.

- Font controls let you adjust text display for legibility when you are using an external teleprompter device.

- The *Flip* switches in the *Image* group likewise allow you to conform the teleprompter output to match your local devices, while the margin sliders let you move text confine teleprompter output to best suit your preference.

STYLE-BASED OPERATIONS

As discussed earlier, various styles applied in the .docx document serve different purposes in the Live Story Creator context, and some styles can even trigger automatic operation.

Document Style	Applies to	Displayed on output	Description	Sets value for DataLink key	DataLink Key Description
Title	Show Title	No	e.g., "State of the Union Address"	%SCRIPTShowTitle%	Main show title
Heading 1	Show Descriptor	No	Sets value for a DataLink key	%SCRIPTShowDescription%	Main show descriptor
Heading 2	Segment	No	e.g., "Intro Package", "Welcome Monologue"	%SCRIPTShowSegment%	Current show segment
Heading 3	Cue	Yes (inverse)	e.g., talent name: "Billy Bob"	%SCRIPTCueName%	Name of speaker

Subtitle	Information text	Yes (yellow, italics)	Displayed but not meant to be read (e.g., “walk behind desk”)	%SCRIPTInfo%	Current/Last information text
Normal	Body text	Yes (white)	Text to be read by on-air talent.	n/a	n/a

The following styles automatically trigger TriCaster operations when the *Headings* switch is enabled:

- **Title** – triggers automatic display of a *LiveGraphics* show opening title animation. This title uses the text from the *Title-style* line to populate the first line of the animated title and takes (hidden) text from a line entered using the *Heading 1* style for its second line (when used).

- **Heading 3** – identifies a *CUE*. When the *Headings* switch is enabled, a lower-third title is automatically displayed for a short duration when the eyeline reaches a CUE for the first time in a *segment*. The first line of the title shows the full *Switcher* input name set in *Input Configuration* for that source. The second line of the title is drawn from the (Input Configuration) *Comment* entry for the source.
  Hint: Titles as discussed above default to a pre-selected LiveGraphics title, and transition in and out automatically. To display a different title page, preload the desired title into Buffer 1 beforehand. This can be done using a command entered as a Comment in the docx file. You can also use Comments to change the title’s transition effect, display duration, and so on.)

COMMENT-BASED COMMANDS

While heading styles provide some useful automation possibilities, the use of *Comments* in the .docx file provide much more powerful and detailed options.

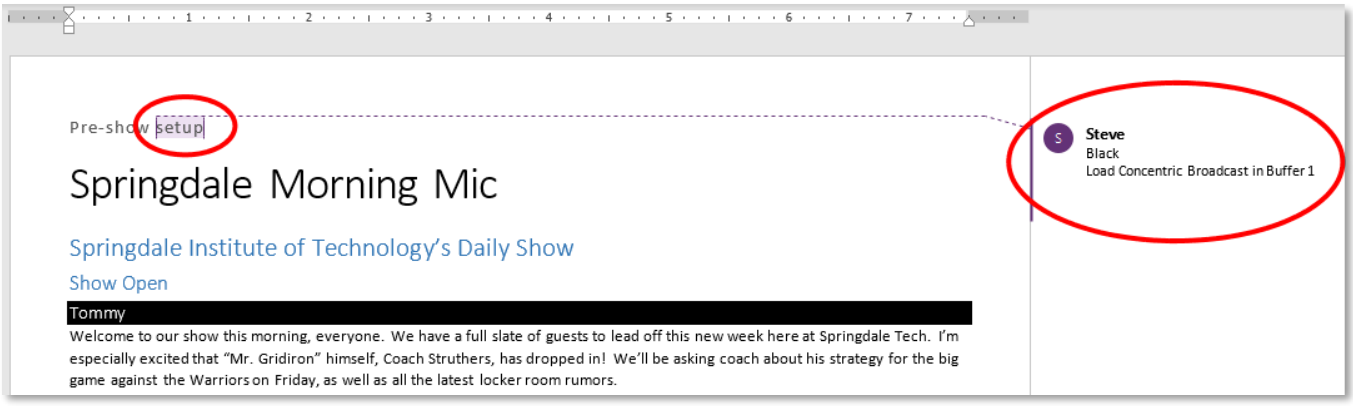

FIGURE 346

Note the *Comment* inserted into the text in the screenshot above. You’ll see that it has two lines. The first is simply “Black”, which tells TriCaster to select the input named “Black” on its *Program* row.

FUZZY LOGIC

Interestingly, the very same thing would occur if the command entered in the *Comment* had instead said "Show black", "Put black on program", "Send Black to Program", or "Output black". Live Story uses "fuzzy logic" to try to find the best match to your entry.

> *Note: Extraneous text is typically ignored so, for example, you could instead write "Put black on program while I have lunch" and still be successful (assuming your lunch was satisfactory).*

We mentioned earlier that you can move the mouse pointer over blue text in the script pane to see a tooltip showing how Live Story interprets your comment. It's helpful to know that Live Story determines the probability that the interpretation is correct. If the wording of a *Comment* entry is ambiguous, and could be interpreted differently, the text color in the script pane is red rather than blue.

> *Hint: If a comment has multiple lines in it, Live Story adds an asterisk to any ambiguous lines in the tooltip. The entry "Output black" would trigger this behavior, even though it is correctly interpreted, with the result that black is shown on output.*

LIVE STORY CREATOR VS. MACROS

Let's pause at this point to consider how Live Story commands differ from the somewhat similar shortcuts used by macros.

Like Live Story commands, a macro shortcut is entered on a single line, and may support arguments, or parameters. Macro shortcuts, however, require you to use very specific syntax. By contrast, though, Live Story commands are entered using 'natural language' – the way you might normally speak or write. A macro shortcut will generally fail with an error if your syntax isn't perfect, while, as mentioned previously, Live Story uses fuzzy logic to try to find the best match for your command, and only fails 'reluctantly'.

> *Hint: Live Story documents are evaluated on loading. When Live Story determines its evaluation of a specific command in a Comment could be incorrect, it posts a message to TriCaster's Notification panel to note the ambiguity, in addition to marking the commented text in red in the script pane.*

Additionally, a single *Comment command* can do things that would otherwise require multiple commands entered on separate lines in a macro. Consider for example, when Live Story encounters the simple *Comment* entry "fade tom slow", it results in the following steps:

1. Select an input named "Tom" (or "tom", or with a similar string, such as "Tommy" in the input Comment box) on the Switcher's *Preview* row.
2. Set the Switcher's *Background* transition effect to Fade
3. Set the effect speed to *Slow*
4. Perform an *Auto.*

To do something similar using a macro, you'd need to enter four separate lines, getting the syntax correct for each macro shortcut – and since macro commands require an input index parameter rather than a name, you'd need to know in advance which camera would be pointed at Tom. If Tom was moved to a different chair on your set at the last minute, the macro would need to be modified. Using Live Story Creator, you could simply rename the camera.

Better yet, continuing with the example above, if – rather than naming an input "Tom", you prepared a PTZ preset (or Pan and Scan preset, for a non-PTZ source) and named it "Tom", TriCaster would automatically select that preset at step 1 above.

Hint: Imagine what this means if you are using a few PTZ cameras to cover a city council meeting, with PTZ presets prepared for different participants. If two people change seats at the last minute, all you need to do is update the PTZ presets and Live Story Creator will take care of everything else for you!

So, not only are Live Story Comment commands easier to write, often performing multiple operations with a single entry, but they are 'smarter', and easier to maintain and update. Which brings us to another key feature.

Live Updates

As clever as Live Story is, at times you will want to experiment, or need to tweak your wording to bring about the result you intend. As we mentioned, you don't even need to press *Play* to test modifications, you can simply reload the .docx file and hover the mouse over commented text to see the way the embedded commands have been evaluated.

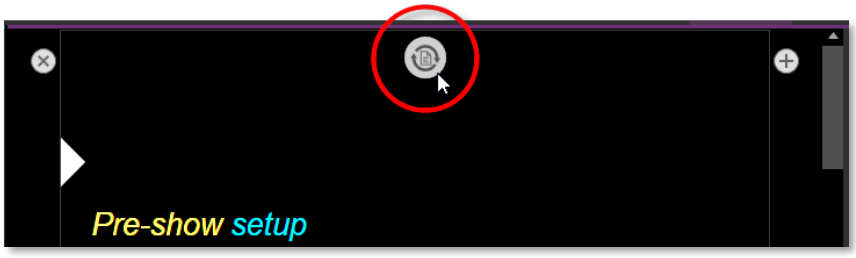

FIGURE 347

Making this exercise even better, Live Story Creator has a built-in *Update* feature, and monitors changes to the script file you loaded. Suppose you are using a laptop to edit your script in Microsoft Word. You might opt to save the file across a network connection to (for example) the shared Public\Documents folder on your TriCaster.

Then, when you modify the document and save it (which typically requires just a quick keyboard operation to perform - CTRL + s) Live Story will immediately show an *Update* icon at the top of the script pane (Figure 347). Click this to reload the .docx file with the changes you made.

Note: This will reset Live Story's eyeline indicator to the top of the script, so don't update when your talent is reading from the teleprompter you are quite confident that they will miss you with whatever they throw!

Default Behaviors

We mentioned that Live Story's *Comment commands* can perform compound operations and are simpler to use than macros. They are designed to provide a useful result even when you don't supply complete information. Let's look at an example.

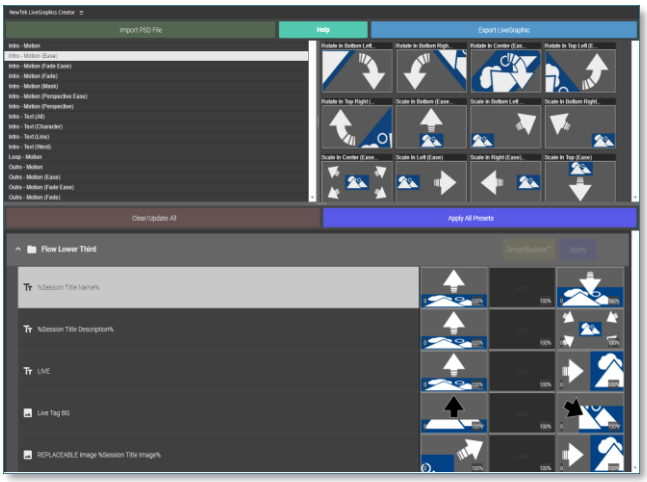

FIGURE 348



FIGURE 349

Figure 348 above illustrates the result of the *Comment command* "Fade Football Star on in PiP" (the simpler entry "PiP football star" would have produced the same result). We didn't supply much detail about our intentions, so Live Story produced a 'default' picture in picture effect, as shown.

But perhaps you want to make some changes. In Figure 349, we have edited the Comment command to read "PiP Football Star large top right". Since we defined the position of the overlay, and specified a size, we achieved a more pleasing result.

The *Comment command* "title" provides another example of default operation. Add the simple entry "title brackets lower third" to a comment. Live Story evaluates the comment when the *eyeline* indicator reaches it, and the predetermined defaults are used so you may not even need to add any more detail. The designated title page (Brackets Lower Third) is automatically i) loaded into a Buffer, ii) assigned to a DSK, iii) faded on, iv) held briefly, and then v) faded off).

In this example, you might kick things up just a bit by changing the effect used to introduce the title page. The *Comment command* "Show Title brackets lower third Edge LtoR(H)" works quite nicely for this purpose.

Hint: You might want a title to remain in view longer than the default time. To do this, add the word "hold" to the command you use to display the title. Then insert a new comment into your script at the point where you want to remove the title from view and enter the command "title off".

Try different things – you can change effect speed (Fast, Medium, Slow), specify the DSK to use, and so on.

More Comment Commands

We can't provide an exhaustive listing of every possible command and combination of options, but we'll identify the main TriCaster Advanced features Live Story currently supports and give some examples and a few alternatives that work just as well. The best way to learn is to just try typing in what you want to happen!

Audio Mixer

- "Set input 2 Volume to -5"; "volume input 2 5dB"; "input 2 9dB"; " Set volume for input 2 to -20"
- "volume master 5dB"; "Set Saster Volume to 5"; "set volume to 5"
- "mute"; "mute on" – mute master output

- “unmute”; “mute off” – unmute master output
- “mute out 2”; “mute out 2”; “mute aux 2”; “mute aux 2 on”; “aux 2 mute on” – mute named output
- “aux 2 mute on”; (etc.)
- “mute input 3”; “mute input 3 on” – mute the named input
- “mute input 3 off”
- “solo input 6”; “solo input 6 on” – solo the named input
- “solo input 6 off”
- “unsolo input 6”; “solo input 6 off” – disable solo for the named input
- “follow input 6”; “follow input 6 on” – solo the named input
- “follow input 6 off”
- “input 4 eq”; “input 4 eq on”; "input 4 enable equalizer”
- “input 4 eq off”; "input 4 disable equalizer”; (etc.)
- “input 5 compressor on”; "input 5 enable compressor”
- “input 5 compressor off”; " input 5 disable compressor”; (etc.)
- "AudioMemName”; "select AudioMemName"; "recall AudioMemName”; “mixer AudioMemName”; “audio AudioMemName”; audio select AudioMemName”; “audio recall AudioMemName”
- “audio select MEM 3”; “audio select 3”; “audio recall 3”; “audio recall mem 3”; “mixer select 3”; “mixer select mem 3”; “mixer recall 3”; “mixer recall mem 3”

COMPS

- “load MyComp”; “select MyComp”; “myComp” – loads the named main Switcher *Comp*.
- “comp 3”; “load Comp 3”; “select comp 3”; “go to comp 3”
- "m/e 1 comp 2"; "me1 comp 2"; "select comp 2"; "load main comp 2"; "go to myMEname myCompName"; (etc.) – loads the designated *Comp* into the main *Switcher* (default) or named *M/E*.
- “myComp medium”; ““myComp normal”; “myComp 1.0”; “go to myComp slow”; (etc.) – loads a Comp using the designated speed.

MEDIA PLAYERS

- “play lion”; “play lion on main”; “="take lion on me1"; "cut to lion on m/e 1"; (etc.) – locates, loads and plays a clip named “lion” on the main Switcher (default) or named M/E; performs an auto or take when playback ends. The scrolling of the script pauses until playback is complete.
- “circle(h) lion” works as above but uses a Circle wipe to display and remove the clip.
- “play lion ddr2” forces the operation to use DDR 2 (rather than selecting a default DDR)
- “add lion to ddr 2; “load lion ddr 2” – adds the clip without displaying it
- “play lion at 9 db";
- “play lion voiceover”; play lion vo” – the script continues to scroll during playback
- "play lion at 5 db”; "play lion 5db"; "lion 5 db”
- “DDR 1 stop”
- "DDR 1 Next"; "DDR 1 Previous"

DSKS

- “Toggle DSK 1”
- “toggle DSK 1 slow”
- “auto on dsk 2 slow”; “auto on M/E 2 key 2 slow”; “Fade M/E 2 keyer 1 slow”;
- "fast auto off dsk3"

- “Set main dsk 1 as input 1”; “Set input 1 on main dsk 1”; “set DSK 1 to GFX 1"; “set M/E 1 Keyer 1 to GFX 1"; "assign GFX 1 to Me2 key 2"; (etc.)
- “Play lion in dsk2”; “Play lion on dsk2”; “Show lion in dsk2” – plays a clip named lion in DSK2, fading on and holding the last frame.
- “Play lion on key 2 in M/E 1 with slow circle(h)” – as above but uses a slow Circle wipe in M/E 1.
- “Show lion on dsk 3 with fast auto"; “Show lion on dsk 3 with take"
- “set main DSK 3 transition to circle(h)”; set circle(h) Me2 key 1"; "change transition on me4 for key 2 to circle(h)"; (etc.)
- (etc.)

See also dedicated PiP (Picture in Picture) commands)

BUFFERS

- “Add globe to buffer 6”; “buffer 6 load globe” – loads the Globe *Frame Buffer Animation* effect to the target buffer
- “Add Hexagon lower third to buffer 6” – loads the named static title page into the target buffer
- “buffer 3 load Hexagon Broadcast” - loads the named LiveGraphic into the target buffer
- “Buffer 1 set speed medium”
- “Buffer 1 speed 2”; “Buffer 1 set speed 2x”; “Buffer 6 globe 200%” – set speed to 2x the default (Medium).
- “set buffer 1 to layer preset 2"; “set buffer 1 to index 2"; “set buffer 1 to preset 2"; "buffer 1 select preset 2"; “buffer 1 preset 2"; select buffer 1 index 2 (etc.) – select the designated *Layer Preset* for a LiveGraphics title page loaded in the buffer slot specified.
- “set buffer 1 to data preset 2"; etc.– select the designated *Data Preset* for a LiveGraphics title page loaded in the buffer slot specified.

