NewTek™

TriCaster®

Advanced Edition

Live Video Production
8000 | 860 | 460 | 410 | Mini SDI | Mini

User Guide

TABLE OF CONTENTS

PART I (GETTING STARTED)

Introducing TriCaster Advanced Edition – 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 use your TriCaster® live video production system. It attempts to convey essential information in a friendly, concise way, while also providing a deeper reference section you can turn to when you really need all of the relevant details.

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

➤ *PART I – GETTING STARTED*
Introduction to TriCaster® – connecting devices (cameras, monitors, etc.) and registration, ending with Basic Training – a brisk jog through helpful resources available to help you become familiar with TriCaster operations and features.

➤ *PART II – REFERENCE*
This section covers every arcane detail related to using TriCaster Advanced Edition (for those who need it, and those who just like to know everything).

➤ *PART III – APPENDICES*
Leads off with a handy section titled "How do I …?", a helpful question and answer section with its own brief index.

When you have a specific need, you may well find a quick answer here, along with cross references to more detailed information when appropriate.

Appendix D lists all shortcut keys. You will also find a comprehensive keyword index in Part III.
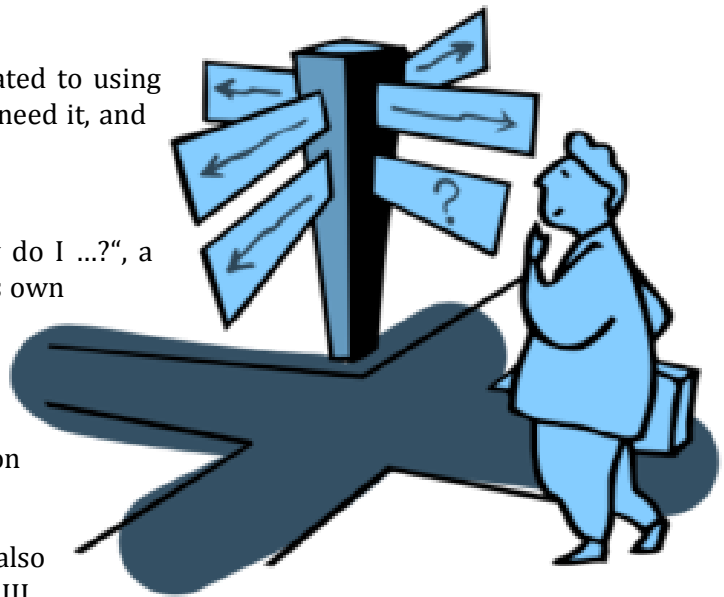
Note: Consistency of layout, controls and features is a noteworthy attribute of the professional TriCaster family. This makes it easy for you to move between TriCaster models without either a significant learning curve or errors, and also lets us reveal them in a single manual. Model differences are noted in this Guide where necessary by remarks such as "TriCaster 8000 only", etc.

Chapter 2 INTRODUCTION

Thank you for purchasing this NewTek TriCaster® system. NewTek™ is extremely proud of its record of innovation and commitments to excellence in design, manufacture, and superb product support. TriCaster Advanced Edition constitutes our best release ever, and you will find it exceptionally powerful. This chapter provides a quick tour of TriCaster models, major components, and features.

SECTION 2.1 MEET THE FAMILY

All professional model TriCasters bear a strong family resemblance. The user interfaces of TriCaster Mini SDI, Mini, 410, 460 and 860 have a great deal in common with the flagship TriCaster 8000. The latter, of course, has a number of unique attributes and features, but many aspects of the workflow and user software are intentionally very similar. Among other benefits, this makes it easy for TriCaster users working with multiple machines to feel right at home and avoid errors.

SECTION 2.2 OVERVIEW

Not so long ago, high definition live production demanded very expensive equipment, daunting technical skills, and a large crew. TriCaster® changed all that. In one compact system, it provides a complete set of tools you can use to create, broadcast, web stream and project your production. TriCaster even includes NewTek's latest edition of the famous LiveSet™ virtual set system to provide you with network quality 'bigger than life' production capabilities.

TriCaster continues to raise the bar for live production systems. Simply put, it represents the most complete, reliable and efficient integrated system available for live production and web streaming. Its capabilities are suited to broadcast center, mobile and remote production alike, and it can be operated, if desired, by just one person. No matter what your live broadcast ambitions are, TriCasters stand ready to help you fulfill them.

With TriCaster you can produce and distribute live video programs from diverse sources and digital media in both standard and high definition. Use multiple cameras, network video sources, recorded digital video, multimedia presentations from networked laptops, live web pages, digital photos and graphics, control robotic cameras, and much more.

Your presentations can simultaneously be displayed by video projectors, television monitors, broadcast by traditional means, and streamed in high quality on the Internet. TriCaster Advanced Edition also supports NewTek's innovative NDI (Network Device Interface) protocol, placing it squarely in the forefront of IP technology solutions for the video broadcast and production industries.

SECTION 2.3 TRICASTER® ADVANCED EDITION

Any TriCaster is an extremely powerful, innovative, and cost-effective tool for creative producers. TriCaster Advanced Edition provides a new level of functionality to simplify or automate complex workflows, for those looking for powerful solutions to their creative problems, and who simply demand the best of the best.

The *Startup Screen* appears shortly after you power up you TriCaster®. This is the command center where most other operations are initiated.
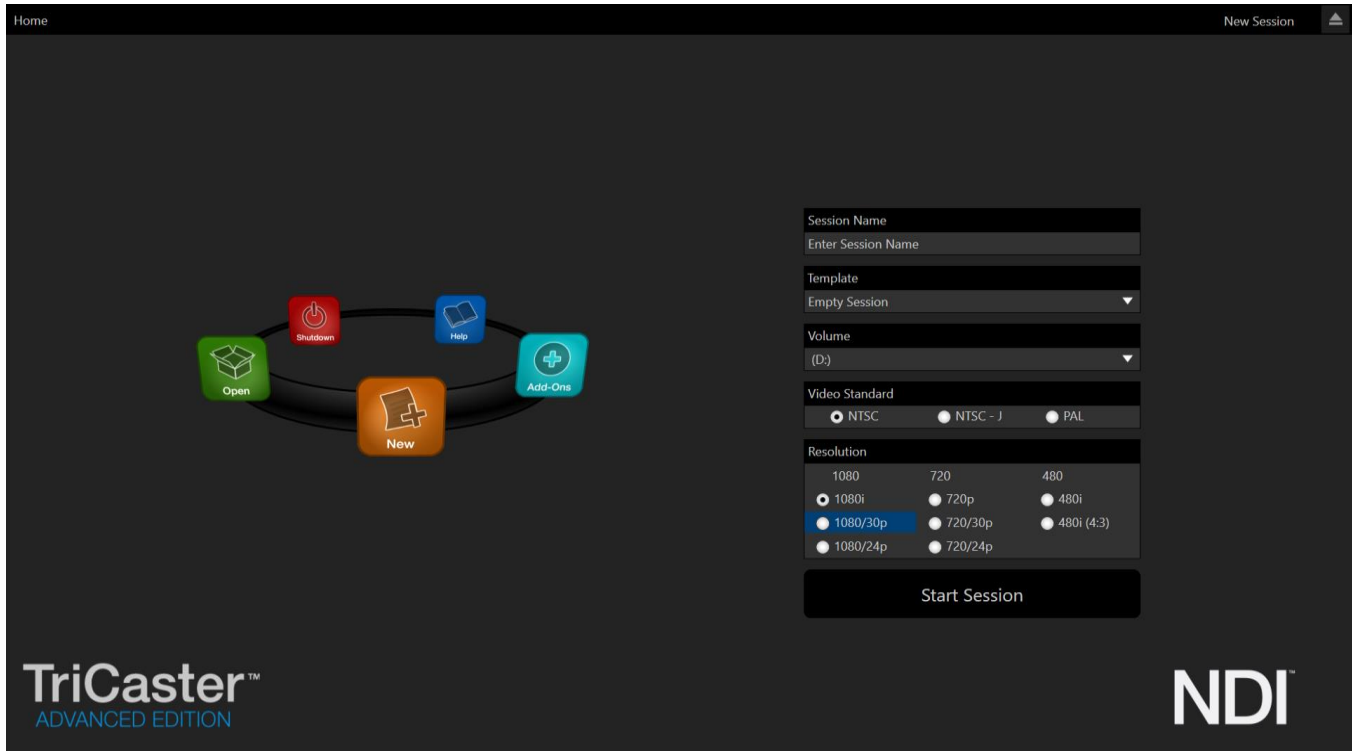
The *Home page* of the *Startup Screen* allows you to create (and re-open) *sessions*. Session are essentially custom presets for individual productions or other purposes. Later, when you enter an existing session, all of its assets and settings are remembered.

After creating or opening a session, clicking *Start Session* takes you to the *Session Page*. Here you can launch the *Live Desktop* (for live production), or perhaps choose to prepare *Graphics* (title pages), *Manage* content, and more.

SECTION 2.5 LIVE DESKTOP

TriCaster's live production features are all available from its unique *Live Desktop*, which in many ways mimics familiar production equipment. However, the *Live Desktop* provides far more functionality than similar single-purpose devices in its integrated environment.

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

FIGURE 2-2

- The top-most band contains TriCaster's 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 area can be re-sized, and even completely hidden when outboard monitoring is in use; or the display can be customized to complement the external *Multiview* 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* panels can be minimized, and are hidden from view in Figure 2-2).

- The bottom third of the *Live Desktop* holds tabbed control modules, including *Media Players* (*DDRs* and *Graphics* players. plus a *Sound player*) and *Buffers*, *PTZ* camera controls and the *Audio Mixer*.

SECTION 2.6 FEATURES

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

2.6.1 PHYSICAL

- Rugged rack-mount chassis (TriCaster Mini SDI and Mini have a unique, durable yet *extremely* compact case).

- Redundant power supplies (TriCaster 8000 and 860 only) ensure robust, reliable and quiet performance in fixed or mobile installations.
- Massive storage capacity.
- For 19" rack-mount models, all audio and video, monitoring and network connectors are easily accessible from the rear for convenient installation in industry standard configurations.
- Audio and video connectors are industry standard – XLR, ¼" TRS jack (both balanced), BNC or HDMI as appropriate – ensuring broad compatibility and secure connections. Headphone output uses a standard 1/4" TRS stereo jack.

2.6.2 MULTI-TIER FAILSAFE

TriCaster's '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 (not a TriCaster Mini or Mini SDI feature) ensures that as long there is AC power, audio and video from *Input 8* (on 4RU models) or *Input 4* (2RU models) 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.
- TriCaster also has a comprehensive integrated system restore feature. Operators can quickly and easily restore to factory defaults, or create a custom restore image on another drive and either restore from that drive or use the backup drive to boot from if a complete hard drive failure ever occurs.
- Should a 'less than ideal' control surface USB connection fail, TriCaster will automatically restart it without user intervention.

2.6.3 A/V INPUT AND OUTPUT

- Live switch up to eight live video sources (4RU models).
- TriCaster 460, 860 and 8000 support SDI and analog video input and output, plus internal and local or remote network video sources. TriCaster 410 and Mini SDI offer HD-SDI input and output without analog support, while TriCaster Mini employs HDMI video input and output.
- Connect popular video routers to greatly multiply input options.
- Professional BNC video connectors provide increased durability and reliability for camera connections. (TriCaster Mini and Mini SDI include strain relief provisions for cabling.)
- Control supported robotic (*PTZ*) cameras via network or serial connection.
- Freely mix 16:9 or 4:3 SD formats, and output HD sessions as HD and SD (4:3 or 16:9) simultaneously from HD sessions.
- 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 NewTek NDI™ Scan Converter.
- Update still *Buffers* in 'watch folders' from networked graphic workstations, even when these are displayed live.

- Transmit NDI output to another TriCaster across the local network.
- Create complex *M/E* effects and compositions using multiple sources and versatile virtual sets with live (virtual) camera moves.
- TriCaster 8000, 860 and 460 *M/Es* are reentrant, allowing you to cascade unbelievable effects in endless creative ways.
- Use switcher row grouping to automatically harmonize video sources for multiple *M/E* s, etc.
- Mix and route internal and external audio sources, including analog or SDI Embedded audio.
- Multiple video outputs, including streaming and *Network* output can all supply independent feeds; designate output mixes or individual sources at various resolutions up to 1920x1080 for output.
- Two additional outputs referred to as *Display* ports.
- Send main or custom audio mixes independently to any of the primary audio outputs, HDMI and the Internet stream.

2.6.4 ALPHA CHANNEL I/O

- Alternate video inputs can be configured as key channels for *Fill + Alpha* sources (not a TriCaster Mini SDI or Mini feature).
- NDI sources, including those from third-party applications, can support embedded alpha channel.
- Alpha channel (matte) output.

2.6.5 TIMECODE

- External LTC timecode support (except TriCaster 410, Mini SDI and Mini).
- Default Quicktime® recording format includes full 'per frame' time-code.
- IsoCorder™ recorded clips from multiple sources are easily aligned for synchronized post show editing using embedded timecode (external timecode is not supported on TriCaster 410 or TriCaster Mini).

2.6.6 MONITORING
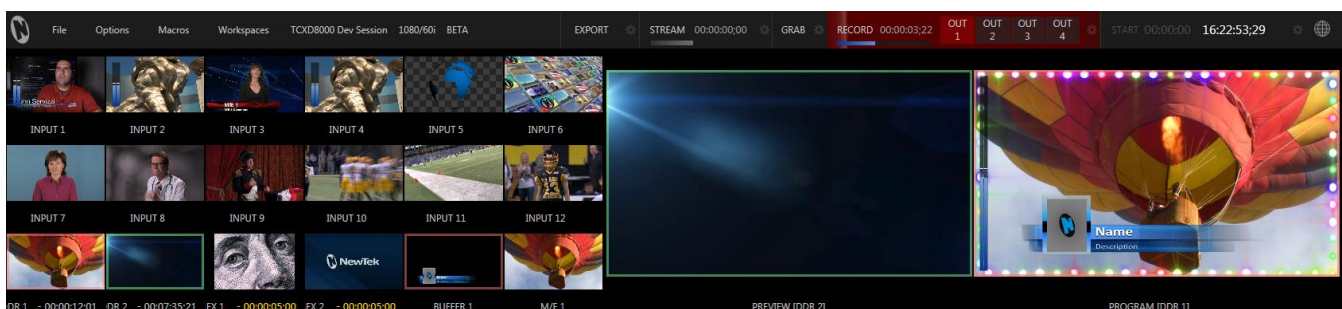
FIGURE 2-3

- TriCaster's *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 desktop 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* offer many alternatives, including numerous multi-bridge layouts, overlays and *Event Clocks.*
- Monitor sources on both *Live Desktop* and *Multiview* 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.

2.6.7 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.

2.6.8 THE SWITCHER

TriCaster's powerful switcher with native support for popular professional video routers puts countless video sources at your fingertips.

FIGURE 2-4

VIDEO LAYERS AND TRANSITIONS

The *Transition* section of TriCaster's *Live Desktop* provides powerful tools for arranging and displaying the numerous video and graphic layers contributing to TriCaster's ultimate program output.
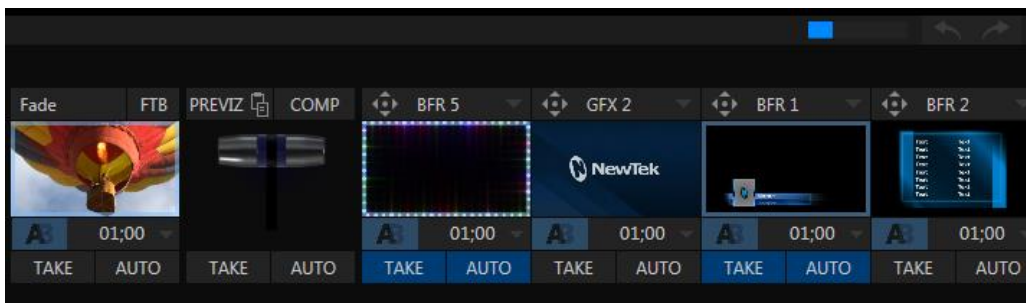
FIGURE 2-5

- Freely *hot-punch* or *transition* between external sources (*Cameras* or *Network 1 or 2*), internal sources (*Media Players*) and *M/E effects*.
- Latch selected *Switcher* and *M/E* source rows in color groups to synchronize switching operations.
- TriCaster 460, 860 and 8000 provide four *DSK* (Downstream Key) *Switcher* channels and four independent *KEY* channels for each *M/E,* permitting endless creative possibilities (other models have two *DSK* and *M/E KEY* channels).
- *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 (such as Adobe After Effects®), and convert them to colorful *animated *Buffer* effects that you can display on demand – without tying up a *Media Player*.
- Reveal combinations of video layers with one operation of the *T-bar* or single-click *Take* and *Auto* buttons.
- Local *Transition* controls for *BKGD* (Background) and *DSK* layers provide flexible, independent layout and display of all layers and their transitions.
- Select individual transition effects for every layer; adjust *Transition Speed*, *Reverse* and *Ping Pong* options.
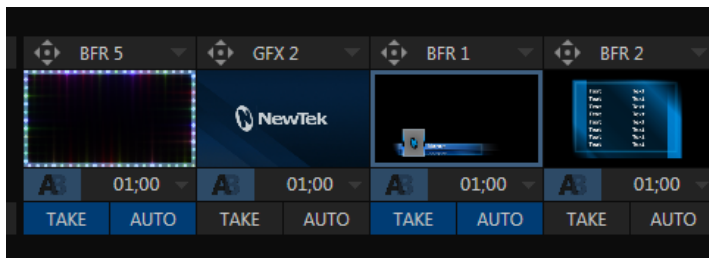
FIGURE 2-6

TriCaster's *DSK* layers support downstream overlays (*M/E Key* serve as *upstream* overlays – that is, ahead of the main *Switcher*). Some TriCaster models offer two *DSK*s, while TriCaster 8000, 860 and 460 have four.

- Display *DSK* channels independently, and swap them during a switch with custom transitions.
- Use TriCaster's numerous *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.

2.6.9 M/Es
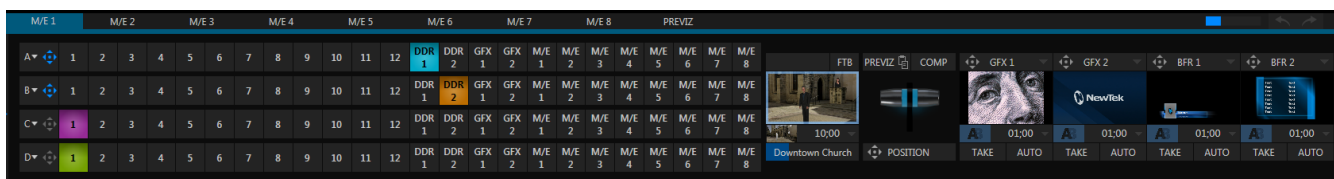
FIGURE 2-7 (TRICASTER 8000 SHOWN)

TriCaster's color-coded *M/E* (Mix/Effect) banks provide stunning effects.
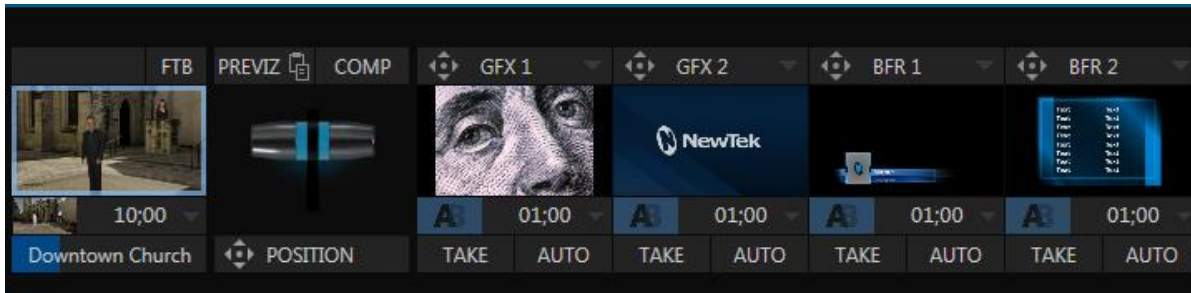
These include secondary video mixing capabilities, switching (with traditional wipes or *Animation Stor*e transitions with *TransWarp* capabilities), full alpha channel support and *LiveMatte*™ realtime keying technology for green/blue screen effects, and jaw-dropping dynamic virtual sets, and much more.

Each M/E bank supports:

- Multiple primary video sources (four for TriCaster 8000, 860 and 460; otherwise, two).
- Multiple *KEY* (overlay) channels (four for TriCaster 8000, 860 and 460 only; otherwise, two), with individual transition capabilities.
- *Mix* mode provides sub-mix functionality, with individual transitions for A/B *Background* layers and Key channel(s).
- Full keyers and discreet transition effects for every *M/E* channel.
- Individual *Scale*, *Position*, *Crop* and *Rotation* controls for all channels.
- *Buffer* support in every channel.
- TriCaster 8000, 860 and 460 provide powerful Comps (compositions) that let you animate KEY layer position, rotation and other attributes in full motion, as well as motion *Tracker* support.
- Convenient *MEMs* allow instant access to pre-configured *M/E* setups.

2.6.10 VIRTUAL SETS

- Achieve the look of large, sophisticated studio sets in a very small space with NewTek's astonishing *LiveSet*™ virtual set technology.
- Virtual sets support up to four keyable video sources (TriCaster 8000, 860 and 460).
- *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.

2.6.11 RECORD AND STREAM

- Record your live-switched production at full resolution to a high quality, multi-platform, application friendly QuickTime® format.
- Recorded files include embedded timecode (on supporting models).
- IsoCorder™ technology lets you record up to eight a/v sources at once (depending on TriCaster model), chosen from among local hardware camera inputs and all four outputs.
- Easily grab still images from any source or selected inputs.

- 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 surface to mark, replay and manage highlights.

2.6.12 MEDIA EXPORT

Export support makes it easy to distribute content to multiple targets in one pass. TriCaster even 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.

2.6.13 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.
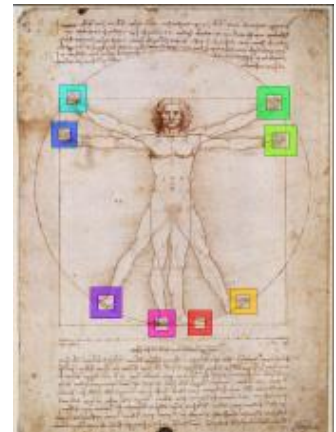
2.6.14 HOTSPOTS, TRIGGERS AND TRACKERS

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

Trackers provide motion data from defined color regions as they move about in the frame in realtime. Lock other video sources to *Tracker* output using *Position* tools in *M/Es* banks and *DSK*s and they will follow obediently.

2.6.15 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 TriCaster's *Media Players.*
- Imported files are automatically categorized and sent to the correct locations, making them easy to find and use during live productions.
- Files are automatically transcoded to formats ensuring smooth playback when necessary.

2.6.16 AUDIO MIXER

TriCaster provides extensive multi-channel audio control and management.

- Adjust individual audio sources (internal and external) and introduce them into your program manually or automatically.
- Control output levels for program, headphones, auxiliary outputs, recording, and stream separately.
- Convenient mixer *MEM*s allow single-click access to prepared setups.
- Powerful and flexible 'audio follow video' options.
- Audio automation also allows 'video follow audio', and more, based on 'threshold macros'.
- Exclusive or latched *Solo* controls, including the ability to monitor audio captured by the IsoCorder™ module.
- Independent 7-band EQ, compressor/limiter and noise gate for each source and output.
- Complete multi-bus matrix routing options.
- Configurable *VU meter* calibration: Show *VU meter* calibration using digital (dBFS) or analog (dBVU or dBu) scales (digital sources, *SDI* and *AES/EBU*, *Streaming* output and *Record* controls default to dBFS).

2.6.17 INTEGRATED MEDIA PLAYERS

TriCaster's numerous *Media Players* and title system serve up graphics, titles, video clips and audio files quickly and easily during your live productions.
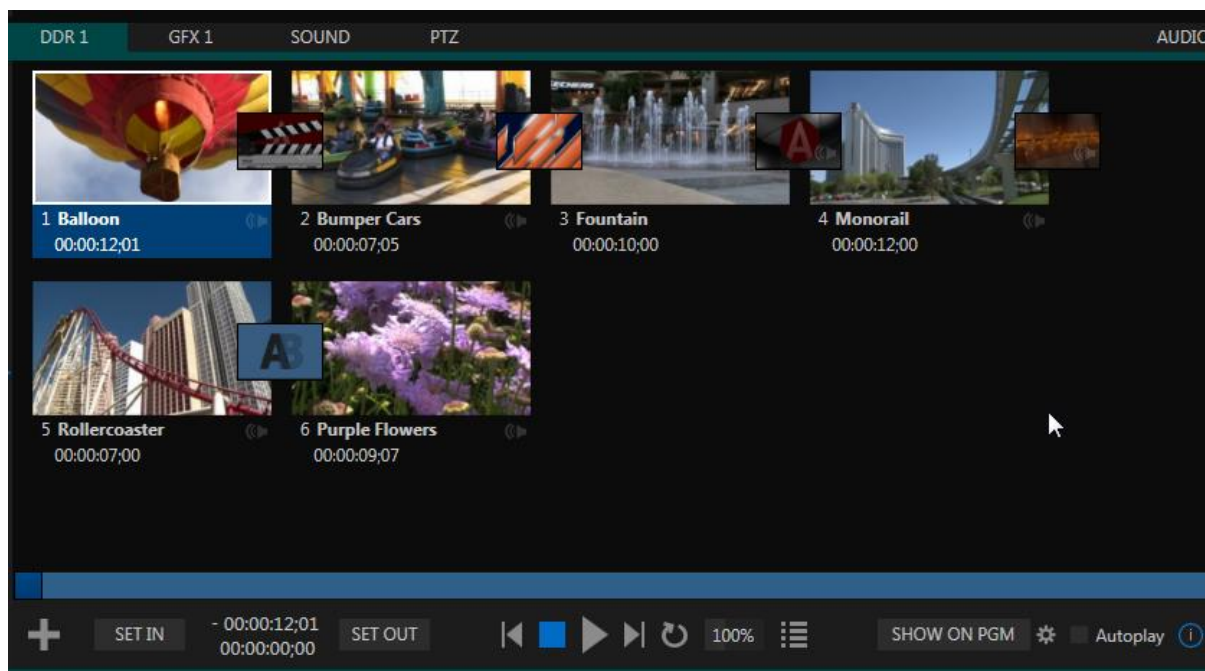
FIGURE 2-9

- Add a/v clips, sound files or still image files to *Media Player* playlists.
- Trim and re-order playlist entries.
- Add colorful transitions between clips.

- Store playlists *MEM slots* for easy recall.
- Flexible playback controls include variable *Speed* and *Loop* options.
- Each *Media Player* has corresponding volume and other advanced audio controls in the *Audio Mixer*.
- Convenient 'per clip' audio level and playback *Speed* control is provided.
- *Autoplay* feature starts and stops playback automatically based on *Switcher* activity.
- Control *Media Players* with *macros* triggered by other events.
- Assign titles, graphics, clips or buffers to multiple *DSK* or M/E *Key* channels.
- Edit titles live, even while 'on air'.
- The powerful *Show* button instantly transitions a selected clip to the *Main Switcher* or an *M/E*, plays it, and then restores the target's original source.

2.6.18 BUFFERS

The *Buffers* module provides quick review and management of TriCaster's internal media buffer system, and is in reality a combined multiview player and asset management tool fully supported by TriCaster's *Macro* system.
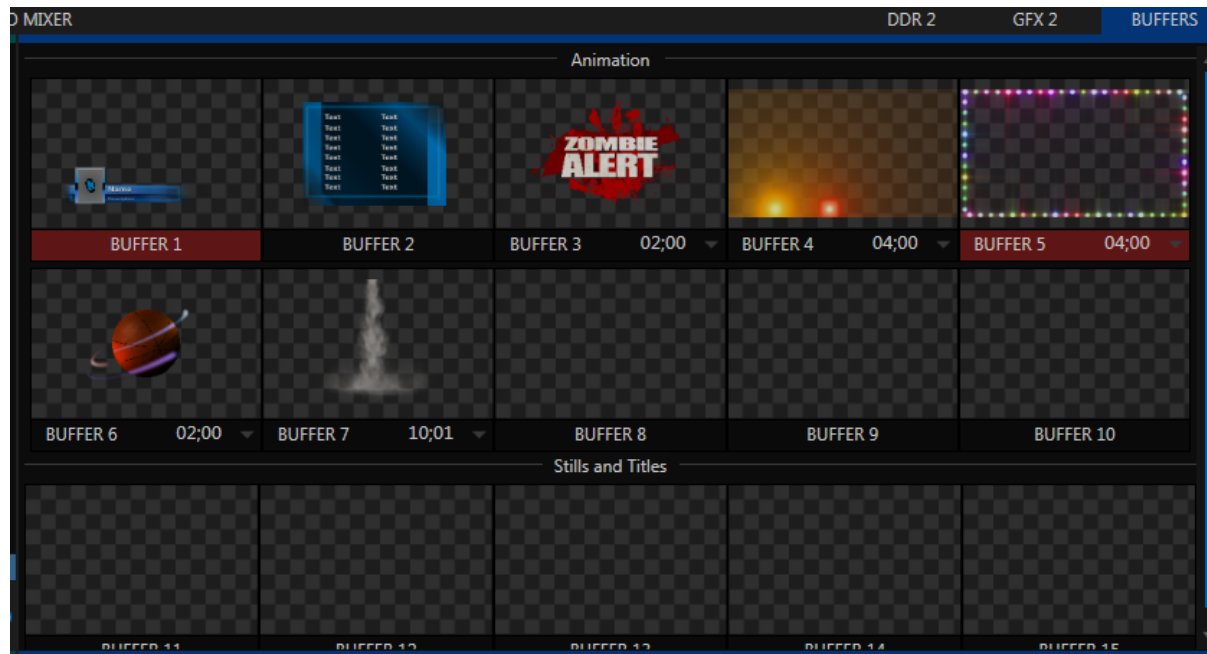
Buffers can be applied in any video channel, including all main *Switcher* and *M/E* rows, or as overlays in the numerous *DSK* and *KEY* channels. *Buffer* 'slots' can contain *animated effects (compiled from your own clips using the supplied *Animation Store Creator* application), still graphics or title pages, all with full alpha channel support (the number of buffer slots supporting animation varies by model).

Animated buffers come in two types, and either loop endlessly (perfect for bugs, station IDs, etc.) or 'auto-run' once when displayed. 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*. In addition, each *Buffer* slot has its own set of convenient presets.

2.6.19 TITLES AND GRAPHICS

TriCaster includes an extensive set of live-editable title pages in various theme packs, all ready for immediate use in your productions. Also part of TriCaster's integrated software suite is LiveText™, NewTek's professional titling and graphics application. LiveText allows you to create your own great looking custom title pages and motion graphics, including scrolls and crawls that can be played back in TriCaster's *DDRs*.

2.6.20 OPTIONAL CONTROL SURFACES

Most TriCaster bundles include a control surface designed as the perfect complement to your switcher, making your live production operations even more convenient. Once you get your hands on one you'll never want to let go. Beyond this primary control surface, NewTek offers an optional instant replay control surface called TimeWarp™. Talk to your local reseller for a demonstration of this powerful add-on for your TriCaster.

In summary, TriCaster gives you the combined power of both a network control room and a complete post-production facility in one simple to use broadcast appliance. Let's jump in now. First, we'll get you connected; following that, we'll explore TriCaster's most important features.

Chapter 3 SETTING UP

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

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

- NewTek TriCaster®
- Keys to front panel of case (Rack-mount models)
- Four attachable rubber feet (for desktop use)
- A/C power cabling (external PSU with cable for TriCaster Mini™)
- BNC removal tool (to assist with cable connection and removal, rack-mount units only)
- NewTek mouse and keyboard
- Quick Start Guide
- NewTek 3PLAY™ brochure
- NewTek TriCaster registration reminder card
- New product letter

SECTION 3.1 COMMAND AND CONTROL

Hint: TriCaster's interface requires a monitor resolution setting of at least 1600x1050. 4RU systems may require 1920x1080.