MACROS

Of course, at times you may want to run a more complex macro from within a script, using a *Comment command.* The commands below will let you do that.

- “*macroname*”; “macro *macroname*”; “run *macroname*”; “play macro *macroname*“; etc.
- “stop *macroname*”; “stop macro *macroname*”; macro *macroname* halt”; *macroname* end”; etc.
- “stop all macros”; “stop macros”; “halt macros”; etc.
- "Continue Paused Macro"

PIP (PICTURE IN PICTURE)

- “Input 5 pip”; “pip input 5”; “ots input 5” – assign input 5 to a default DSK and display it using default options
- "pip globe" – show the matching file (in the example, a Framebuffer Animation) using default PiP settings
- "pip globe center large"; "pip globe middle large"
- "pip me1 key 2 globe small bottom right”
- “pip input 5 large center” – assign input 5 to an unused DSK and display it large size at center screen
- “pip main dsk 3 input 5” – assign input 5 to DSK3 and display it using default options
- “pip me1 dsk 1 input 2” – assign input 2 to DSK1 in M/E 1, and display it using default options
- “pip input 5 fly in L” - – assign input 5 to an unused DSK and fly it in from left

- “fade pip off”; “ots off” – remove the default PiP from output using a fade effect
- “pip main dsk 2 off”– remove the PiP in DSK 2 from output
- "pip *myPtzPreset*” – recall the named PTZ preset and show that source in a PiP
- "pip dsk1 *myPtzPreset* “; "pip me1 key1 *myPtzPreset*"; "take pip *myPtzPreset* "; (etc.)

PTZ

- "*myPtzPreset* "; " *myPtzPreset* on program”; "put *myPtzPreset* on program"; "take *myPtzPreset* on program"; "select *myPtzPreset* on program”; "take to *myPtzPreset* “; (etc.) – locate a PTZ preset named “myPtzPreset” and display it on Program output.
- "put *myPtzPreset* on preview"; "select *myPtzPreset* on preview"; etc.
- " *myPtzPreset* on M/E 1 b row"; "me1 put *myPtzPreset* on b row"; "me1 select *myPtzPreset* on b row"; "set me1 b row to *myPtzPreset*"
- See also PiP-related PTZ preset commands.

Record, Grab

- "record"; "record on”; "recording on"; "start record"; "begin record"; "start recording"; etc.
- "record off"; "recording off"; "stop recording"; "end recording"; etc.
- “Grab still”

Stream

- "stream"; "stream on"; "streaming on"; "start stream"; "begin streaming"; etc.
- "stream off"; "streaming off"; "stop streaming"; "end stream"; etc.

Switcher

- “auto"; "transition" – perform a *Background* transition on the main *Switcher*
- “take”; “cut”
- “fade”; "crossfade"; fade slow; etc.
- "input 4”; "input 4 on program"; "put input 4 on program"
- “bob”; “take to Bob”; "take Bob on program"; “fade to Bob”– perform a *Background* (Take or Fade, respectively) transition to show a source (or PTZ preset) named “Bob” on the main *Switcher.*
- "input 4 on preview"; "put input 4 on preview"; "set preview to input4"; "input 4 on b row”; "set layer b to input 4"; etc.
- "me1 put input 4 on preview”; "set M/E 1 preview to input 4"; etc.
- "set M/E 1 b row to input 6"; "set me1 layer b to input 6"; "input 6 on me1 b row"; etc.
- “auto to input 4”; "transition to input 4" etc.
- “fast auto to input 4”; etc.
- “auto to input 4”; "transition to input 4" etc.
- “M/E 3 bob“; me3 auto to input 4”; "transition me3 to input 4"; etc.
- “ftb”; “fade to black”; “ftb off”; etc.

DSK

- "DSK1 Auto"; "dsk 1 perform auto"; etc.
- "dsk2 take"; etc.

DataLink

- “set datalink key myVar to I’m a Yankee Doodle Dandy”
- "datalink key myVar equals 12";” set datalink key myVar to value 12”; "set datalink myVar to 12"; “set myVar to 12”; “myVar equals 12”

Titles

- "Aero Broadcast"; "Title Aero Broadcast" – for a LiveGraphic title, sets the default layer preset (10), then transitions the designated title in a default buffer assigned to a default DSK, removing it after 8 seconds;
- "Aero Broadcast hold”; "title Aero Broadcast hold” – as above but does not automatically remove the title
- "title Aero Broadcast Fly In L medium"; etc. – as above using the designated transition and speed
- See also title-related commands listed in the Buffers subheading.

Aliases and Comments

You can use these *comment commands* to eliminate the need to pre-configure Switcher source names. Instead, you can set them right in the .docx script. This also allows you to change the metadata associated with a Switcher inputs at various points in your show as you wish.

- "Sam Smith is on input 4"; “assign input 4 to Sam Smith”; “set input 4 to Sam Smith” - set an alias for the designated input’s name value
  Hint: You’ll likely want to use the full name here, for use in connection with titling.

- "input 4's description is CEO of Megadyne Inc."; "Input 4 memo is CEO of Megadyne Inc."; etc. – sets the descriptor for the input, which is used as the value for the second line of default lower third titles

TELEPROMPTER OUTPUT

Even apart from all the foregoing (for example, if you disabled both the Comments and Headings support), Live Story Creator would still be very useful as a native teleprompter. Coupled with file watcher functionality to easily update your script right up to ‘air-time’, this feature saves setup time, expense, and provides exceptional output flexibility.

Control

We discussed Live Story’s onscreen teleprompter controls earlier in this section, but these primarily serve for use during setup.

For live use, most prefer a dedicated physical controller device, whether for use by the talent or another teleprompter operator in the studio. Live Story natively supports the ShuttleXpress USB controller by Contour Design Inc. (Figure 350).



FIGURE 350

You will find this device provides common teleprompter controls in an easy to use and affordable manner.

OUTPUT

To support a wide array of external teleprompter hardware, Live Story assigns the scrolling text output to the highest numbered Switcher output by default. You can then assign this signal to a video Mix output supplying a physical video output connector to feed an external device.

Of course, in an NDI® environment, you have other powerful options. TriCaster automatically supplies the teleprompter output to your network as an NDI stream, offering many display options. For example, the Studio Monitor application included with the free NDI Tools bundle can be used to display your teleprompter output on Windows® and OS X® platforms. Another option, (in a new session) Live Story assigns the highest numbered external Switcher source to the Teleprompter's NDI output, making the Teleprompter output available to Multiviews.

A.3 FORMAT INDEPENDENT PRODUCTION





Did you ever need to compose a double-wide, vertical, or square scene to fulfill projection systems, signage, or social media requirements?

Advanced Features and resolution-independent NDI make this all possible, providing precision aspect control at every stage of the process.

- Select from numerous non-traditional frame formats to work in when creating a session, including double-wide and many more
- Flip, rotate, scale, and crop individual inputs
- Flip, rotate, and choose the resolution for individual outputs
  You can even send left/right or quarter screen segments, and optionally enable automatically blended Overlap

SESSION OPTIONS

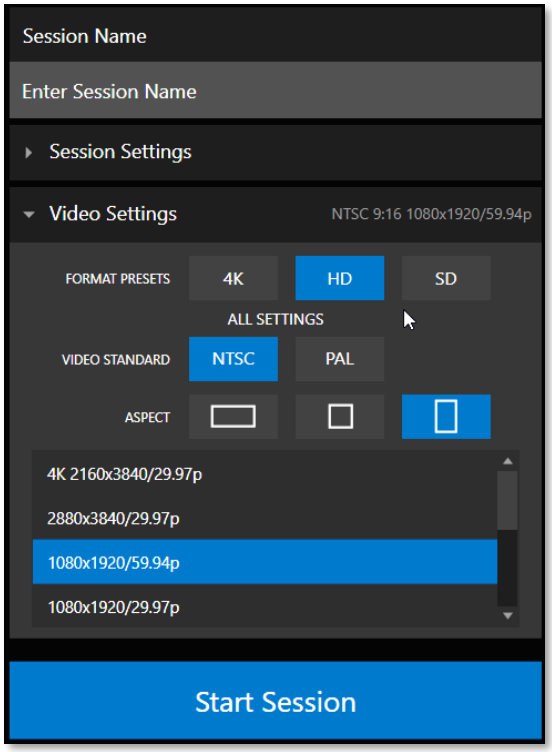

FIGURE 351

You'll first encounter these powerful features on the *Home* page of the *Launch screen*. Here you will notice a new group of buttons labeled *Aspect*, which allow you to choose between landscape (horizontal), square, or portrait (vertical) aspect modes.

In the Format selector, you will find that traditional video formats have been complemented by appropriate non-standard options including, for example, portrait aspect 1080x1920/59.94p and 1080x1920/29.97p options, and so on.

INPUT ROTATION

To complement non-traditional sessions and handle unusual *Switcher* sources (e.g., non-landscape mobile device output) each input now features a new *Rotate* menu, which also includes *Flip* options.

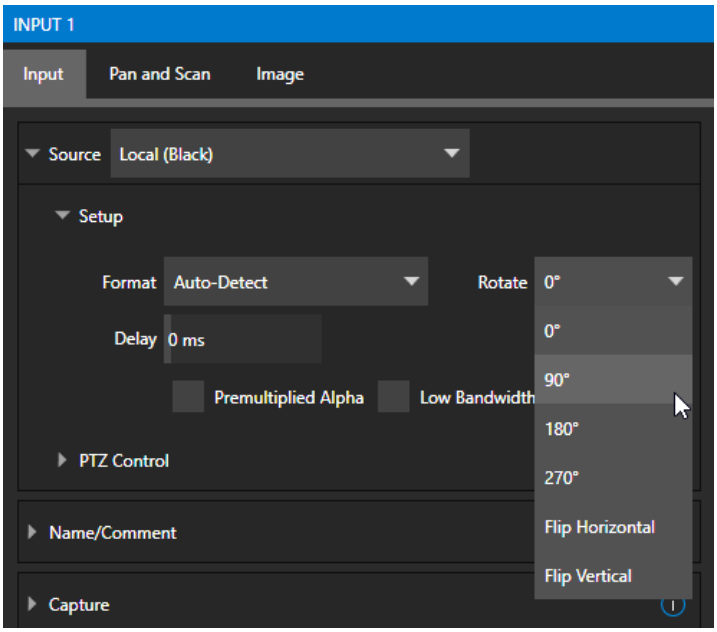

FIGURE 352

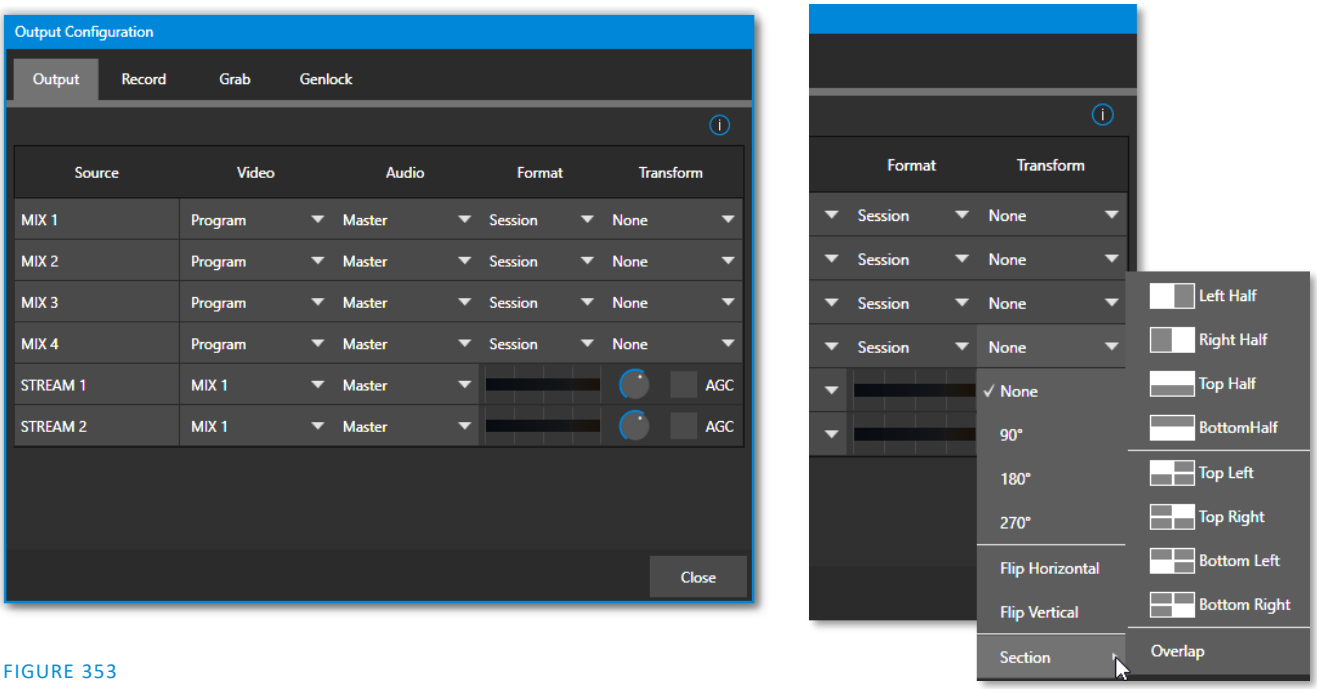

FIGURE 353

Extending these capabilities even further, all *Mix* outputs now support independent format selection, rotation, and flip control, as well as *Section* options.

A.4 LIVEGRAPHICS

LiveGraphics® represents a revolutionary approach to title and CG page creation, combining the power of the most complete production systems on the planet and the world's leading creative platform—Adobe® Creative Cloud®. Of all the Advanced Features benefits, LiveGraphics is the one of those most likely to dramatically elevate your productions in ways that grab the attention of your viewers.



FIGURE 354

LiveGraphics comprises several key elements: It includes an extensive set of professionally prepared animated title templates and the interface to control and update these in your NewTek live production system, but this is just the beginning.

Imagine designing animated titles, motion graphics, and looping effects using popular Adobe® Creative Cloud® tools—then importing them directly into your NewTek live production system, which will then allow you to both animate and update them dynamically.

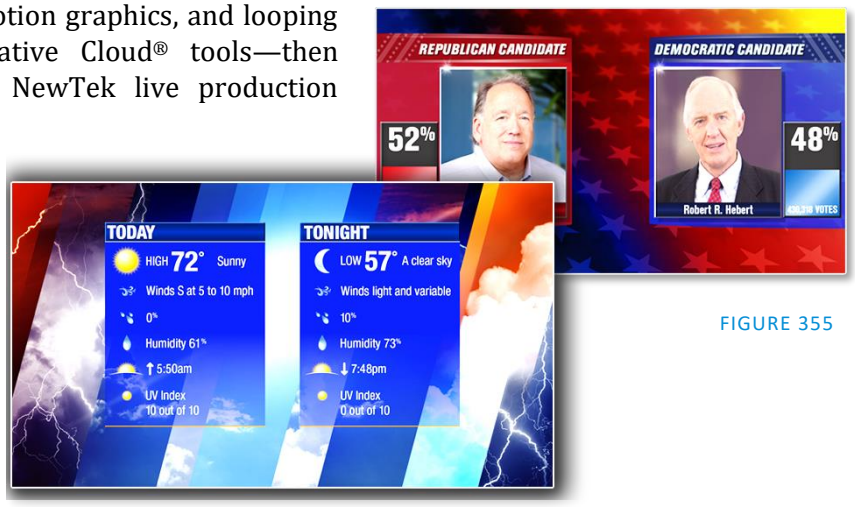

FIGURE 355

With the LiveGraphics Creator plugin to simplify authoring in After Effects® CC for users of all experience levels, enhanced real-time system functionality allowing powerful customization, playback, and even automation options, LiveGraphics lets you produce and present spectacular live graphics faster and easier than ever before.

Note: Please download and install the After Effects plugin "LiveGFX Creator Plugin Installer" located on the NewTek Download page. (https://www.newtek.com/downloads/)

USE LAYERED PSD FILES

Create individual graphics or an entire package in Adobe® Photoshop® CC, then bring the PSD files directly into your NewTek live production system.

LiveGraphics recognizes the layers automatically, allowing you to manage elements independently and store up 16 macro-ready variations per system buffer.

ANIMATE IN AFTER EFFECTS

Animate graphics faster and easier than ever before with the included LiveGraphics Creator plugin for Adobe® After Effects® CC.

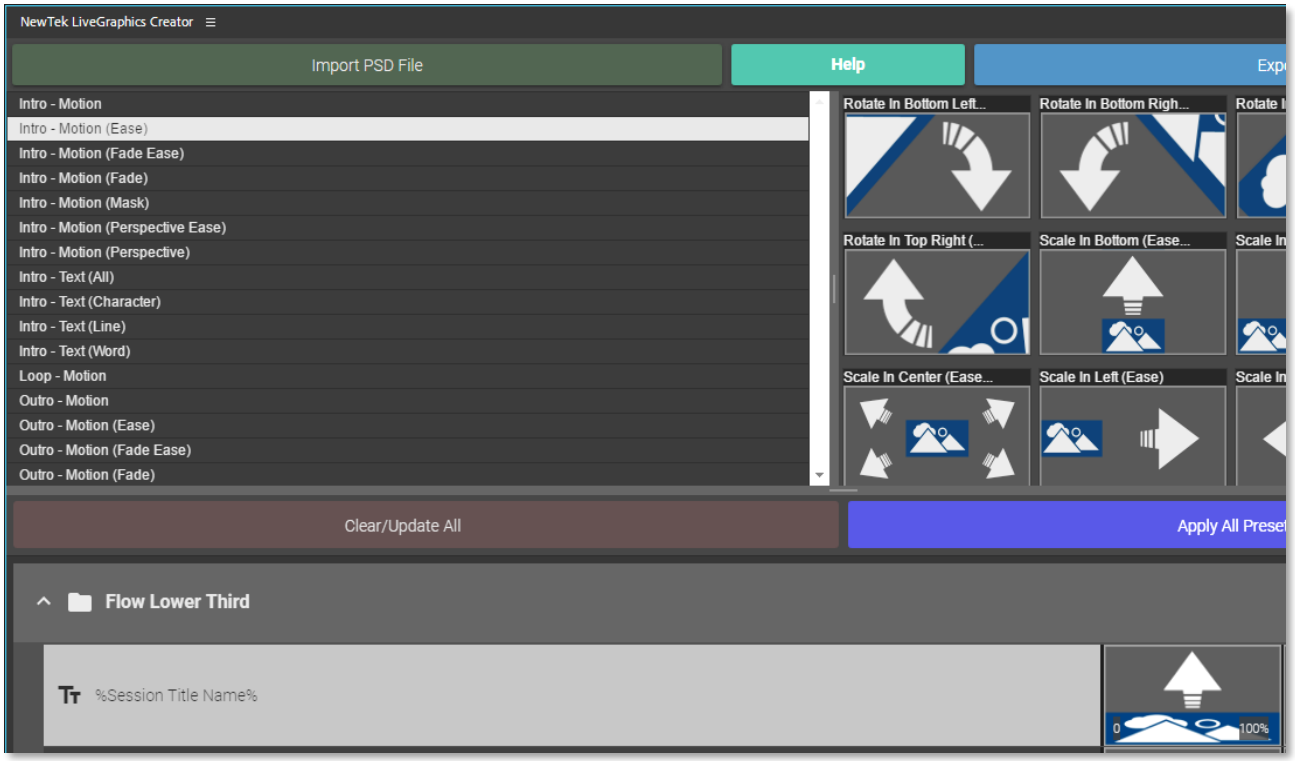

FIGURE 356

With LiveGraphics Creator, AE novices can simply import a layered Photoshop® PSD file, drag and drop presets to apply motion to its different layers, then export the result ready for live use.

Or use the included SmartBuilder™ to have LiveGraphics analyze your content and add animations for you with a single click! Of course, more advanced users can refine their creations using standard methods right in After Effects.

Hint: The use of NewTek LiveGraphics Creator is documented in its own manual, installed with the plugin.

USING LIVEGRAPHICS

You can also simply load any of the 100+ production ready LiveGraphics templates supplied with Advanced Features into your system's Buffer slots and get started right away.

The *Title Editor* lets you change text and images on the title pages and hide or show layers using the *Layers* menu (Figure 357). Layers animate into place as you do so. Then, store the results as presets – display the *Layer* preset bin by clicking the *Preset* button at upper right (Figure 358).

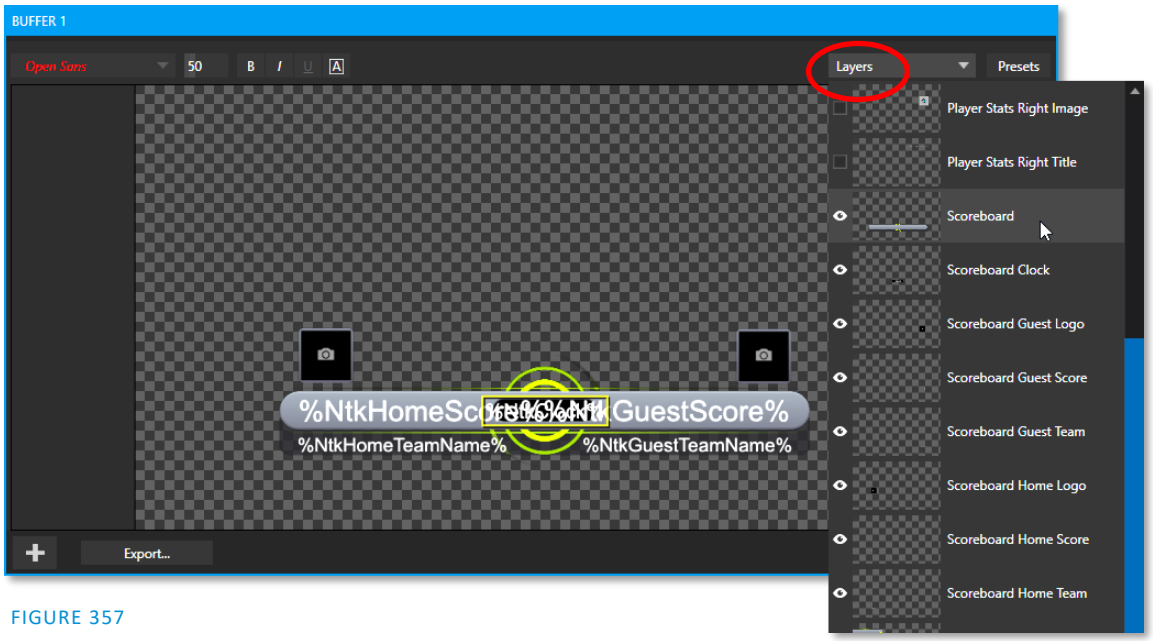

FIGURE 357

To preserve the *Layer* and *Data* presets you generate for your LiveGraphics pages outside of the current live session, you can use the *Export* button at left in the *Title Editor*'s footer. Afterward, load your creation into a *Buffer* slot, and use its preset bin to animate from one state to another at will – see Section 11.3.10, Buffer Presets for more detail.

LIVEGRAPHICS AND DATALINK

Naturally, LiveGraphics supports NewTek's DataLink system for dynamically updating title page details even during live display (information about DataLink appears in several places in this manual, but you might start your exploration at Section 11.2.3).

DataLink™ technology lets you use external hardware scoreboards, spreadsheets, and other remote data sources to populate and update your graphics automatically.

LiveGraphics templates even support text and images direct from the Web when combined with the *DataLink Web Browser extension*.

In addition, the next Advanced Feature we will discuss (LivePanel) provides several powerful ways to update *DataLink* key value (such as its integrated *Scoreboard* control pages for various

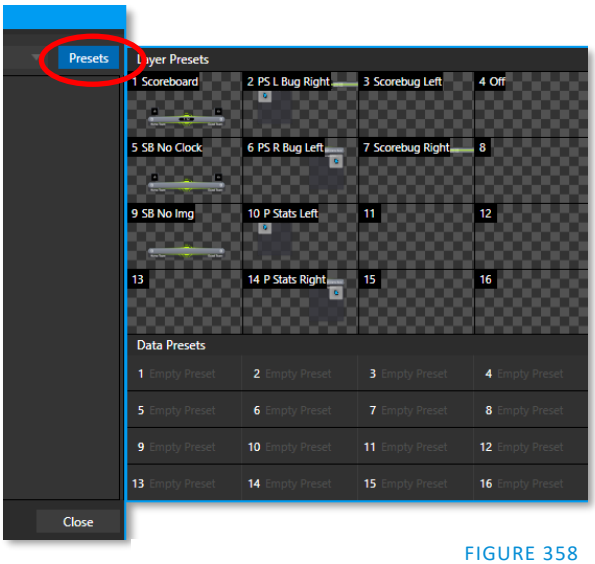

FIGURE 358

sports). And thanks to the included *Builder* web app, you can even build custom control pages capable of driving your motion graphics from any device on your network with a web browser.

A.5 LIVEPANEL

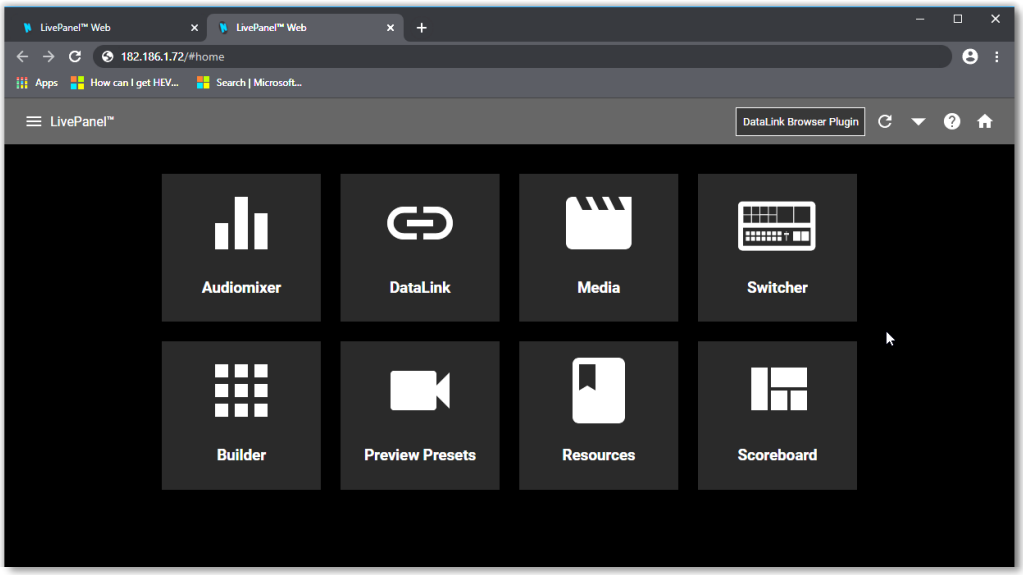

FIGURE 359

LivePanel, included with your TriCaster Advanced Features, provides potent tools to extend your production workflow, and is also available for separate purchase.

Among other features, LivePanel lets you create custom control panels for your NewTek live production system accessible in web browser of a device on your network. LivePanel also provides several production-ready tools for remote video mixing, media playback, audio mixing, and macro automation.

A.6 NETWORK ACCESS TO LIVEPANEL

To access LivePanel, click the *Notification icon* (see Section 7.6) at upper-right on your NewTek live production system's *Live Desktop*, to open the Notification Panel.

Note the URL shown beside the *Web Browser* button at left in the footer of the *Notification Panel*.

Enter this into the address bar of a web browser on another device on the same network.

Note: You may be asked for a username and password to access LivePanel – see Section 4.1.

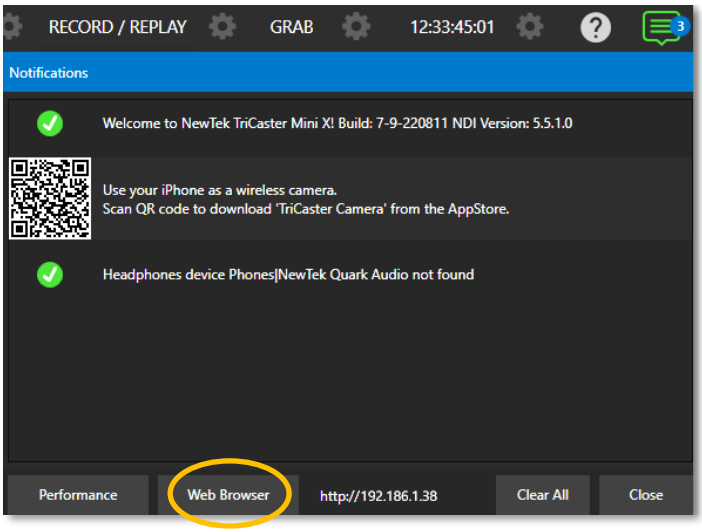

FIGURE 360

A.7 HOME PAGE

After entering security credentials (if necessary), Live Panel's *Home* page is displayed in your web browser.

Note: We recommend using a modern web browser (such as Chrome or Firefox) available for your platform for best results when using LivePanel.

All the existing LivePanel tools can be accessed from the Home page, either by using the 'hamburger' menu at left in the titlebar, or by clicking the large icons on the page.

Hint: Click the (?) icon at right in the titlebar to view information about LivePanel tools on the current page.

A.8 AUDIO MIXER

LivePanel's prepared web applets are easy to use. In many cases the controls mimic similar items in the main interface for your system. This can be seen in Figure 361, which shows LivePanel's *Audio Mixer* applet.

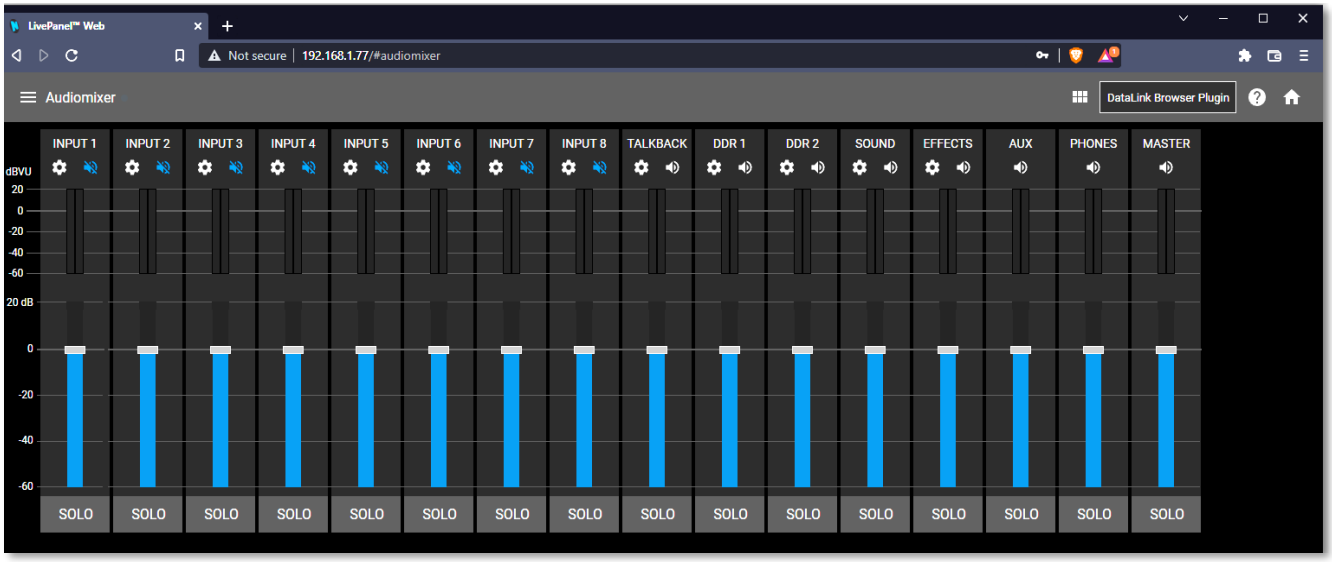

FIGURE 361

A.9 DATALINK

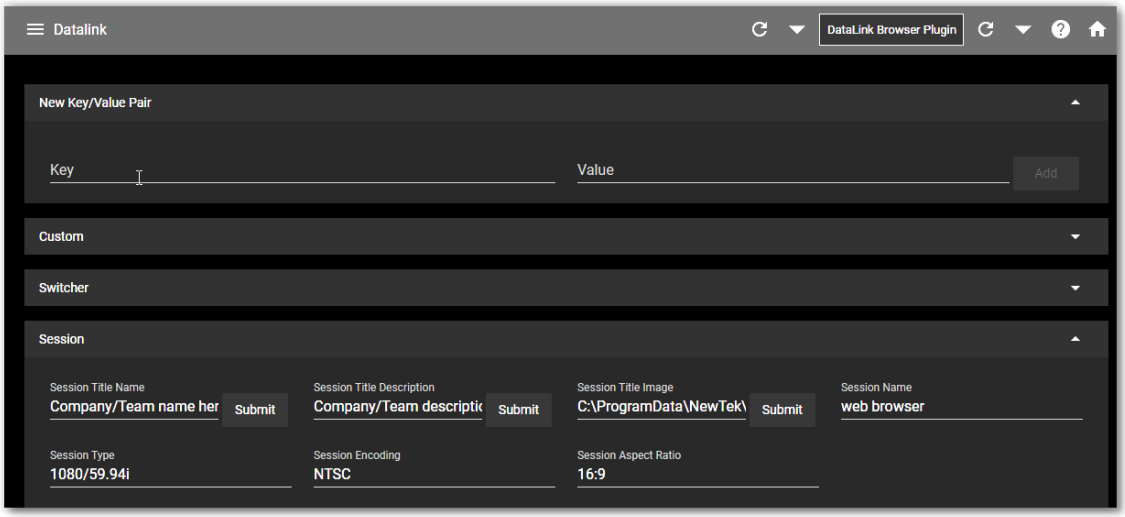

FIGURE 362

The *DataLink* page lets you selectively review the values for all current DataLink keys, edit these, and even generate entirely new key-value pairs.