1. Connect an external computer monitor to the port labeled *Interface* on the backplate of 4RU models.
2. For 2RU models, use the DVI connector nearest to the *Video In* group for the interface monitor connection. For TriCaster Mini SDI or Mini, use either port in the group labeled Interface/Multiview.
3. Connect the *mouse* and *keyboard* to USB ports on TriCaster.
4. Connect the *power cord* (or cords, for 4RU models); or, for TriCaster Mini or Mini SDI, the external power supply between the DC Power input connection on TriCaster's backplate and an external power receptacle.
5. Turn on the computer monitor.
6. Press the *Power* switch on TriCaster's faceplate (located behind the door on some models).

A word about UPS devices:

'Modified sine wave' UPS devices are popular due to low manufacturing costs. However, such units should generally 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.

At this point, the blue *Power LED* will illuminate, and the adjacent hard drive *activity light* should flicker as the device boots up. (If this does not happen, check your connections and retry).

Though not a requirement, we do strongly recommend that you connect TriCaster using 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. Power conditioners can reduce wear on TriCaster's power supplies and other electronics, and provide a further measure of protection from surges, spikes, lightning and high voltage.

SECTION 3.2 LICENSE AND REGISTRATION

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

IMPORTANT NOTE: TRICASTER'S VIDEO OUTPUT DISPLAYS A WATERMARK UNTIL THE SYSTEM IS REGISTERED AND UNLOCKED.

> *Hint: If the Serial number doesn't appear automatically, and you can't find it on your unit, you can obtain it from the registration webpage mentioned in the next section, or by calling Customer Support Desk (open seven days a week).*

You can register and obtain your registration code directly from TriCaster or other system connected to the Internet, or by telephone. If you have connected your TriCaster to the Internet, the registration process will guide you through the process.

> *Hint: Information on connecting TriCaster to a network can be found in Section 3.15.*

Otherwise, you can visit the registration webpage from another system with Internet access. In either case, after registering on the website, enter the resulting *registration code* into the field provided in the *Registration dialog*.

> *Hint: For later convenience, record the registration code for your TriCaster on the sticker provided for the purpose inside the front access panel of the system.*

3.2.1 REGISTERING BY TELEPHONE

NewTek's Customer Support center can also handle registration requests by telephone, if that is more convenient (when opportunity permits, you should still visit the website as discussed above to gain access to software updates).

Please have your *Product ID* (from the *Registration dialog* mentioned earlier) handy when you call. The phone numbers for Customer Support follow:

Telephone:
- (US) 1-800-862-7837
- (Outside US) +1-210-370-8452
- (Europe) +33 (0) 557-262-262

> *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 TriCaster software to as-shipped state when you don't have access to the Internet.*

It's a great idea to check for recent free software updates for your system at this time, too – see the heading System Utilities in Section 5.2.3 for more on this.

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 3.3 RACK MOUNTING TRICASTER

Several TriCaster models are designed for convenient mounting in standard 19" racks (mounting rails designed for different TriCaster models 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, and this is true of TriCaster as well. 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 2RU TriCasters in particular require ventilated space above the unit (1RU minimum is recommended).

> *Hint: When operating TriCaster 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 TriCaster will be installed inside furniture-style enclosures.

> *Hint: See also Appendix E, Dimensions and Mounting for helpful information for your TriCaster model.*

SECTION 3.4 INPUT CONNECTIONS

3.4.1 CONNECT A/V SOURCES

External audio and video sources are connected to the appropriate inputs on TriCaster's backplate.
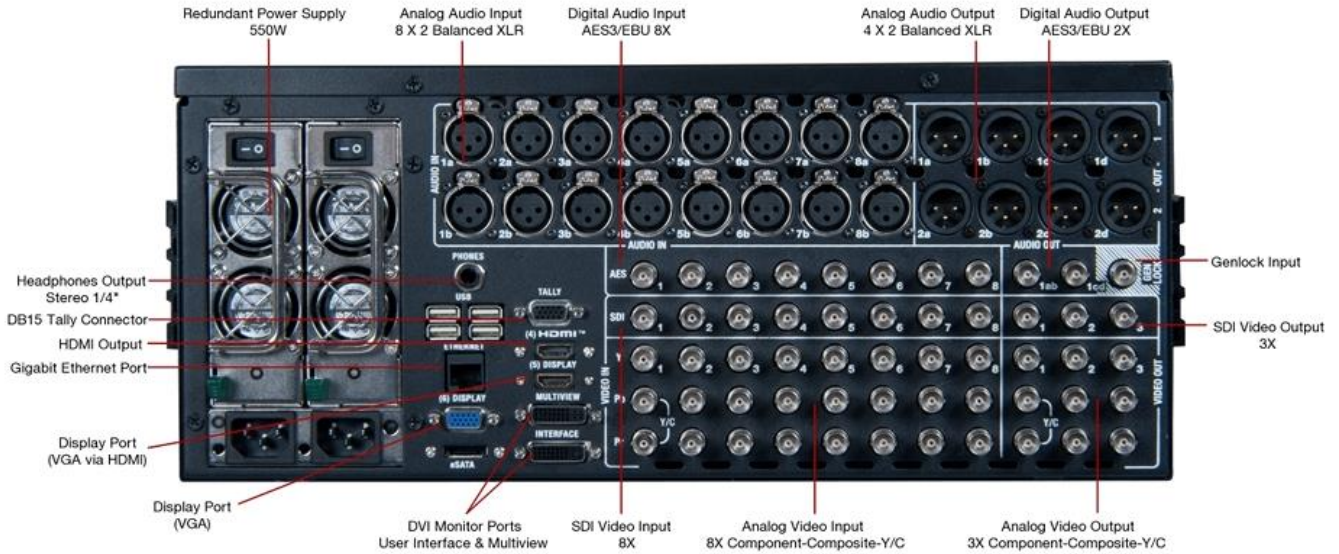
FIGURE 3-1 – 4RU MODELS
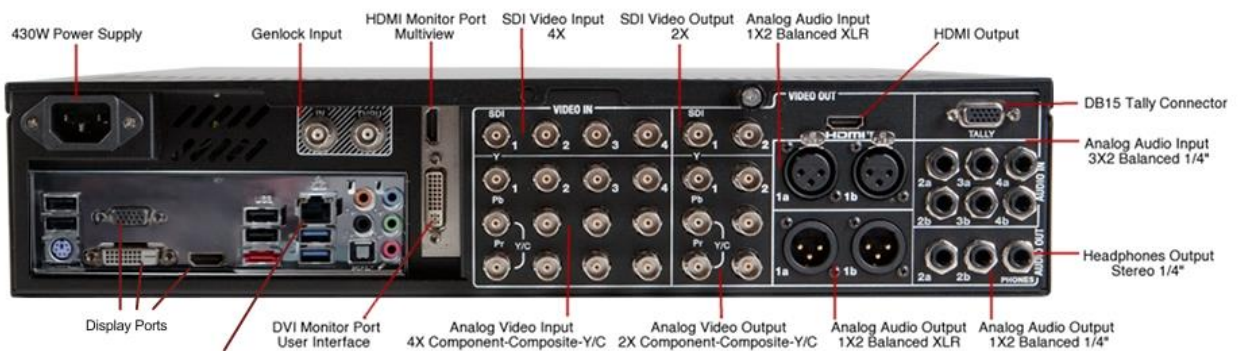
FIGURE 3-2 – TRICASTER 460
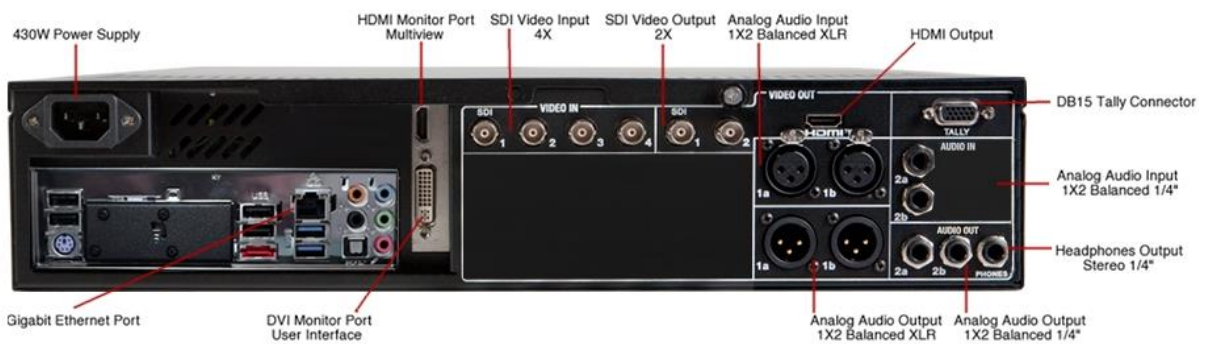
FIGURE 3-3 – TRICASTER 410
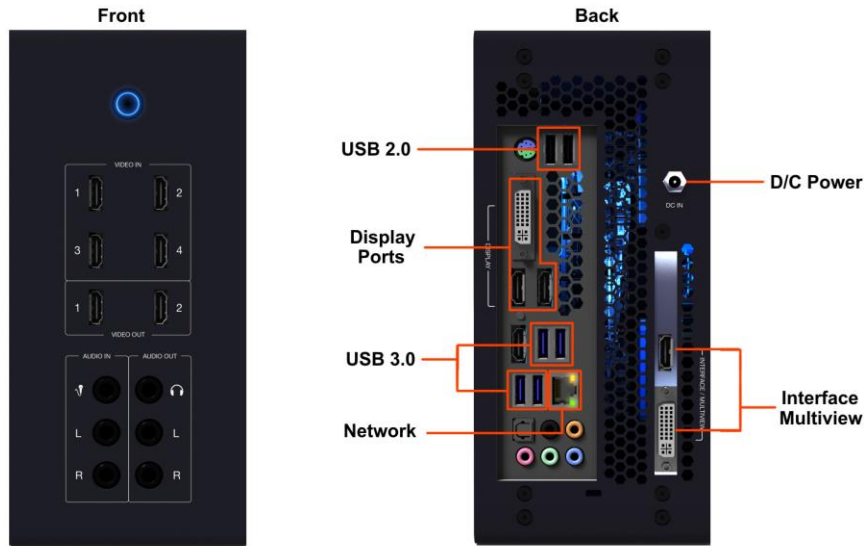
FIGURE 3-4 – TRICASTER MINI

Note: Hardware details as depicted are subject to change without prior notice.

If your equipment supports SDI, this is the best quality option.

1. Connect sources to suitable connectors in the *VIDEO IN* section: *SDI*, *HDMI* (TriCaster Mini only), *Component*, *Y/C* (S-Video), or *Composite* (may require RCA> BNC adapter).

    a. *SDI* – Attach SDI source connectors to one of the BNC connectors in the *Video In* group marked *SDI*.

    b. *HDMI* (TriCaster Mini only) – Connect your HDMI source cables to HDMI inputs on the front of the unit.

Note: The analog video input connection options listed next are not provided by TriCaster 410 or Tricaster Mini.

    c. *Component* – Attach the appropriate BNC connectors from your sources to all three analog BNC connectors (labeled *Y*, *Pb* and *Pr*) in a column of the *Video In* group.

d. *Y/C* – If your S-Video equipment and cabling has the usual 4-pin mini-DIN connectors, you will need an *S-Video to dual BNC* adapter.

To connect Y/C sources, attach the *Y* (luma) connector of your source to the second analog BNC connector (labeled *Pb*). Attach the source's *C* (chroma) connector to the *bottom* connector (labeled *Pr*).

e. *Composite* – Attach the composite source's connector (may require use of an RCA to BNC adapter) to the connector in the input row labeled *Y*).

Note: The broadcast video standard (such as NTSC, NTSC-J or PAL) of all video sources connected for a given session must match.

> SDI Recommendations:
>
> It's worth mentioning here that SDI, while ideal for many purposes, does nevertheless have some limitations.
>
> We do not recommend cable runs exceeding 100 meters (for HD; or double that for SD). Transmission over greater distances may result in signal losses, and call for measures to boost levels, which may in turn introduce added latency into the signal path before TriCaster.

2. To input *analog* audio along with the video, connect the desired audio sources to the (XLR or ¼") connectors as provided in the *Audio In* group.

We'll discuss audio *Connection Type* options a bit later, in Section 3.12.

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

3.4.2 CONNECTING A VIDEO ROUTER

With the appropriate software installed, TriCaster Advanced Edition systems 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 TriCaster by Ethernet cable, and then connect one (or more) of the router's video outputs to TriCaster inputs with matching numbers, using suitable video cables.

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

- Click the *Shutdown* icon on TriCaster's *Home page* (Startup), and click the *Administrator Mode* at right.

- In the *Administrator Mode* panel, click *Exit to Windows.*

- Navigate to the C:\TriCaster\Configuration folder, 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 TriCaster to recognize. 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 TriCaster.

Note: TriCaster communicates with each using individual IP address and port numbers, allowing multiple routers to be connected simultaneously. Several TriCasters can even control either the same router(s) – especially useful when TriCaster control is mirrored.

File comments explain how you can bypass the default 1:1 mapping of router outputs to TriCaster 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, TriCaster may be able to access that name and use it for Switcher buttons as appropriate.
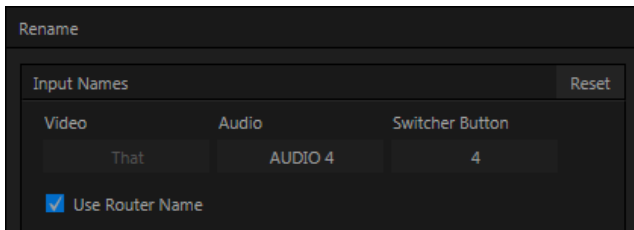
FIGURE 3-5

To enable this behavior, checkmark the *Use Router Name* switch in the *Properties* panel (Figure 3-5) opened by the *Switcher* (or *M/E*) button context menu item of the same name.

Hint: The router settings can be made to persist from session to session and even after a new install. To do this you will need to copy the router_setup.xml file from its current location.

If using TriCaster copy from:

C:\ProgramData\NewTek\TriCaster\Configuration

If using VMC1 copy from:

C:\ProgramData\NewTek\VMC1\Configuration

And paste in the appropriate location:

C:\Users\[Username]\AppData\Local\NewTek\TriCaster\Configuration

or

C:\Users\[Username]\AppData\Local\NewTek\VMC1\Configuration

Anytime you need to edit this file, you will edit the version in this new location.

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 3.5 GENLOCK CONNECTION

(Not a TriCaster 410, Mini SDI or Mini feature.) The *Genlock* input on TriCaster's backplate is for connection of 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 supplying TriCaster, *and* TriCaster itself. To connect the genlock source TriCaster, supply the reference signal from the 'house sync generator' to TriCaster's *Genlock In* connector. (See Section 3.13 regarding genlock configuration.)

SECTION 3.6 TIMECODE CONNECTION

TriCaster Advanced Edition supports external linear timecode (LTC) input. Connect the cable from your timecode generator to one of the connectors in audio *Input 7* (4RU models) or the 1/8" motherboard line input connector (all other models). External timecode is automatically recognized when present, but there are some related settings in the *Live Desktop* (see also Section 3.14).

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 TriCaster session.

3.7.1 A/V OUTPUT

TriCaster provides multiple video and audio output connector groups, and very flexible options for display of your live and recorded video streams. Here are some of the possibilities:

- Simultaneously send output to standard and/or high definition devices from HD sessions.
- All hardware inputs and all four outputs are always presented to your local network as NDI sources, ready for varied utilization at any convenient place where your network extends.

- Simultaneously send output to both analog and digital devices (except TriCaster 410, which provides digital output connections only).
- Send program output, secondary mixes, or custom 'monitor bridge' layouts to a supplemental monitor or projector using *Multiview*.
- Supply independent video outputs to the two *Display* ports for supplemental monitoring or projection.
- Stream program output to the Internet via a suitable network connection.

3.7.2 HD AND SD

As mentioned earlier, for HD sessions TriCaster supports *simultaneous* output of both SD (Standard Definition) and HD (High Definition) video. Except for TriCaster 410. TriCaster Mini SDI and Mini, the *Video Output* connector groups on TriCaster's backplate are arranged in vertical columns of four BNC connectors, offering the following connection possibilities for live production:

- *Output 1* video output format is determined by the session (see Section 5.1). When the session is SD 4:3 or 16:9, output is likewise SD 4:3 or 16:9. When the session is HD, output is HD.

- TriCaster Advanced Edition supports independent configuration of *Output 2* (and *Output 3* for 4RU models). The desired format can be selected in the *Live Desktop* (*Output Configuration* panel).

1. Connect downstream video devices to the appropriate output connectors in the *VIDEO OUT* section, whether *SDI*, *HDMI, Component, Y/C* (BNC) or *Composite* (TriCaster 410 supports SDI output only, TriCaster Mini supports HDMI only).

   Please note that Y/C and Composite may require RCA (cinch plug) or S-video (4 pin mini-DIN) to BNC adapters, and also that both of these connection options support output at SD resolution only.

   a. *SDI* or *HDMI* – Attach SDI connectors to BNC or HDMI (TriCaster Mini only) connectors in the VIDEO OUT group labeled 1-(2 or 3).

   Hint: If your equipment supports SDI, this is the best alternative. Note that the following analog output options are not supported by TriCaster 410 or TriCaster Mini

   b. *Component* – Attach your device to the *second, third and fourth* BNC connectors (Y, Pb and Pr).

   c. *Y/C* – If your S-Video equipment and cabling has the usual 4-pin mini-DIN connectors, you will need an 'S-Video to dual BNC' adapter.
      i. Attach the *Y* (luma) connector of your device to the *second* analog BNC connector row (labeled Pb at far left in the VIDEO IN group).

      ii. Attach the *C* (chroma) connector to the *third* analog connector (labeled Pr).

   d. *Composite* – Attach the device's connector to the *first* (top) analog connector (just above the pair labeled Y/C).

2. Connect TriCaster's audio outputs:

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

4RU TriCasters offer two pairs of four audio output connectors:

    i.   Connectors *1a-(1b or 1d*) provide sound from the mix assigned to *Output 1* (defaults to *Master* in *Output Configuration*)

    ii.   Connectors *2a-*(*2b* or *2d*) provide sound from the mix assigned to *Output 2* (defaults to *Aux* in *Output Configuration*)

Note: These two output groups are actually treated by TriCaster as four independent stereo outputs, each configured and controlled separately; see Chapter 15, Audio.

    b.   *Digital audio* – A separate digital audio connection is not necessary for SDI or HDMI output with embedded audio. AES/EBU connectors are provided for *Output 1*(channels a-d) on 4RU models.

Hint: TriCaster's SDI and analog output sections can be used simultaneously. For example, you could use the Composite output to view your program on a local composite monitor at the same time as you use the SDI connection to supply broadcast equipment.

3.7.3 SUPPLEMENTAL VIDEO OUTPUTS
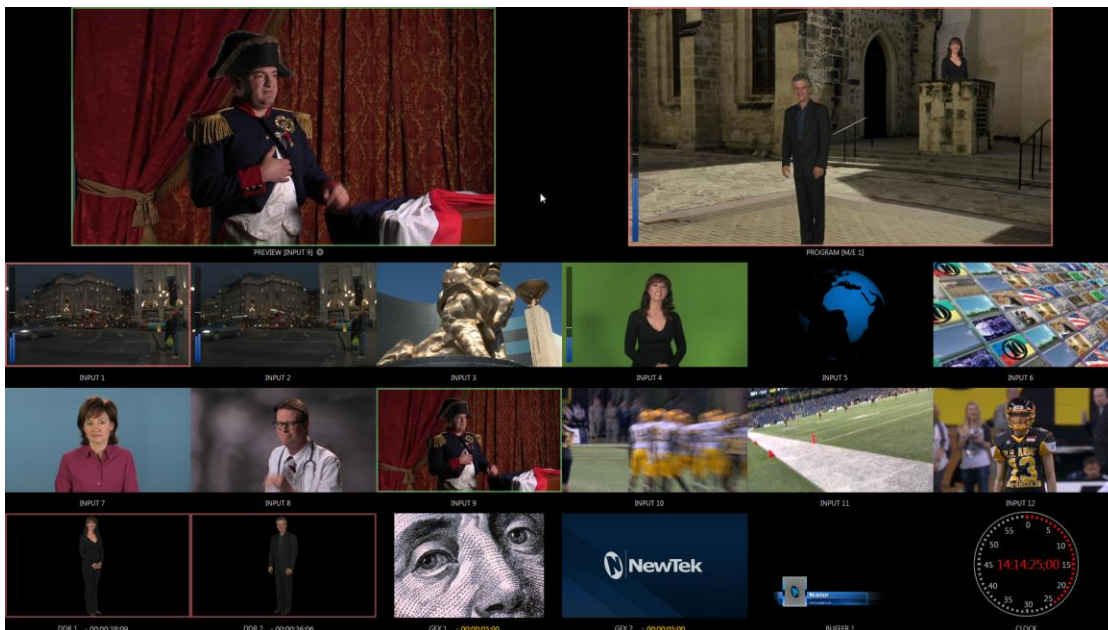
FIGURE 3-6

Additional dedicated video outputs make it possible to connect monitors or projection devices to TriCaster for a variety of purposes including program output for IMAG (Image Magnification) installations or flexible monitoring for the convenience of the operator.

1.   TriCaster's external *Multiview* output is supplied by a connector located near the main *Interface* monitor connector (RU models) or a neighboring HDMI port (2RU models). Again, connect a suitable

monitor or display device. The new device should be recognized and enabled by the system automatically.

The *Multiview* output offers a variety of optional monitoring layouts that can be selected at any time in TriCaster's *Live Desktop*.

2. Some *TriCaster* models also provide an additional, assignable video output on a labeled *HDMI* connector. Simply connect a suitable external monitor or device to the connector on the backplane.

3. *Stream* and *Network* both require only a network connection.

4. Two special outputs are labeled *Display* (numbered [5] and [6] on 4RU TriCaster's backplate)*. These ports can serve projectors or similar large display systems, though of course they can be used for other purposes too.

Note: A mismatch of output format and connection type is possible at times. For example, a Graphics player can display imagery that does not correspond to the current output resolution or is not supported by the selected connection type. TriCaster will attempt to display the output despite mismatches, but may not always succeed.

SECTION 3.8 TALLY LIGHTS

TriCaster's *Tally Light* support allows you to connect external tally lights and similar devices. These typically provide a red LED for the video input that is currently selected on the Switcher's *Program* row. (Not a TriCaster Mini SDI or Mini feature.)

TriCaster's NDI outputs also natively support tally.

Note: Tally over SDI, as supported by devices from Blackmagic Design, is natively supported, and requires no special configuration. Please see also: Section 21.9 regrading GPI support to trigger tally (and more); or search among third party tally solutions listed at http://www.newtek.com/solutions/newtek-developer-network/all-partner-list.

3.8.1 CONNECTION DETAILS

Here is a pin-out listing for TriCaster's HD15 Tally connector:

- Pin1 – LED1
- Pin2 – LED2
- Pin3 – LED3
- Pin4 – LED4
- Pin5 – LED5 (4RU only)
- Pin6 – LED

- (4RU only)
- Pin7 – LED7 (4RU only)
- Pin8 – LED8 (4RU only)
- Pin9 – GND
- Pin10 – GND

- Pin11 – GPI1
- Pin12 – GPI2
- Pin13 – NC
- Pin14 – 3.3V (20 Ohms current limit)
- Pin15 – NC

- 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 inside TriCaster.

- 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 support for GPI triggers has not been implemented in TriCaster at this time.

- To prevent damage to TriCaster's components when making external 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 TriCaster is not already running, power it up now to reveal the *Startup Screen*. (If TriCaster is already running, and is in the *Live Desktop* or another area of the interface, you may need to click the small [x] button at upper-right to exit, or click the *Back* arrow at upper-left in the *Session Page* to return to the *Home Page*.)

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

THE HOME PAGE

When no previously created sessions exist, the icon ring dominating the *Home Page* defaults to *New*, inviting you to create a new session.
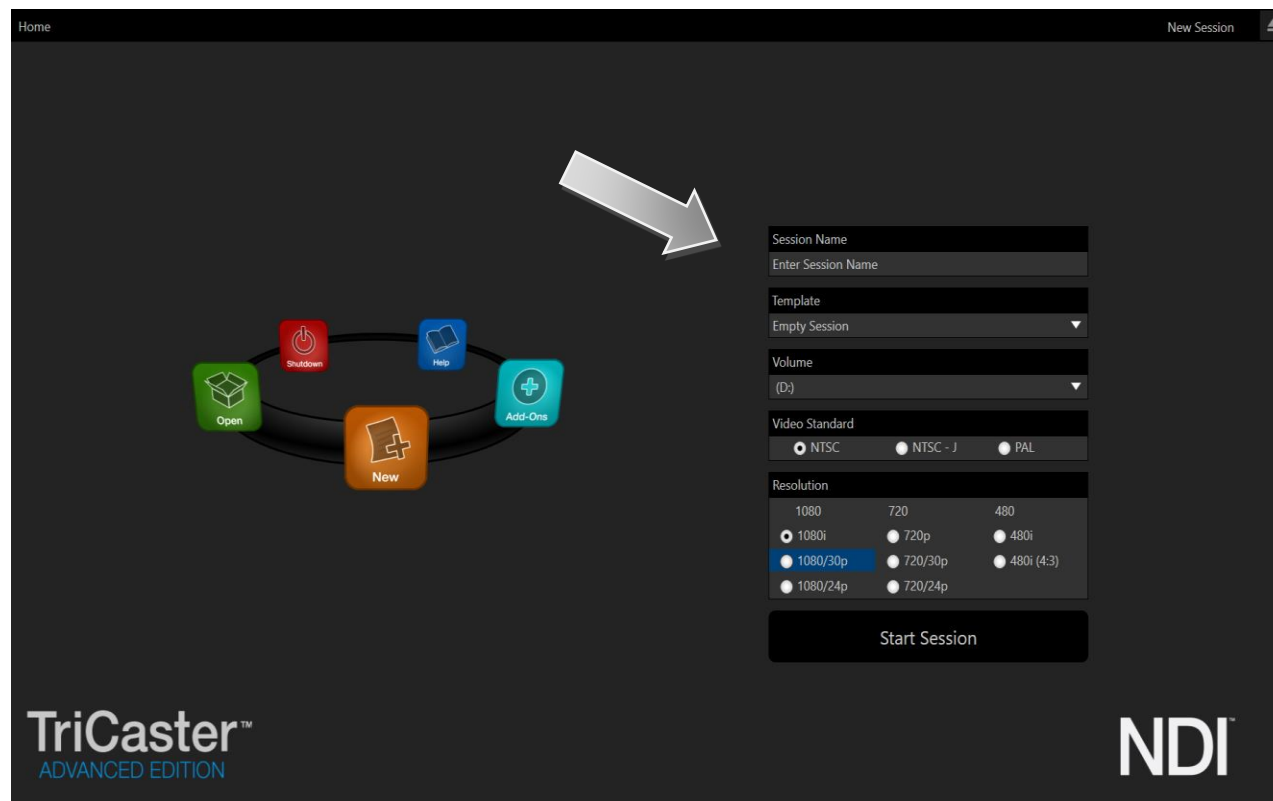
FIGURE 3-8 (MULTI-STANDARD TRICASTER SHOWN)

A link initially containing the text "*Enter Session Name"* is shown at the top of the right-hand pane when the *New* icon is selected on the ring. Click in this area to modify the name using the keyboard if you like. (The default name is the current date.)

> Note: TriCaster supports a variety of optional session configurations for live production.   You can choose either HD (High Definition) or SD (Standard Definition) operating modes.
>
> SD options include both 4:3 and 16:9 (widescreen) image aspects. TriCaster Multi-standard models permit you to select from different video standards according to your locale, choosing between NSTC, NTSC-J (Japan) or PAL.

Continue with session creation by designating the *Video Standard* used in your locale (Multi-standard models only). For the moment, let's choose *1080i* for *Resolution* (even if the cameras you plan to connect are SD 4:3), then click the *Start Session* link below. By default, new sessions are created on TriCaster's D: (Media) drive (see Section 5.2.1 for a discussion of session *Volume* options).

<div align="center">

THE SESSION PAGE

</div>

Clicking *Start Session* will take you to the *Session Page*. As our intention is to configure our connections (done in TriCaster's *Live Desktop*), click the *Live* button on the icon ring.
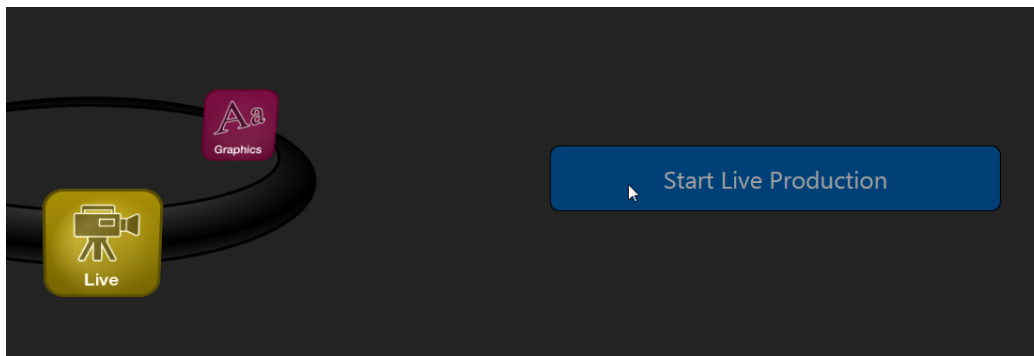
FIGURE 3-9

Simply click the link labeled *Start Live Production* to launch the *Live Desktop*, which is likely where you will spend most of your time working with TriCaster.
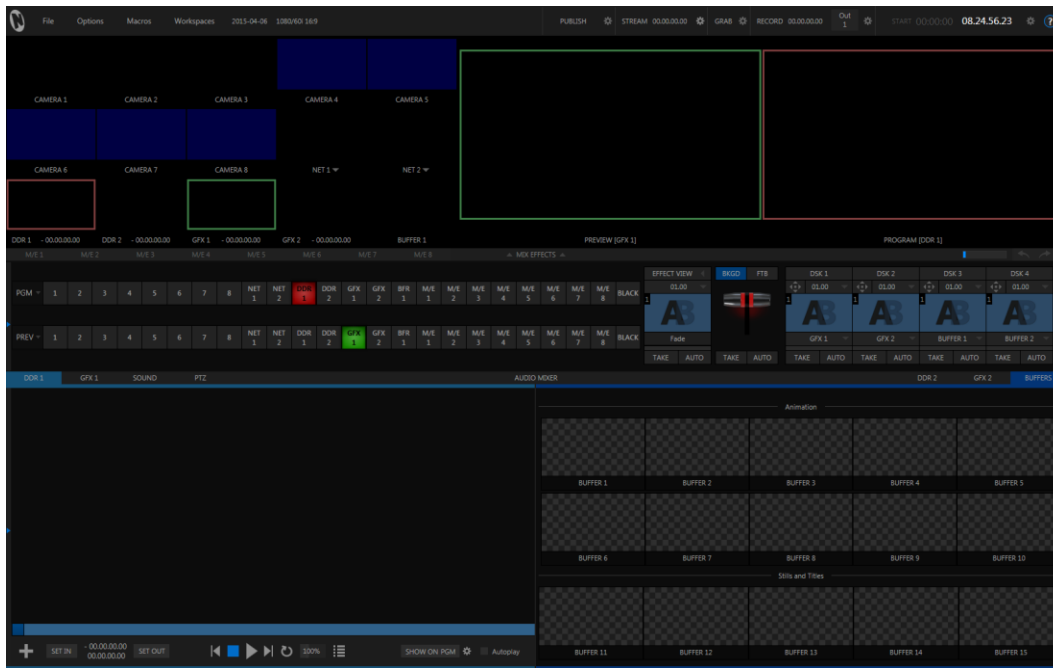
FIGURE 3-10 (TRICASTER 8000 SHOWN)

INITIALLY, AS YOU HAVE YET TO CONFIGURE INPUT DEVICES OR ADD CONTENT, THE *LIVE DESKTOP* WILL LOOK A BIT BARREN (

Figure 3-10).