A.10 MEDIA

Likewise, LivePanel's *Media* page provides you with remote access to the system's *Media Players*, allowing you play, trim, add and remove media files in the playlist.

Toggle the Media Player's *Autoplay* and *List/Single* playback modes, and trigger the *Show On* feature to push *Media Player* output to display on *Program* output or in a designated *M/E.*

You can even upload images from a local host device (such as a tablet or smart phone) to the playlist on your NewTek live production system.

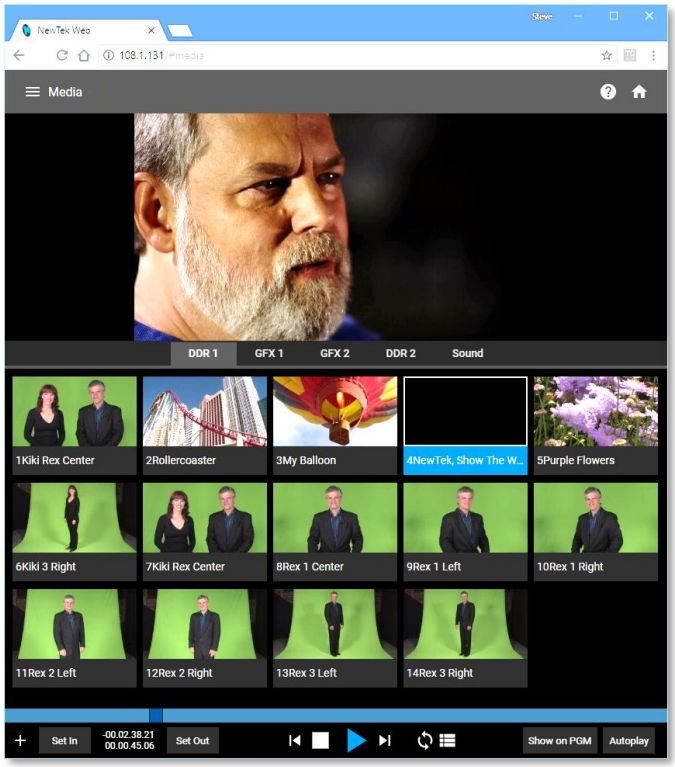

FIGURE 363

A.11 SWITCHER

The LivePanel Switch applet is designed to make it easy to switch less demanding productions without a complex interface. Simply tap a viewport for a video input to *Take* it to Program output or swipe it horizontally to do so with a transition.

Select transition effects for the *Switcher*, an *M/E*, *DSK*, or *KEY* layer, and – most powerful of all – select a *Comp* to change your composition entirely with a single tap.

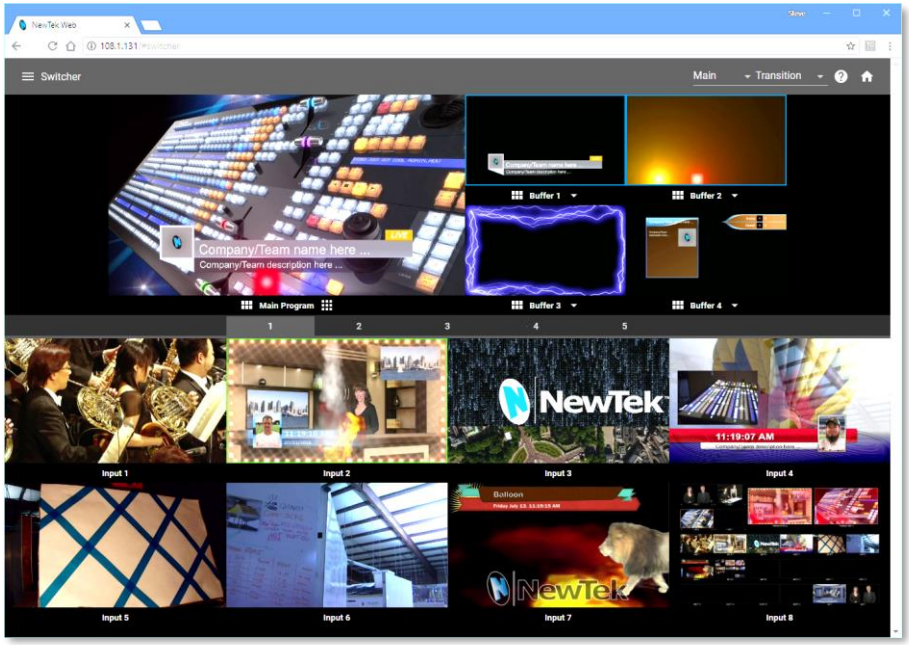

FIGURE 364

A.12 SCOREBOARD

As discussed elsewhere, DataLink can be directly connected to several popular scoreboard systems.

With the new *Scoreboard* applet included in LivePanel, however, you can be your own scorekeeper using the web browser in virtually any laptop or tablet. Better yet, Advanced Features includes full motion *LiveGraphics* scoreboard title pages already configured to work with the *Scoreboard* applet.

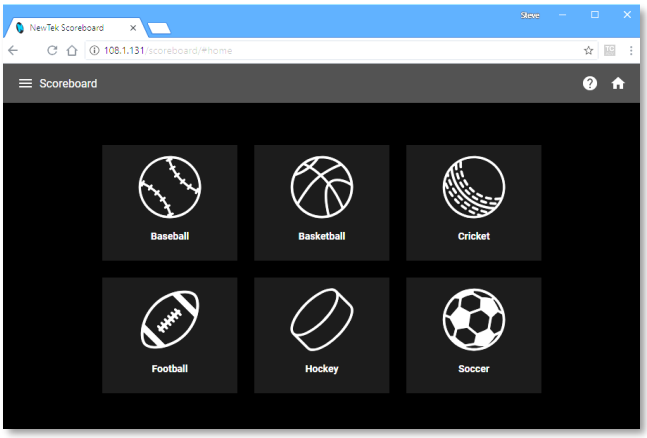

FIGURE 365

Having chosen the *Scoreboard* for your sport, and a matching scoreboard title page, the applet lets you set the team names, supply individual team logos, and track The *Channel* menu controls just one of two related channel settings – this one (on the local host), and another channel used by the control panel itself. These combine to let you connect to and control alternate live production systems.

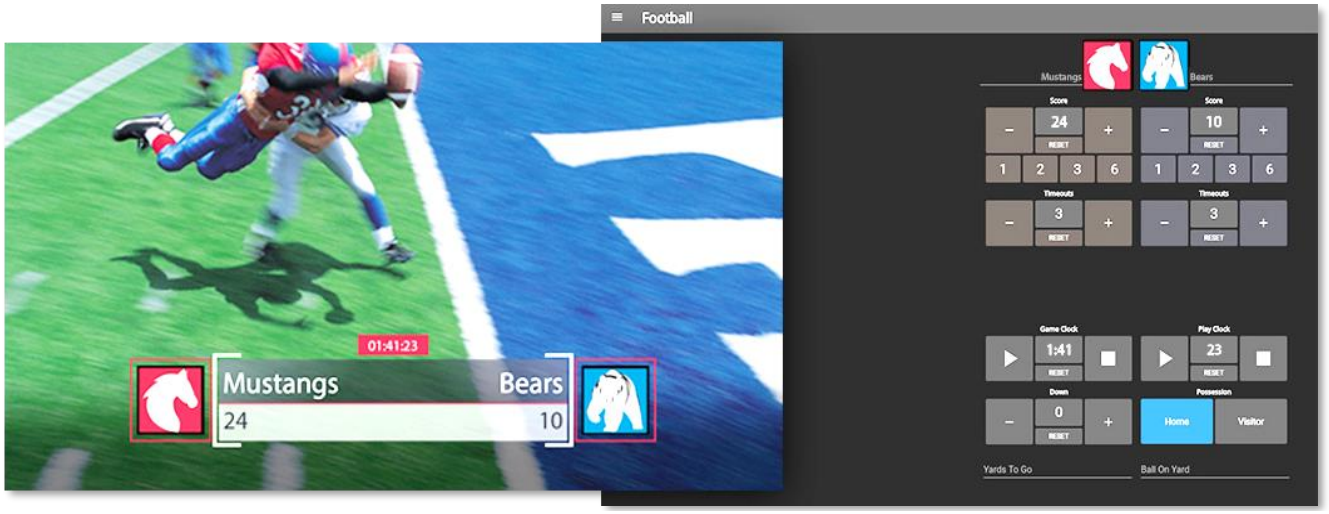

FIGURE 366

Hint: You can open the Switcher applet or a custom Builder page in another browser tab (or on another device) to display and removed the various elements of your animated LiveGraphics scoreboard, too.

BUILDER

Unquestionably the icing on the LivePanel cake, the Builder Applet allows you to easily create custom control panels to meet a virtually limitless number of needs.

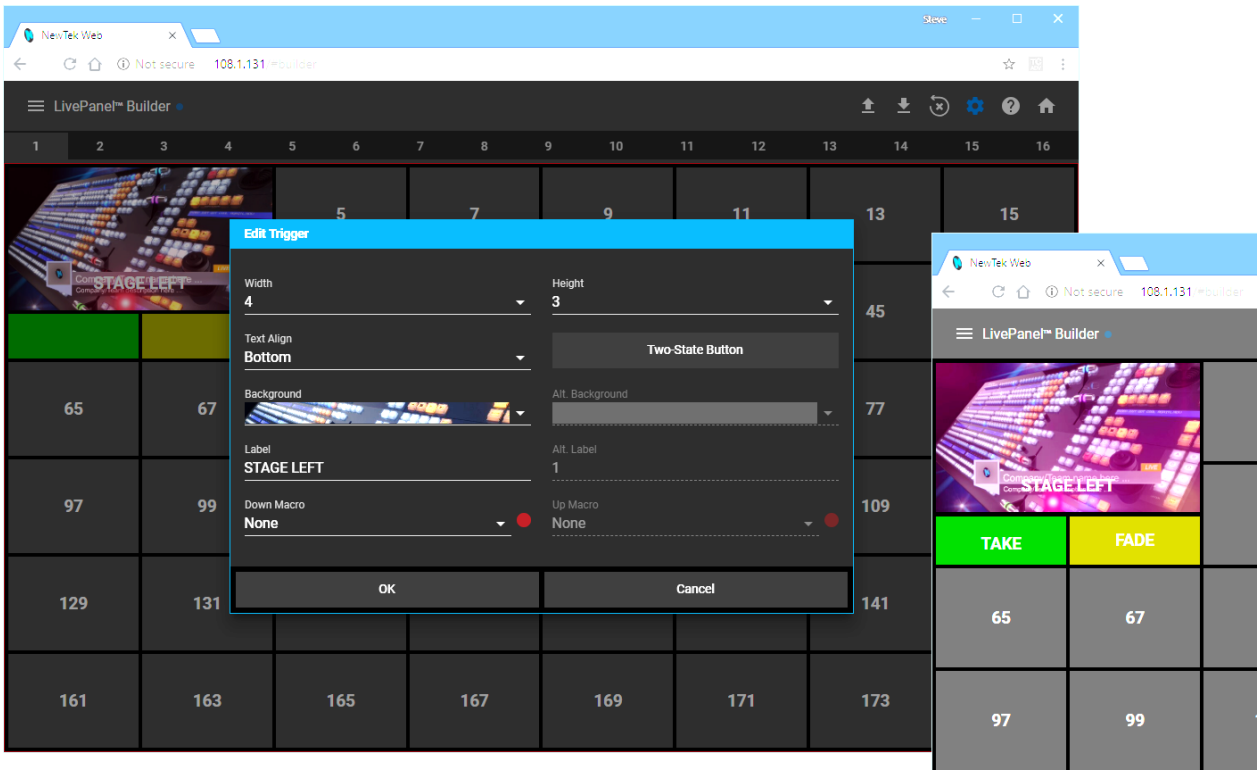

FIGURE 367

Flexibly assign a macro to a button, or perhaps two – one to operate when the button is pressed, and another to be applied when you click it a second time. Give the button a color or fill it with a still image of your choice.

The Builder applet lets you gang buttons together to give them more prominence, and you can even assign moving video from an external *Switcher* input, *Media Player*, or output to a button (effectively turning it into a monitor) and creating your own custom *Switcher* interface.

Hint: Each individual live production system hosts its own LivePanel instance, so Builder pages can be exported for use on additional systems.

A.13 ADVANCED AUDIO I/O

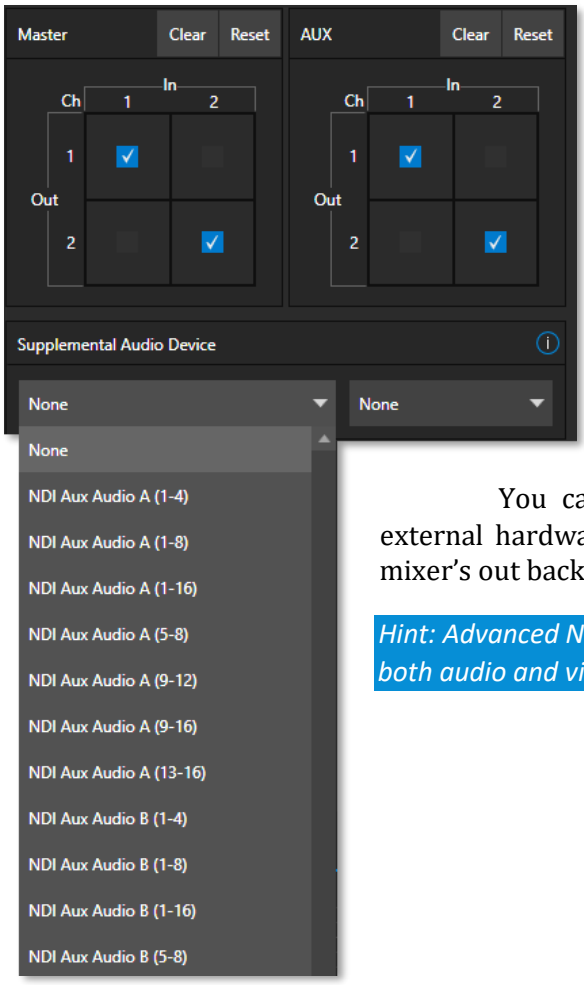

FIGURE 368

Advanced Features software provides our most complete support for audio solutions such as Audinate's Dante and AES-67 implementations (with required third-party drivers).

NewTek's *Advanced Audio* support for ASIO drivers allows you to easily transmit or receive audio using these popular 'audio over IP protocols.

Send selected channels from any *Mixer* input, *Media Player* or output bus and channels you wish to send and match these to the transmit channels provided by your third-party driver.

You can, for example, send your *Media Player* output to an external hardware mixer supporting the same protocol, and route that mixer's out back into your NewTek system for output with your video.

Hint: Advanced NewTek systems also provide independent per input delays for both audio and video, for a perfect match every time.

A.14 VIRTUAL PTZ

Virtual PTZ, also referred to as "pan and scan", is a unique *Switcher* input feature applied to 'standard' video sources, i.e., those which are not actually connected to physical PTZ (Pan, Tilt, Zoom) cameras.

Naturally, the latter (real PTZ cameras), when connected and configured, show *Pan*, *Tilt*, and *Zoom* controls in their *Input* tab of the corresponding *Input Configuration* panels.

The *Virtual PTZ* feature adds similar controls to all *Switcher* sources (except M/Es, which already have similar capabilities thanks to *Comps*). This even includes *Media Players* and *Buffers*.

Since the *Virtual PTZ* implementation includes *Presets* and *Speed* controls, this means is that you can zoom in/out and pan around within the frame supplied by any source.

Of course, this is a particularly attractive feature ion the context of UHD video sources but can also be used to mimic the so-called "Ken Burns effect" (a.k.a., 'pan and scan') when applied to imagery in *Media Players* (Figure 369).

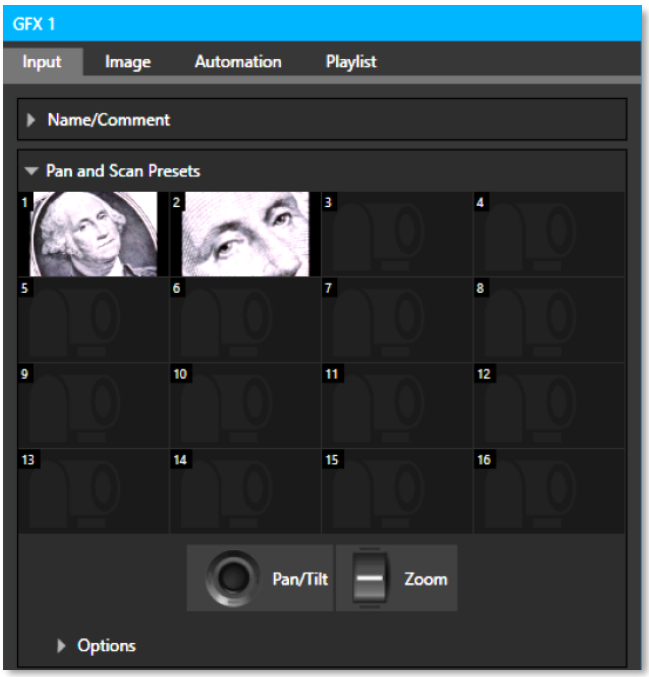

FIGURE 369

A.15 SOUND AND MUSIC

This 100-track bundle of songs includes a variety of license-free, full-length audio tracks to engage your audience and give you plenty of soundtrack options. The multiple musical genres in this bundle allow you to develop a theme or evoke specific emotions with background music for live content or edit these unlimited-use music clips into pre- and post-production content.

APPENDIX B: SKYPE AND SKYPE TX

Skype® and SkypeTX may sound alike, but they are not really the same thing. Each delivers specific capabilities, and their connection and configuration details differ as well. This chapter will help you understand these distinctions, so you can take full advantage of these important connection options.

Literally hundreds of millions of people use Microsoft Skype, so it's very likely that you are already acquainted with its use on mobile and desktop platforms. It's hard to imagine better technology to extend your productions to remote participants, whether around the corner or in far-flung corners of the world. NewTek products provide several approaches to working with Skype.

Let's discuss two approaches that utilize Microsoft's professional level Skype TX platform first.

B.1 SKYPE TX

Until recently, however, there were 'missing links' in the i/o chain between Skype and the video broadcast realm. Microsoft introduced its Skype TX platform, comprising purposed-designed hardware, software, and control room tools, to link the two worlds. NewTek was honored to be selected as the sole North American manufacturer of authorized Skype TX hardware, the NewTek TalkShow® product line.

B.1.1 TALKSHOW®



FIGURE 370

Each Skype TX-based TalkShow® VS4000 unit provides the features needed to connect four high quality a/v streams between Skype callers and standard studio systems. NewTek live production systems make connection particularly convenient, by leveraging NDI® (Network Device Interface) IP protocol. Thanks to NDI, a single gigabit network connection easily handles all a/v traffic between the two units.

The basic IP connection setup between the NewTek production system and TalkShow is quite simple. Individual a/v outputs for each remote Skype caller from TalkShow can be assigned to the *Switcher* and Audio *Mixer* like any other NDI a/v input source.

Similarly, the video output from your program can be assigned as the return-to-caller source on the TalkShow system. You will likely want to prepare a unique mix minus audio feed for the audio return to each individual caller. See the sub-heading Sub-Mixes and 'Mix Minus' in Section 15.10.3 of this manual for more detail on configuring these.

B.1.2 SKYPE TX CONTROLLER

A vital part of the Skype TX platform is the call-center application referred to as Skype TX Controller (available free from https://media.skype.com/skype-tx). You might think of Skype TX Controller as the 'switchboard' for your calls. The operator can initiate outgoing calls, answer incoming calls, and more.



FIGURE 371

The Skype TX Controller console provides numerous professional conveniences, including contact and call management tools, auto-answer, detailed call quality metrics, and fallback images to be displayed automatically should network conditions for a remote caller fall below designated minimums.

B.1.3 SKYPE TX CALLER

NewTek's TriCasters also features native Skype TX capabilities independent of a TalkShow system.

This unique support lets you directly connect Skype calls from anywhere in the world to either of two special *Switcher* inputs by leveraging the Skype TX Controller.

All you need to use this feature is a network connection between your NewTek system and the computer running the (free) Skype TX Controller application that provides call management.

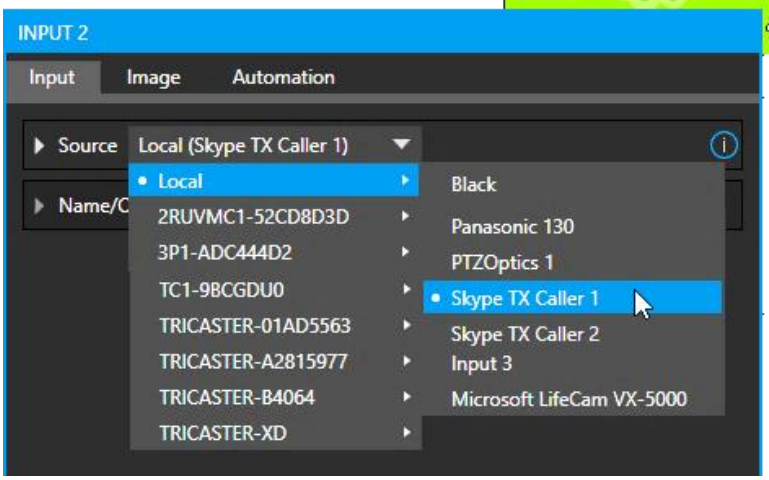

FIGURE 372

AUDIO AND VIDEO CONNECTIONS

Section 8.1.1 explains how to assign a *Skype TX Caller* to a selected video *Switcher* input.

In this implementation, by contrast with the use of an external TalkShow system discussed earlier, it is not necessary to manually create a special mix minus audio return feed to send to the remote caller(s). You will find details on the special 'mix minus' that is automatically supplied in 15.4.2.

In addition, you will find it worth reading Section 15.6, which explains the unique *TalkBack* feature provided in the *Audio Mixer* to let the production system operator talk 'offline' with selected callers, without fear of the conversation being overheard on program audio output.

Hint: The return video sent to remote Skype callers can show a tally overlay. The overlay image is named SkypeTally.png, and is located in the file folder at one of the locations below, by model:

C:\ProgramData\NewTek\TriCaster\Configuration\Skype

This image can be deleted to disable the feature, or replaced to modify it.

B.2 SKYPE FOR CONTENT CREATORS

Microsoft has announced an important update called Skype for Content Creators, designed to provide new possibilities for Skype users including broadcasters, streamers, and vloggers. Importantly, when Content Creator mode is enabled, this release will include not only recording but also output using NDI protocol.

This support for NDI in this version, described as "in preview" at the time of writing, provides yet another way to bring Skype calls into NDI–enabled software and systems.

Input setup for Skype a/v output will be similar to connecting any other NDI source. This edition does not directly support NDI input to Skype, but you can use the NDI Virtual Input application included with the free NDI Tools pack from NewTek to connect program video output and a mix minus audio return feed prepared as discussed in the sub-heading Sub-Mixes and 'Mix Minus' in Section 15.10.3 of this manual.

APPENDIX C: TC MINI INPUT ADAPTER (TCMI4KUHD)

This appendix briefly describes how TC Mini owners can prepare their new NewTek TCMI4KUHD device for use. First, we'll give you a Quickstart lesson to get you set up quickly and easily (more detailed information is provided in the next section).

C.1 QUICKSTART

Step 1 – Connecting Your TCMI4KUHD Input Adapter

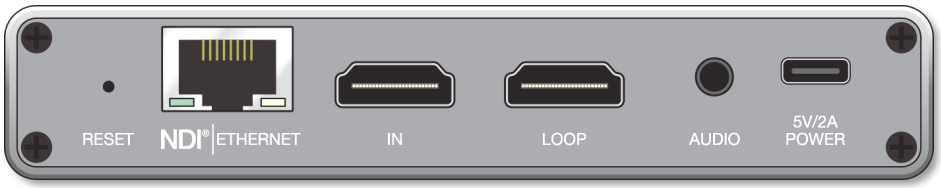

FIGURE 373

1. Using a CAT-5 (or better) Ethernet cable, connect the TCMI4KUHD device to one of the four PoE (Power over Ethernet) RJ-49 connectors labeled *NDI1-4* on the rear of your TriCaster TC Mini.

Step 2 – Access the Device Webpage

2. Open the *Input Configuration* panel for the TriCaster *Switcher* input you intend to connect this device to. To do so, right-click on either a *Switcher* button or the input's monitor viewport and select *Configure* in the context menu.

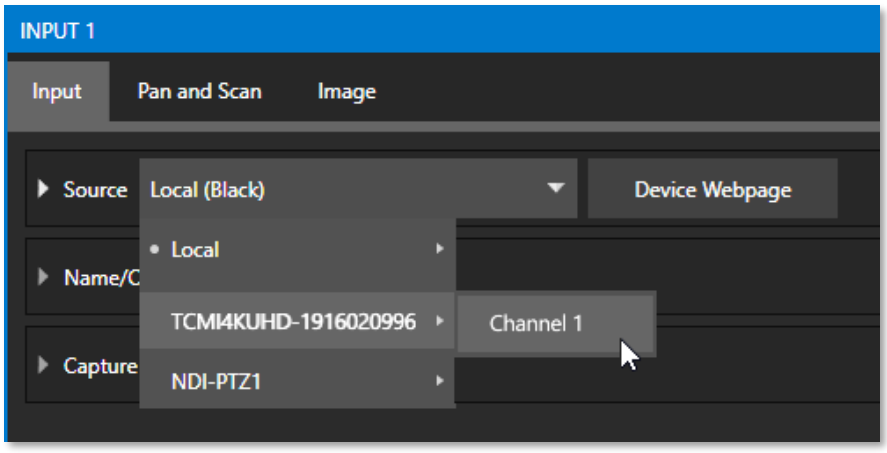

FIGURE 374

3. Click the *Source* menu on the upper left in the input tab to view available sources.

Hint: Connected TCMI4KUHD devices appear the menu as TCMI4KUHD – (unit serial number) > Channel 1.

4. Select *TCMI4KUHD – (serial number) > Channel 1* as the source for the *Switcher* input.

5. Then click the *Device Webpage* button that appears at right upon connection to open TCMI4KUHD's configuration webpage in a web browser.

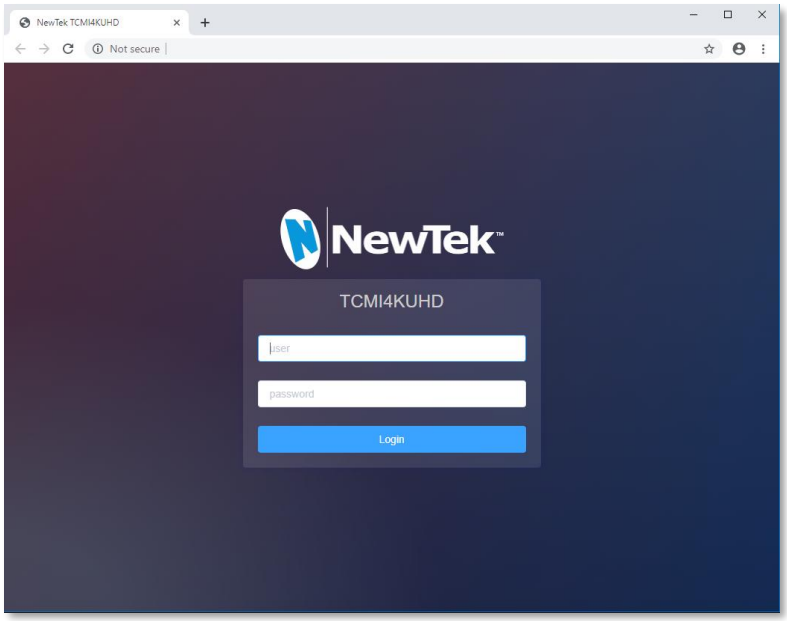

FIGURE 375

6. Log in to the webpage (Figure 375) using the default username "admin" and password (also "admin").

At this point, the TCMI4KUHD configuration webpage will be displayed (Figure 376).

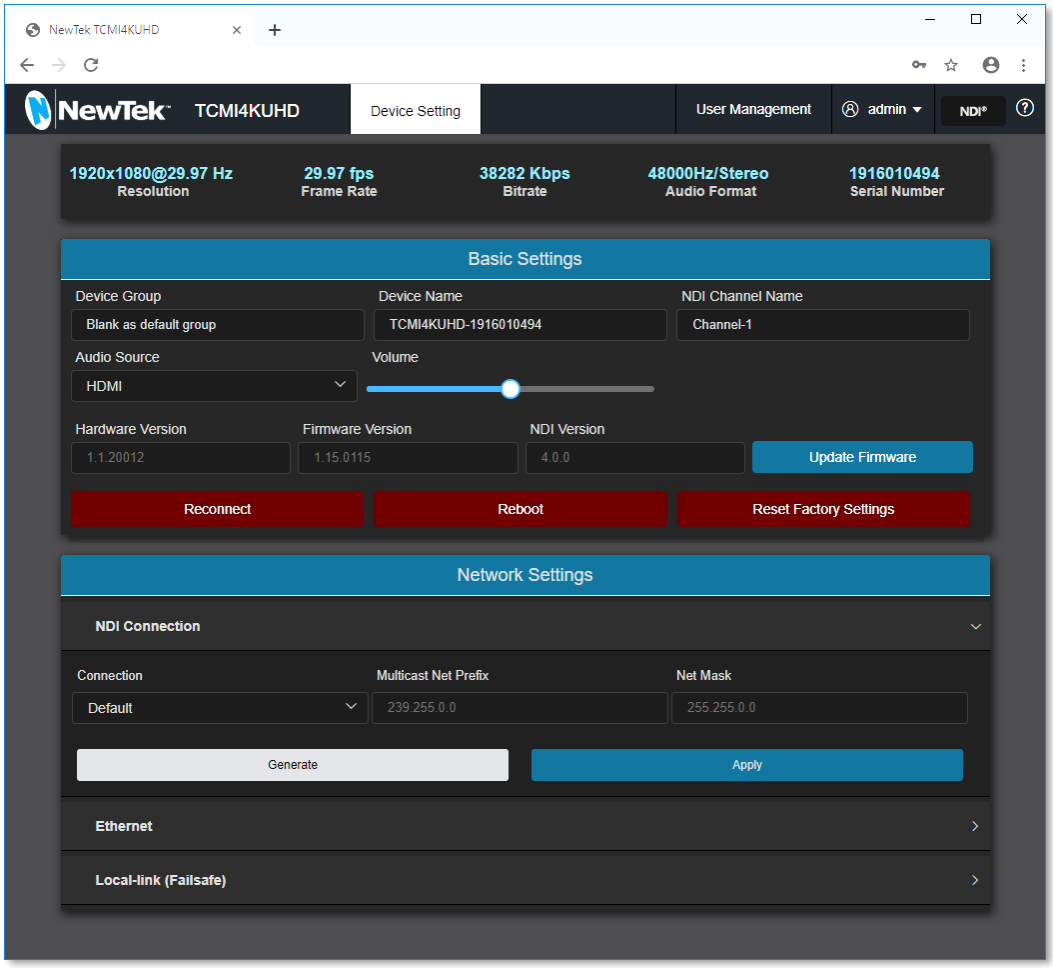

FIGURE 376

Step 3 – (Optional) Update Your Firmware

We encourage you to keep the firmware on your device up to date. Updates may contain bug-fixes, provide improved performance, or even enable new features.

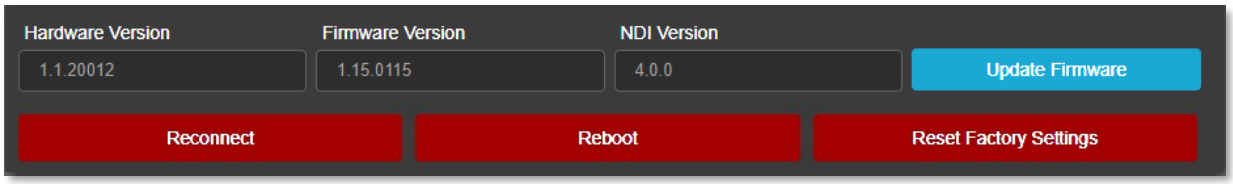

FIGURE 377

The update process is not complicated – simply follow the steps listed below:

7. Download and unzip the most recent firmware update archive to extract the '.bin' file.

8. Click the *Device Settings* tab at the top of TCMI4KUHD's webpage and compare the *Firmware Version* shown to the number in the filename of the firmware version you downloaded. If the download has a higher revision number, continue below to perform the update.
9. Click the *Update Firmware* button and click *Choose File* to show a file explorer.
10. Use the file explorer to locate the firmware .bin file and follow the prompts to perform the update.