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 2.5, but we'll examine it more closely in Chapter 4, Basic – coming up soon.)
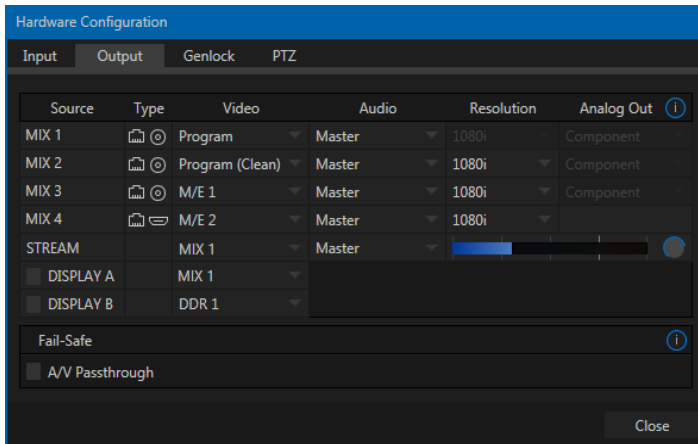
FIGURE 3-11 (TriCaster 8000 shown)

TriCaster provides complete video input monitoring right on the *Live Desktop*. This allows you to operate it without even connecting downstream video monitors or devices. (You might do just that in the case of productions intended primarily for live streaming.)

Often, though, you will want to connect external monitors or other downstream devices to the *VIDEO OUT* connectors on TriCaster's backplate (see Section 3.6).

High definition video monitors should be connected to either *SDI* or *Component* connections.

For standard definition monitoring, several different connection types continue in service, including *Composite*, *Y/C* (also known as 'S-Video') and – at the upper end of the analog quality range – *Component.* (*SDI* provides a digital output option, and is the only alternative offered by TriCaster 410.)

To connect an *analog* standard definition monitor (not supported by TriCaster 410), you must specify its connection type in the *Output Configuration* panel.

Note that analog connections for LiveText™ output are pre-defined (see Chapter 20 for details).

Let's take a closer look at configuration options. Move your mouse pointer over the large *Program Output* monitor on the *Live Desktop*.

1. Click the *Configure button* (gear) that appears beside the source label below the monitor pane to open the *Hardware Configuration* panel.

This panel provides several tabbed panes, including one labeled *Output*. This is where the video signals sent to each of TriCaster's video outputs, including the *Stream* output and *Display ports* are configured.

There are various decisions to make for each output:

- What video source will you assign to that output?
- What audio source will accompany it on connections that carry both signals?
- In some cases, which video format will be sent to the connectors?

Let's consider an example: An HD 1080i session offers the largest list of optional output formats. The controls allow you to select any of a number of HD or SD formats. Selecting an HD format sends the source to TriCaster's SDI and Component output connectors simultaneously.

Selecting an SD format adds a "Composite + Y/C" option to the menu. Choosing this option sends composite video output to the second BNC connector in a given connector row (*Y*), and Y/C to the third and fourth BNC connectors (labeled *Pb* and *Pr*).

As well, 16:9 or 4:3 screen aspect alternatives are provided for SD output selections.

- For hardware video outputs, which connection type will be used – SDI, Component, Y/C or Composite?

And so on …

> * Resolution and color adjustments for devices connected to the two *Display* ports are located in the *Display Settings* panel, accessible from the *Workspaces* menu found in the main *Dashboard*.

3.10.1 OUTPUT CHANNEL OPTIONS

Let's review *Video* source selection first. The drop-down Source menu permits you to select sources for TriCaster's principal video outputs, referred to as *MIX 1 – 4* (and more). Depending on the model, as many as 3 of these primary outputs represent hardware outputs, but in all cases all four *output mixes are presented to your network as NDI sources.

> * In addition, any connected hardware inputs are output as a/v NDI streams.

TriCaster can send other streams to its outputs as well, as discussed shortly – but the primary output streams are unique in certain respects.

> *Hint: Either (or both) of the a/v streams assigned to Mix 1 -4 are available for assignment to other TriCaster outputs as well, by means of the 'Follow Mix (1-4)' items in the respective source menus.*
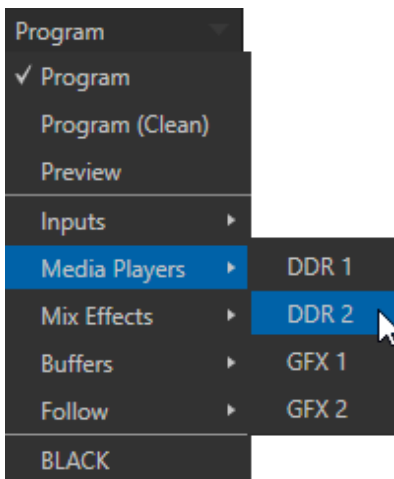
FIGURE 3-12

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

- *Program* output
- A clean *Program* feed
- The 'look ahead' *Preview*
- The feed from any external switcher input
- Either network input source
- *Media Player* output
- Direct output from any *M/E*
- Selected *Buffer* content
- *Follow* selected M/E *Program* or *Preview*, or a *Switcher* color group
- *Black*

Audio menu options include the *Master* and *Aux* mixes, or the sound from any one of TriCaster's audio inputs.

The video format (*Resolution*) for *Output 1* always matches the current TriCaster session format, so its menu is locked. For *Output 2*, though, the *Resolution* menu allows you to independently configure the format.
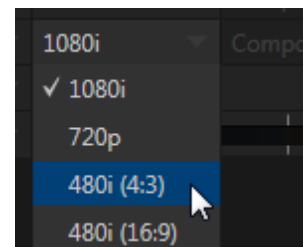
> *Hint: Multiview, a versatile external display intended primarily for control room monitoring, is configured in TriCaster's Dashboard (click the Workspace menu).*

FIGURE 3-13

It's worth mentioning that, for TriCasters with analog outputs, SD formats offer different *Analog Out* options than HD. HD is always presented on *SDI* and *Component* connectors, but in addition to these, *Composite* and *Y/C* connections are still in common use for SD.

Composite and *Y/C* can even be used simultaneously, allowing three different devices to be connected to outputs in one row for SD output formats – one digital (SDI) connection along with two analog connections (see the example at right).

> Note: See 8.1.7 for detailed information on all output options.

SECTION 3.11 CONFIGURE VIDEO INPUTS

Source selection settings for video inputs can be accessed in TriCaster's monitoring section.

The individual monitor viewports on the *Live Desktop* can be flexibly assigned to different video sources. Complete monitor layouts can be stored and recalled using tools located in the *Workspace* menu in the *Dashboard*. We'll look into that in depth in the *Reference Section* of this manual, but for now let's configure the video sources you connected earlier (Section 3.4.1).

1. Click *Workspace* in the *Dashboard* (at the top of TriCaster's *Live Desktop*).

2. Four 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. The monitoring pane will now show individual monitors for each camera, among others, with *Camera 1* at upper left.

FIGURE 3-14 (TriCaster 8000 shown)

4. To continue, you could select *Configure* from the monitor's context menu, but let's take a different approach.

5. Move your mouse back and forth over the *Input 1 monitor* and notice that a *Configure button* (*gear* icon) appears beneath it at right. Click this *Configuration button* to open a tabbed settings panel for *Camera 1* (Figure 3-14).

> Hint: Alternatively, double-click the monitor to open this panel.

6. Click the *Source* menu to see a list of sources you can select. Each is identified by a thumbnail icon. Local hardware inputs (4 or 8 according to your TriCaster model) are listed first, with NDI sources discovered on your network grouped below under headings identifying the source system.

> Hint: In some cases, an icon may initially be black – as for example when a hardware source has not previously been connected. Thumbnails are updated periodically. If a source is no longer sending frames but remains connected, the last image seen may be shown.

For NDI sources, simply making a selection completes the connection. If you choose a local hardware source, further selections may be required on some models. These inputs default to Auto-detect SDI (or HDMI) on models with those input connectors only. In such a case, or if your connected source type matches, you'll be all set.

Hint: SDI Auto-detect may not be able to select the correct format for sources that don't match the session SD/HD mode. In such cases, you can specify a format explicitly in the Output tab.
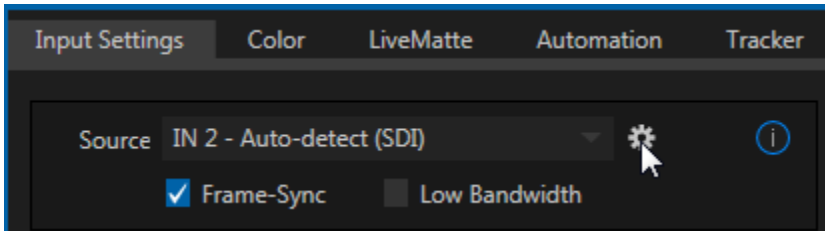
a. Otherwise – for example if your source connects using analog component cabling – an additional step is involved. Figure 3-15 depicts a configure gadget (gear) that is displayed to the right of the *Source* field when local hardware sources are selected. Click this gear to open the *Input* tab in the *Hardware* Configuration panel (Figure 3-16).
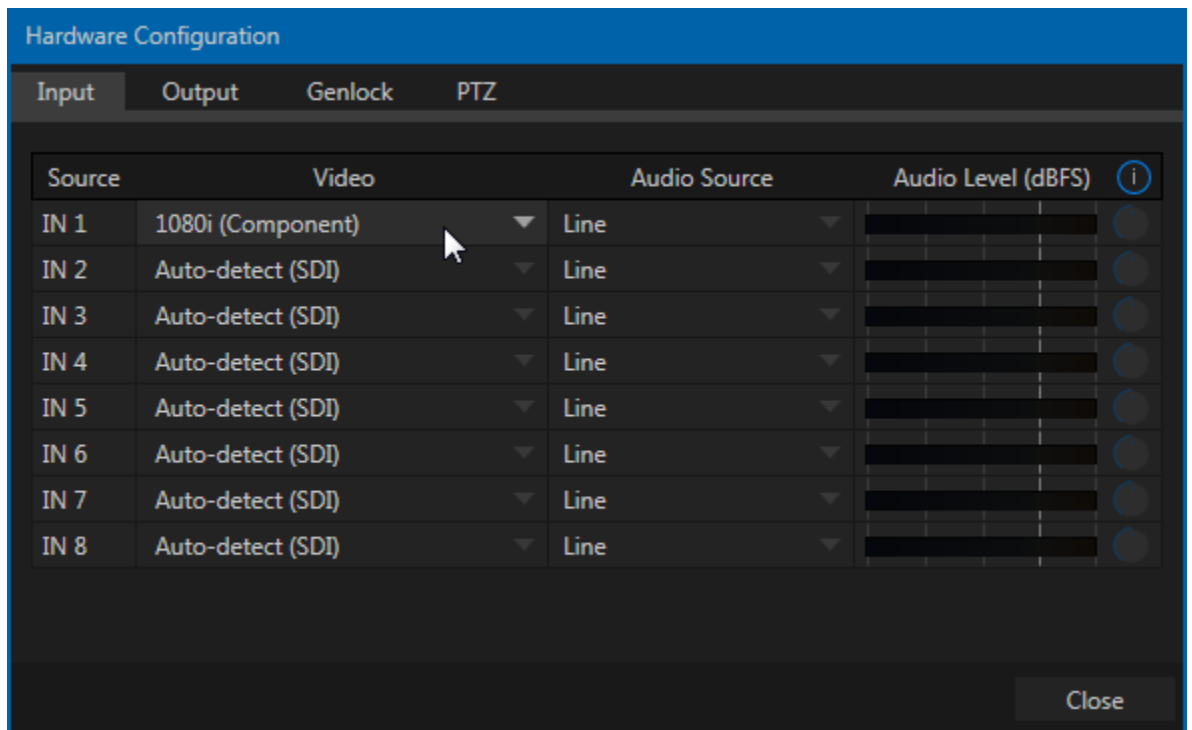
b. Select the correct format, such as *1080i (Component)*, for the video source you wish to connect to *Video Input 1* on TriCaster's backplate (menu options vary by TriCaster model).

Note: TriCaster Advanced Edition provides an Auto-detect (SDI) connection option. This will automatically configure HD-SDI sources in an HD session, or SD-SDI sources in an SD session. However, mismatches between source and session format require manual Connection type selection.

7. Close the *Hardware Configuration* panel for now (note that you can click the *Close* button or simply 'click outside' the panel to close it).

8. Continue to configure all connected external 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 TriCaster input where the router is connected (see Section 3.4.2 for more detail) to select which router input will be transmitted to TriCaster.

SECTION 3.12 CONFIGURE AUDIO

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.
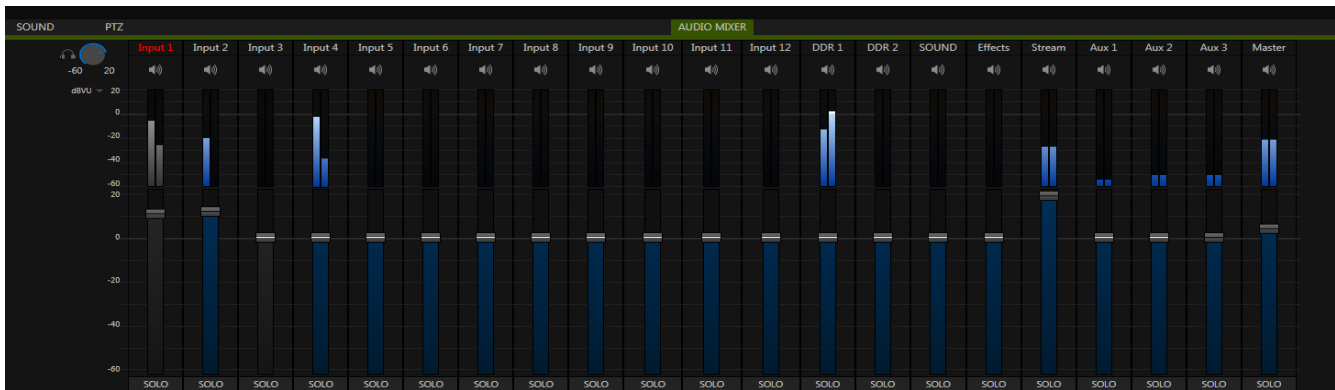
FIGURE 3-17 (4RU VERSION SHOWN)

Each input has its own small control panel, with *Volume* slider(s), VU meter(s), and other important features conveniently located. At the top of each of these control panels is a label.

Roll the mouse pointer over the label to reveal a gear button at right which, when clicked, opens the *Configuration* panel (Figure 3-18) for the input.
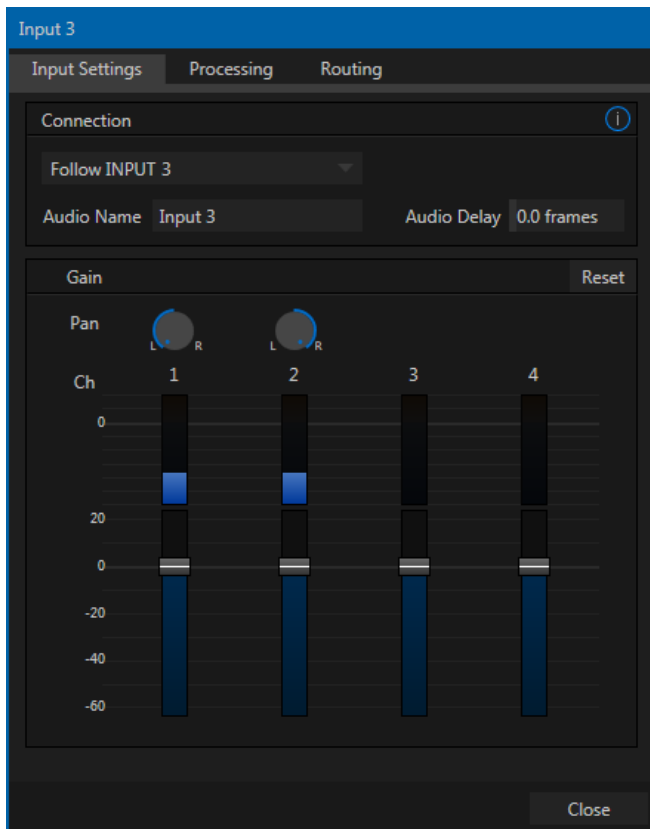
FIGURE 3-18

FIGURE 3-19

Click the source menu at the top of the panel to display connection options for an input (Figure 3-18). Audio options are similar to video, in that you will see local hardware inputs (shown as "IN 1", "IN 2", etc.) along with network sources, including both NDI audio and (Audinate™) Dante sources.

Generally, hardware inputs default to "line level". As when configuring video inputs, choosing a local hardware audio source causes a configuration 'gear' icon to be displayed at right. Again, clicking the gear opens the *Hardware Configuration* panel.
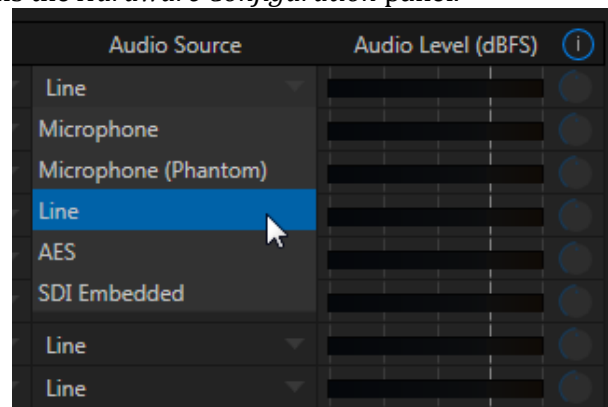
In this case, you will need to use the menu in the *Audio Source* column for the input you are configuring to choose an appropriate connection type, such as *Line*, *Microphone*, or perhaps *SDI* or *HDMI* (Figure 3-19 – options vary by model).

> Note: Analog audio levels conform to SMPTE RP-155. The maximum input/output level is +24 dBu, nominal Mic input level +4 dBu (-20dBFS), and the sample rate is 96 kHz.

- Select *Mic* for professional grade microphones or similar sources. On supporting models, use the *Phantom* option for condenser type microphones requiring supplementary power.

- Choose *Line* for most other analog sources (including consumer devices such as a CD player, computer audio output or VCR).

- For 4RU models only, select *AES/EBU* for digital audio from an AES/EBU (AES3) source.

- *SDI Embedded* or *HDMI* provide digital audio from the associated video connection.

> Hint: Some variation exists as respects signal levels from individual sources, even within the same type. For Mic (and Mic + Phantom) connections, Gain (a.k.a., Trim) controls are provided to allow fine tuning of the input level.

Returning to the audio *Input Configuration* panel (Figure 3-18), note that it holds both basic and advanced audio features. In the former category, volume sliders are provided below *VU meters* for each audio source and output. Source sliders default to their lowest setting on first launch. After adding audio sources, slowly bring these sliders up to pass their respective signals through the system.

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. TriCaster's audio controls follow well-established 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. TriCaster's VU meters have selectable indexing, allowing you to view a traditional dB VU scale or dBFS as you please (see Section 15.8.1).

Whatever scale you choose, use *Volume* controls (and, for *Mic* connections, the *Gain* controls in the *Configuration panel*) to avoid over-modulation. TriCaster's *Compressor/Limiter* feature (also located in the *Audio Configuration* panel) is another powerful tool to help you prevent clipping – see Section 15.7.

SECTION 3.13 CONFIGURE GENLOCK

Genlocking is supported on TriCaster 460, 860 and 8000.

1. If the *Live Desktop* isn't already open, launch a TriCaster session from *Startup*.

2. Access the *Hardware Configuration* panel by double-clicking the main *Program Output* monitor on the *Live Desktop*.

3. Click the *Genlock* (Figure 3-20).

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)*.

5. With the aid of downstream *Waveform* and *Vector Scopes*, adjust TriCaster's *Horizontal* and *Vertical Position* and *Phase* settings in the *Genlock* section of the *I/O Configuration* panel.
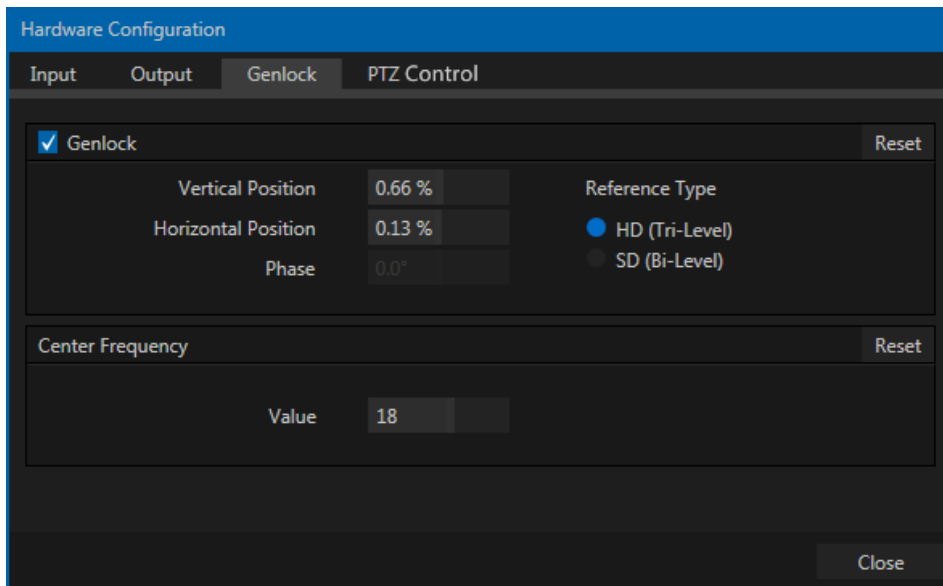
FIGURE 3-20

Ideally both the cameras and TriCaster should be genlocked. If they are not genlocked to the same reference signal as the TriCaster output, a TBC (Time Base Correction) operation is automatically applied. Time base correction may drop or insert frames as necessary to maintain sync, hence is a less desirable approach.

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

SECTION 3.14 CONFIGURE TIMECODE

TriCaster can use the system clock to generate 'local timecode' which is both shown in the *Live Desktop titlebar* and also embedded in recorded clips. TriCaster Advanced Edition also supports external linear timecode (LTC). To configure timecode, click the configure button (gear) located beside the timecode display at right in the *Dashboard*. LTC is automatically used if a suitable LTC source is connected to the system. Please see Section 8.3.3 for more detail.

SECTION 3.15 NETWORKING

Of course, one of the great advantages of TriCaster Advanced Edition is its native support for NDI a/v sources. Few will be surprised to find utilizing this next generation feature requires that your TriCaster be connected to the network. ☺

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.

Generally, simply connecting a suitable cable from the Ethernet port on TriCaster's backplate to your local network is all that is required to add TriCaster 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 5.2.3. If further help connecting is required, please consult your system administrator.

The next section (Chapter 4, Basic Training) will introduce you to online tutorials, training materials and other assets to guide you through your experience using TriCaster.

Chapter 4 BASIC TRAINING

	This chapter provides a little information designed to guide you to other resources that will introduce the major components and functions of your NewTek TriCaster®. This includes extensive online training resources, friendly and helpful online communities, and more. In a very short time, these basics will be second nature to you. More detailed reference material on all aspects of TriCaster follows in Part II (Reference).

Having made the essential external connections in the previous section, you'll want to start your first practical TriCaster® session, and skim through some important fundamentals. This would be the ideal time for us to introduce you to a special feature of your TriCaster - it has its very own webpage.

SECTION 4.1 RESOURCES WEBPAGE

Having launched a session (refer to Section 3.9 if you need a refresher), those of you familiar with standard TriCaster features will notice something new at upper-right in the *Dashboard* at the top of the *Live Desktop*.
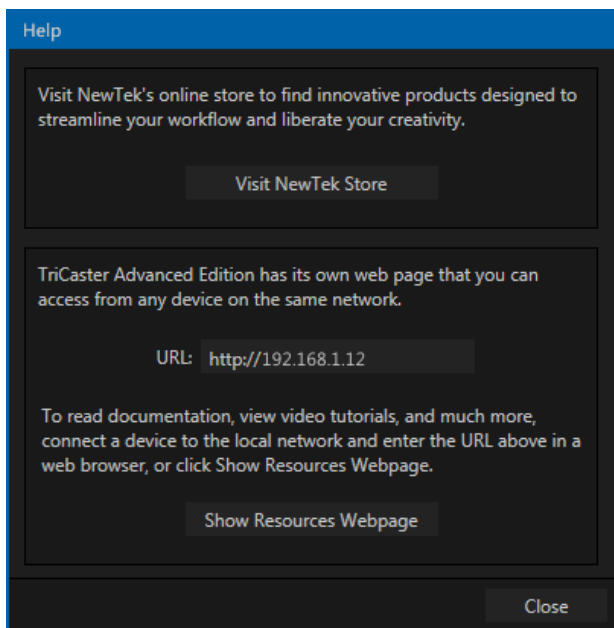
Click the 'globe' gadget shown there to open a panel that tells you how to navigate to your TriCaster's unique *Resources* webpage.

- Simply connect any suitable device (be it a laptop, tablet, or desktop computer) to the same network your TriCaster is on
- Open the web browser on the device
- And navigate to the URL shown in the dialog you opened by clicking (?)

FIGURE 4-2

The *TriCaster Resources webpage* is served directly from your TriCaster Advanced Edition system, and thus is always available. Not only does this mean its content is always up to date and relevant to your installed software, it also means that you can view it on a convenient mobile device alongside your TriCaster.

This allows you, for example, to use an iPad® or other mobile device to follow along with the steps outlined in an online video tutorial, or look up the details of a TriCaster feature in the User Guide even during production.

4.1.1 VALUABLE CONTENT

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

- **Documentation**
  - *What's New* – a brief overview of TriCaster Advanced Edition features
  - *TriCaster User Guide* – the document you are reading (which tells you all about TriCaster)
  - *Automation and Integration Guide* – provides a wealth of information pertaining to all aspects of internal TriCaster (and 3Play™) macros and automation features, along with discussions

of third-party solutions and topics related to integrating NewTek live production systems into your studio pipeline.

- o Animation Store Creator™ and Virtual Set Editor™ Guides
- **Training** – online TriCaster video tutorials and Operator Certification programs.
- E**xtras** - download updates, codecs and utilities, or install the *DataLink™ for TriCaster* web browser extension (see Section 4.1).
- C**ommunities** – forums, blogs, YouTube™ videos, Facebook®, and more …
- **Support** – contact official Customer Service (including live chat), or read about product protection programs.

SECTION 4.2 VIDEO TRAINING

NewTek is in the video production business, and it couldn't seem any more appropriate to us that we would provide your introductory TriCaster lessons using that easy to understand and follow medium.

The link to online videos mentioned in the previous section takes you to a long list of TriCaster tutorials designed for all users from novice to 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 all clearly illustrated and explained here.

It's very likely that you will be able to easily grasp the basics of TriCaster production after 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 TriCaster family of products, you will be able to benefit from tutorials prepared using any TriCaster model.

SECTION 4.3 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 TriCaster: every button, menu item, feature and control is considered in this section, so you can take full advantage of your system.

Chapter 5 THE STARTUP SCREEN

The TriCaster® Startup 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 Startup Screen's *Home Page* appears whenever you launch TriCaster®.
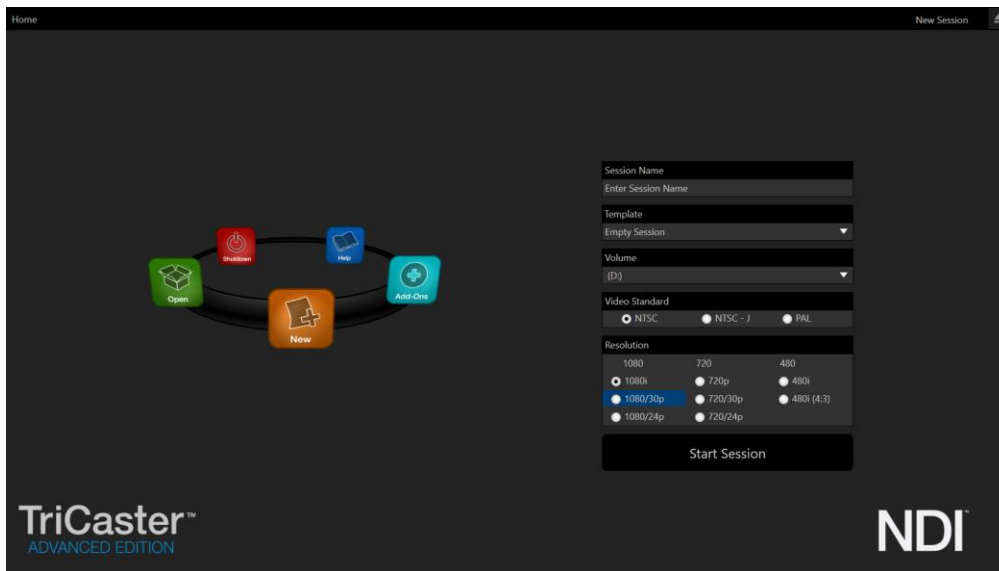
From here, you create and launch sessions, then choose what sort of operations you wish to pursue within the current session by making a selection from an icon ring on the *Session Page*. Your intention may be to begin a new live production, or to produce another episode of a live series. Perhaps you wish to prepare some title pages for an upcoming event, or perform system maintenance.

We'll look into each of these in turn, but first let's consider that fundamental TriCaster concept, the *session*. What is a session, and why are sessions both important and valuable to you?

SECTION 5.1 INTRODUCTION TO SESSIONS

Whenever you work with TriCaster, you provide certain information about the production environment:

- What broadcast standard is used in your locale? Is it *PAL*, common in Europe among other places, or perhaps *NTSC*, standard throughout North American regions?

- If your task includes cameras or other live sources, are they HD, SD or a mixture of both?

- How are cameras connected (are you using component or SDI connections, something else, or a mixture of several connection types)?

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

- You might calibrate your cameras individually using the *Proc Amp* settings in the *Input Configuration* panels.

- If your production plans include the use of greenscreen staging, you will probably adjust the *LiveMatte* settings for one or more cameras to provide optimal keying.

- Perhaps you will use the *Multiview Proc Amps* to adjust the display sent to a projection system.

- What are your output device connection preferences?

  o For example, do you require a local SD video reference monitor connected by means of an analog S-Video or composite cable?

  o 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 playlists for the *DDRs*.

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 could grab a series of still images from *Program Output*.
- Grab some clips from the production for replay later.
- 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 here is that the *session* is comprised of <u>all of the above</u> 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.)

Naturally, you can store multiple sessions and re-open them freely. This greatly simplifies business models that involve regular trips to specific remote sites or a number of unique episodic programs, and easily accommodates different users with their own individual requirements and preferences.

> 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, TriCaster automatically locates 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).

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 TriCaster's *Home Page*.

This primary screen is the first thing you encounter on launching TriCaster. It is dominated by the icon ring shown in Figure 5-2.

When you click an icon on the ring (such as *New* or *Open*), that item advances to the front-most position.

FIGURE 5-2)

> *Hint: Alternatively, you can use the keyboard's left and right arrow keys to cycle through the icons on the ring.*

Choosing an icon from the ring also 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 new TriCaster is create a session. In anticipation of that, the *New* icon is automatically pre-selected whenever no sessions already exist on TriCaster. This results in the relevant session options being displayed at right, as shown in Figure 5-3 (Multi-standard TriCaster options shown).

5.2.1 NEW (SESSION)

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

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

- Select NTSC, PAL or NTSC-J
- Select a session format such as 1080i, 720p, etc. (or PAL format equivalent).

* TriCaster Mini HDMI models do not offer interlaced SD formats.
** TriCaster Mini SDI does not offer progressive SD formats.

SESSION NAME

You will see a name field for your session listed above the options pane at right (Figure 5-4). You can click in this field to modify the default name (the current date) using the keyboard.
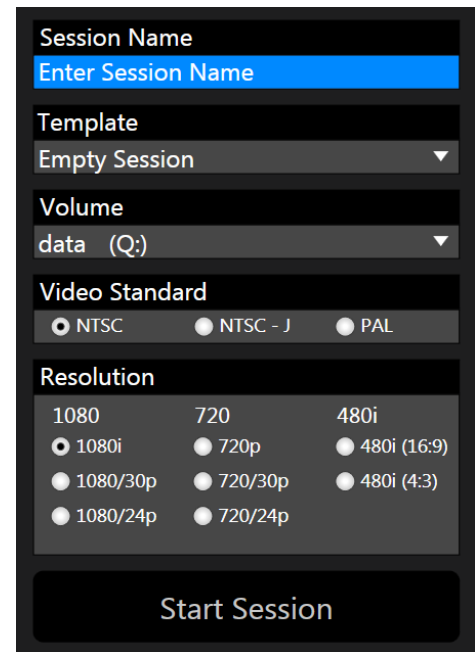
FIGURE 5-3
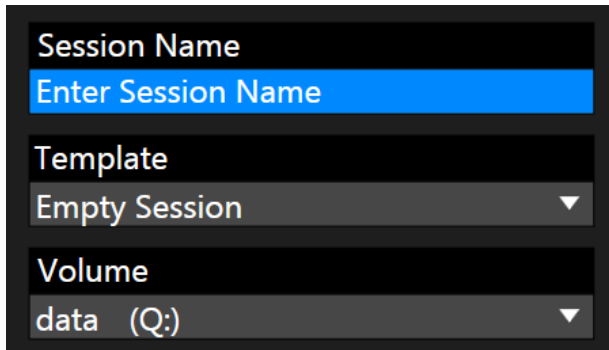
FIGURE 5-4

TEMPLATE

The *Template* drop-down menu (Figure 5-4) 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, including the content from its *Media Player* playlists.

VOLUME

A control labeled *Volume* appears just beneath the *Session* name. This assigns a hard drive for the session (and its associated content) to be created and stored on.

> *Note: When using TriCaster's IsoCorder™ feature to record multiple sources, you will likely assign more than one hard drive to capture duties. Session keeps track of recorded clips too, providing easy access to them for live use.*

Suitable hard drives inserted in removable drive bays on selected TriCaster models are listed in a drop-down menu when you click on the *Volume* control. You can select any drive shown as the session drive.

> *Note: External drives are not recommended for active use as session drives. See Section A.1.8 for hard drive recommendations for use in TriCaster's removable drive bays.*

FORMAT AND OUTPUT CONSIDERATIONS

Remember that for live production, TriCaster can simultaneously supply both SD and HD output for *either* SD or HD sessions. During an HD session, for example, you can output either (or both) HD or SD video, and SD video output can be *either* in a 16:9 widescreen format or cropped for display on a 4:3 television (see 8.1.7).

The session setting has some other significant ramifications, too. 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; the opposite is also true.

> *Note: See 8.1.7 for more information on Video Output configurations.*

Having made your selections, you would normally click the *Start Session* button at lower right to launch TriCaster's *Live Desktop* – but first, let's explore a few other features of the *Home Page*.
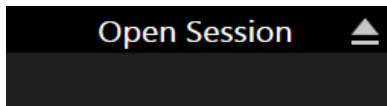
FIGURE 5-5

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.*

5.2.2 OPEN (SESSION)

If there are existing sessions on TriCaster, the icon ring on the *Home Page* will default to *Open* (Figure 5-6). Clicking *Open* causes the *Sessions List* to appear at right. This pane lists all sessions stored on qualified media currently mounted on TriCaster.
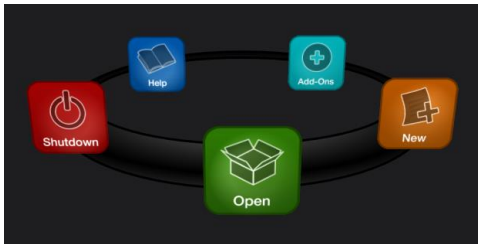
FIGURE 5-6
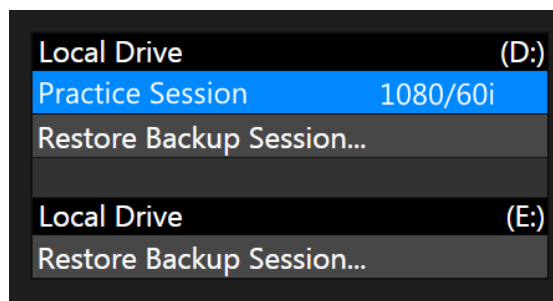
FIGURE 5-7

Available sessions are grouped under the names of the storage volume they are located on (Figure 5-7). The listing shows the *Session Name* and *Format* for each session. Let's look at the *Sessions List* briefly before we open a session.

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 clips, images and titles, and even *LiveText* title 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 actually importing the files into the session. Those external files will not be deleted.*
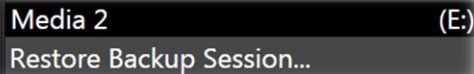
In another section of the *Startup Screen* (*Session Page>Manage*) there is a feature that allows you to back up the current session to another storage volume.

The *Restore Session Backup* link at the bottom of the *Session List* (for each drive) is provided to compliment this feature. To restore a session you have previously archived, click *Restore Backup Session* (Figure 5-8), and use the file explorer provided to select a *SessionBackup* file.

FIGURE 5-8

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.*

OPENING A SESSION

Just as you were able to select an icon on the ring using the left and right arrow keys, you can highlight a name in the *Session List* using the *Up* and *Down* arrow keys; then press the *Enter* key to open it (or simply click the name of a session to open it immediately). Selecting a session takes you to the *Sessions Screen*.

5.2.3 SHUTDOWN

This selection provides *Restart TriCaster, Shutdown TriCaster,* 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* icon ring exits TriCaster's live production environment, and takes you to a new screen (Figure 5-9) that offers various functions and settings having to do with TriCaster system maintenance and management.
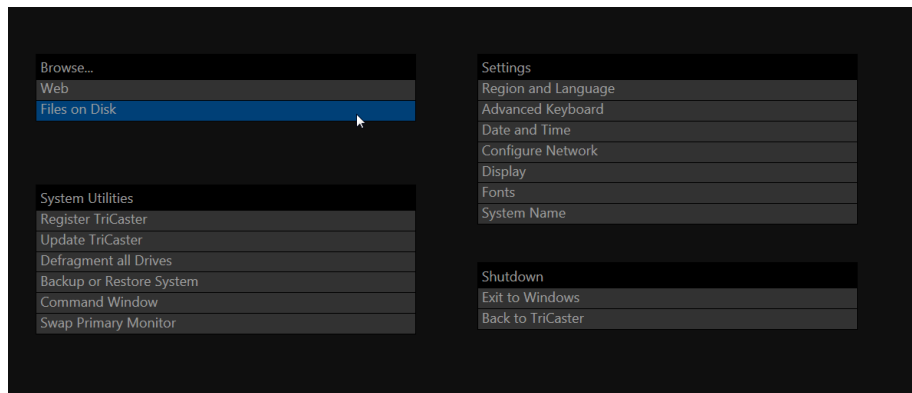
FIGURE 5-9

*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.

SYSTEM UTILITIES

- *Register TriCaster* – TriCaster 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.)

- *Update TriCaster* – NewTek may periodically provide software updates for your TriCaster. Updates can enhance performance, security or even add useful new features. If TriCaster is connected to the Internet, clicking *Update TriCaster* 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 TriCaster media files may be larger or smaller.

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

  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.

FIGURE 5-10

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' (in reality large video files from your TriCaster 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 end result is that TriCaster 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 TriCaster. Please refer to Section A.5.7 in Appendix Chapter 21 for details.

- *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* – reverse the monitor assignments currently in use for TriCaster's interface and Multiview displays.

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 your TriCaster is identified on the network. This is especially true when more than one TriCaster 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 TriCaster's *Startup* screen.

5.2.4 HELP

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

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

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

FIGURE 5-11

5.2.5 ADD-ONS

NewTek offers additional software tools to expand the power of your TriCaster. The icon labeled *Add-Ons* on the *Home Page* provides access to some of these tools.
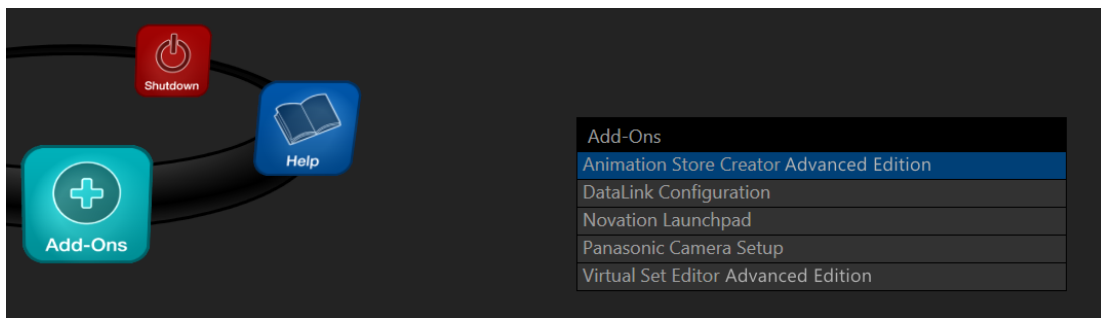
FIGURE 5-12

When you select the *Add-Ons* icon, links are displayed at right for installed software applications, allowing you to launch them. For example, Figure 5-12 shows links to the included *Animation Store Creator* utility as well as a demo version of the optional *Virtual Set Editor*™ program and 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).

SECTION 5.3 THE SESSION PAGE

FIGURE 5-13

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 icon ring.

The name of the current session is shown in the top-left corner of the screen. 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 beneath the session name, or the word "Home" in the session name label.

Initially, the icon ring in the *Session Page* offers three selections. These are discussed next.

5.3.1 LIVE
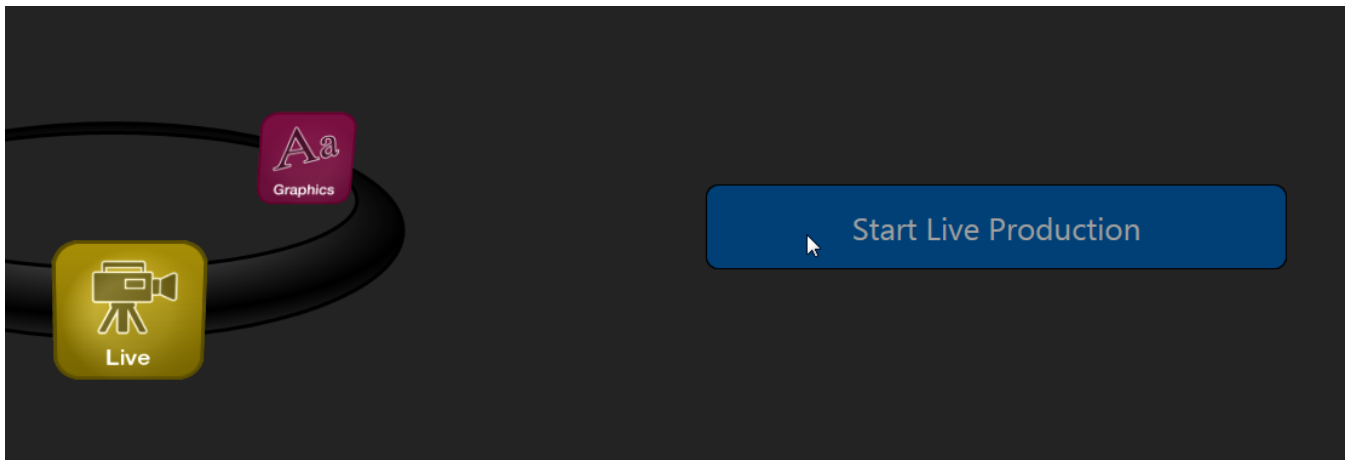
The icon labeled *Live* represents the *Live Desktop*, TriCaster's live production center. Selecting it (by clicking the icon or using the left/right arrow keys to bring it to the front), presents a *Start Live Production* link in the *Session Page's* right-hand pane; click this link to launch the *Live Desktop*.

5.3.2 GRAPHICS

TriCaster includes an integrated variant of LiveText™, NewTek's standalone titling and CG application. This version gives you the ability to create title pages with text entries and images that can be updated (even from using sources) when displayed from TriCaster Media Players or Buffers during live production in TriCaster.
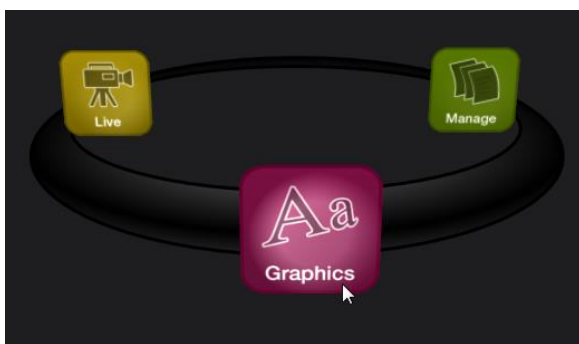
Selecting the *Graphics* icon displays a number of related items on the right-hand side of the *Session Page*.
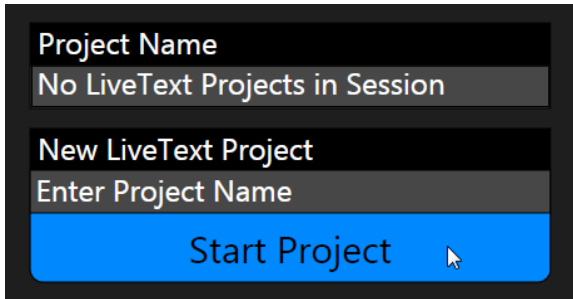
When you first enter a new session, no LiveText projects are listed in the area under *Project Name*. After you create one or more projects, the name(s) will appear here and, as you would expect, you can re-open the project by clicking its name.

> *Note: TriCaster stores new LiveText projects inside a folder named for the current session, as follows (for example): D:\LIVETEXT PROJECTS\sessionname\projectname.cg.*

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 that projects stored outside the session structure are not shown in the project list on the *Sessions Page*. To re-open them, you'll need to navigate to the project file using *File>Open* in LiveText.

> *Note: Similarly, external projects will not be backed up by the Backup Session function (or be deleted by the Delete Session function)*

To create a new *LiveText* project, click in the default project name field (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 operation. 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

Various TriCaster components 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 a number of convenient items.

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.
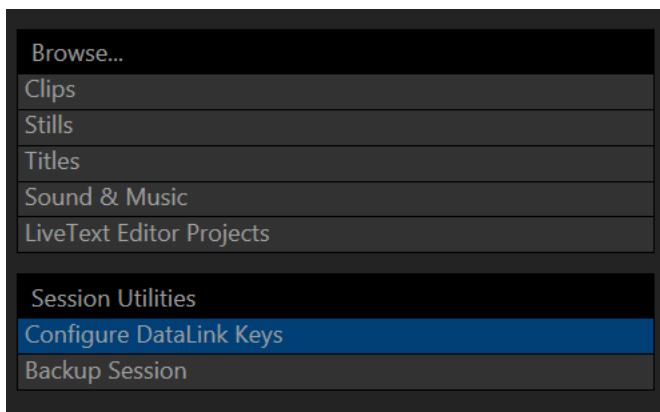
FIGURE 5-18

> 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.
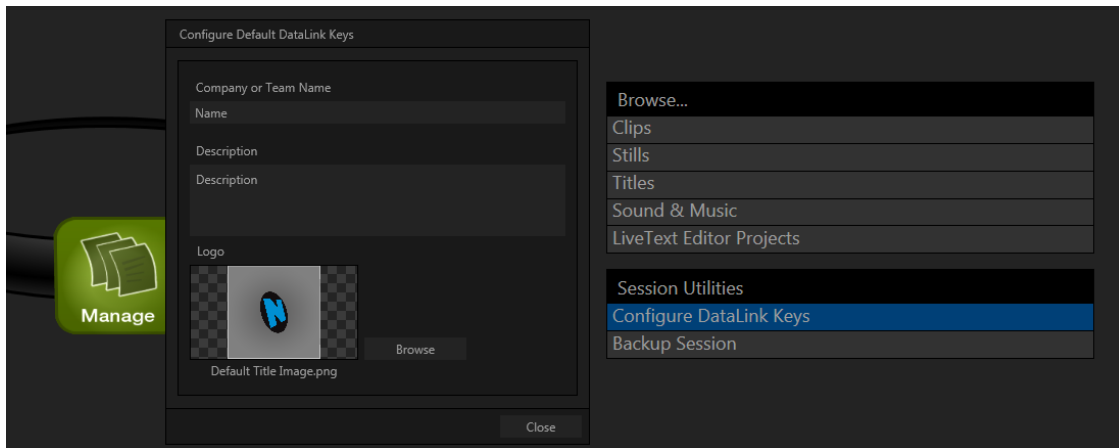
FIGURE 5-19

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

> *Hint: DataLink keys can serve in other ways, too, as 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 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; but we'll mention a few highlights as we go along in this manual 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 to TriCaster, they will appear as expected when the session you backed up is restored.*

Chapter 6 LIVE DESKTOP: OVERVIEW

The TriCaster® *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 TriCaster® *Live Desktop* is launched by creating (or opening) a session in the Startup 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 1600x1050.

SECTION 6.2 OVERVIEW

TriCaster's *Live Desktop* provides visual feedback for operations, including monitoring, live switching, and so on. It is divided into five horizontal bands.

From top to bottom, these are:

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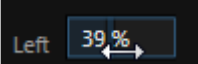
- *Switcher* rows – *Program* and *Preview* rows
- *Transition* controls – *T-bar* and *Delegate* buttons
- *DSK* video layer configuration and controls
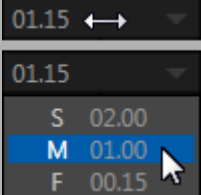
5 - Tabbed Control Modules

- 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 TriCaster's *Live Desktop.* Some examples are shown in the table below.

Control Type	Type	Examples	Usage
Left 39 %	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

TriCaster's *Live Desktop* layout can be adapted to many different scenarios, and provides a number of 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.
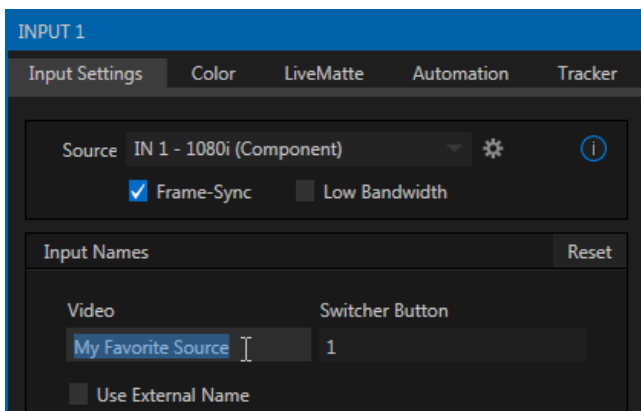
FIGURE 6-2

To do so, simply right-click on one of the following items and select "*Configure …*" to open the configuration dialog (Figure 6-2):

- Any monitor in the *Live Desktop* or external *Multiview*
- Any *Switcher* source button

The dialog contains several editable text fields under the label *Input Names*, including *Video* (the label shown under monitors), a shorter *Switcher Button* label and the longer *Comment* field. The latter can be used for more than just memory aid. TriCaster's *DataLink* feature can automatically update title pages as individual inputs are displayed by drawing on the names and information you enter here.

6.4.2 WORKSPACES AND MIN/MAXIMIZE

Various layouts and custom monitoring options for the *Live Desktop* and Multiview are provided in the *Workspace* menu. When a *Multiview* monitor is in use, the two *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 in the two monitor areas.

For example, you might show main *Program* and *Preview* monitors along with all *8 M/Es* on the *Live Desktop*. Meanwhile, the *Multiview* monitor could display up to eight live *Camera* feeds plus *Media Players*, as well as the (program) output and *B* row selections for a specified *M/E* set to *Mix* mode.
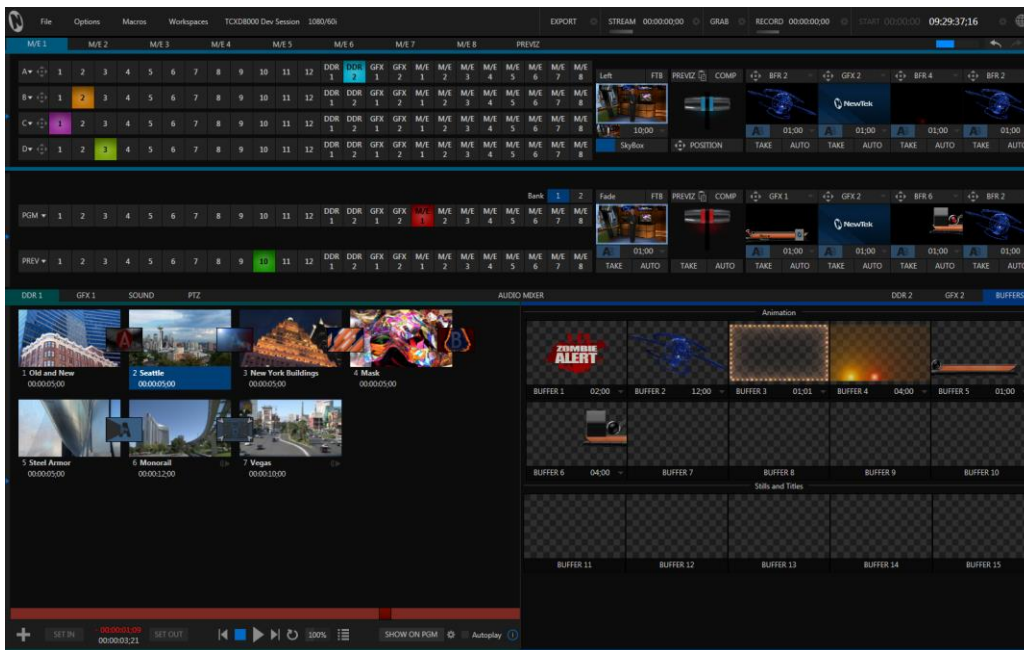
FIGURE 6-3

Notice too that you can also drag both the horizontal divider between the *Live Desktop* monitor pane and the *Switcher*, and the divider between the *Program-Preview* panes at right and viewports at left. 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 6-3), providing much more room for other modules in the process.

> *Hint: Reset the horizontal divider to its default locations by double-clicking it.*

Click the *Mix Effects* label or an *M/E tab* between the *Monitor* and *Switcher* sections to toggle display of the *M/E* pane – or press the keyboard shortcut "m".

A number of further workflow and interface options that can be very valuable are found in the *TriCaster Options* menu, discussed shortly (Section 7.1).

Chapter 7 THE DASHBOARD

TriCaster's 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 TriCaster Options menu.

TriCaster's *Dashboard* is home to a number of important displays, tools and controls. Prominently located at the very top of the *Live Desktop*, the *Dashboard* occupies the full width of the screen.
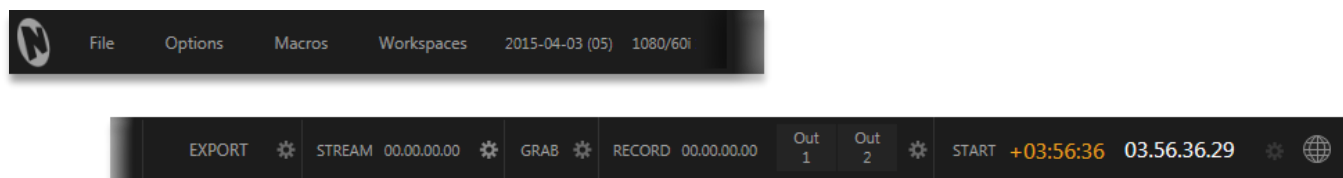
The various elements comprising the *Dashboard* are listed below (starting from the left):

1. *File menu*
2. *Options menu*
3. *Macros menu* (see Chapter 16)
4. *Workspaces* menu (see Chapter 10)
5. *Session Information* (display)
6. *EXPORT button* and Configuration
7. *STREAM* button and *Configuration* (see Chapter 17)
8. *GRAB* button and *Configuration* (see Chapter 19)
9. *RECORD* button, *Replay Pad*, and *Configuration* (see Chapter 19)
10. *Time Display(s)* and *Configuration* (see Section Section 8.3)
11. *Information* (see Section 4.1)

Of these items, some 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 which are not discussed in 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, automatically transcoding them to friendly formats for optimal playback if necessary. (The *Import Bin's* features are similar to those of the *Publish Bin*.)
- *Share Media Folders and Buffers (see* Section 11.4)
- *Exit* – close your live production session, and return to the *Session page* of your TriCaster's *Startup* 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 *TriCaster Options* menu.

- *Tabs Follow*

  o 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).

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

  o Follow All Delegates will appear when a control surface is connected and causes M/E Preview monitor panes to update when a new M/E Delegate selection is made.

Hint: Control surface 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 surface Delegate button again to re-display the tabbed pane you are interest in.
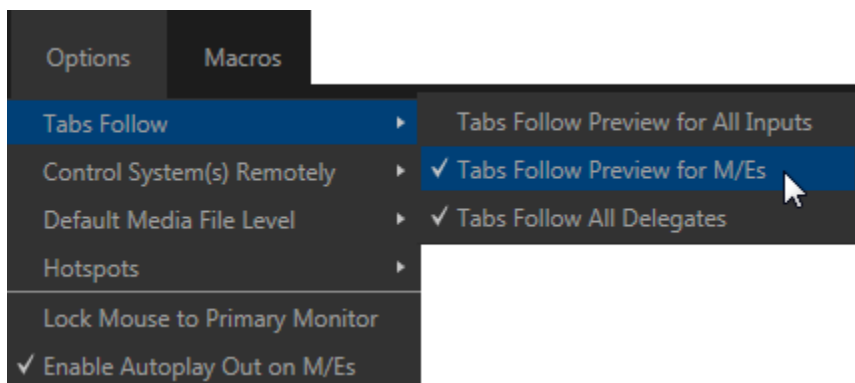
- (TriCaster 8000 and 860 only) *Control System(s) Remotely* – select one (or more) TriCasters detected on your local network, and all control operations you perform using the user interface, the control surface, or keyboard will be echoed to the controlled system – see Section 16.4.

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

- The *Hotspots* menu offers *Disable All Hotspots* and *Disable Hotspots for Sources Not on Output* options to prevent macros from being triggered inadvertently.

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

- *Enable Autoplay Out on M/Es* – You may find it useful to enable *Autoplay's* 'transition-out when nearing the end of play' feature for *M/E's* (*Mix* mode).   By default, this option is off.

<div align="center">

SECTION 7.3 MACROS

</div>

Macros are an extremely important TriCaster feature. Sufficiently so, in fact, that not only have we given them a place of their own in the User Guide (Chapter 16), but they are also discussed in greatly expanded detail in the accompanying Automation and Integration Guide.

<div align="center">

SECTION 7.4 WORKSPACES

</div>

The *Workspaces* menu opens when clicked to reveal two groups labeled *Multiview 1* and *2*. These control the monitor viewport layouts shown on the *Live Desktop* and external *Multiview* displays. *Workspace* features are discussed in Section 10.1.

<div align="center">

SECTION 7.5 INFORMATION PANEL

</div>

An information display in the *Live Desktop* titlebar provides a number of useful items. Displayed information includes:

- (Session Name)
- (Session format)
- *Status message* display
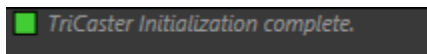
FIGURE 7-3

The *Status message* area sits next to the session information display, but is hidden when no message is shown. When TriCaster needs to inform you regarding system events or conditions, text messages replace the normal information display. Status messages may pertain to operations or system conditions; they may be benign, as in *Figure 7-3, or cautionary.

> * A brief initialization is required following system startup for *DDR* video playback to stabilize. During this brief 'warm-up' period, an *initialization countdown* appears in the *Status message display*...

The display automatically clears itself a few moments later so as not to pose an unnecessary distraction.

Chapter 8 I/O CONFIGURATION

TriCaster® provides extensive control over your video sources, along with related creative features. Each video source (internal and external) has its own Proc Amp, keyer (LiveMatte™) and Crop ('garbage matte') features. Input Configuration panels are also home to TriCaster's powerful realtime Hotspot and Tracker features.

In addition, the number and flexibility of TriCaster's outputs is astonishing, and we'll discuss these fully in this chapter.

The addition of NDI™ (Network Device Interface) support provides TriCaster® Advanced Edition with additional input and output possibilities. Generally, an NDI source needs little if any configuration, but other sources may require you to choose between optional connection methods and settings.

SECTION 8.1 INPUT CONFIGURATION
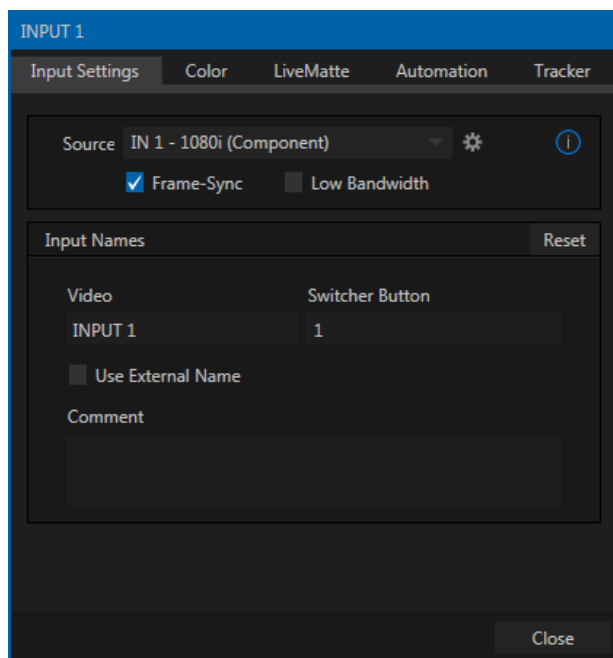
FIGURE 8-1

- Any external Switcher input can be flexibly assigned to either an NDI source from the network, or (as before) a local source connected to one of TriCaster's hardware input connectors.

- In a departure from prior practice, hardware sources can now be re-ordered on the Switcher. Likewise, rigid ordering of audio and video input sources (e.g., audio input 1 and with video input 1 being inextricably linked) is no longer enforced.

The assignment of one of the various supported source types to a *Switcher* button (e.g., "Input 1" on the *Switcher*) is made in the *Input Configuration* panel (Figure 8-1), introduced back in Section 3.11.

Open *Input Configuration* by double-clicking a monitor viewport, or right-clicking a Switcher input button.

In the case of an NDI source, no further settings are required. If the video source is local, and supplied to one of TriCaster's hardware connectors, additional information is needed in some cases. Before going on to discuss Hardware Configuration (Section 8.1.7), however, let's explore other features located in the *Input Configuration* panel.

Hint: Double-click a monitor to open the Input Configuration panel, without having to hunt for the gear or open the menu.

TriCaster's internal *Frame Sync* is enabled for all sources by default, allowing you to work with a wide array of potential video sources without concerns about video timing. For TriCaster 460, 860 and 8000, it is

FIGURE 8-2 possible to ensure the very lowest possible throughput latency for genlocked sources by disabling *Frame Sync*. Sources with *Frame Sync* disabled *must* be genlocked, and further, must be 'in phase' (within 180° of the current switcher output); otherwise, video from the source will simply not be visible.

In practice, then, disable *Frame Sync* for your genlocked sources, adjust the *Phase* setting (see Section 8.2.3) until video is displayed and you should be all set.

> Note: If Frame Sync is enabled or disabled for one source in a 'Fill + Alpha' input pair, the Frame Sync setting for the corresponding input channel is automatically updated to match.
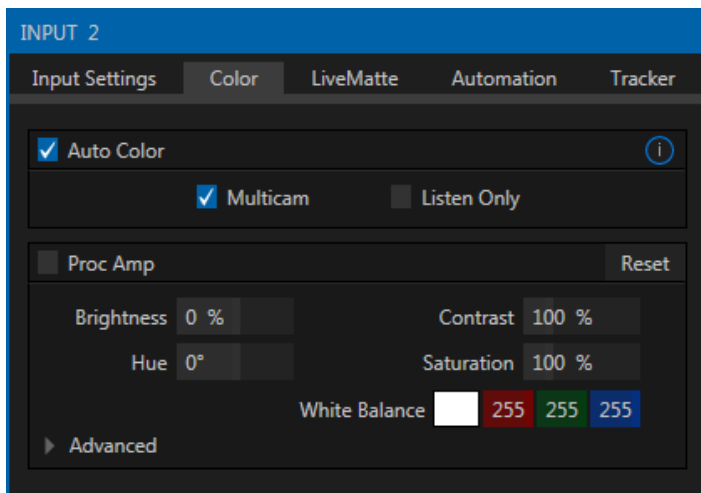
FIGURE 8-3

TriCaster Advanced Edition provides extensive color control processing options for every video source. These are hosted in the *Color* tab of the *Input Configuration* panel.

AUTO COLOR

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.