The device will reboot during this process, which can take up to a few moments. *Please be careful not to interrupt power to the device during the update process.*

11. Following a firmware update, we recommend performing a *Restore* operation. A recessed *Reset button* is located at left on the device's rear connector panel, or you can use the *Restore* function from the web page.

    Hint: On some web browsers, you may occasionally need to clear the browser's cache (history) to see the result of a firmware update or Factory Reset. Also, please note that it can take a minute or two before the NDI channel name shown in TriCaster refreshes.

    The IP address of the device can change as a result of a *Restore* operation. You may need to use TriCaster to locate the device on the network and log in again afterward. Also, if you have previously set a manually configured IP address for the unit, you will need to reconfigure the IP settings again following a *Restore* operation.

    Hint: Should you set a custom password and then forget it; you can reset the device to factory defaults using the Factory Reset process.

Conclusion

This completes the initial setup of your NewTek TCMI4KUHD. You should see its output displayed on Studio Monitor. The sections that follow provide more in-depth coverage of features and options.

C.2 INTRODUCTION AND SETUP

OVERVIEW



Unlike typical encoders and capture card systems, your NewTek TCMI4KUHD leverages NDI-based IP workflow, supported by leading video software and hardware developers around the globe. This section will assist you to install and configure your new input device.

MAKING CONNECTIONS

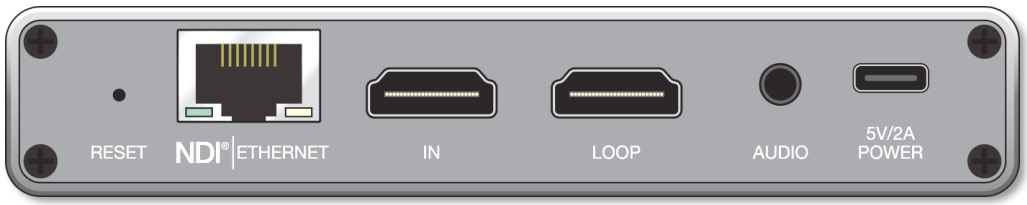

FIGURE 378

1. Supply *power* and *network connectivity* between the TCMI4KUHD device and your TriCaster TC Mini by connecting an Ethernet (Cat 5 or better) cable from the input module's Ethernet port and one of the special RJ-45 ports marked NDI 1-4 on TriCaster TC Mini's rear.

Hint: The input module boots as soon as this connection is made if TriCaster is powered up.

   At this point, the NewTek logo will illuminate. (If this does not happen, check your connections, and retry.)

2. Optional steps:

   a. Connect an HDMI video cable from a suitable video source to the device's HDMI connector.
   b. If you wish, connect an analog audio source to the 6.35mm stereo audio input.

If you connected a video source in step 2 above, the TCMI4KUHD module is ready to send NDI audio and video to TriCaster. To access and use it, we need to open TriCaster's Live Desktop.

Hint: In 'mission' critical installations, it is wise to use an uninterruptable power supply (UPS). Likewise, consider A/C "power conditioning", especially in situations where local power is unreliable or 'noisy'. Surge protection is especially important in some locales. Power conditioners can reduce wear on power supplies and other electronics, and provide a further measure of protection from surges, spikes, lightning, and high voltage.

CONFIGURING TRICASTER

TCMI4KUHD is very easy to use. In many installations all you need to do is supply power, connect a video source to the input module, connect the module to your TriCaster, and assign it to a *Switcher* input. Let us take that last step before discussing other features.

3. Open the *Input Configuration* panel for the TriCaster *Switcher* input you intend to connect this device to. To do so, right-click on either a *Switcher* button or the input's monitor viewport and select *Configure* in the context menu.

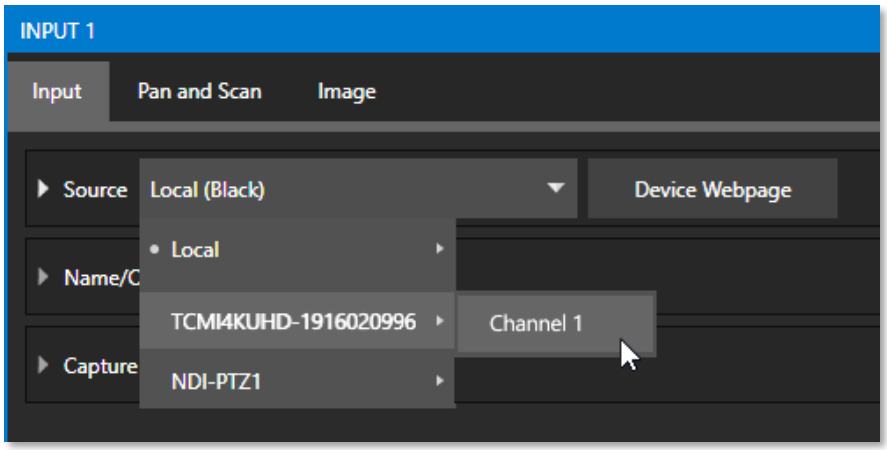

FIGURE 379

4. Click the *Source* menu on the upper left in the input tab to view available sources.

Hint: Connected TCMI4KUHD devices appear the menu as TCMI4KUHD – (unit serial number) > Channel 1.

WEB CONFIGURATION

Sometimes, though, you will want to access your input module's local settings, perhaps to configure login credentials, update firmware, etc. These features are made available by means of the device's local configuration webpage, which you can access directly from TriCaster.

Note: You may occasionally find it necessary to delete cached files (sometimes referred to as the browser's "history") before the display refreshes to properly show some recent change. This can happen, for example, after a firmware update.

When you assign TCMI4KUHD as the source for a TriCaster *Switcher* input as described earlier, a convenient *Device Webpage* button is shown in TriCaster's *Input Configuration* panel (Figure 380).

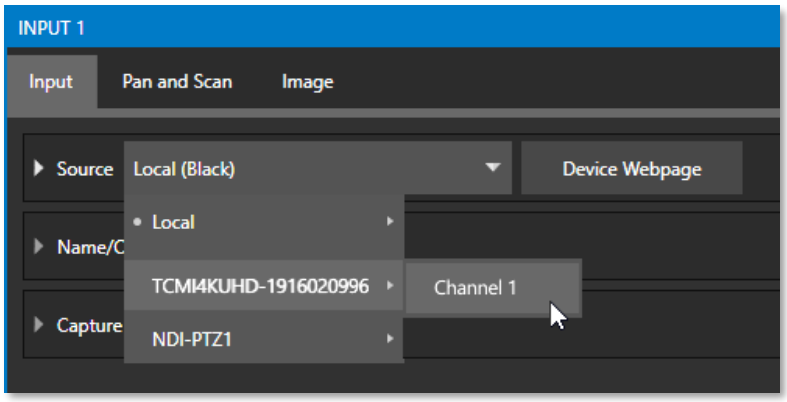

FIGURE 380

Simply click this to open the corresponding web control page.

5. Having selected *TCMI4KUHD – (serial number) > Channel 1* as the source for the *Switcher* input, click the *Device Webpage* button that appears at right to open TCMI4KUHD's configuration webpage in a web browser.

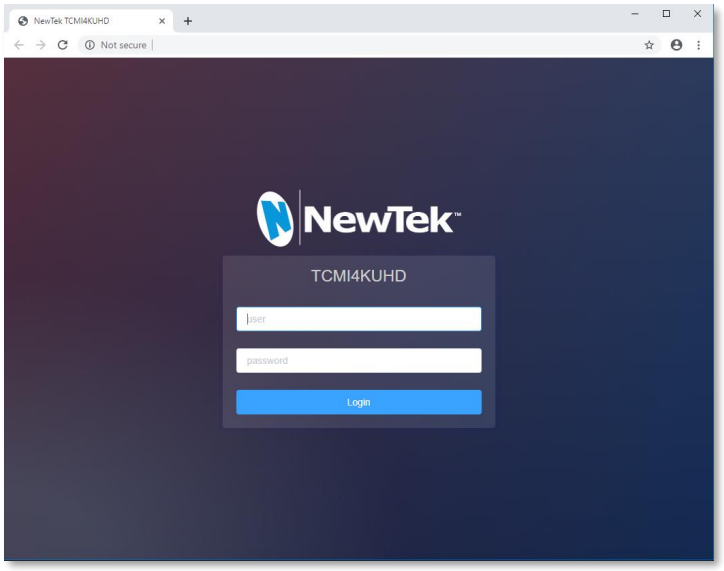

FIGURE 381

6. Log in to the webpage (Figure 381) using the default username "admin" and password (also "admin").

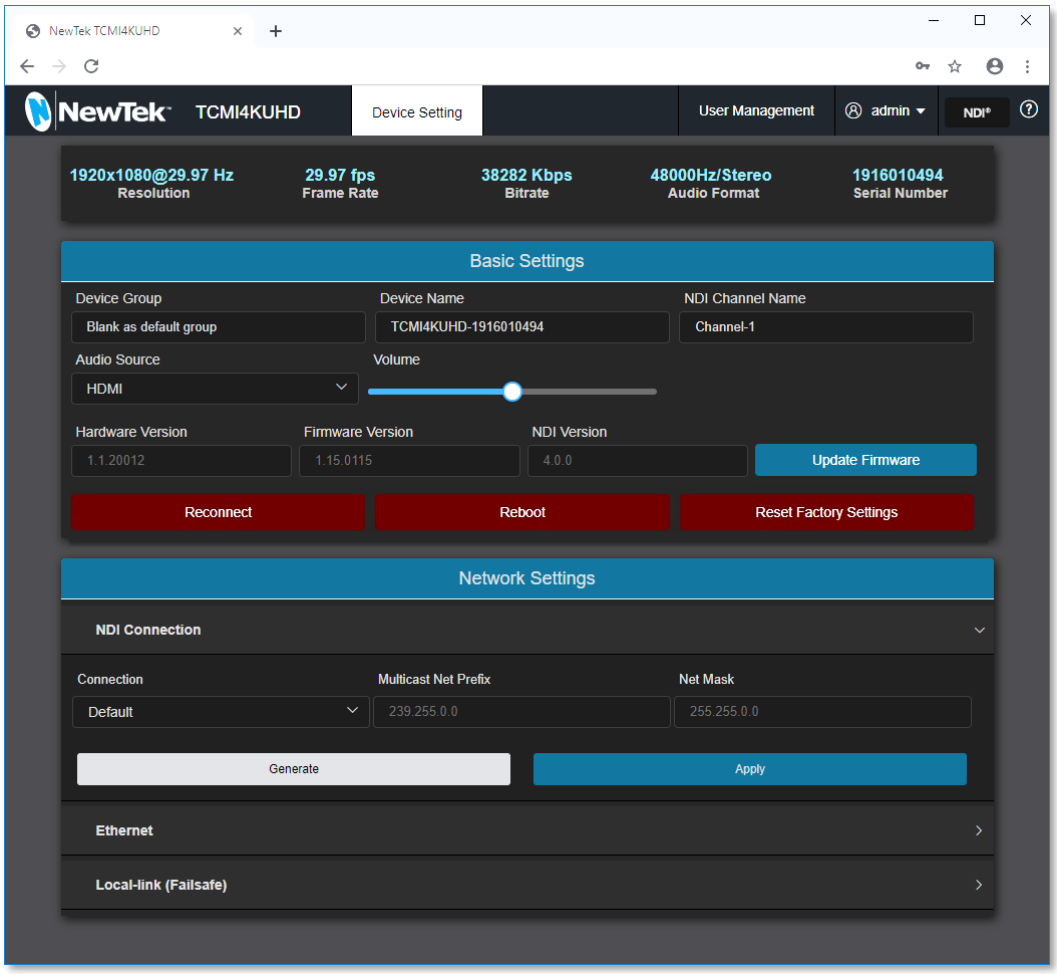

FIGURE 382

At this point, the TCMI4KUHD configuration webpage will be displayed (Figure 382).

DEVICE DETAILS

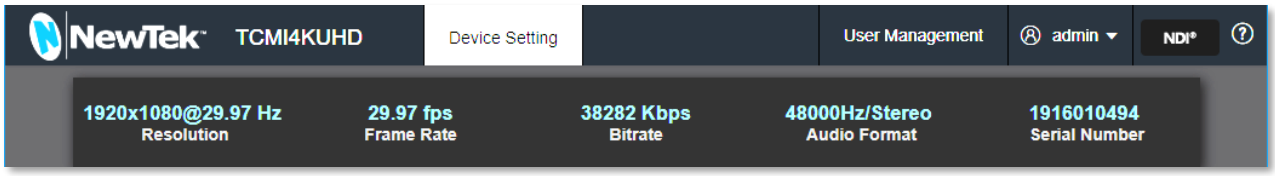

FIGURE 383

The uppermost section of the Device Setting tab on the web page shows Audio/Video format details, the current bitrate and the unit's serial number. These values are automatically detected and are not editable.

Device and Channel Name

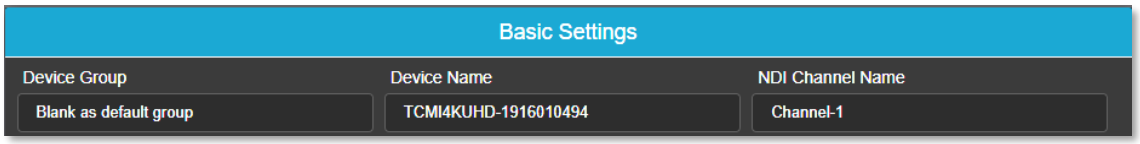

FIGURE 384

Just beneath, under the heading Basic Settings, you will find *Device Name* and *NDI Channel Name* boxes. The entries here determine how your device is identified by TriCaster.

These names are editable, allowing you a convenient way to identify the output of specific units to downstream NDI-enabled devices and systems.

Hint: The default name includes the unit serial number, which is also provided on a sticker on the chassis to help you identify a specific device.

Audio

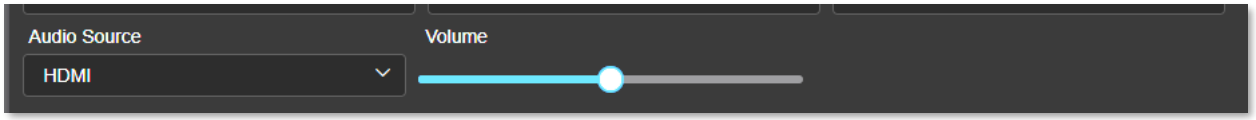

FIGURE 385

Just below, you will see the *Audio Source* menu (Figure 385). It offers two options, labeled *Line In* and *HDMI*. These determine whether device supplies TriCaster with the embedded audio source (digital audio included with an HDMI video source) or analog audio supplied to its 1/8" line level stereo input connector. The nearby volume control governs the audio output level. The device's nominal audio level is +4dBu.

Version and Update

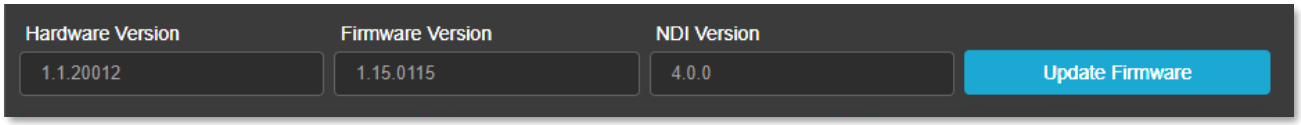

FIGURE 386

The control group below *Audio* settings lists *Hardware*, *Firmware*, and *NDI Version* details, which can be helpful if you need support or wish to confirm you have the latest firmware update installed.

Utilities



FIGURE 387

Completing our discussion of the *Basic Settings* control group, we find *Reset*, *Reboot* and *Restore* buttons at the bottom of this pane.

- **Reconnect** – breaks and re-establishes the connection between the source and TriCaster.
- **Reboot –** restarts the device (a 'warm' reboot)
- **Reset Factory Settings –** has the same effect as pressing the recessed *Reset* pin near the RJ-45 NDI connector on the back of the device for a few seconds. This resets all settings to their as-shipped default states. (On selection, the tally LEDs on the front of the unit progressively cycle to off, then on again a short while later after defaults have been restored and the unit has rebooted.)

NETWORK SETTINGS



FIGURE 388

Just beneath the *Reset*, *Reboot* and *Restore* controls in the *Device Settings* tab is a control group labeled *Network Settings*, which is host to *NDI Connection*, *Ethernet*, and *Local –Link* settings.