To help you overcome these problems, TriCaster Advanced Edition provides *Auto Color,* a unique feature

 capable of dynamically adapting the color characteristics of your video sources as lighting conditions vary. For many productions, simply enabling the *Auto Color* switch is all it takes to produce a show that looks amazingly consistent.
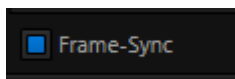
By default, each camera with *Auto Color* enabled is processed uniquely – without reference to other sources. Often, though, even greater consistency can be achieved by treating sources in similar illumination environments as a group. Enable *Multicam* for several cameras causes *Auto Color* to evaluate 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 consequent *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
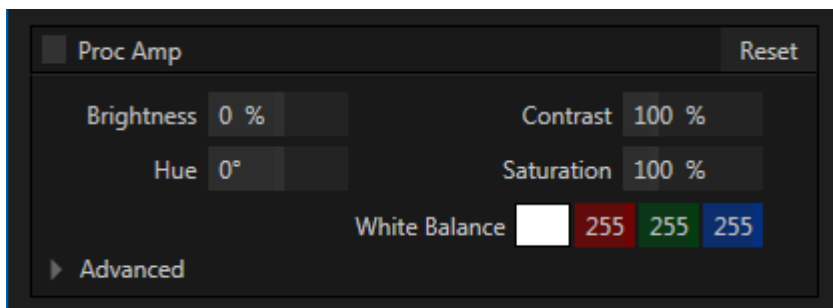
FIGURE 8-4

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.)

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
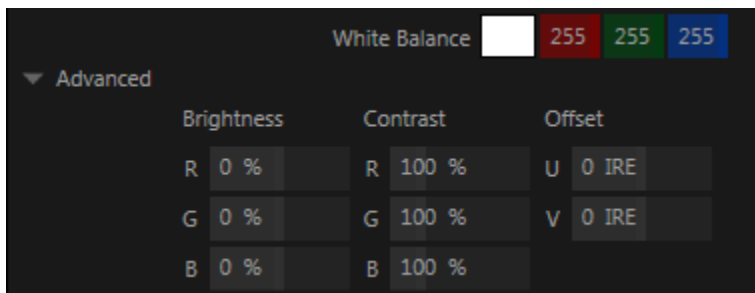
FIGURE 8-5

This secondary control group is revealed when you click the triangle gadget 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.

8.1.3 LIVEMATTE

The next tab in the *Input Configuration* panels is where TriCaster's powerful realtime keying system for live production, *LiveMatte,* is configured. Keying is a popular and powerful method of compositing multiple images, whether photos, video clips or live camera streams.
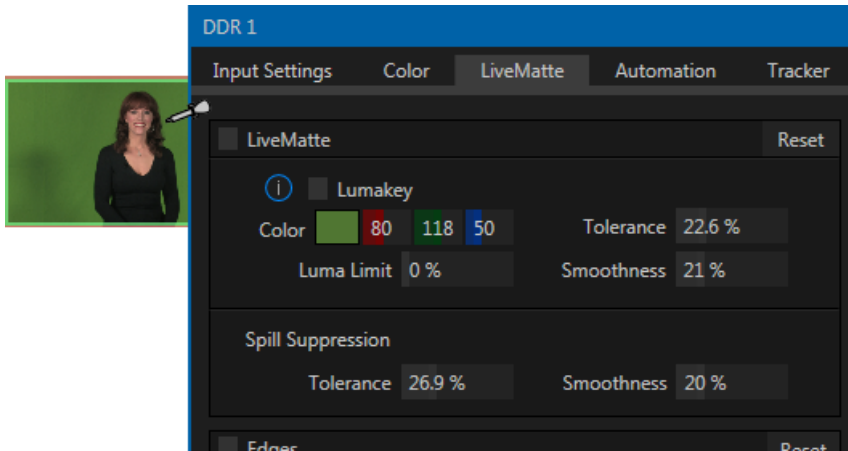
The process involves eliminating a portion of the image (effectively cutting a digital 'keyhole' in it) to reveal a user-defined background scene. It also plays an important role in the workflow of *LiveSet*, TriCaster's powerful virtual set technology.

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.*

8.1.4 EDGES

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.

Cropping settings in the *Edges* control group can be used to remove such unwanted 'garbage' from the scene, or used independently for other purposes – such as to isolate some portion of the screen for use as a 'Picture in Picture' overlay source.
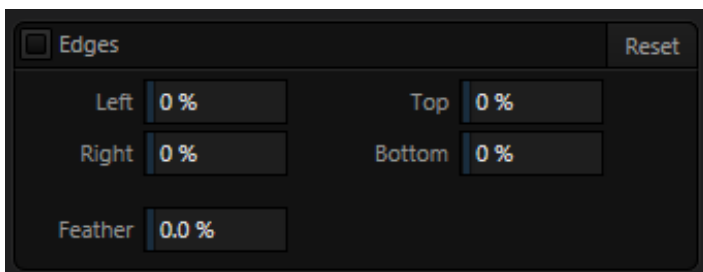
Essentially, the numeric controls in this group allow you to define independent margins for the frame. Drag left or right on the number fields to adjust the values interactively, or double-click a field to type a value using the keyboard. The region defined by these controls will be completely cropped. Use the *Feather* setting (Advanced Edition products only) to soften the edges.

> *Hint: For added convenience, similar cropping tools are available separately in the Position panels of DSK channels and M/Es.*

8.1.5 AUTOMATION

Automation is one of those wonderful things that really set TriCaster Advanced Edition apart from the mundane. 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 to a degree 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 surface 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 some predetermined criteria. Thus the automatic transmission in your car upshifts and downshifts all by itself when certain conditions are met. The automatic pilot on an airplane responds to flight conditions in a predetermined way, without pilot input.

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
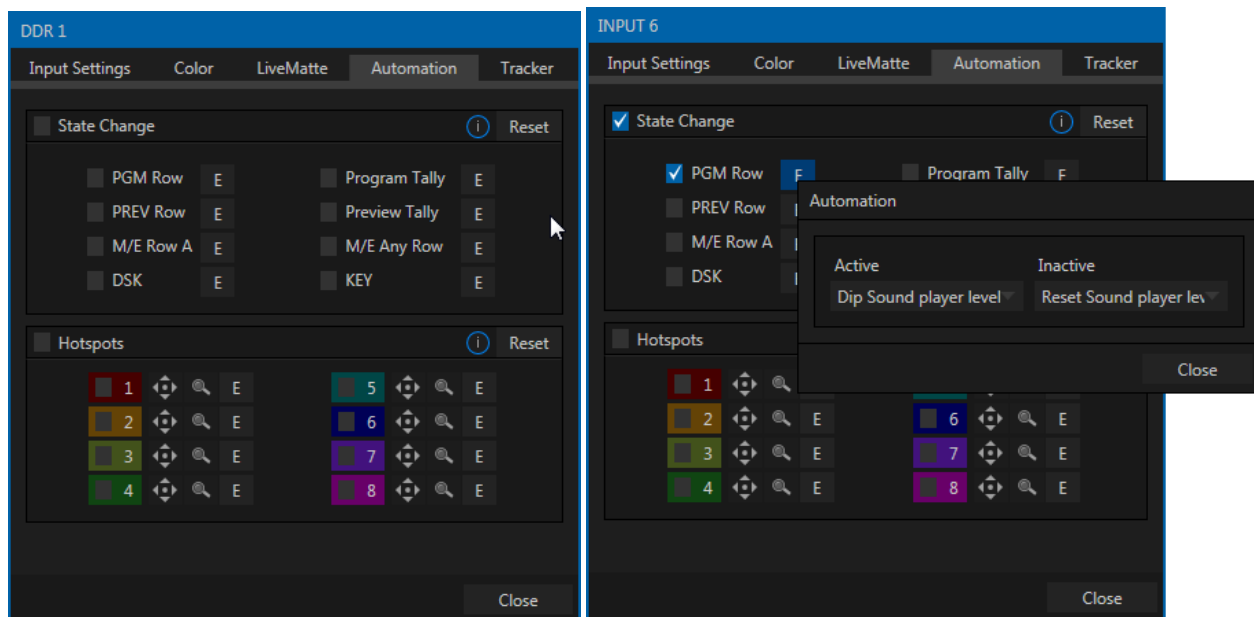
FIGURE 8-8

Click the [E] button next to a 'state' (see Figure 8-8) 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 TriCaster's *SOUND* player. Whenever *Camera 6* is newly selected on the Switcher's *PGM* row, the *Active* macro will run. Conversely, replacing *Camera 6* 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 all 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
- Or automatically select a different *Audio Mixer* preset when you switch from viewing a source in the B monitor of a virtual set on *Program* to displaying it full-screen
- And 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
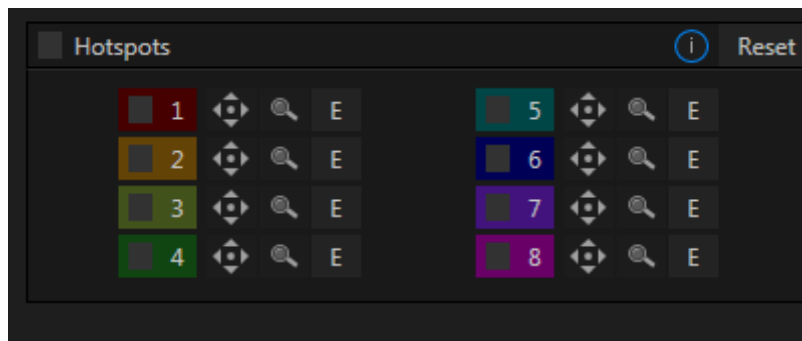
FIGURE 8-9

The lower portion of the *Automation tab* is devoted to *Hotspots* – another of TriCaster's powerful interactive automation features. 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).

With *LiveMatte* properly configured, the *Hotspot* feature can trigger a macro when opaque pixels are newly detected in an active *Hotspot* (as, for example, when talent in a greenscreen set walks into that location in the frame), and a second macro when all opaque pixels move out of the region. All manner of creative implementations are possible. *Hotspot* setup, options and use is discussed in Chapter 16, Macros, Automation and Remote Control.

8.1.6 TRACKER

(TriCaster 8000, 860 and 460 only) The *Tracker tab* provides control over TriCaster's realtime 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 (Section 8.1.3).

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 to TriCaster.

In turn, *Tracker* output from one source can be used to control the placement of other video sources configured to do so in their individual *Position* panels (supplied wherever appropriate in *DSK* controls and *M/E* panes).

ADJUSTING TOLERANCE

Click the eyedropper, keep the mouse button depressed, and drag the pointer over top of the monitor showing the source you want to track (Figure 8-10). The color swatch updates constantly as you drag, until you release the button to make a selection.

TriCaster makes it easy for you to adjust the *Tracker* settings by making it possible to see the result of your attempts in its monitors. Right-click on a monitor and select *Tracking Markers* from the *Overlays* options group in the menu. A yellow-shaded rectangle is overlaid on the video using the current 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.

FIGURE 8-10 (TriCaster 8000 Shown)

SMOOTHNESS

The *Smoothness* setting works just like the *LiveMatte* feature with the same name. Its impact on tracking *data* output is minimal, but it is often 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 (Figure 8-11):

FIGURE 8-11

- 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: Generally, locking channels in this manner make it easier to obtain a very steady motion track; but just as often, your choices will be dictated by creative requirements.

LIMIT TO REGION

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.
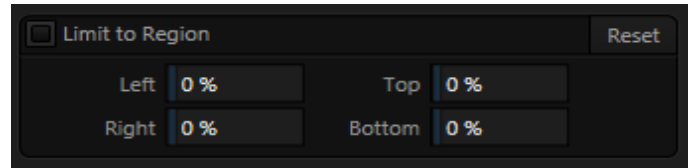
FIGURE 8-12

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.

8.1.7 HARDWARE CONFIGURATION
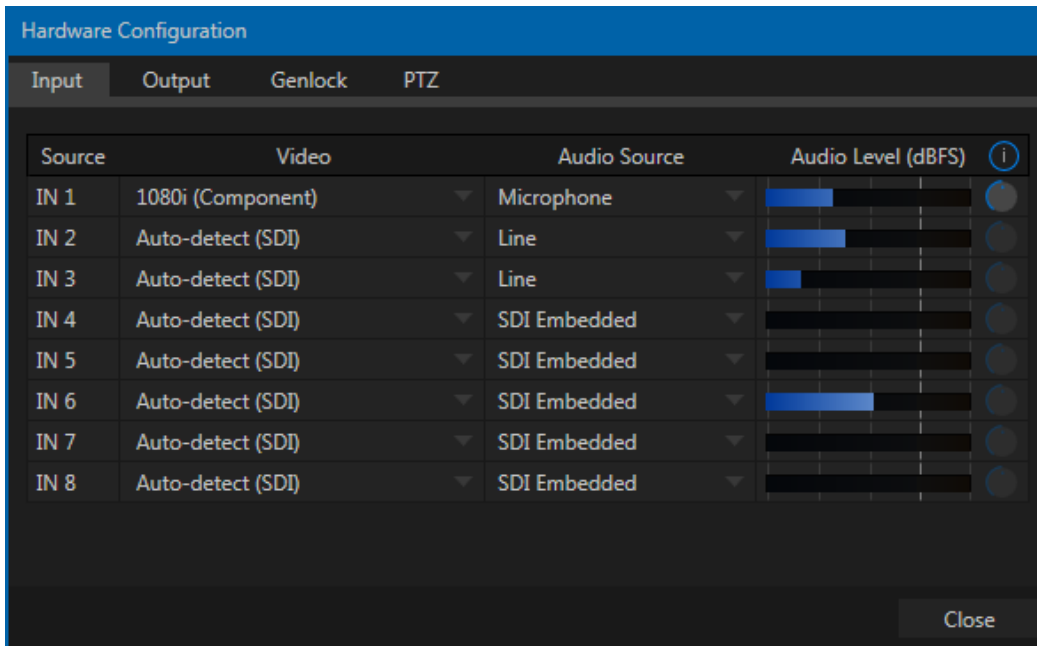
FIGURE 8-13

For SDI or HDMI sources, TriCaster is usually able to auto-detect the format and configure the input settings appropriately.

You may, however, need to manually select the format in some cases. For example, if you connect an SD-SDI source within an HD session, or vice versa. Alternatively, you may need to connect an analog source, such as an HD camera or recorder that employs a traditional analog component output.

Connection type and format options are provided in the *Hardware Configuration* panel (Figure 8-13). Conveniently, you can open this pane by clicking the configuration (gear) icon shown at right of the *Source* selection in *Input Configuration* (or you can double-click the *Program* output viewport to do so).

The *Input* tab in this panel lists all local hardware inputs (either 4 or 8, depending on the TriCaster model) in a table. Drop-down menus in the *Video* and *Audio* columns allow you to choose between various connection types and, for audio, different levels (Figure 8-14).
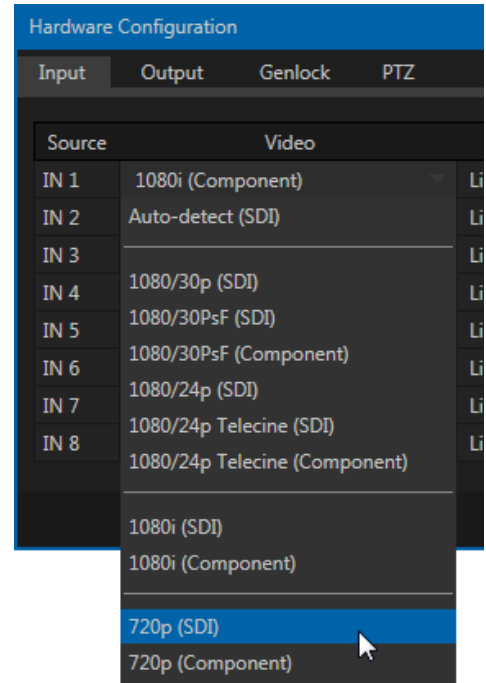
CONNECTION TYPE

FIGURE 8-14

The *Video* menu lists appropriate options for the current session video standard – *PAL*, *NTSC* or *NTSC-J*. Changing from one video standard to another requires exiting the session.

> Hint: All connected cameras must conform to the current video standard for the session.

AUTO-DETECT (SDI)

TriCaster Advanced Edition's *Auto Detect (SDI)* feature makes configuring SDI sources easy. Generally, you can simply connect a camera and see the signal from their SDI sources immediately, without any need to set resolution and framerate options. (Note that this feature requires that the source is supplied in an HD format for HD sessions or an SD format for SD sessions. So, for example, if you connect an HD-SDI camera in an SD session, *Auto-Detect* will work as expected.)

SUPPORTED FORMATS

Other standard options are described below (note that TriCaster 410, TriCaster Mini SDI and TriCaster Mini do not support analog video input options):

1080i (Component), 1080/30PsF (Component), 1080/24p Telecine (Component)

- Analog source, high definition, interlaced or PsF (Progressive Segmented Frame)
- 1080/60i , [2]1080/50i, or 1080/24p
- 1920x1080 pixels, 16:9 picture aspect
- Connected to TriCaster by Y, Pr and Pb input connectors

1080i (SDI)

- Digital source, high definition, interlaced
- 1080/60i or [2]1080/50i
- 1920x1080 pixels, 16:9 picture aspect
- Connected to TriCaster by SDI input connectors
- Optionally carries embedded audio

1080/30p (SDI), 1080/30PsF (SDI), 1080/24p (SDI), [1]1080/24p Telecine (SDI), [2]1080/25p (SDI), [2]1080/25PsF (SDI)

- Digital source, high definition, progressive scan, or PsF (a hybrid)
- 1920x1080 pixels, 16:9 picture aspect
- Connected to TriCaster by SDI input connectors
- Optionally carries embedded audio

720/60p (Component), [2]720/50p (Component)

- Analog source, high definition, progressive scan
- 1280x720 pixels, 16:9 picture aspect
- Connected to TriCaster by Y, Pr and Pb input connectors

720/60p (SDI), 720/30p (SDI), 720/24p (SDI), [2]720/50p (SDI), [2]720/25p (SDI)

- Digital source, high definition, progressive scan
- 1280x720 pixels, 16:9 picture aspect
- Connected to TriCaster by SDI input connectors
- Optionally carries embedded audio

The standard definition options listed below are provided in <u>both</u> 4:3 and 16:9 versions:

480/30i (Component)

- NTSC analog format, standard definition, interlaced
- 720x480 pixels, 4:3 picture aspect <u>or</u> anamorphic 16:9 picture aspect
- Connected to TriCaster by Y, Pr and Pb input connectors

480/30i (SDI)

- NTSC digital format , standard definition, interlaced
- 720x480 pixels, 4:3 picture aspect <u>or</u> anamorphic 16:9 picture aspect
- Connected to TriCaster by SDI input connectors
- Optionally carries embedded audio

480/30i (Y/C)

- NTSC (S-Video) analog format , standard definition, interlaced
- 720x480 pixels, 4:3 picture aspect <u>or</u> anamorphic 16:9 picture aspect
- Connected to TriCaster by Y and Pb input connectors

480/30i (Composite)

- NTSC analog format , standard definition, interlaced
- 720x480 pixels, 4:3 picture aspect <u>or</u> anamorphic 16:9 picture aspect
- Connected to TriCaster by Y input connector

[2]576/25i (Component)

- PAL analog format, Standard definition, interlaced
- 720x576 pixels, 4:3 picture aspect <u>or</u> anamorphic 16:9 picture aspect
- Connected to TriCaster by Y, Pr and Pb input connectors

[2]576/25i (SDI)

- PAL digital format , standard definition, interlaced
- 720x576 pixels, 4:3 picture aspect <u>or</u> anamorphic 16:9 picture aspect
- Connected to TriCaster by SDI input connectors
- Optionally carries embedded audio

[2]576/25i (Y/C)

- PAL (S-Video) analog format , standard definition, interlaced
- 720x576 pixels, 4:3 picture aspect <u>or</u> anamorphic 16:9 picture aspect
- Connected to TriCaster by Y and Pb input connectors

[2]576/25i (Composite)

- PAL analog format , standard definition, interlaced
- 720x576 pixels, 4:3 picture aspect <u>or</u> anamorphic 16:9 picture aspect
- Connected to TriCaster by Y input connector

Note: TriCaster Mini SDI does not support 1080/60 or 1080/59.97

[1] The 'telecine' option removes '2:3 pull-up' in output from cameras claiming 24PsF but actually supplying video at 30 fps (to make it suitable for 24P use sessions).

[2] PAL connection type.

TriCaster 860 band 8000 optionally allow one or more neighboring pairs of video *inputs* to be combined as a single 'video + alpha' channel (sometimes also referred to as "fill and matte").

The ability to configure one input as the alpha channel source for another is invaluable for installations employing traditional video feeds from high end external CG and chromakeying systems (some third-party systems now provide NDI output with embedded alpha channel, making this older method unnecessary and eliminating the need to sacrifice an extra input).

To use this feature, select *Act as Alpha Channel for Input (#)* as the *Connection Type* in the *Input Configuration* panel for an even-numbered input (feature not supported by TriCaster Mini).

480i, 4:3, (SDI)
480i, 4:3, (Component)
480i, 4:3, (Y/C)
480i, 4:3, (Composite)

Act as Input 1 Alpha Channel
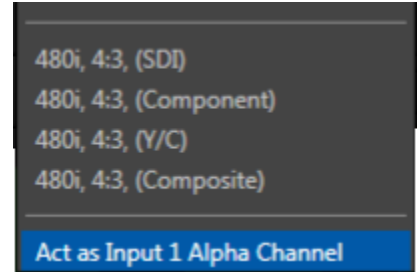
FIGURE 8-15

Note: The input configuration (video format and connection type) for the alpha input is automatically configured to match the fill source it is paired with.
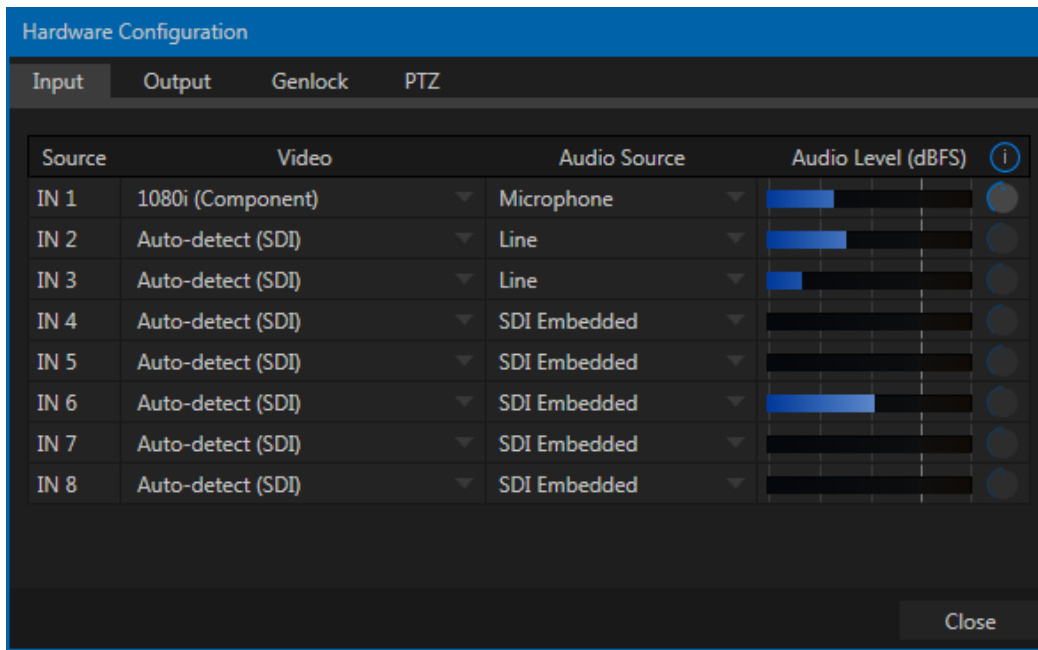
FIGURE 8-16
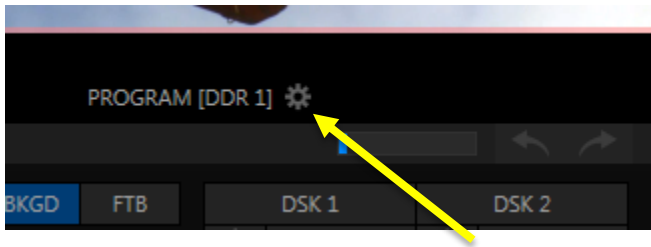
Roll the mouse pointer over the *Program* monitor to reveal a *Configure* button (Figure 8-17) at right in the titlebar below the display. Click it to open the *Hardware Configuration* panel.
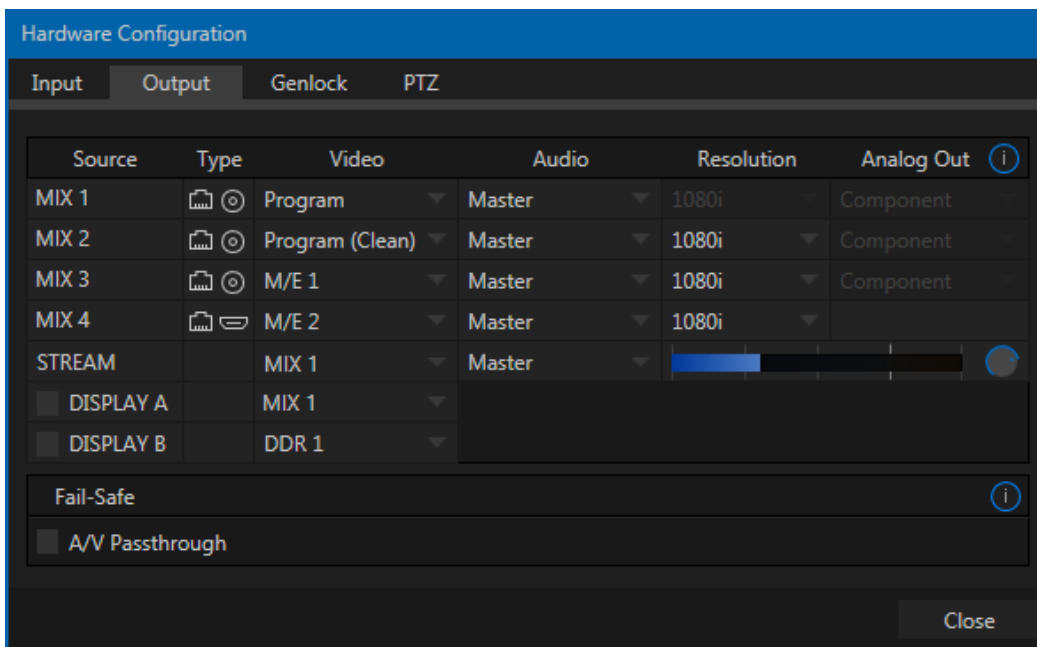
Note: The features shown in this panel vary by model.

8.2.1 OUTPUT TAB

The *Output tab* in the *Hardware Configuration* panel contains controls governing TriCaster's outputs.

PRIMARY OUTPUTS

Depending on the model, either the first two (Mini SDI, Mini, and 2-RU models) or three (4-RU models) output row entries correspond to physical output connectors. In addition, the first four entries are always exposed to connected networks as NDI (Network Device Interface) outputs.

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

Uniquely, *Output 2* can be tasked with sending an alpha channel matte to downstream systems.

Let's consider the optional settings provided by *primary outputs*:

- *Video* menu – assign any source from the following list to either *Output 1* or *Output 2:*

    o Program
    o Program (Clean)
    o Preview (look ahead)
    o Cameras – Inputs 1-(8 or 12)
    o Media Players (DDRs and GFX players)
    o Output from M/E 1- (4 or 8)
    o Buffers (1-15)
    o Follow
        ▪ M/E Preview
        ▪ M/E Program
        ▪ Green (FX)
        ▪ Gold
        ▪ Blue Red
    o Black
    o *Alpha Matte – Output 2* only

- *Audio* menu – choose which audio is presented on the corresponding *SDI, HDMI, Stream and Network* outputs (Analog *Outputs 1* and *2* connections <u>always</u> carry *Master* and *Aux* sound, respectively):

    o *Outputs*
        ▪ *Master* (sound from the *Master* bus channels)
        ▪ *Aux* 1, 2 (sound from the *Aux* busses, 1-3)

        (See Section 15.7.2 for discussion of TriCaster's internal audio busses).

    o *Inputs* 1-(8 or 12) – sound from any single audio input

- *Resolution* menu – Output 1 is always at *session resolution.* For other outputs, select the video format for downstream devices you intend to connect to the corresponding output:

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

Note: Output 1 always transmits video in session format, thus shows a Resolution display only (rather than providing menu settings).

- *Analog Out* menu (not present on TriCaster 410 or TriCaster Mini) – select the video connection type for downstream devices you intend to connect to the corresponding output:
  - Component
  - Composite + Y/C

Note: The only analog connection type suitable for HD video is Component. The Analog Out menu for primary outputs are automatically set to Component when the selected Resolution is HD.

Choosing *Component* or *Composite + Y/C* results in the output connectors in the corresponding row being configured as shown in the following table:

Connection Type	BNC 1 (SDI)	BNC 2 (Y)	BNC 3 (Pb)	BNC 4 (Pr)
Component	SDI	Y	Pb	Pr
Composite + Y/C	SDI	Composite	Y	C

Note: TriCaster's digital (SDI) video outputs are always active, even when the analog outputs in the same group are in use. HDMI display devices will typically show black when they do not support video displays of the format (resolution, etc.) selected as source.

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

ALPHA MATTE

The *Video* source menu options for *Output 2* include a switch labeled *Alpha Matte*. This feature can be used independently, or supplement the *Act as Alpha* option (discussed in Section 0).

An alpha matte can be automatically derived from suitable sources. It might be the matte from a *LiveMatte* keyer effect, allowing *Output 2* to support downstream compositing of the full color source. Or, it could be drawn directly from an image or *Title Page* in a *Media Player*. It could just pass-through the matter from an upstream alpha channel source. Simply enable the switch in the *Output Configuration* panel, and select a suitable source using the same menu.

Note: Generally, the source's Resolution should match session format when supplying an Alpha Matte signal to downstream devices.

GENERAL NOTES

Here are some other noteworthy facts related to output:

- For SD session formats, session aspect (4:3 or 16:9) is respected on output (e.g., when the session is SD 16:9, video output is also 16:9).
- For HD sessions (which are always 16:9), interlaced SD video from a *primary output* and any output set to *Follow* it) can use either a 16:9 image aspect or as (side-cropped) 4:3 video, as noted earlier when discussing the *Resolution* menu.

Hint: Even if you are not using the HDMI output, , it can be especially useful, since a) it supports the full array of optional sources, and b) secondary outputs can follow it. For example, you might set HDMI to

'output' an M/E, and then send that M/E to the Network output (which is not normally able to output an M/E directly).

These outputs (provided on certain models) independently offer a subset of the options available for *Outputs 1* and *2*. *Video* menu options include:

- Cameras 1-(8 or 12)
- Media Players (DDRs and GFX players)
- Buffers 1-15
- Follow (Output 1- 4)

Choosing *Follow 1- (3 or 4)* transmits the same video source, at the same resolution, as the 'followed' output.
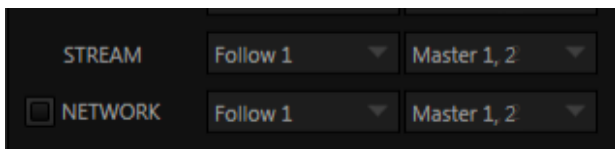
FIGURE 8-19

Hint: TriCaster's 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 which audio and video sources sent to the streaming output. All other options and settings relevant to streaming are discussed in Chapter 17.

DISPLAY OUTPUTS
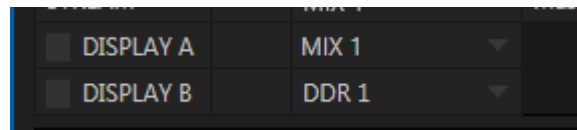
FIGURE 8-20

Two rows at the bottom of the configuration panel are labeled *Display*. The corresponding output ports are intended to supply video to projection systems or other display devices. The physical *Display* connectors may vary by model, but are typically presented physically on TriCaster's rear connection panels as HDMI and either DVI or VGA ports. *Video* source options are the same as the *Stream* output. No audio is supplied to these connectors.

Note that the resolution and color of a monitor connected to one of these special *Display* ports can be adjusted in the *Display Settings* panel opened from the *Workspaces* menu, found in the main *Dashboard*.

Note: TriCaster Mini and Mini SDI systems, depending on the model, may also provide CASE DISPLAY setup features, providing access to a number of useful display alternatives for the side-panel LCD screen.

8.2.2 FAILSAFE

Fail-Safe
A/V Passthrough
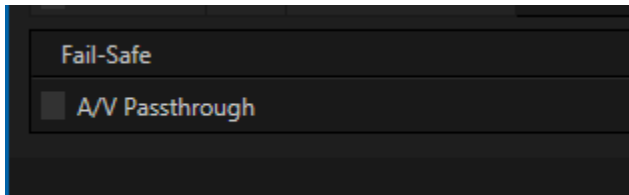
FIGURE 8-21

For TriCaster rack mount units, 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 pass-through ensures that as long there is AC power, audio and video from Input 8 (on 4RU models) or Input 4 (2RU models) 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.

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, TriCaster's failsafe video passthrough mechanism (which ensures that video output continues even in catastrophic circumstances) can actually *prevent* the external system from engaging. For this reason, a *Failsafe* control group has been added to the *Output* tab for TriCaster rack-mount models. It provides a switch to let you disable the A/V passthrough when necessary. By default, A/V passthrough is off.

> Hint: Only use fail-safe when a stable video source is connected to video Input 8.

8.2.3 GENLOCK TAB

TriCaster's *Genlock* feature allows it to 'lock' its video output to a reference video signal supplied to its *Genlock* input connector. (Note that TriCaster 410, TriCaster Mini SDI and Mini do not provide Genlock support.)

This synchronizes TriCaster output to other 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.

TriCaster mixes and switches output from up to eight directly connected local camera sources (4RU models). Miniscule local timing differences between these may force tiny delays during switching operations, which can also contribute to throughput latency. Thus, serving i) TriCaster's Genlock input <u>and</u> ii) other video devices in the chain with a single reference is the best approach.

You could think of it this way:

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'.

❖ 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 TriCaster's *Genlock* input ensures a match between TriCaster 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. Some devices require SDI sources to be genlocked when mixing digital audio (whether for recording or live production).*
>
> *TriCaster, however, includes dynamic audio re-sampling for each input. Genlocking of SDI audio/video sources is not a requirement. Still, genlocking sources and TriCaster to a house reference signal, or genlocking the cameras directly to the TriCaster output is encouraged (to genlock cameras, see your camera manual).*

Genlock settings are hosted in a tab by the same name in the *Hardware Configuration* panel (Figure 8-22).

VERTICAL POSITION, HORIZONTAL POSITION AND PHASE
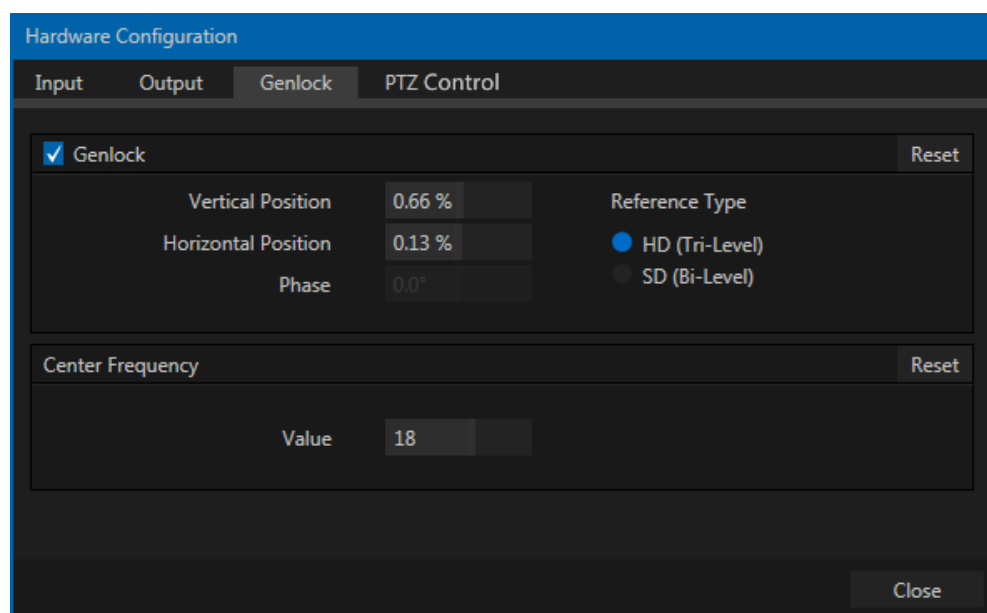
FIGURE 8-22

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 TriCaster provides several adjustments in its *Genlock* section. 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.

Thus, the *Vert Position*, *Horiz Position* and *Phase* settings allow you to 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).

The 'bi-level' reference signal long used for standard definition television is often used for genlocking both SD and HD installations.

However, if you are supplying an HD reference signal to TriCaster's *Genlock Input* (and your other equipment), select the *HD (Tri-level)* switch in the *Reference Type* area of TriCaster's Genlock settings.

Note: Reference Type options do not appear for SD sessions.

8.2.4 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 TriCaster's 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 .

8.2.5 PTZ
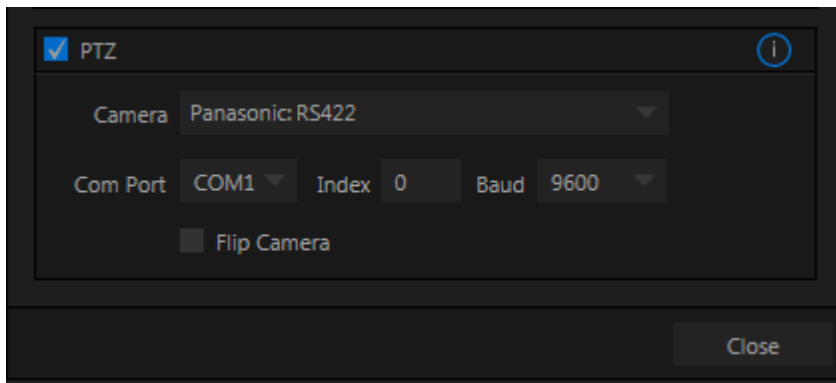
FIGURE 8-23

PTZ (pan-tilt-zoom), or 'robotic' cameras can play important roles in certain types of productions. These systems range widely in price, from a few hundred dollars to those in the 'six figure' range, with an equally diverse range of quality and features.

*Note: **TriCaster Mini SDI** does not support PTZ Optics SDI cameras.*

Generally, remote control of PTZ cameras involves sending instructions to the camera across either serial (RS232, RS422 or RS485) or network connections. TriCaster support for both types (see note below). Connection settings shown in the *PTZ* tab (*Input Settings* tab) update depending on which *Camera* type you select.

Choose your camera protocol (or one similar to it) using the drop-down menu, and then enter (or select) appropriate settings for the unit. The *Flip Camera* switch inverts the image, helpful when the camera is mounted in an upside-down orientation. It also affects the pan and tilt controls, when possible (this support varies by camera).

As TriCaster does not have an external serial port, you will need to use a third party USB-to-Serial Port adapter for PTZ cameras requiring a serial connection. Windows will automatically assign a COM port number to the adapter, usually COM 1. In some cases, you may wish to manually assign it to a specific port.
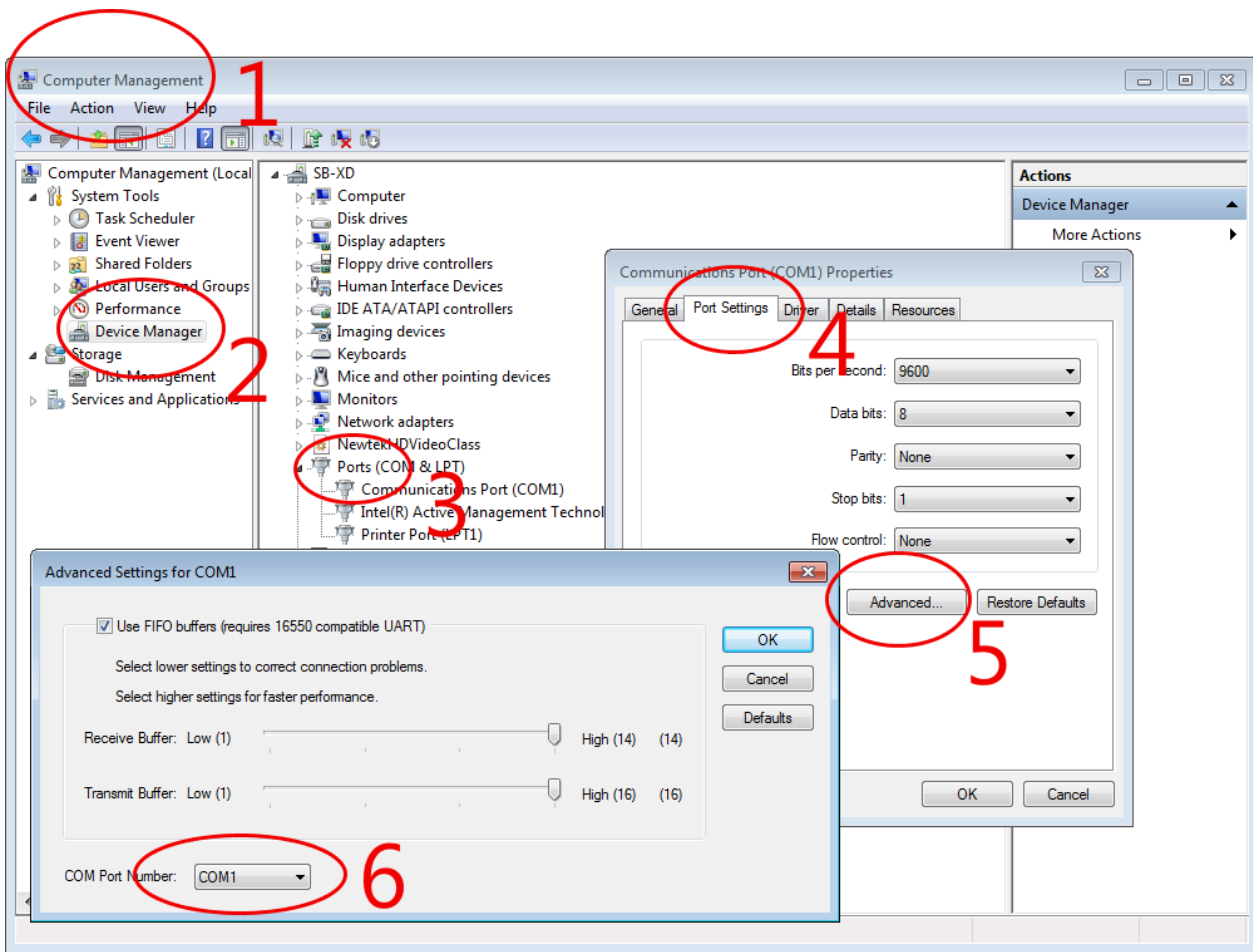
Exit to Windows from TriCaster's *Administration Mode* screen (Section 5.2.3) to access the controls shown in Figure 8-24. Refer to the documentation provided with your adapter for further directions.

SECTION 8.3 TIMECODE CONFIGURATION
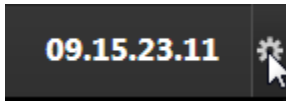
FIGURE 8-25

TriCaster can supply event time values based on the system clock, when necessary. To access timecode options, click the small gear icon next to the timecode display at right in Live Desktop's *Dashboard*.

Hint: You can set TriCaster's system clock as for any computer by exiting to the Windows® Desktop.

Advanced Edition TriCasters can optionally use an external linear timecode (LTC) reference to drive their clocks (and timecode for capture).

We'll discuss the shared timecode features first, and then focus on the unique aspects of the LTC timecode support (Section 8.3.3).

FIGURE 8-26

8.3.1 SUBTRACT 12 HOURS

The current time value is embedded in the frames of Quicktime video files captured during the session using TriCaster's *Record* function. For this reason, a switch labeled *Subtract 12 Hours* is provided.

This option permits you to avoid confusion that might arise when sequencing files based on timecode that 'wraps around' past midnight. (Otherwise, for example, a video frame recorded one minute *before* midnight would be assigned the timecode 23:59:59.00, while frames recorded one minute or more later would have timecode ≥ 01:00:00.00 – seemingly a *lower* (i.e., ordinarily *earlier*) timecode value.)
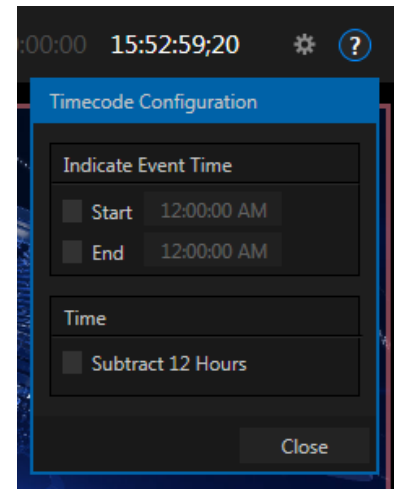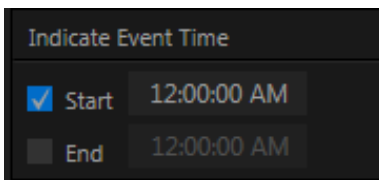
8.3.2 EVENT TIME

FIGURE 8-27
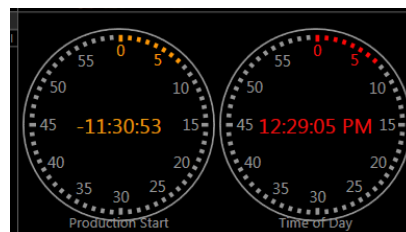
FIGURE 8-28

Two more 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, and 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 TriCaster's monitor panes and default *Multiview* layouts (Figure 8-28) 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.

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. TriCaster 460, 860 and 8000 support 'LTC'.
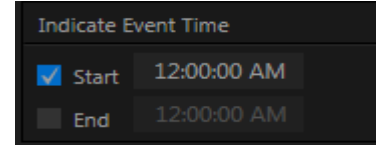
FIGURE 8-29

4RU TriCaster Advanced Edition models use *Audio Input 7* for timecode input. Sound from audio input 7 on these models is automatically muted for recording and output purposes, but you can un-mute it briefly in the *Audio Mixer* to let you adjust input levels.

For TriCaster 460, connect LTC to the 1/8" motherboard Line input connector (see also Section 3.6). TriCaster decodes time stamps from the audible signal, and uses the values for clock displays and embedded timecode when recording video. 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).*

Chapter 9 SWITCHER, TRANSITIONS AND OVERLAY

TriCaster's Live Desktop replicates traditional video switcher controls in easy to comprehend and use fashion. It provides numerous transitions that you can use to add interest when changing scenes, four independent downstream overlay channels, and some very useful automation.

When the *M/E* pane is minimized , the central band of the TriCaster® *Live Desktop* (between the upper monitoring section and the tabbed modules below) is taken up by the *Switcher* and related controls and features, including the *Layer Controls*, which include main and *DSK* channel *Transition* controls and configuration features (Figure 9-1).
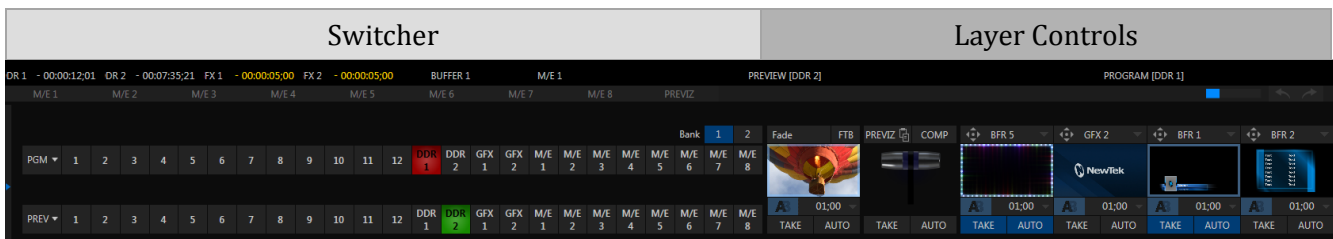
FIGURE 9-1(TRICASTER 8000 SHOWN)

SECTION 9.1 SWITCHER ROWS
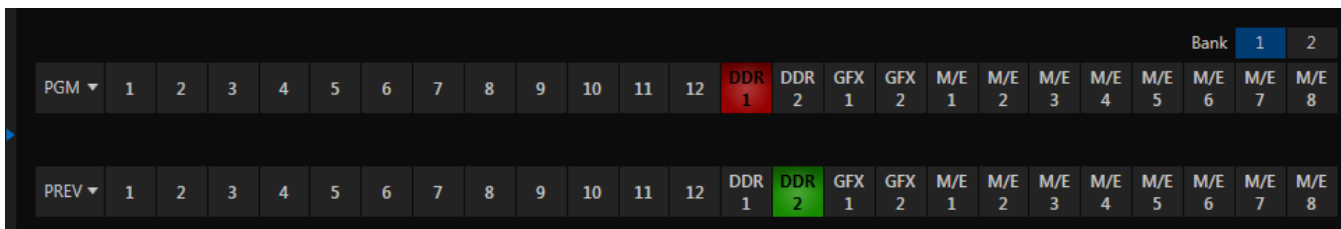
FIGURE 9-2 (TRICASTER 8000 SHOWN)

From top to bottom, the two main *Switcher* rows are labeled *Program* and *Preview*. Clicking a button in the *Program* or *Preview* row selects the active video source for that row (audio sources may or may not be affected by *Switcher* activity – see Chapter 15 Audio).

The number of sources available in NDI-enabled TriCasters is so extensive that sources are arranged in two banks. In this arrangement, each button does double duty, depending on which bank is currently being controlled.

FIGURE 9-3

Bank 1 is shown by default. Holding down *Alt* on the keyboard reveals *Bank 2* (Figure 21-2). On releasing *Alt*, *Bank 1* is re-displayed. It's also possible to 'latch' *Bank 2* if you like. Pressing the *Tab* key cycles the currently displayed bank.
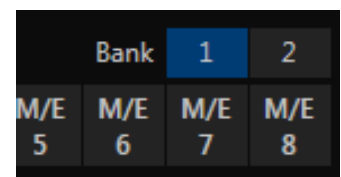
SECTION 9.2 PROGRAM AND PREVIEW

Optional video source selections for the *Program* and *Preview* rows include all external (*Camera* and *Network*) inputs, including video router sources; internal sources (*Media Players* and *Buffers*); and also the output from all of TriCaster's M/Es, represented on the *Switcher* rows by buttons labeled *M/E 1- (4 or 8*, by model*)* – see Chapter 14, Mix/Effect (M/E) Tools).
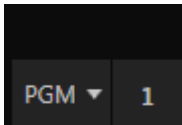
The *PGM* (Program) row selection determines the dominant video stream of the *Background* (BKGD) *video layer* – the bottom-most layer of the composition sent to the *Program* output.

Other sources may be mixed into the *Background* layer at times, as you apply *LiveMatte*, or see portions of an incoming *Preview* row video source during a transition.
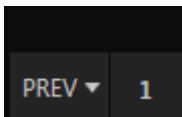
Normally, the *Preview row* selection determines which source is queued up for display in the *Background* layer by the next (BKGD) *Take* or *Transition* operation.

SECTION 9.3 BACKGROUND AND DSK LAYERS

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

- TriCaster's *Background* layer (often shortened to simply 'BKGD') is always the base for the video composition displayed on *Program out.*

- *DSK* (DownStream Keyer, or 'overlay') layers may or may not appear above (or, if you like, 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' can contribute to TriCaster's final *Program* output at any given moment:

- Either two or four (TriCaster 8000, 860, 460) overlay layers (*DSKs* are *c*omposed 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.
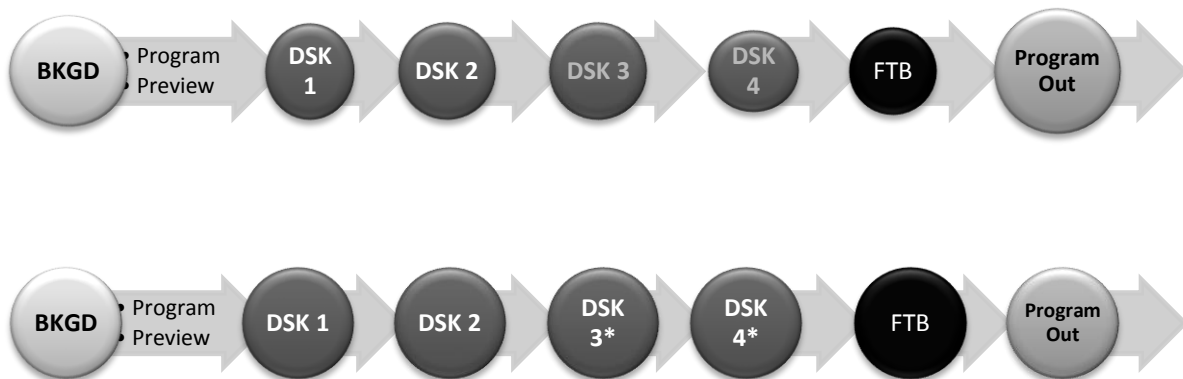
* TriCasters 8000, 860 and 460 only

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 bring many more sub-layers into the *BKGD* composite, including the M/E's primary *Inputs* and the dedicated M/E *KEY* layers, which are similar to *DSK* layers.

Note: Since TriCaster 8000's M/Es are reentrant, the BKGD layer can at times reach astronomical numbers of sub-layers in its composition all by itself!

9.3.1 SELECTING SOURCES

Video sources for *PGM* (Program) and *PVW* (Preview) rows, of course, are selected by pressing buttons on those rows. For *DSK* video layers, source selection is made using a drop-down menu above the individual *DSK* layer controls, located at right in the *Layer Control* section of the *Switcher* section.

Hint: Right-click camera input or Buffer buttons to select special sources from video routers or Buffers – see Section 3.11.1 (Configuring Routers) and Section 11.4 (Buffers).

9.3.2 LINKING SWITCHER ROWS

It can be very useful to link two (or more) *Switcher* or *M/E* source rows together, causing them to operate synchronously. The *Program* and *Preview* rows and the source rows in *M/E* panes show a downward pointing triangle to the right of the row label. 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 9-4 shows the Input A row for an M/E linked to the PGM row of the main Switcher. The "No Group" menu item removes the current row from a group, while "Clear Group" removes all rows from the current group.
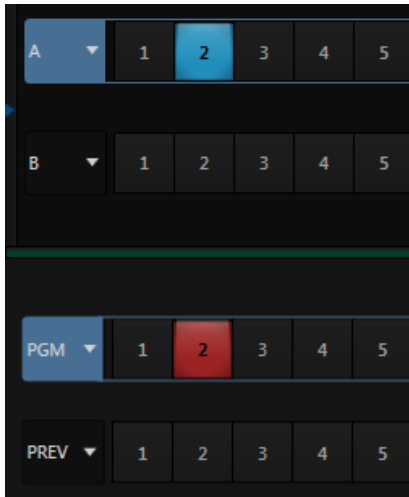
FIGURE 9-4

SECTION 9.4 TRANSITIONS AND EFFECTS

We discussed video layers in Section 9.3. With this in mind, it's easy to comprehend the layout and use of TriCaster's *Transition* controls.

At left in this group are the main *Transition* controls, including the *T-bar*. The larger portion at right provides *solo* control and configuration options individually for the *DSK layers.*
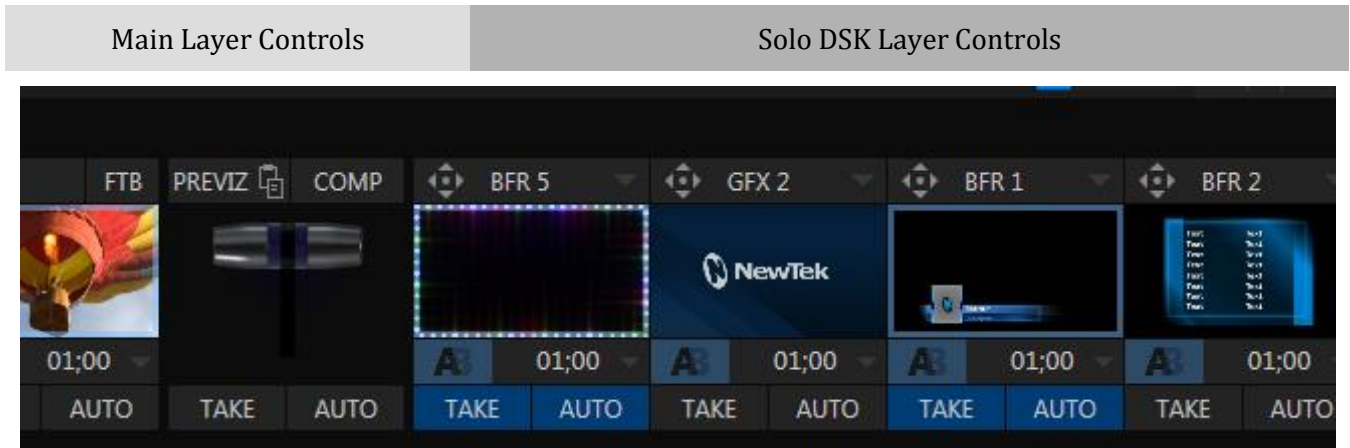
FIGURE 9-5 (TRICASTER 8000 SHOWN)
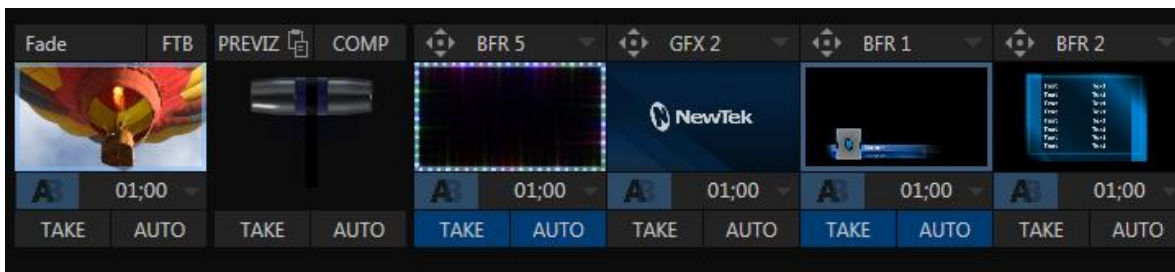
FIGURE 9-6

Let's consider the individual *DSK Layer Controls* first.

9.4.1 DSK CONTROLS
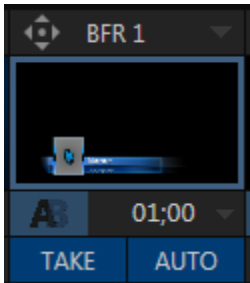
Pressing the local *TAKE* button for any *DSK* displays or hides the corresponding video layer (shown on top of the *BKGD* layer). Local *AUTO* buttons beneath each DSK's thumbnail icon perform similarly, but apply the currently selected transition (i.e., the effect represented by the small icon shown above TAKE).

Hint: You can halt an Auto operation partway by clicking the button again during the transition. For DSK (and M/E KEY layer) transitions, if the effect has progressed more than halfway when halted, clicking Auto again will complete it. Otherwise it is reversed, returning the layer to its prior display state.

CONFIGURING TRANSITIONS

Each *DSK* has its own transition effect, applied when you click *Auto*. Click the transition icon for any *DSK* control area to reveal a palette of different transition icons 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 TriCaster's *Custom Media Browser.* Here you can choose from the hundreds of transition effects included with TriCaster, or even custom Animation Store effects that you prepare yourself using the included *Animation Store Creator* application. The selected effect will replace the current one in the palette.

Hint: The frequently-used Fade transition is always available in transition palette. As it cannot be replaced, no Configure button appears for its icon.

Transition durations are stored on a 'per slot' basis, using the numeric duration control beside the effect icon. You can select transition speeds from the menu, or drag the mouse pointer left or right over the numeric display to set a custom time, or click the numeric field directly to enable keyboard entry.

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

TriCaster can also employ 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 (sounds are optional). 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.

Note: The Animation Store Creator application is covered in its own manual, which can be opened from the Help menu in TriCaster Startup.
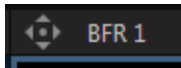
Each *DSK* layer has its own *Position* button and settings. Click the 'diamond' button to for the associated *DSK* are active.

FIGURE 9-8

POSITION

Positioning panel settings are organized into tabs. The first tab, *Position*, hosts one or two control groups, by model:

1. *Position*
2. *Use source Tracker* (TriCaster 8000, 860, 460 only)

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

Click and drag on the *Position* button to relocate the associated *DSK* layer vertically or horizontally within the frame. Dragging left or right directly on either of the two nearby numeric controls adjusts the position on a single axis only (and allows you to change from negative to positive values, and vice versa, which is otherwise not possible).
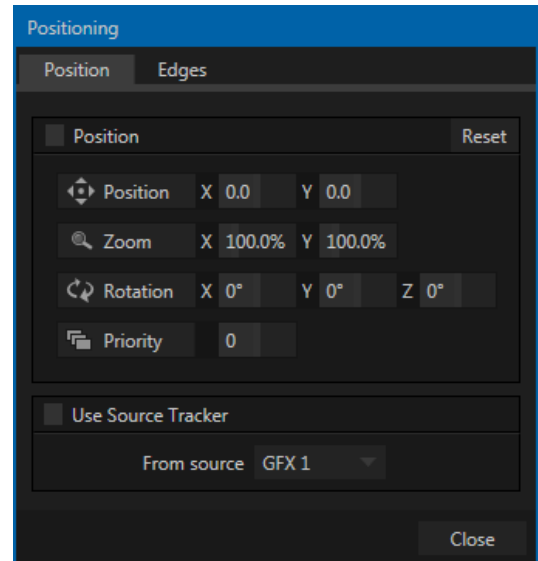
FIGURE 9-9 (TriCaster 8000)

> Hint: You can also constrain mouse actions to one axis by holding down the Ctrl key before dragging.

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:

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 adjust positioning without the result being inadvertently shown on output.

- Drag left/right to rotate the source about the Y (vertical) axis.

- Drag up/down to rotate the source about the X (horizontal) axis.

- Drag while holding *Ctrl* 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).

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*.
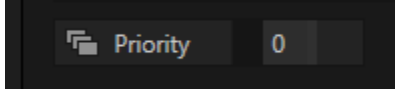
FIGURE 9-10

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 implemented especially to provide additional flexibility for use with the *Comps* feature. For example, imagine an M/E set up with 4 KEYs 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, KEYs 1-3 would always appear *behind* KEY 4, not what you need 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 them in their natural (DSK/KEY layer) order.

USE SOURCE TRACKER

A unique ability of TriCaster 8000 is that it allows you to assign the motion data output from the *Tracker* for any video source to the current *DSK* layer, by selecting it in this menu.

Positioner settings enabled above 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*.
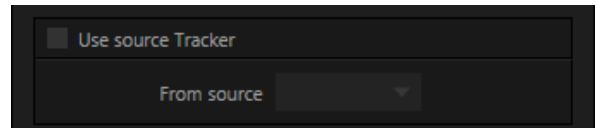
FIGURE 9-11

EDGES

The *Edges tab* (Figure 9-12) in the *Positioning panel* also has two control groups, *Edges* and *Borders*.

The *Edges* controls are similar to those found in TriCaster's *Input Configuration* panel. However these Edges settings are independent, applying even when the similar option in *Input Configuration* is not active.