NDI CONNECTION

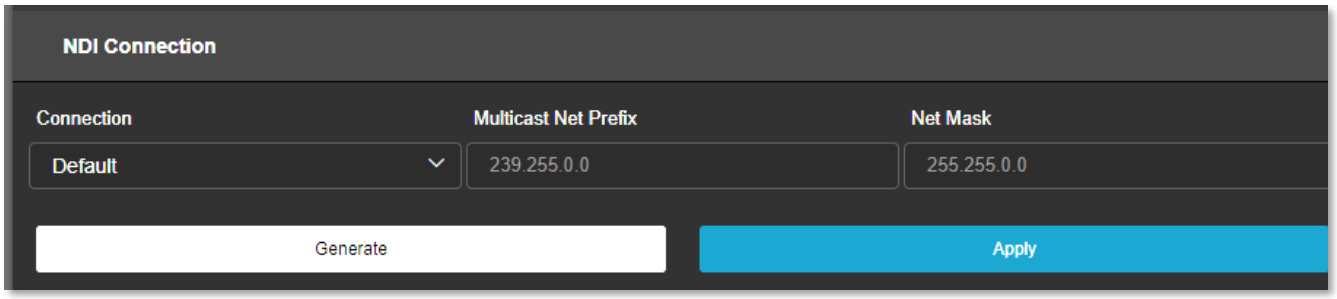

FIGURE 389

CONNECTION: DEFAULT OR MULTICAST

Although it serves no useful purpose when connecting directly to one of TriCaster TC Mini's dedicated NDI inputs, this option may be helpful in some more sophisticated environments. Select *Multicast* to transmit video using multicast, rather than the default unicast method. A suitable multicast address is generated, but you can edit the result manually if you need to. To update the address to another random value, click *Generate*.

Please take time to consider the following information before enabling this feature.

MULTICAST OR UNICAST?

Multicast can seem like a bandwidth-saving miracle. Unlike NDI's default mode (unicast), multicast does not require a unique stream from the source to each receiver. When using unicast, each connection to the sender reduces the bandwidth available by a similar amount.

By contrast, multicast connections do *not* add significantly to the bandwidth required as connections multiply. You could be forgiven for wondering why anyone would ever turn this option off - yet it is off by default. Why?

This is because multicast requires more careful network configuration. While you might not notice any issues in a simple network setting; a poorly configured environment can have serious impact on more complex networks.

- Specifically, it is essential that IGMP snooping be enabled for each switch on the network. This lets the device listen to traffic between other hosts, switches, and routers, and identify receiving ports using various IP multicast streams.

- In addition, we strongly recommend that all network switches be of the 'managed' type (see the sidebar "Managed vs. Un-managed").

ETHERNET

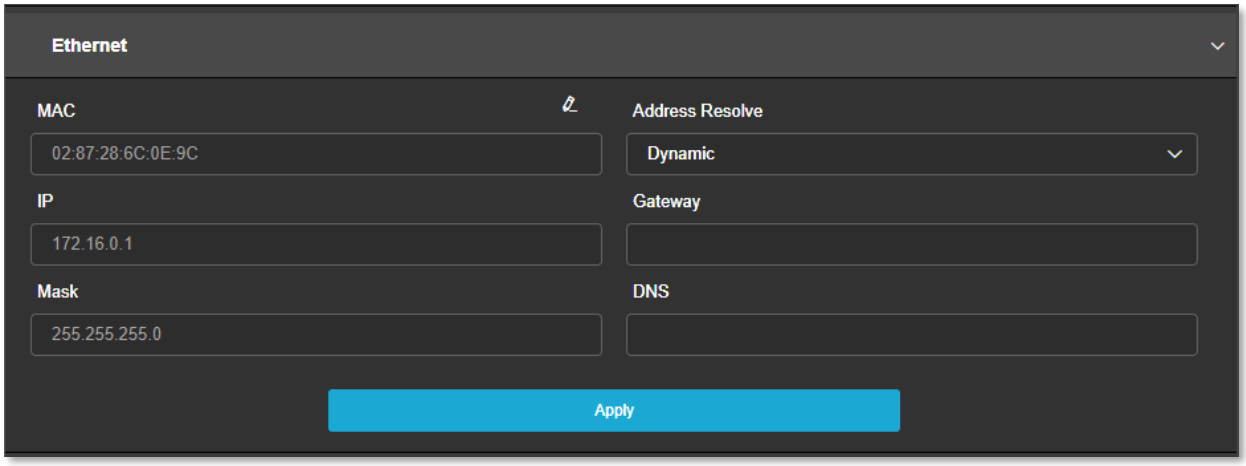

FIGURE 390

Controls in this section will be quite familiar to anyone who has connected a computer or mobile device to a network and require little explanation. Typically, networks are configured to automatically supply IP addresses to devices you connect to it by means of a DHCP server. Your device's IP Address resolution method is set to *Dynamic* by default, to take advantage of this scheme. To assign a static IP address to your unit, change the IP Address setting to *Manual*.

LOCAL-LINK (FAILSAFE)

If the default IP Address setting (Dynamic) should ever fail to provide a usable IP address within a minute or two – as when an active DHCP server is not found on the network – you can locate your device on the network using its failsafe Local-Link feature.

In this scenario, temporarily set the corresponding TriCaster's network connection (or that of another computer if not directly connected to TriCaster) to a static IP address such as 192.168.100.1, with a netmask of 255.255.0.0) and connect the device. Then run TriCaster (or NDI Studio Monitor, from the free NDI Tools suite) as described earlier to locate the unit. This will allow you to use the *Device Webpage* to set a static IP

ore re-enable the *Dynamic* option, following which you can restore the downstream network to its usual configuration.

TALLY



FIGURE 391

Your TCMI4KUHD unit provides 'tally' notification from TriCaster. Specifically, a row of LEDs will light up in red or green to tell you when video output from the device is visible on the *Program* output or *Preview* row of a video switcher respectively, as illustrated.

APPENDIX D: PERFORMANCE CONSIDERATIONS



In this section, we'll consider the most common questions you may have (and of course we'll provide the answer, too). Answers are intentionally brief – perhaps just a reminder of one or two steps required to perform some operation. For this reason, we'll also point you to explanatory information elsewhere in this manual whenever that would be useful.

D.1 TESTING, ONE TWO …

Professionals simply do not leap into new environments blindly. They prepare, plan, plan some more, and then – most importantly – they test. This allows them to tackle the really tough jobs with confidence.

D.2 IMAG AND LATENCY

What's IMAG? It's a compression of the expression "Image MAGnification." Typically, in modern IMAG applications, video cameras supply live imagery to projection systems, magnifying speakers and performers so that audience members further back in large venues can still see what's going on.

IMAG is a very tricky task at the best of times, one that calls for excellent planning, and where possible, testing. Those designing an IMAG installation have, not just one, but *two* inter-related broadcasts to consider – in the form of the audio and video streams.

D.2.1 RELATIVITY AND THE SPEED OF LIGHT

Wouldn't it be nice if audio and video travelled from their respective broadcast devices at the same speed? Then, wherever you were seated in the audience, the sound from hypothetically perfect speakers and the video image from huge video displays co-located at the front of the auditorium would reach your ears and your retinas at precisely the same moment!

This is not the case, however. Sound travels quite slowly – so slow, in fact, that even in relatively small venues it reaches those in the rear of the audience noticeably later than those in the front.

In loose terms, for a mid-size auditorium 600 feet long, it takes around a half-second for the audio to reach those in the back. For this reason, audio engineers often position speakers throughout the 'house', then introduce carefully considered delays by electronic means – to ensure 'late sound' from front speakers does not arrive after sound from the nearest speaker to those further back.

Light, on the other hand, travels so much faster that for all intents transmission can be considered instantaneous in the same setting. So, a person in the rear will see the image on a screen at the front long before sound from a *co-located* speaker arrives.

If transmission of the video signal from the camera lens right through to the projection screen were instantaneous (it's not, mind you), we'd likely need to *find* a way to delay it. Viewed in this light, a certain amount of latency is actually "A Good Thing!"

D.2.2 LATENCY AND YOUR AUDIENCE

"Latency" – what's that you ask? In this context, latency refers to the time it takes for the video signal to transit one part of the IMAG path, from camera lens to final display. Latency is usually expressed either in milliseconds or in video "frames" (typically either 25 or 29.97 to the second.)

As we said above, really a little video latency is not a bad thing as viewed from a surprisingly short distance back into the audience. This is just as well, since for all practical purposes a little latency is also unavoidable.

Even so, as long as audio and video are in sync *at your seat*, only a rather 'significant' degree of latency will be objectionable – unless you happen to be very near the stage. For those in the front rows, a few extra frames of latency *may* be rather disconcerting. (It's true that IMAG was conceived primarily for the benefit of those further back, but if the latency is too obvious for those nearest the front it can be disconcerting distraction.)

For this reason, it's desirable to keep video latency to an agreeable minimum – but put away any notion of 'zero latency.' Not only would this require bending the laws of physics, it would be a bad idea.

Even before considering minimizing latency in the device chain, acknowledging that there is always going to be some latency calls for some creative thinking with regard to practical staging. For example, if you design your IMAG layout in such a fashion that those in the front row are unlikely to be able to see the screen(s) without lifting their eyes from the onstage talent, they are extremely unlikely to notice a small amount of latency.

D.2.3 LATENCY AND YOUR NEWTEK SYSTEM

NewTek systems excel at IMAG, but inevitably constitute just one (albeit critical) link in a chain of devices. It is common for each device to contribute a little to the combined total latency for the system.

Your NewTek system's portion of the total latency is well within acceptable standards for devices of this sort – roughly between 1 and 2.5 frames (the actual amount can vary slightly within this range, depending on several factors).

> *For example, suppose a 'video frame' supplied by a camera arrives at an input one millisecond after a different frame has been sent to the output. Obviously, the new arrival must wait its turn; it can't be transmitted until the correct duration for its predecessor has elapsed. Thus, the newly arrived frame must 'wait' almost one entire frame, until its turn comes.*

How can you achieve the lowest possible latency for the switcher's section of the IMAG chain? One trick is to 'Genlock' your cameras to the switcher output (see Sections - Section 3.6, Section 3.13 and 8.2.2). This bypasses input time-base correctors, ensuring latency is consistent during switching operations. For genlocked sources, consider disabling *Frame Sync* – see Section 8.1.1.

> *Hint: You can assess the latency of your pipeline fairly easily. Run timecode directly to 1) a monitor and at the same time 2) through the switcher to a second (identical) monitor. Take a photograph that encompasses both monitors, and compare the timecode shown.*

D.2.4 OTHER SOURCES OF LATENCY

Often, significant latency is added by other devices in the IMAG chain that come *after* the switcher. Projectors are a common contributor, but at times the cameras themselves are a factor.

Here are some helpful points to consider when designing and connecting your system:

- If you use Multiview output from the switcher to the projector – if at all possible, match the resolution sent from the switcher to the native resolution of the projector. (On some projectors this allows the unit to avoid using its own internal scaling, which is often a significant factor in unwanted latency.)

- When possible, try supplying the projector with analog video. This can eliminate a lot of the complexity from the process (of course, this is not always possible.)

- Certain projectors provide a 'low latency mode' to disable features of the unit that carry a heavy toll in latency. Enabling this mode can make positioning the projector slightly more challenging (as you may sacrifice some ability to position and scale the image using projector menu functions) – but the latency reduction can be very worthwhile.

- Some cameras include features that add more latency than you would expect. For instance, image stabilization (by definition) adds one field of latency and sometimes more. Disable anything of that sort that you can.

- Latency may be slightly lower for progressive sessions, so for lowest latency, (genlocked) 720p cameras and session are theoretically ideal (again, for genlocked sources, consider disabling *Frame Sync* – see Section 8.2.3).

APPENDIX E: VIDEO CALIBRATION



An oft-heard expression is "Don't worry – we'll fix it in post". Post-production techniques are invaluable, but they do not invalidate another often repeated axiom – "Garbage in, garbage out." And, in the case of live production, the results are immediately obvious to your audience … for good or for bad.

For these reasons and many more, it's important to control the visual quality of your work all the way through the production pipeline. Adequate lighting, good cameras, and high-quality connections are critical, but there are other things to consider.

Human vision is remarkably adaptable. In one study, participants equipped with inverting lenses initially saw everything upside-down. After a few days, people reported that things appeared right-side-up again.

Even when things are dramatically wrong our brains compensate to a remarkable degree. Have you ever looked at a television in a store without noticing anything untoward, and then realized that the colors on another unit nearby looked much better?

This built-in tolerance makes it difficult for us to judge whether the blacks in our video productions are really black –or just dark gray; whether reds are purple or tinged with a slight greenish caste, and so on. What we really need is a reference for comparison – just as we find it easier to pick the best-looking display from a row of television sets on a store shelf.

E.1 WHAT (AND WHERE) TO CALIBRATE?

Tip one – forget 'point and shoot'. Lighting, set design, and countless other factors have an impact on the video attributes our cameras 'see'.

As a first step, cameras need to be properly calibrated. *Ideally, this is done right at the camera*. Corrective measures taken downstream never fully compensate for problems at the first link in the chain. Most cameras, even inexpensive consumer models, provide adequate controls for this purpose. Some other video sources do not offer much if anything in the way of adjustment, however. You may need to adjust the *Proc Amp* settings to improve previously recorded video played from a DVD player, or a networked 'video chat' system.

In both cases above, the *Waveform* and *Vectorscope* monitors will help. We also need to consider *downstream* devices, though.

Computer displays are inherently different than television sets. Thus, the video you see on your computer interface can vary quite a bit from what your viewers see on their televisions. Too, you will want to be able to correctly judge colors when preparing titles and graphics. It will help you a great deal if your downstream video monitors are properly set up to allow you to make these judgments.

E.2 CALIBRATING VIDEO SOURCES

The obvious disparity between neighboring televisions on display in a store amply demonstrates that even identical (and brand-new) video devices can differ dramatically. When mixing multiple cameras, we need to ensure that their output matches. Switching to a camera with obviously different color characteristics will be seen as a glaring error by your viewers.

Even when we restrict matters to a single unit, color characteristics can change as the system warms up, and as it ages. For this reason, it's important to allow a device to warm up before attempting to calibrate it.

E.2.1 SETTING BLACK AND WHITE

Naturally, the color range available for transmission and recording is bounded at the upper level by white and at the lower level by black. Anything else falls somewhere in-between.

Consider what happens if you gradually raise the brightness control on your television. Beyond a certain point (and unlike claims made for laundry detergent) your whites do not become whiter. They can't – the upper limit (white) is firmly fixed. Instead, parts of the image that are nearly white are boosted, eventually also becoming white. Meanwhile, black portions of the picture are tending towards gray. Since white cannot become whiter, and black has become gray, we could say that the dynamic range of the image has been narrowed. The net result is a less vibrant image.

The same thing is true for video from your cameras. If the black and white levels from the camera are incorrect, you are effectively losing either shadow or highlight detail. For this reason, the first thing many do is calibrate their camera for correct levels.

WAVEFORM MONITOR

From days of old, for video engineering purposes the scale between black and white was defined in IRE units (IRE being an acronym for "Institute of Radio Engineers"). White was pegged at 100 IRE. For PAL (and NTSC-J) countries, black was defined as 0 IRE. For NTSC lands, black properly sat at 7.5 IRE.

Thankfully, the day of strict adherence to these analog video concepts has virtually disappeared. Today, confirming that the black and white levels your camera is sending are correct is as simple as sending first black, and then white (or the brightest past of your scene, and reading values from the scale alongside the *Waveform* scope.

Hint: Your system automatically compensates for the traditional 7.5 IRE black (also known as "setup" and "pedestal") in SD format NTSC sessions.

Connect your camera to the correct input, block the lens so it receives no illumination, and check the level shown in the *Waveform* monitor. Generally, it should be 16 on the 8bit scale.

To check white, use either the brightest part of your scene or a white card, ensuring that it is evenly illuminated with the same lighting your main subject will receive. Move in or zoom to fill the viewfinder with this, and confirm that the Waveform monitor is showing 235 on the same scale. Otherwise, you might try using your camera's Auto White Balance feature with the white card – your camera manual will provide instructions. Afterwards, check the black level again.

Some more professional cameras offer full manual controls for white balance and/or black level. Use these as instructed to ensure your camera is providing the correct white and black levels.

If you cannot make source adjustments, or can't get it quite right by these means alone, you can use the Brightness and Contrast controls in the *Proc Amp* for that input to tweak black and white levels. (Of course it is always best to perform adjustments at the source if possible.)

E.2.2 ADJUSTING COLOR

We're going to move into color calibration next, but first we can use our black and white signals for some further tests.

VECTORSCOPE

While we're still working with black and white levels, we can introduce the *Vectorscope*, and perform an initial test of the camera's color balance.

A vectorscope (Figure 392) can be likened to the familiar 'color wheel' (Figure 393) which sweeps radially through the colors of the spectrum – yellow, red, magenta, and so-on, around the arc of a circle. Colors are more progressively intense (saturated) towards the outside of the circle, while color saturation is zero at its center.

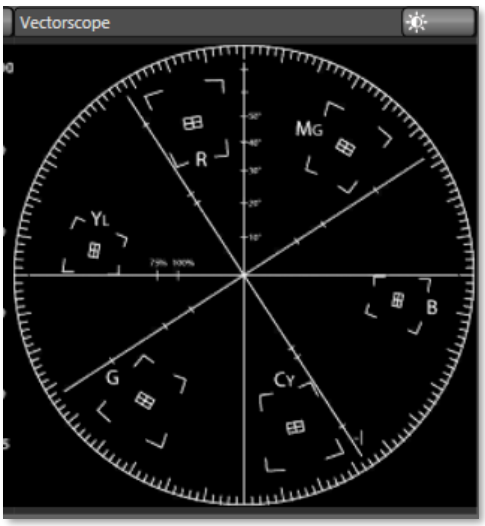

FIGURE 392

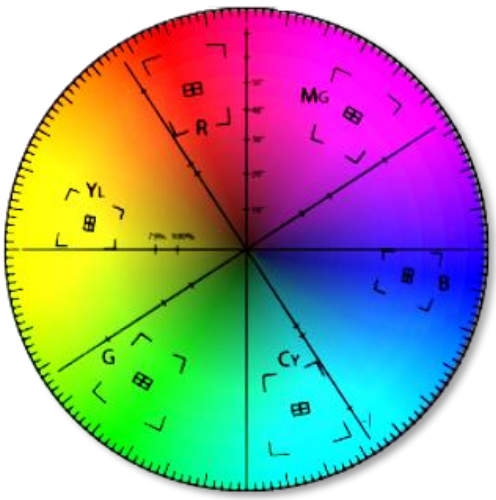

FIGURE 393

As it happens, from the vectorscope point of view, neither black nor white properly have any color saturation. Thus, with the lens cap on (or with a white card filling the viewfinder), the vectorscope should show only a small fuzzy trace at its center. If the fuzzy dot is off-center horizontally or vertically, this would indicate that the camera is incorrectly calibrated, tinting gray areas.

When the trace *is* off center, the direction and distance of the offset tells us what sort of tint (and how much) is represented by the deviation. You may be able to use the color controls at your camera to correct for this

offset, or you can use the Proc Amp's *U Offset* and *V Offset* controls to do so (as always, source controls are best). Adjustments to *U Offset* move the trace left or right, while *V Offset* changes adjust its vertical position.

Let's move on to a slightly more rigorous testing.

E.2.3 COLOR METRICS

At this point, we've assured ourselves that the signal from the camera is neither too bright nor too dark, that its output falls within broadcast legal luminance limits, and that the black & white part of the signal does not have an unwanted color cast.

We haven't done anything yet, though, to assure our reds are red, not slightly brown, or that our blues are not slightly green or magenta, etc. The *Vectorscope* can provide much more specific information about your cameras color signal. Let's see how it can assist you to ensure your colors are accurate.

USING COLOR BARS

You'll no doubt have seen the familiar color bars used as a standard reference for video signal calibration. Two examples are shown here. Figure 394 is an example of the color bars used in NTSC countries, while Figure 395 is a PAL example, common throughout European nations.



FIGURE 394 (NTSC)

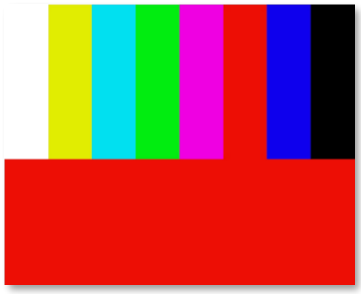

FIGURE 395 (PAL)

You can use color bars in conjunction with *Waveform* and *Vectorscopes* to make sure the video supplied to is consistent, accurate and broadcast legal. Most video cameras are capable of displaying color bars – check your camera manual to see how to display these (given a choice, use 75% bars). Then look at the *Vectorscope* to see how it traces the individual colors comprising the image.

The *Vectorscope* graticule has six distinct rectangular *targets*, one each for Yellow, Red, Magenta, Cyan, Blue, and Green. The targets are small rectangles with a cross-hair superimposed on them.

When a source is properly calibrated, the trace from the different colored segments of the color bars displayed will fall right inside their individual targets (see Figure 396).

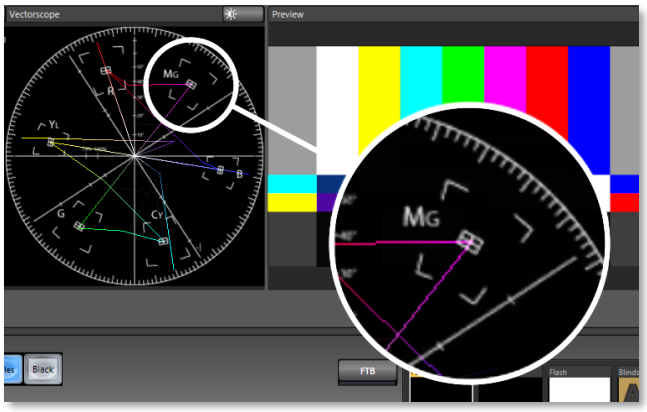

FIGURE 396

If the trace vectors do not line up as they should even after performing a white balance at the camera, you can use *Proc Amp* controls to tweak the signal.

Adjust the *Hue* control to rotate the vectors around the center point to line them up correctly on their respective targets. Increasing *Saturation* will move the trace further out towards the edge of the scope. Decreasing Saturation lowers color intensity, bringing the trace back closer to the center.

Hint: Naturally, you should repeat the steps above for each connected source, to ensure a perfect match when switching from camera to camera during your live productions.

At this point, your video signal should be reasonably accurate, and broadcast legal. Naturally, there are other devices between that signal, you, and your viewers. Let's discuss ways to calibrate downstream video monitors to ensure that you see your video at its best.

E.3 CALIBRATING YOUR MONITORS

In most cases, you will use a computer monitor of one type or another to display your system's controls – the user interface. Even though the television monitors you likely use for final program output may look somewhat similar to your computer monitor, they do differ in a number of important respects. For this reason, we will approach their calibration separately.

E.3.1 COMPUTER MONITOR

This is a subject that could (and does) easily fill multiple volumes, but which we will sadly give short shrift. It may not be *quite* as important to achieve 'spot-on' color calibration for the monitor used for the user interface. Not surprisingly, video output color is best judged on larger downstream video monitors.

Nevertheless, you may find a trip to one of any number of websites providing test imagery and calibration hints useful. A search for "computer monitor calibration" will yield an endless list, along with some commercial utilities for those who feel the need. Here are links to several such sites:

http://epaperpress.com/monitorcal/
http://www.lagom.nl/lcd-test/

http://www.jasc.com/support/kb/articles/monitor.asp
http://www.photofriday.com/calibrate.php
http://www.onecomputerguy.com/windows7/windows7calibratecolor.htm

E.3.2 PROGRAM OUTPUT MONITOR

Again, a search of the Internet for "video monitor calibration" will yield a large number of resources, both free and commercial. If you have television monitors connected to your outputs, though, you can make further use of the color bars. The approach is somewhat similar to what we did for our video sources, in that the first adjustments are to ensure that black and white levels are correct. Color calibration is performed afterward.

First, warm up your monitor for at least 10 minutes (some sources recommend a half-hour), to stabilize its output. Dim room lights and window light, to eliminate light sources that might skew your color perception. Pass the color bars from your camera through to program output (or use a color bars image in one of the *Media Players* for this purpose.

E.3.3 COLOR ADJUSTMENTS

Having set the black and white levels earlier, let's continue…

NTSC

1. If your monitor has a "Blue-gun only" setting, enable it. Depending on the brand of your monitor, the alternating bars will appear either as light gray and black, or blue and black (Figure 397).

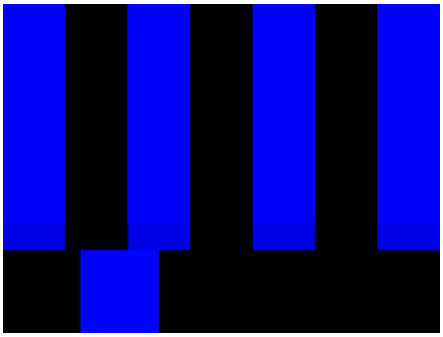

FIGURE 397

2. If the monitor lacks a "Blue-gun only" feature, you can obtain a colored filter such as a Kodak Wratten #47B gel and hold that between your eyes and the monitor for a similar result.

3. Tweak the *Color* (or *Saturation*) knob until the small rectangular patches at very bottom of the tall upper bars on the extreme right and left of your screen merge with the tall bars above.

4. Tweak the monitor's *Hue* control until the small rectangles beneath the third and fifth tall upper bars likewise blend into bar above.

5. You may need to redo the last two steps several times, balancing the adjustments of these two controls until all four of the lighter bars evenly match the smaller rectangles just beneath them. (Note that a perfect match simply may not be possible on some monitors.)

6. Check your results with some familiar imagery and make any further tweaks you feel are required.

PAL

1. If your monitor has a "Blue-gun only" setting, enable it. Raise the *Color* or *Saturation* setting until the three right hand bars all appear to be the same shade.

2. If the monitor lacks a "Blue-gun only" feature, you can obtain a colored filter such as a Kodak Wratten #47B gel and hold that between your eyes and the monitor for a similar result.

3. Turn off the "Blue-gun only" feature (or dispense with the filter if you used one) and examine the red bar. It should appear not to be so vivid that it bleeds onto the nearby bars.

4. Check your results with some known familiar imagery and make any further tweaks you feel are required.

E.4 FURTHER READING

You may find it helpful to review the white paper, available from NewTek's website, entitled "NewTek TriCaster Scopes – How and Why", by Allan Tépper. This document provides many helpful insights into waveform and vectorscope use, as well as the development and application of video standards.

APPENDIX F: KEYSTROKE SHORTCUTS

F.1 SWITCHER…

Program Row, Inputs 1 to 24 (by model)	F1 – F12 plus [Shift + F1-12]
Preview Row, Inputs 1 to 24 (by model)	1 – 0, -, =, and [Shift + 1-0, -, =,]
Transition Delegate – select BKGD	[key (left square bracket)
Transition Delegate – multi-select BKGD	Shift + [
Transition Delegate – select DSK 1	] key (right square bracket)
Transition Delegate – multi-select DSK 1	Shift +]
Transition Delegate – select DSK 2	\ key (backslash)
Transition Delegate – multi-select DSK 2	Shift + \
Transition Delegate – select DSK 3	Backspace
Transition Delegate – multi-select DSK 3	Shift + Backspace
Transition Delegate – select DSK 4	Insert
Transition Delegate – multi-select DSK 4	Shift + Insert
Transition Delegate – select FTB	b
Transition Delegate – multi-select FTB	Shift + b
Select FTB Delegate and perform Fade	Ctrl + b
Auto DSK 1 On/Off	a
Auto DSK 2 On/Off	s
Auto DSK 3 On/Off	d
Auto DSK 4 On/Off	f
Take DSK 1 On/Off	Shift + a
Take DSK 2 On/Off	Shift + s
Take DSK 3 On/Off	Shift + d
Take DSK 4 On/Off	Shift + f
Select Transition (prev/next)	, and . (comma and period)
Select Fade Transition	Ctrl + f
Restore Last Transition	Shift + Ctrl + f
Transition – Slow … Medium … Fast	z…x… c
Transition – Increase Speed	Shift + c
Transition – Decrease Speed	Shift + z
Toggle Reverse Transition On/Off	e
Ping Pong Transition (off/on)	Alt + e

F.2 T-BAR

Take	Return Key
Take T-bar Back to Top	Shift + Return
Transition … Go/Pause	Spacebar

Auto Reverse	Shift + Spacebar
Adjust T-bar… Down/Up	t / Shift + t (faster add Ctrl)
Halfway T-bar… Take	h

F.3 RECORD, GRAB, AND STREAM

Record on/off	r/ Shift + r
Grab (still image)	p
Stream Start	Ctrl + /
Stream Stop	Ctrl + Alt + /

F.4 TABS

Show (DDR, PTZ, Mixer, etc.; varies by model) tab	Ctrl + (F1 to Fn)
Select M/E 1- 8	Ctrl + Shift + F1-F8
Show M/E pane	Ctrl + m
Hide M/E pane	Alt + m
Toggle M/E pane	m

F.5 WORKSPACE

Show Interface A	Alt + Numpad 0
Show Interface B	Alt + Numpad 1
Show Interface C	Alt + Numpad 2
Show Interface D	Alt + Numpad 3
Show Multiview A	Ctrl + Numpad 0
Show Multiview B	Ctrl + Numpad 1
Show Multiview C	Ctrl + Numpad 2
Show Multiview D	Ctrl + Numpad 3

F.6 MEDIA PLAYERS

Stop	k
Play	l (lower case L)
Go to previous playlist item	j
Go to next playlist item	; (semi colon)
Autoplay On/Off	u
Loop On/Off	‘ (apostrophe)
Single On/Off	q
Navigate through Playlist items	Up/Down/Left/Right Arrows
Set In Point for current Playlist Item (Clip or Audio file)	i

Set Out Point for current Playlist Item (Clip or Audio file)	o
Split clip at current frame	/
Reset In and Out Point to the file's first and last frame	g

F.7 GENERAL

F.7.1 EDIT TITLE PANE

Save the current title page	Ctrl + Shift+ s
Save the current title page, and duplicate it in the playlist	Ctrl + Shift+ s
Save the page and move to the previous playlist item	Page Up
Save the page and move to the next playlist item	Page Down

F.7.2 SELECTION AND NAVIGATION

Select All	Ctrl + a
First/Last Item	Home/End
Navigate through Playlist items	Up/Down/Left/Right Arrows
Select All Previous/Following Items	Shift + Home/End
Playlist - select to Top/Bottom	Shift + Home/End
Playlist – add to selection (Up/Down)	Shift + Up/Down arrow

F.7.3 MISC.

Cut	Ctrl + x
Copy	Ctrl + c
Paste	Ctrl + v
Delete	Delete Key
Show version	Alt + b

APPENDIX H: RELIABILITY TESTING

We know our products play vital roles in the productions of our customers. Durability and consistent, robust performance are much more than just adjectives for your business and ours.

For this reason, all NewTek products undergo rigorous reliability testing to ensure they meet our exact test standards. For TC1 the following standards are applicable:

Test Parameter	Evaluation Standard
Temperature	Mil-Std-810F Part 2, Sections 501 & 502
Ambient Operating	0°C and +40°C
Ambient Non-Operating	-10°C and +55°C
Humidity	Mil-STD 810, IEC 60068-2-38
Ambient Operating	20% to 90%
Ambient Non-Operating	20% to 95%
Vibration	ASTM D3580-95; Mil-STD 810
Sinusoidal	Exceeds ASTM D3580-95 Paragraph 10.4: *3 Hz to 500 Hz*
Random	Mil-Std 810F Part 2.2.2, 60 minutes each axis, Section 514.5 C-VII
Electrostatic Discharge	IEC 61000-4-2
Air Discharge	8K Volts
Contact	4K Volts

APPENDIX I: CUSTOMER SUPPORT



It is frequently said that "All good things must come to an end" … but your NewTek live production system is designed to work as well on any day as it did on the day you bought it. NewTek's Customer Support features and options are meant to help you achieve that goal. This chapter identifies the many assets and services available to you.

I.1 NEED A LITTLE HELP?

Product support is available for as long as you own your NewTek system. Find complete details on our main Support page at https://www.newtek.com/support/get-support or request a ticket with customer support https://support.newtek.com/hc/en-us/requests/new.

- **Training:**
  - **NewTek University**: Our new online training will help you take advantage of the countless creative possibilities your unit offers (you can also become a Certified Operator once you pass the exam) – see NewTek U
  - **Discover:** Watch our online videos to learn the benefits and features of NewTek professional video production systems NewTek's YouTube channel
- **Software Updates**: visit NewTek's download page
- **Knowledge Base**: Our extensive online knowledge base will help you troubleshoot issues and clear up any misunderstandings – see http://new.tk/kba.
- **NewTek User Forums**: Join the conversation, get answers, learn techniques, and share ideas with users like yourself at http://forums.newtek.com

I.1.1 THE PROTEK ADVANTAGE

The option ProTek℠ plan goes far beyond basic service, offering you NewTek-provided priority service for however long you own your product. ProTek enhances your support experience—every step of the way.

- With ProTek coverage, you are part of a select group of customers whose needs are our priority.
- Every ProTek Ultra customer gets the white-glove treatment from their local Ultra Service Provider.
- ProTek Ultra customer calls and emails are answered first.
- ProTek gives you priority access to the people who can answer your questions, help you with configuration, and walk you through solutions, step by step.
- And if disaster should strike and your NewTek product needs repair, we're standing by ready to provide the best access. You get free overnight shipping.
- If you opt for a repair rather than a replacement, you get a guarantee that within three to five days of receiving your product it will be on its way back to you.
- If your product needs to be back in service immediately ProTek Ultra customers can usually get a replacement shipped right to your doorstep the very next day. Find full details of the ProTek program at http://new.tk/ProTek.

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