Hint: As for most similar controls, individual Edges settings can be reset to their default values by double-clicking with the Shift key held down. Restore default settings to all parameters of the Position or Crop control groups by clicking Reset.
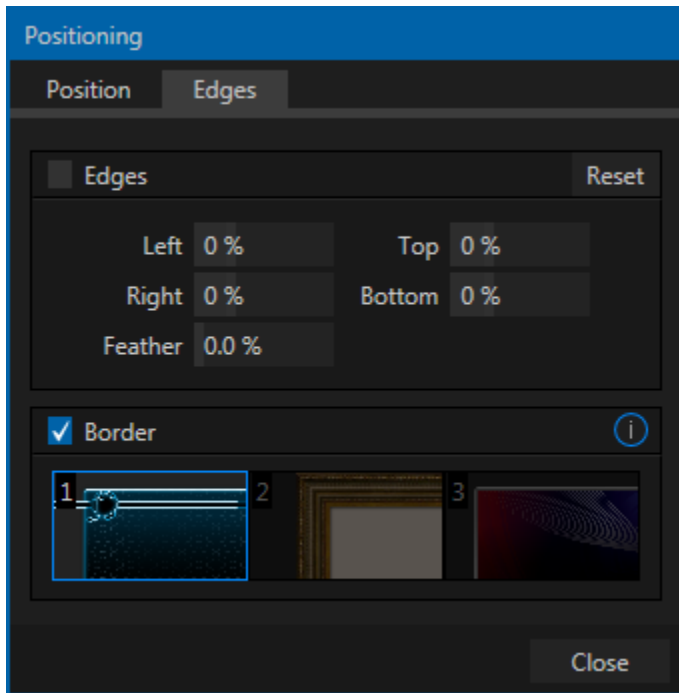
FIGURE 9-12

The *Edges* tab for TriCaster Advanced Edition systems also provides each *DSK*, *KEY* and *M/E* layer with quick access *Border* preset slots (Figure 9-12) to supplement the scale, rotation, edge and other controls. These powerful border effects can include full color overlays, backgrounds, matte layers for 'keyhole' effects, and shadows.

This feature allows you to freely scale, position and rotate various 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*. Since these are per-layer *Positioner* effects, you can easily create custom multi-box compositions in TriCaster's *M/Es*.

FIGURE 9-13

In addition to hundreds of supplied borders, you can easily create elaborate custom effects using Photoshop®. A template PSD file is supplied to assist you to do so. You will find it in the Borders folder, at C:\TriCaster\Effects\Borders.

You will find it is easy to create a custom border. 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).

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

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

Important Note: It's best to use files with straight (a.k.a. "non-premultiplied") alpha channels in TriCaster's Media Players. Premultiplied files will generally not yield correct results when overlaid on other imagery.

FIGURE 9-14

TriCaster's *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 9-14), or set up many other elaborate effects in this manner.

9.4.2 MAIN CONTROLS

In large measure, TriCaster's main *Transition* controls behave similarly to their local sidekicks. What makes them especially powerful is the *T-bar* and *Transition Delegate* button group located just above.

BACKGROUND TRANSITION

Transition control settings in this section apply to the *Background* video layer only. In most respects, these tools are identical to the *DSK* transition controls discussed earlier (Section 9.4.1), but there is one difference worth mentioning.

The *Duration* menu for the *Background* transition offers two additional items compared to the similar menu in the DSK control groups:

- *Reverse* – configures the current transition to run in reverse direction the next time it is applied.
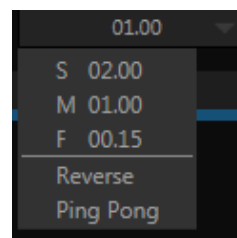
FIGURE 9-15

- *Ping Pong* – when enabled, this option causes the direction of the transition to be automatically swapped after each time it is applied.

An executive maxim suggests "Don't do anything yourself when you can delegate it". In TriCaster Advanced Edition, each video layer has its own small 'confidence monitor. To delegate the *T-bar*, *Auto* and *Take* controls to govern one or more layers in the Switcher or an M/E, simply click the monitor for the layer you want to control – whether the *Background*, or a *DSK/KEY* layer.

To delegate multiple channels simultaneously, hold the CTRL key while clicking the monitors for the desired channels. The monitor for delegated channel(s) will be shown with a blue border (see Figure 9-16).
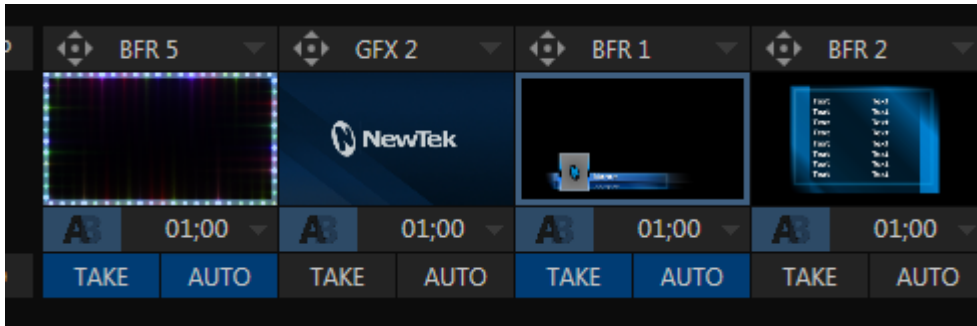
Let's see how applying the concept of delegating controls affects their use:

- Assign something suitable to the *DSK 1* and *DSK 2* layers.

- Click the solo *Take* buttons in the *DSK* control groups to hide these *DSK* layers, if they are visible on output.

- Click the small *BKGD* monitor left of the *T-Bar*.

- Click the main *Auto* button (below the *T-bar*).

- Now, hold down the *Ctrl* key and click the monitor for *DSK 1.* (Or, press both *the BKGD* and *DSK 1* buttons on a *TriCaster* control surface *Transition Delegate* group at the same time.)

You have just delegated the controls to two *video layers*. You can likely guess what comes next.

- Press *Auto* or *Take*, and observe the result.

- Now add *DSK 2* to the delegate selection, and switch again.

The *BKGD* layer is updated, *DSK 1* is removed, and *DSK 2* is displayed.

> Hint: The Look Ahead Preview monitor respects your Transition delegate selections, allowing you to configure layers for upcoming switcher operations with great confidence.

A progress bar beneath each of the *DSK* control groups tracks transition progress (progress bars remain fully 'on' when a layer is 100% displayed).

Let's discuss the final button in the *Transition* group – *FTB*.

The acronym *FTB* stands for *Fade to Black*. The result of clicking *FTB* will not likely surprise you very much. *FTB* offers a convenient method of doing precisely 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* layer setting. Hold down *Shift* while pressing the FTB on a control surface button to initiate an FTB operation.
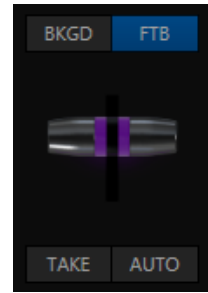
FIGURE 9-17

> *Note: Hiding or displaying FTB will trigger both Autoplay and Audio Follow Video when these settings are active for displayed Media Players. FTB also fades Master Audio to mute when displayed, and back up again when hidden.*

TAKE AND AUTO

As we have seen, clicking the main *Take* button (keyboard shortcut *Enter*) performs a straight cut for all video layers that are currently selected (i.e., those whose monitors have blue borders due to you having clicked them).

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

> *Note that there are local (BKGD layer-only) Take and Auto buttons beneath the Background Transition icon.*

T-BAR

The *T-bar* mimics the similar control on a traditional video switcher, and allows you to *manually* perform a 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 9.5 PREVIZ

TriCaster's *Look Ahead Preview* pane shows the *outcome* of the currently configured transition before it is performed. The *Previz* feature takes this capability much further, allowing you to pre-visualize effects in full 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.
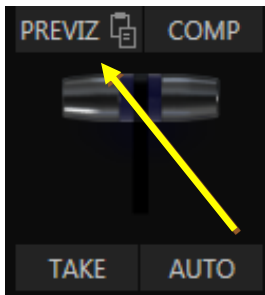
You might use *Previz* to test your currently delegated transitions and sources before applying them. Alternatively, though, you can experiment to your heart's content. Freely change layer sources, modify *Positioner* settings, transitions or effects, layer delegates, test the result of *Take/Auto*, use *T-Bar* or *Zoom* controls with impunity.

Clicking *Previz* copies the settings of the source (*Switcher* or *M/E*) into the dedicated Previz pane, which really can be thought of as a specialized M/E – but one *never* visible on output.

> Hint: The best way to monitor your experiments in the Previz pane is probably to use the "M/E Follow" Workspace.

If, while experimenting, you arrive at a composition you like, simply click the *Paste Previz* (clipboard) gadget located beside the *PREVIZ* button in the desired destination to send the current composition to the target.

> Hint: This allows you to very easily transfer all of the settings 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 9.6 UNDO/REDO
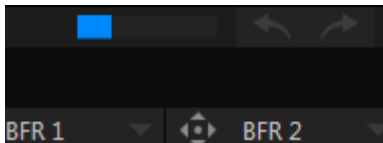
FIGURE 9-19

The *Undo/Redo* feature is unique to TriCaster Advanced Edition. This very useful innovation 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. TriCaster 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 9.7 SWITCHER MEMORY

The nearby *Switcher Memory* gauge (beside *Undo*) tracks how much system memory is consumed by currently selected virtual sets, transitions and effects. (If you do inadvertently overtax the effects system by pre-selecting many, many large custom effects – an unlikely scenario – you might just reach the limit, which could in turn result in dropped frames.)

SECTION 9.8 COMPS AND MEMS

You'll notice a button labeled *COMP* immediately above the *T-Bar*. Clicking it opens the *Comp Bin*, which provides powerful layer and effect control features. We're going to discuss the *Comp Bin* in full soon (Section 14.8), but at this point we do want to take the opportunity to distinguish them from *Switcher* MEMs. Bumping the cursor at the left edge of the screen reveals a fully functional *MEM bin* with features that are quite similar those provided for *Comps* in both the main *Switcher* and *M/E* banks. The primary difference between *MEMs* and *Comps* is that the former retain (and apply) all settings in the *Switcher*, including source selections.

Chapter 10 MONITORING YOUR VIDEO

The word "monitor" comes from the Latin "monēre" – meaning 'to warn'. The word 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, TriCaster® Advanced Edition 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* (TriCaster 8000, 860, and 460 only) and *Crop* controls. (To give some of these features the attention due, they are treated individually in Chapter 8, I/O Configuration, and elsewhere.)

SECTION 10.1 INTERFACE AND MULTIVIEW

Really, TriCaster provides *two* multiview monitor displays – one right on the *Live Desktop* (a.k.a., the "Interface"), normally comprising its upper third, and the other a fully independent display presented on a secondary monitor output labeled *Multiview* on TriCaster's rear connector panel.
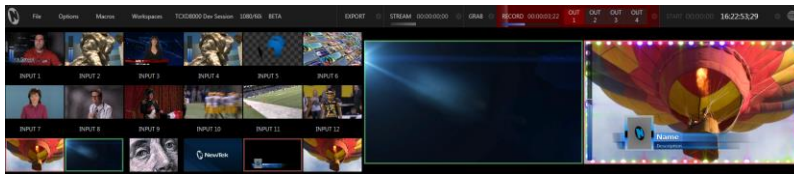
FIGURE 10-1

FIGURE 10-2

The overall layout of each of these multiview monitoring areas is governed by two *Workspace* presets.

10.1.1 WORKSPACE PRESETS

FIGURE 10-3
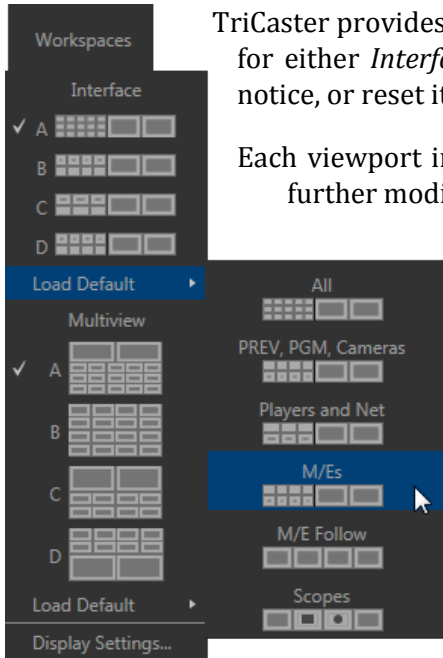
TriCaster provides powerful *Workspace* options. Freely switch from preset A to B to C to D for either *Interface* or *Multiview*, customize the display shown, recall it at a moment's notice, or reset it to a default layout using *Load Default*.

Each viewport in any layout offers diverse input or output source options, and can be further modified to produce just what you need.

As you'd also expect, the settings you select for individual monitors are retained in the current *Workspace* preset.

Note: The Display Settings menu option opens a menu that 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.

Let's consider further one of the important *Workspace* layout options next - *Scopes*.

SECTION 10.2 SCOPES
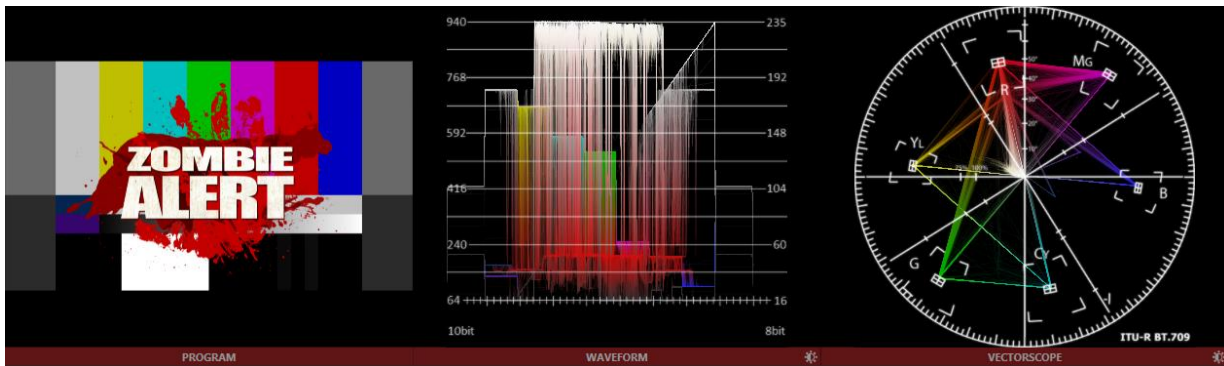
FIGURE 10-4

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). (To display the *Scopes* view, select that entry from the *Load Default* options.)

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

Double-click the video monitor in this *Workspace* to access *Proc Amp* and *LiveMatte™* controls for the current source (or the Output Configuration panel for *Program* and *Preview* selections).

<div align="center">VIEWPORT OPTIONS</div>

FIGURE 10-5
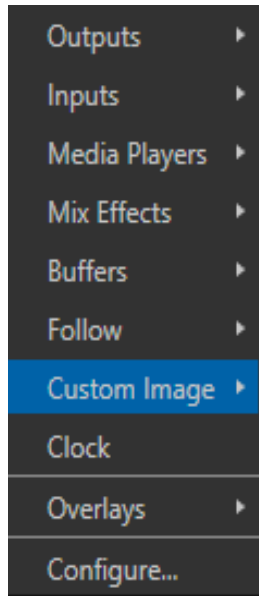
Right-clicking an individual monitor viewport also opens a context menu. The first option group governs the monitor's source.

In addition to the 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); or *Output 1* or *2*.

Several special displays are also available. Selecting the *Clock* item replaces the video display with *Event Clocks* showing current time or LTC timecode along with countdown style *Start* and *End* clocks (see Section 8.3.3). 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).
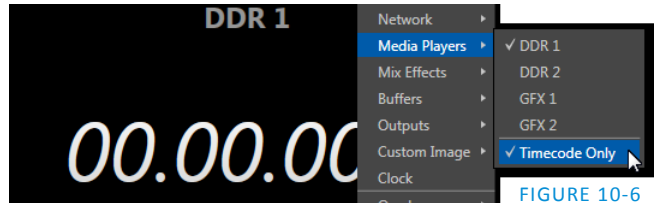
FIGURE 10-6

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* (see 8.1.6) and *Hot Spot Markers* (see Section 8.1.5)*.*

Long-standing practice when using color bars to calibrate video signal color attributes requires special video monitors with 'blue only' (or 'blue-gun') displays. TriCaster Advanced Edition's *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).
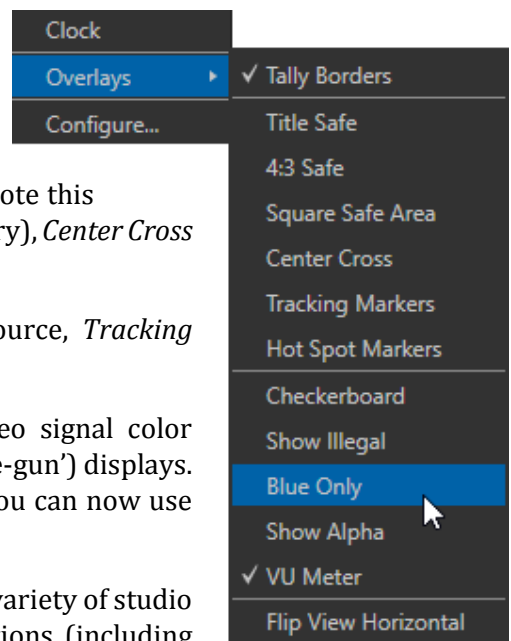
FIGURE 10-7

Two final items complete the monitor viewport options:

- *Rename* – allows you to supply a custom name to be shown for the monitor viewport (as well as the associated *Switcher* row button) for sources.

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

SECTION 10.3 PROGRAM MONITOR

The *Program Output* monitor could hardly be more important, hence it's prominent default location at upper-right on the *Live Desktop.*
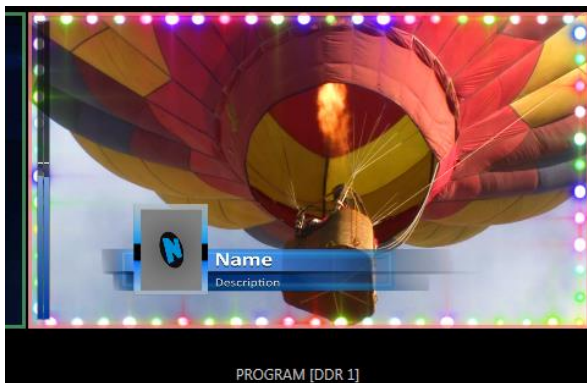
Normally, *t*he *Program* monitor shows what TriCaster is displaying to your principal viewing audience at any moment. The display includes the *BKGD* video layer as well as any other video layers (such as one or more *DSKs,* or *FTB*) displayed above it.

FIGURE 10-9

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

The *Look Ahead Preview* is versatile and powerful.   Instead of showing just one video source (the *Preview* row selection), it displays the composite result of a *Take* operation applied to all currently delegated video layers (see the sub-heading Transition Delegates in Section 9.4.2).

- Selecting the *BKGD delegate* tells TriCaster 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 delegate* is not active, the *BKGD 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, TriCaster's monitor viewports can also be assigned to display the output of TriCaster's *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* in *Mix* mode to supply an auxiliary program mix for independent display. Viewports can be assigned to specific M/Es, or follow the delegate status (*Outputs > M/E Follow*).
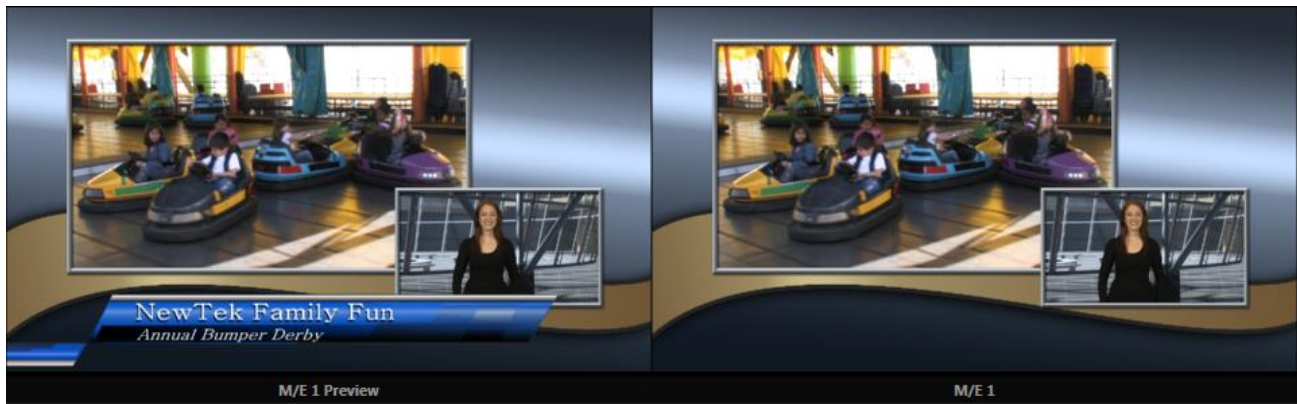
FIGURE 10-10

Complementing this feature, TriCaster provides *Look Ahead Preview* monitoring capability for *M/Es* as well (Figure 10-10). The *Viewport Options* menu group *Outputs* 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 tab 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

TriCaster's Media Players permit you to integrate video, stills and title pages into your live presentation with simplicity and style. Preload content and display it sequentially as a playlist, or call up individual items on demand. Media Players can even play, stop and advance automatically in response to your Switcher operations.

Animated buffer effects can provide similar capability, but are resident in memory, and thus best suited to short duration or looping effects. Conveniently, this makes them perfect for many purposes, freeing up the Media Players for long form or more elaborate requirements. Still image and title buffers (all models) provide similar advantages.

SECTION 11.1 SPECIALIZED MEDIA PLAYERS

TriCaster® sports multiple *Media Players*, located in tabbed panes found in the bottom third of the *Live Desktop*. Here you will find individual *DDR*, *GFX* (Graphics) and *Sounds* modules. (This is also where the powerful *Buffers* feature is located.)
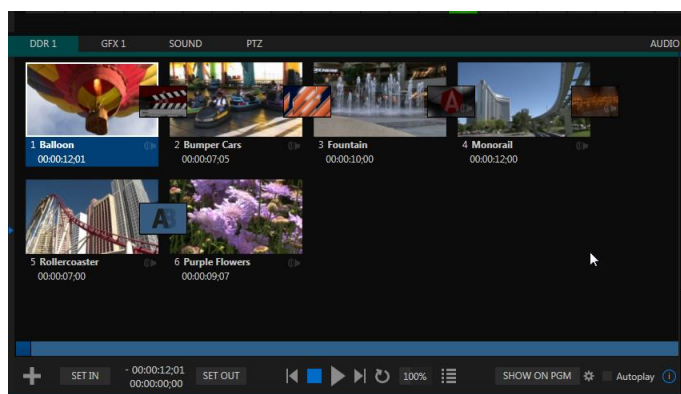
TriCaster's different *Media Players* are essentially specialized variants of a single module, modified to suit specific and complementary purposes. The foremost difference between players is in the file formats each supports (and even that distinction is not rigidly adhered to, as we will see).

- *Graphics (GFX)* players are principally intended for display and management of title pages (whether those based on TriCaster's integrated titling system, or titles prepared as image files in third party applications) or other still imagery – photos, graphics, and the like.

- The purpose of the *Sound* player is self-explanatory, and perhaps it is equally obvious why (alone among *Media Players*) it is not represented by a *Switcher* row button. *Sound* plays back standard .wav or .mp3 format audio files, but does not support graphics of any sort. Controls are similar to *other Media Players,* except that neither *Autoplay* nor *Speed* controls are provided.

Only the two *DDRs* have the capability to play video clips (including motion titles such as scrolls). *DDRs* can also host images, title pages, or even audio files.

Media Players of different types are accessed using tabs in the lower section of TriCaster's *Live Desktop*.

11.2.1 PLAYLISTS

The dominant feature of all of TriCaster's *Media Players* is a storyboard-style playlist, used to organize content for use during live productions.
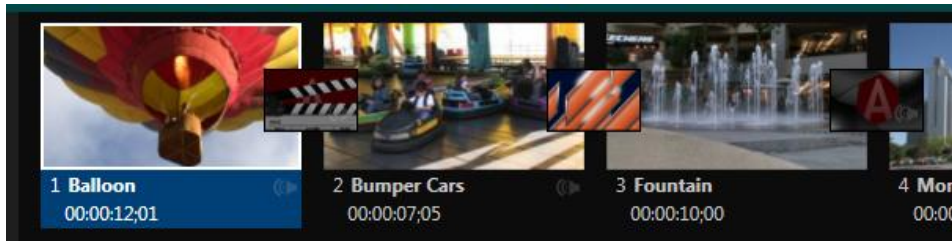
FIGURE 11-2

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 not stills, or titles, for reasons that will become apparent) added to a playlist are automatically trimmed to accommodate the addition of transitions between clips when necessary.

(Otherwise, i.e., if there are no 'unused' 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, select it and press the 'g key (multi-selection is supported, too).

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.

FILE OPERATIONS

- Click the large + (*Add Media*) button at left beneath the playlist pane to open a custom *Media Browser* (see Section 11.2.2). Alternatively, double-click in an empty part of the *Playlist* pane.

- 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*
  - *Angle*
  - *Automation*
  - *Use Current Frame as Icon*
  - *Edit Title*
  - *Properties*

  - *Add to Publish Bin* – see Section 18.3.
  - *Send to > Buffer n* (Still image and title icons – see Section 11.4)

- 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.

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%.

AUTOMATION

We've discussed elsewhere in this Guide (Section 8.1.5) how you can assign macros to any *Switcher* source, including *Media Player*. Beyond this, though, the playlist context menu item *Automation* 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 executed 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.*

PROPERTIES
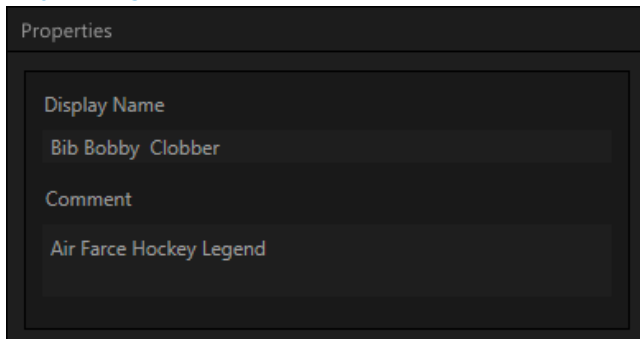
FIGURE 11-3

DISPLAY NAME

The *Properties panel* allows you to edit the *Display Name* for a file in the playlist. The name fields defaults to the filename, but is actually a local alias, or 'nickname'.

Editing the name does not actually 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* box permits to enter metadata to associate 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.*

Just beneath the *playlist* pane is a full-width *Scrub-Bar* (Figure 11-4). The width of the *scrub-bar* represents the full run time of the current clip or other media file. Drag the knob left or right to change time position in the current playlist item.
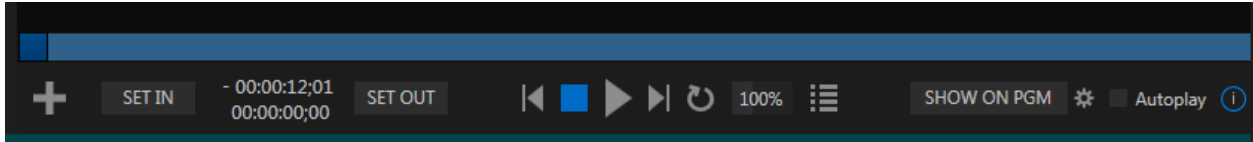
In and *Out Points* for newly added Media are automatically adjusted when necessary to accommodate motion when transitions you add require it.

- 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 11-4). The lower time display shows embedded clip timecode.

> Hint: For longer durations, holding SHIFT while dragging the scrub bar knob increases precision.

FIGURE 11-5

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 begin playing the clip.

- (Of course, all of this could easily be performed by a macro, too.)
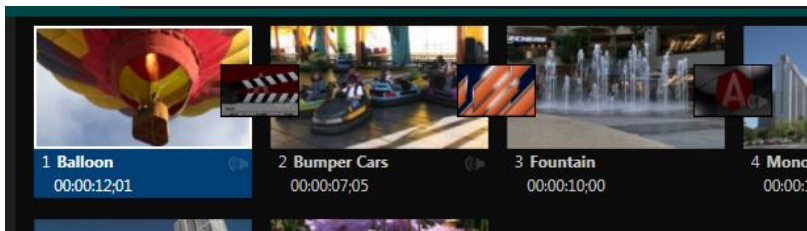
It's useful to note that (Quicktime only) clips that are still being captured continue to 'grow' even after addition to a DDR playlist (see Section 11.2.2).

These growing clips, featuring the red 'recording' overlay (Figure 11-5) 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.

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

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

TriCaster Advanced Edition *Media Players* likewise support alpha channels. See Section 11.2.3 for a tip on using this ability.

11.2.2 MEDIA BROWSER
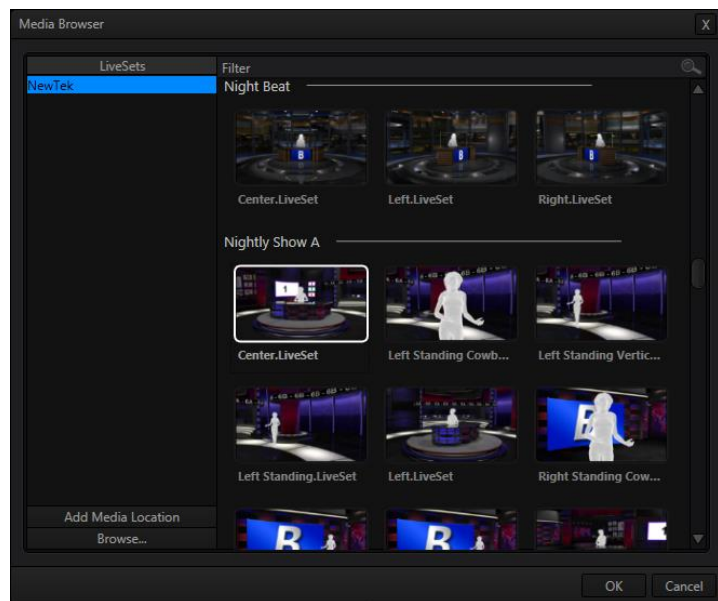
The custom *Media Browser* provides easy navigation and selection of content on your TriCaster (or other NewTek live production system) on the local network. The *Media Browser* appears anywhere in the *Live Desktop* that you might wish to select content, transitions or effects for use in your project (such as the *Media Players*, *LiveSet* and *Transitions* sections). Its layout is principally comprised of two panes at 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. 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 will appear under each main heading 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.

Session Recordings and Grabs
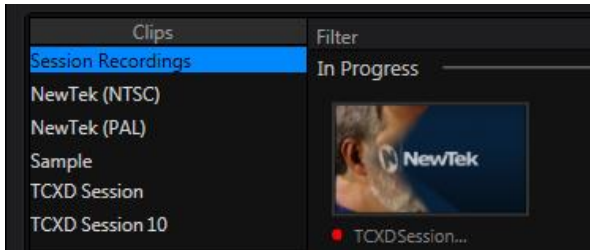
FIGURE 11-7

In addition to locations named for your stored sessions, the *Location List* includes two special entries worth noting. The *Session Recordings* location shows you all files captured in the current session, saving you time hunting through a hierarchy to find them. Similarly, *Session Grabs* makes it easy to find those still images you just snapped with TriCaster's *Grab* feature.

> *Hint: Clips that are being actively captured are marked with a red 'record' overlay (Figure 11-8). These clips continue to 'grow', and can be re-trimmed after their addition to DDR playlists or the Publish Queue.*

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.
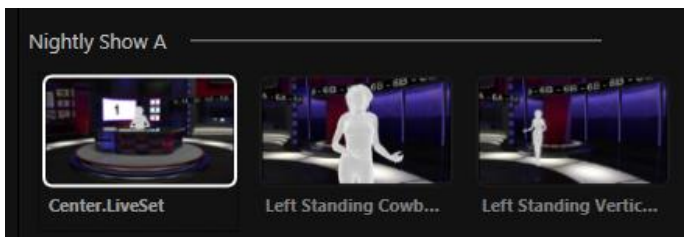
FIGURE 11-8

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 11-9

An additional filter appears above the *File Pane*. 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.

11.2.3 PLAYER CONTROLS

Transport controls and playback settings are located directly below the *Playlist* and *Scrub-Bar*.
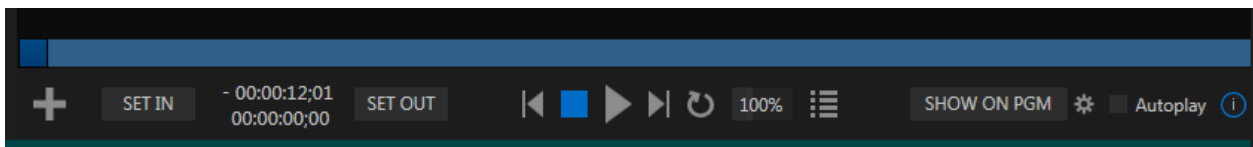
FIGURE 11-10

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
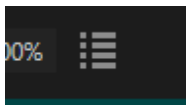
FIGURE 11-11

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 11-11) tells the *Media Player* to operating 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 <u>all</u> 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

FIGURE 11-12

It's extremely useful to realize that, since TriCaster Advanced Edition supports transitions 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
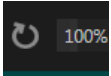
FIGURE 11-13

The *Speed* control is only found in *DDRs* (as opposed to *GFX* or *SOUND* players). 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 TriCaster, 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 the 100% default.

LOOP

Enabling *Loop* repeats playback continuously (respecting the *Single* switch state).

AUTOPLAY
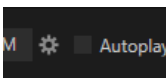
FIGURE 11-14

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 7.1.)

> *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 *Single* mode, the current play position advances to the next item after playback is automatically stopped.

11.2.4 SHOW ON (…)

Another extremely powerful feature is nestled beside just to the left of *Autoplay* in the footer of TriCaster Advanced Edition *Media Players.*

Labeled *SHOW ON PGM* by default, this feature can actually target *M/E*s as well (Figure 11-15) 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 11-15.
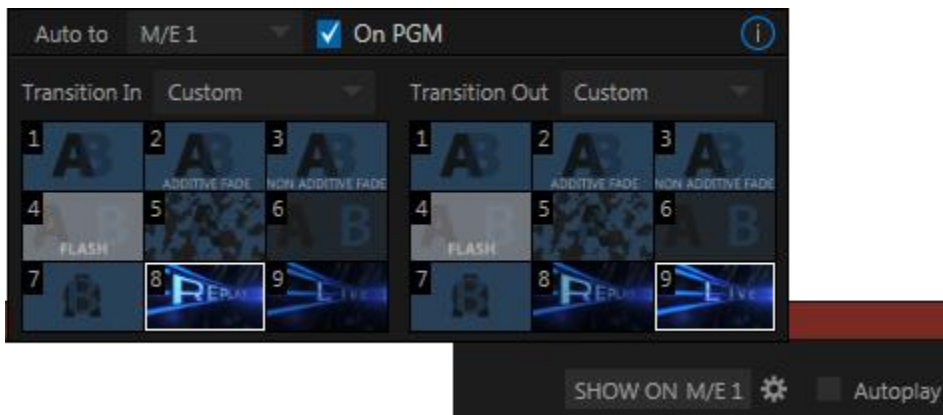
FIGURE 11-15

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*. Thus selecting *Current* uses the current selection in the *Background* transition bin of the target bus.

> *Hint: Unlike other transition bins in TriCaster's interface, 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 out for a custom animatino store (such as "Replay!")
- 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 DDRs 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 complementary features in the IsoCorder Replay tab, SHOW ON functionality can be triggered by simply adding a clip (with custom length and speed defined in the Replay tab) 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.

11.2.5 MEMS

Another very useful feature of all TriCaster *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. To display the bin, roll the mouse pointer to the (nearest) side of the screen in a tabbed *Media Player* or the *Audio* tab (for *Sound* and *Audio*, *MEM slots* are presented on the left 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.

FIGURE 11-16

MEM slots can be named, and 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').
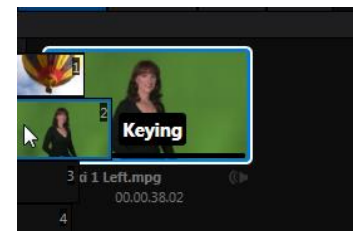
PREVIEWING MEM SLOTS

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 flyout *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.

11.2.6 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 backup and 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 TriCaster application folder are also shared. This allows applications such as NewTek's Virtual Set Editor, etc., running on external systems to export directly to TriCaster. These network shares are unaffected by the Share Media Folders and Buffers setting.*

Transferring very large files across a network can 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, TriCaster's *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 files while 'live'. TriCaster may be using the network for many purposes – including streaming, or video feeds from a 3Play™, iVGA™, LiveText™ or third party software, as well as any unrelated traffic on the network.
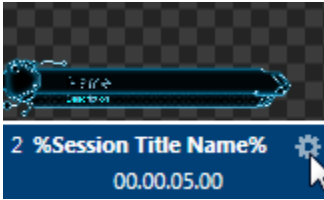
FIGURE 11-17

On mouse-over, title page icons (Figure 11-17) display a configuration (gear) icon in their lower-right corner.

Clicking this button (or selecting *Edit Title* in the icon context menu) opens the pop-up *Title Page Editor*.

Opening the pop-up *Title Page Editor* during playback is permitted, meaning *Title Page* content can be edited during both play and 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.

When you move the mouse over text in the *Title Page Editor's* preview pane, a white bounding-box appears (Figure 11-17). If you click once inside the box it turns yellow, indicating the text object is selected, and a text edit field opens.

Hint: When the box is yellow the text can be nudge 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.

FIGURE 11-18

(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.
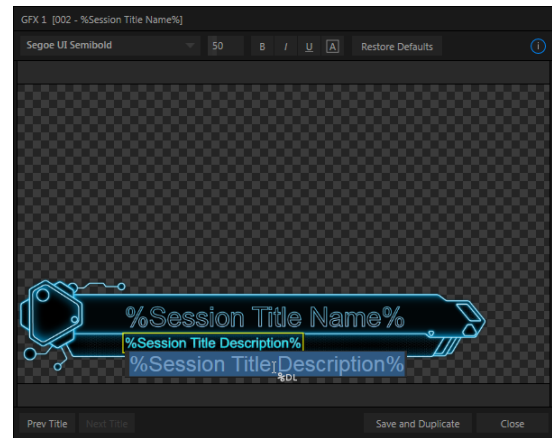
11.3.1 HEADER TOOLS
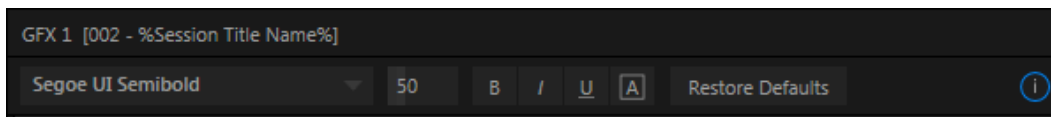
FIGURE 11-19

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 11-20

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.

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.*

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).

If 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 11-21). It provides the same set of *Fill Mode* options, but adds an *Image Source* box supporting direct entry.
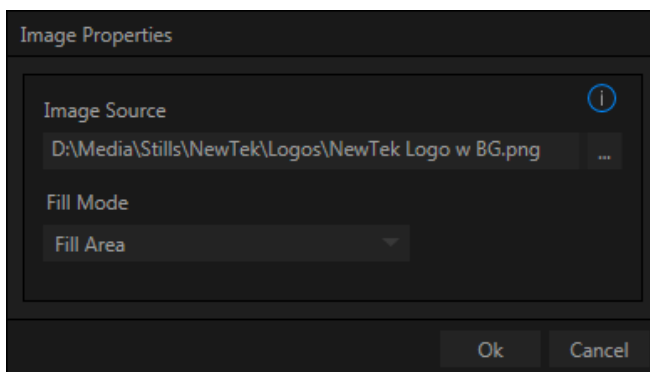
FIGURE 11-21

The *Image Source* box comes into play in connection with the next (extremely important) topic – *DataLink*.

FIGURE 11-22

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.

TriCaster Advanced Edition tells you which entry boxes accept *DataLink* keys by showing a custom mouse pointer, in the form of %DL, as shown in Figure 11-22.
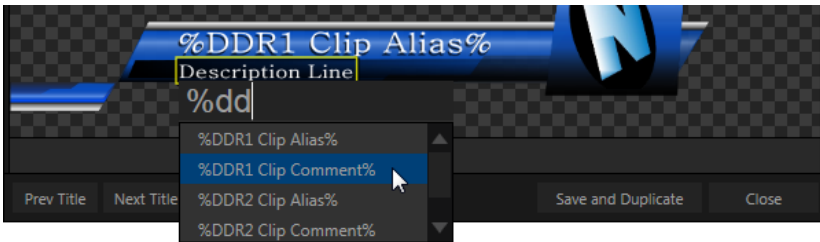
FIGURE 11-23

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 11-23).

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 this technology, and a wealth of methods to provide and update the values assigned to *DataLink keys*. For just one example, refer to the heading Configure DataLink Keys in Section 5.3.3. And do not fail to take advantage of the power and convenience of the DataLink™ for TriCaster 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 11.4 BUFFERS

TriCaster's powerful *Buffer* system provides convenient alternative graphics and animation sources for *M/Es* (including their associated *KEY* channels), the *Switcher'*s primary *Program* and *Preview* rows*,* and its *DSK* channels. The tabbed *Buffers* module (Figure 11-24) shows icons and controls for fifteen *Buffers.*
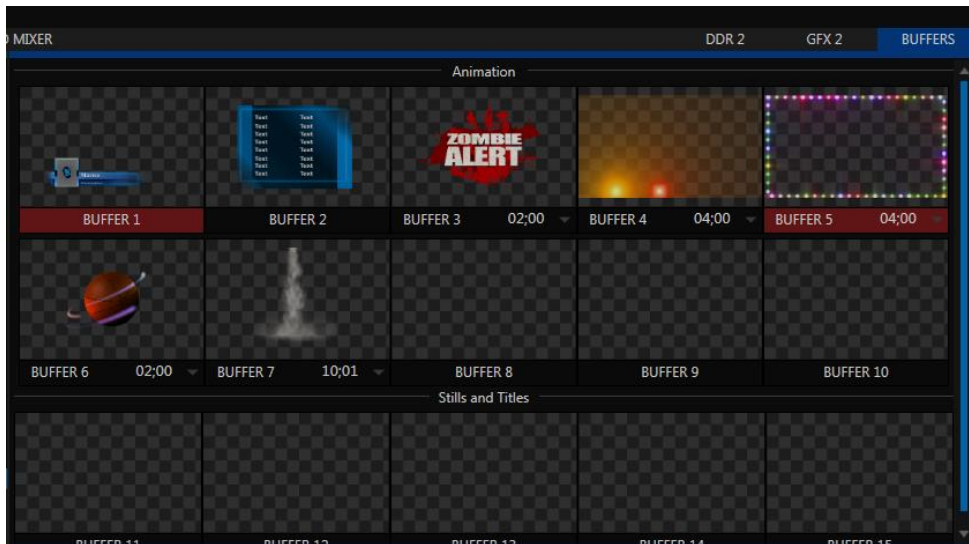
FIGURE 11-24

Buffers are sometimes even more useful than similar imagery supplied from *Media Players*. *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.

11.4.1 BUFFER TYPES

Buffers support the following media types:

- *Animation effects*

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.

  o *Looping* effects – These animations play repeating endlessly, making them ideal for station ID 'bugs' and the like.

  o *Auto-run* effects – These effects auto-run on display following a *Take* or *Auto*. Playback runs once and then holds the last frame.

- *Graphics* (all TriCaster models)

  o *Images* – 24 bit or 32 bit (with embedded alpha channel) images.

  o *Title pages* – editable TriCaster title pages, identical to those served up by the various *Media Players*.

Buffers tab item selection and display is controlled by a *Buffer (BFR)* button on main *Switcher* source rows, *M/E* rows, and options in *DSK* and *M/E KEY* source menus.

For TriCaster 8000, 860 and 460, the top ten buffer slots (or the top five, for other TriCaster Advanced Edition models) support both compiled *animation effects* and graphics – *still image* files or TriCaster *title pages*.

FIGURE 11-25

The remaining buffer slots are restricted to graphics content, including popular image formats along with TriCaster title pages (i.e., .cgxml files).
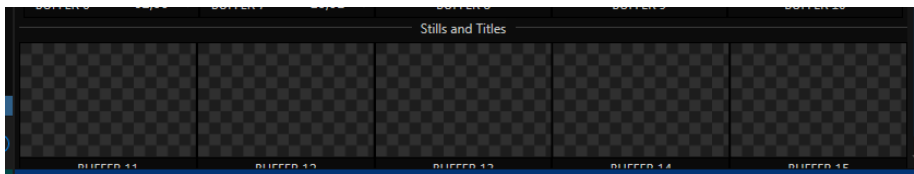
FIGURE 11-26

11.4.2 SELECTING CONTENT

FIGURE 11-27

Clicking an icon reveals a palette of nine buffer presets (Figure 11-27). When you move the mouse over one of these icons a [+] (*Add Media*) button appears. Click this + sign to display the *Media Browser*, and then pick a suitable file to populate that buffer preset.

Alternatively, assign content to a buffer slot by following the steps below:

- Right-click a still image or title page icon in a *Media Player.*

- Choose *Send to* from the context menu (select a specific buffer slot using the hierarchical menu).

Hint: Alternatively, drag a still or title page icon from a Media Player onto a Buffer slot.

Note that, in *DDRs*, this menu item only appears for *still image* formats and TriCaster *title pages*. *Animation effects* must be complied using the *Animation Store Creator™* add-on application before they can be loaded into buffers.

(Naturally, if an image or title has previously been previously assigned to the active preset for the designated buffer, the new file will replace the current one.)

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, it no longer matters whether the item continues to be available in a Media Player playlist. 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.

11.4.3 BUFFERS MENU

Right-click a thumbnail icon in the *Buffers* pane to open a menu offering two items:
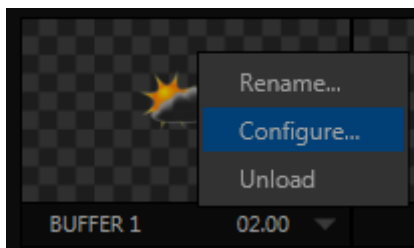
FIGURE 11-28

- *Rename* allows you to assign a custom name to the buffer. The name will also be visible in menus (such as DSK source menus).

- *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*.*

Hint: A small [x] button appears over the upper-right corner on rolling the cursor into a Buffers tab icon. This button simply provides another convenient method of unloading an effect from Switcher Memory.

11.4.4 ANIMATION FEATURES

The thumbnail icon for a buffer with an animation effect 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).

FIGURE 11-29

Loading either class of animation effect into a buffer results in a time control being displayed at right in the buffer label (Figure 11-29).

> *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.*

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 11-29). 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.

11.4.5 SHARING BUFFERS

If you wish, you can share the *Frame Buffer* folder, which contains any *still images* used in *Buffers*, across a network. *Share Media Folders and Buffers* are easily enabled or disabled 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 top level *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 TriCaster session.*

11.4.6 WATCH FOLDERS

The *Frame Buffer* folder is a "watch folder". When you save an image into the correct location for a given buffer, the corresponding buffer immediately updates, even if it is currently displayed. This lets you refresh overlays virtually instantly from any computer on the same 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. TriCaster always shows the 'newest' file – that is, the one with the most recent modification date.

11.4.7 USING BUFFERS

Creative uses for buffers abound. You'll notice that the sample media content supplied with your TriCaster includes a number of different styles of animated buffers – some full screen, suitable for looping backgrounds or similar applications; others that are suited to overlay, bug, or alert tasks.

Buffers of all sorts can be displayed in the following locations:

- Main *Switcher*

  o *Program/Preview*) rows – right-click the *BFR* button to select which buffer to assign to that button.

  o *DSK* channels – choose a specific *buffer* using the *DSK's* drop-down source menu.

- *M/E banks*

  o *Mix mode* – select a buffer for the *A/B* row *BFR* button just as you would for the main *Switcher*.

  o *Effect Mode* – for multi-layer effects, the *BFR* button in each row can be assigned independently.

  o *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* supports up to eight animated buffers (varies by model). Especially for TriCasters with re-entrant M/Es (8000, 860 and 460), layering possibilities are nearly endless.

11.4.8 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 assigning a desktop or *Multiview* monitor to the *Buffer* (or choosing a *Workspace* option that includes *Buffers*) and opening its *Input Configuration* panel. Of course you can also apply *Position* settings, including *Rotation* and *Scale,* in *DSK, M/E* and *KEY* channels.

11.4.9 EDITING TITLES

When a title page (.cgxml file) is loaded into a buffer, TriCaster's live *Edit Title* panel (see Section 11.3) can be opened by clicking the gear icon that appears at lower-right when you move the mouse over the icon (Figure 11-30).

Changes made in this panel take effect immediately. If the buffer is displayed, the new title will appear as soon as your modifications are complete.
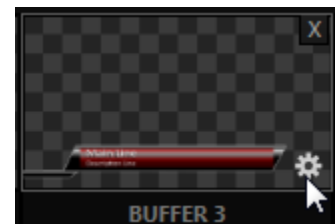
FIGURE 11-30

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. Not only do they offer dramatic potential savings, robotic camera installations also offer both creative possibilities and, in certain environments, safety benefits.

TriCaster's PTZ implementation makes it easy to operate supported PTZ cameras from the Live Desktop or control surface.

For all TriCaster professional models, the *Input Configuration* panels for cameras 1-8 allows any or all of these cameras to be configured as a PTZ cam, controlled directly from TriCaster (see Section 8.2.5).

In addition to pan, tilt and zoom control, TriCaster can also govern *White Balance* settings, *Focus*, *Iris* (or 'brightness'), and *Animation Speed* ('travel speed') settings for supported cameras. TriCaster also provides a convenient and very visual *PTZ preset* system allowing you to 'lock in' your shots and access them quickly.

SECTION 12.1 THE PTZ TAB
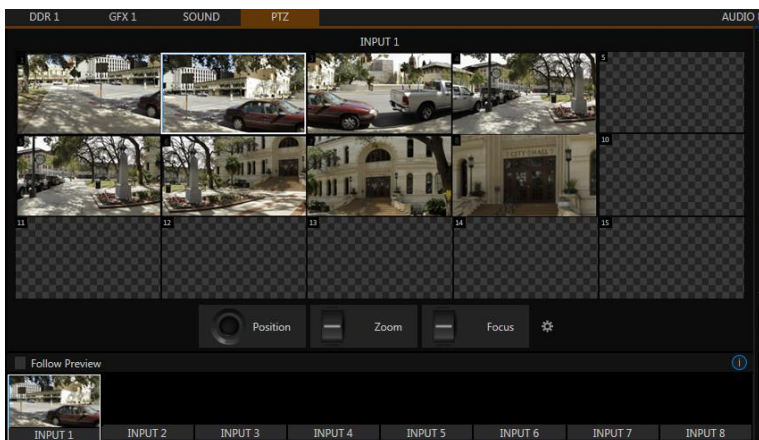
FIGURE 12-1

All of the controls and features just mentioned are located in the *PTZ tab*, located at left in the lower third of the *Live Desktop* (Figure 12-1).

12.1.1 THE CAMERA BIN
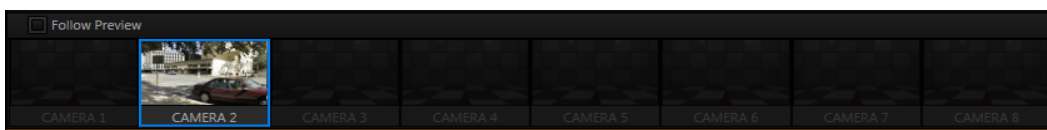
FIGURE 12-2

The *Camera Bin* (Figure 12-2), located across the bottom of the *PTZ tab* contains icons for each camera. A camera currently being controlled is denoted by a blue outline. The icons update to show the thumbnail for the preset icon selected above.

> *Hint: Cameras whose PTZ switches are disabled in their respective Input Configuration panels (Section 8.2.5) show dimmed icons in the Camera Bin, but may still be selected.*

Enabling the *Follow Preview* switch at left in the *Camera Bin* header will automatically select camera icons for you as these are chosen on the main Switcher's *Preview* row.

12.1.2 PTZ PRESETS

The large *Preset Bin* (above the *Camera Bin*) shows eight thumbnail icons for the currently selected *PTZ camera*. Click a preset to select it, and the camera automatically begins moving to the new position.

> *Hint: The number of the current Preset icon is shown in an overlay at upper left. When the actual camera position at the moment does not correspond to a preset, an "M" is shown over the most recent selection, rather than a number.*

12.1.3 CONFIGURING PRESETS

When you roll the mouse over a preset, a configuration overlay ('gear') appears in its upper right corner. Click this to display the *PTZ Preset Editor* (Figure 12-3)*.*

Initially, preset icons display the default *PTZ Canvas* representation. When a live source is connected (and enabled in the *PTZ* tab of *Input Configuration*), click the *Snapshot* icon to update the image using a grab from the live source after making desired adjustments.
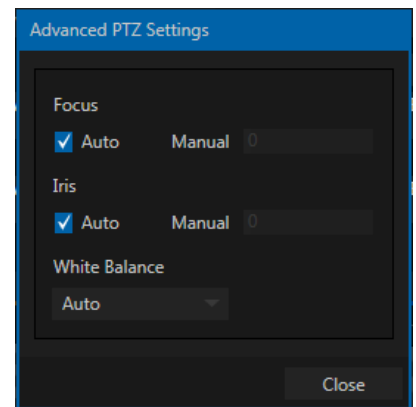
FIGURE 12-3

NAVIGATING IN THE PRESET EDITOR

While you will likely use the control surface joystick for most purposes during production (see Section 12.1.4, the *canvas* in the *PTZ Preset Editor* panel also provides 'trackball-like' control over pan and tilt for connected cameras using the mouse. Simply drag horizontally or vertically on the canvas to pan or tilt. The mouse-wheel provides zoom control.

> *Hint: If no camera is connected, a virtual display updates to simulate rotation and zoom as you navigate, but you may well prefer to connect a camera and assign it to Preview, checking the output the camera on a larger monitor while making adjustments.*

CAMERA SETTINGS

Some further camera settings are grouped together just to the right of the Preset Editor's *Canvas.* The *White Balance* menu offers three options – *Auto*, *Indoor* and *Outdoor*. (This is a global setting, and affects all presets for the selected camera.)

By contrast, the *Focus* setting, and the state of its *Auto* switch are stored individually in each preset. This is also true for the *Iris* setting, and its *Auto* switch.

Pan, tilt, zoom control, and several settings for connected robotic cameras are also directly supported on several NewTek control surfaces. See Chapter 21, Control Surfaces for details.

Chapter 13 LIVEMATTE

Although its controls are deceptively simple, TriCaster's LiveMatte™ employs powerful chromakeying technology capable of extremely high quality results. Used alone or in conjunction with TriCaster's 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. TriCaster® also relies on this method to insert talent seamlessly into virtual sets via *LiveSet*™.

FIGURE 13-1, SHOWING TRICASTER 8000

LiveMatte™ controls are located in the *Input Configuration* panels for every *Switcher* source. To access them, click the *Configure* button (gear) that appears above an onscreen monitor in the *All Monitors* tab. The second tab in the (source) *Configuration* panel is labeled *LiveMatte*.

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 algorithms actually go well beyond simple chromakeying techniques to provide support realtime 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 CHROMAKEYING

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 television meteorologist in front of a weather map, that person is almost certainly posed in front of a green screen. The background is 'keyed out' and replaced by computer generated imagery.

FIGURE 13-2

Of course, if you choose poor settings, foreground areas may inadvertently be cut away as well. Good keying often requires judicious balance between 'too much' and 'too little'. Let's consider the tools TriCaster provides to help you achieve a great result.

The term *Matte* refers to a black and white representation defining the transparent (background) and opaque (foreground) parts of an image during compositing.

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.

FIGURE 13-4
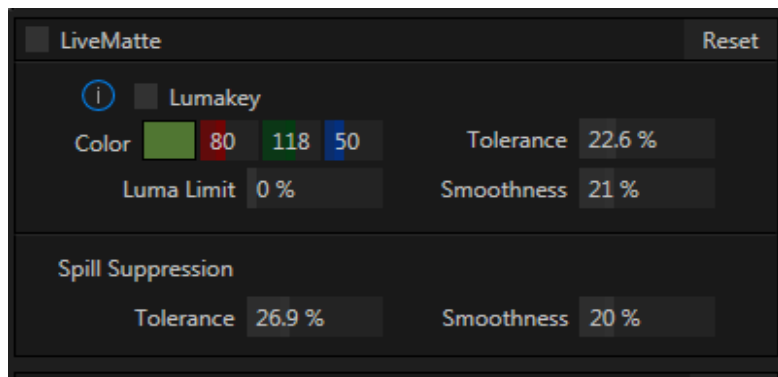
FIGURE 13-3

TriCaster's supplies a digital version of this traditional tool. The controls under the *Matte* label, as you would expect, allow you to define and adjust the matte for the corresponding video input.

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, TriCaster provides a numeric slider labeled *Tolerance j*ust 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. 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. 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.
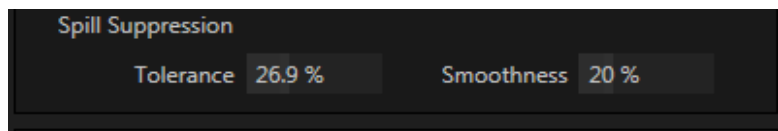
FIGURE 13-5

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.

> Hint: The best method for optimizing the key is to begin with the best incoming source possible; if your cameras have both composite and S-video outputs, check to see which one gives you the best picture quality.

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 PRACTICAL STAGING FOR LIVEMATTE

We'd like to offer a few suggestions here to guide you in preparing your set.

13.6.1 LIGHTING

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).

13.6.2 CONNECTION CONSIDERATIONS

As mentioned above, washed-out areas in the video signal lack sufficient color information to provide good separation. For similar reasons, it's worth considering the color characteristics different video signal types.

- *SDI* connections are ideal, if you can use them. Otherwise, in the analog video realm you will encounter three main types of camera connections. We present them here in ascending order according to the quality of video signal they provide (and as things go, in the reverse order of their cost, and the likelihood that you will have access to them).

- *Composite* – a two conductor design using the classic RCA connector (also referred to as a phono connector or CINCH/AV connector).

- *Y/C* – typically using a round, 4-pin mini-DIN connector or <u>two</u> BNC connectors, Y/C keeps Y (luminance) and C (chrominance) signals separate.

> *Hint: Y/C is occasionally called "component" (which while technically correct, can be a bit confusing given the name of the next class), S-Video (legitimate) or "S-VHS" (completely incorrect, though a common error.)*

- *Component* (a.k.a. 'YUV' or 'Y, Pb, Pr') – a three wire system typically using BNC (push & twist-on) connectors.

For analog connections, either of the last two methods is to be preferred – but it is entirely possible to succeed with only a composite signal. When you have something better available, however, you should naturally use it. (Try to avoid downgrading the pre-LiveMatte signal from a Y/C camera, for example, by connecting it to your TriCaster using composite cabling.)

> *Hint: Cameras using IEEE 1394 connection (such as mini-DV or HDV format) are not supported as live switching sources, for several reasons. However they may often be connected by Y/C cable (SD cameras only) or Component cabling. This configuration may actually provide a better color rendition for keying purpose than if it were possible to connect them by IEEE1394 cable.*

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 TriCaster's potent realtime virtual set technology, called LiveSet™, is applied.

We introduced TriCaster's *M/Es* way back in Section 2.6.9, but it's time for us to look into these extremely powerful tools in greater depth.

SECTION 14.1 OVERVIEW

The *Mix Effects* tabs beneath the monitoring pane on the *Live Desktop* are labeled m/E 1, 2 and so on. These tabs are toggle buttons you can click to expand or collapse the *M/E* interface.
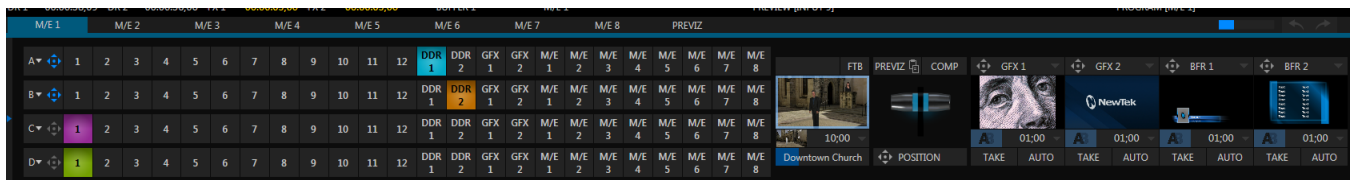
FIGURE 14-1 (TRICASTER 8000 SHOWN)

When expanded, the *M/E* pane spans the upper-central part of the *Live Desktop*. 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, up to 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.

For TriCaster 800, 860 and 460, *M/Es* are re-entrant. This means that *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. TriCaster will simply show black in such cases. 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*) is scarcely distinguishable from the main *Switcher.* However, each of TriCaster's M/Es 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 14-2

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 11.2.3).

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 TriCaster *Options menu* toggles AutoPlay's triggering of '*Auto* out' transitions.

In TriCaster Advanced Edition, the *M/E* mode is automatically established by the type of effect you assign 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 you will observe source button rows at left labeled input with the letters *A* through *D*. The number of layers shown varies by model and effect selection. Several TriCaster models support four effect layers, while other models will show two rows.

FIGURE 14-3

- At right are either two or four *KEY* control groups, again depending on which TriCaster model you are using. In most respects these are identical in appearance and practice to the *DSK* controls located in the main *Switcher* (see Section 9.4.1).

- Even the central control group mimics the main *Switcher*, with its *Transition* controls and options, *T-bar* and so on.

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 one of TriCaster's primary outputs (as well as the *IsoCorder* section)

14.2.2 EFFECT MODE
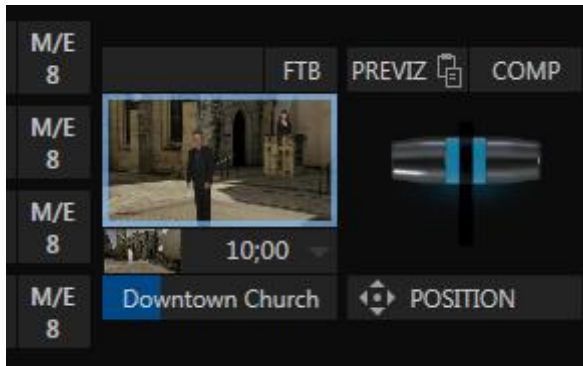
Careful scrutiny reveals some (outwardly) subtle differences in the controls when a *LiveSet* is loaded as the *Background* effect selection (Figure 14-4):

- The *Take* and *Auto* buttons normally located beneath the *T-bar* and *Transition icon* are replaced by a large *Position* button.
- As required, as many as 4 input rows may be shown in *Effect* mode.
- *Positioner* controls appear for up to four input layers (A, B, C, and D) as supported by the effect, and depending on which TriCaster model is in use).

> *Hint: When using the positioner clicking and dragging the Right Mouse Button will allow you to zoom in and out.*

Let's consider these reasons behind for 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 (for some models, also 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 realtime 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 0-100%.

The *Duration* control works like similar numeric fields in TriCaster's *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.*

FIGURE 14-5

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 Positioning* in Section 9.4.1.

SECTION 14.5 DEFAULT EFFECTS

As mentioned, in *Effect* mode an M/E may support up to four input layers (TriCaster 8000, 860 and 460). 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 at left. With the exception of *Advanced Tracking* effects (supplied with TriCaster 8000, 860, 460 only), 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 at 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 (TRICASTER 8000, 860, 460)

As we mentioned, effects can be 'simple' compositing effects, like most of the *Default* group, or more advanced. Before considering TriCaster'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 or advanced compositing effects.
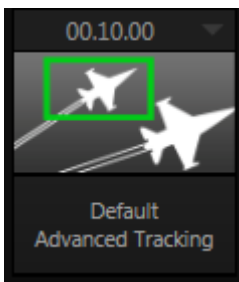
FIGURE 14-6

For example, we mentioned that one member of the Default group is unique.

The *Advanced Tracking* effect takes three video sources as input 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 *GFX 1* 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 *GFX 1* as input *C*.

10. Double-click the monitor for *DDR 1* to open its *Input Configuration* panel.

Continue to configure both *LiveMatte* and the *Tracker* for the video clip in *DDR 1*:

11. In the *LiveMatte* tab, click *Reset* to update the keyer settings to their defaults, and enable the *LiveMatte* switch at upper-left.

12. Use the *Scrub* bar under the playlist in *DDR 1* to advance through the clip until the colored card is visible in the frame.

13. 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*.

14. Boost the *Tolerance* setting to 34%.

15. 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 *GFX 1* (*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 to TriCaster. Let's do so now.

16. Click the *Position* button for input *B* to open the *Position Panel* for that layer*.*

17. Select *DDR 1* in the *Use source Tracker* menu.
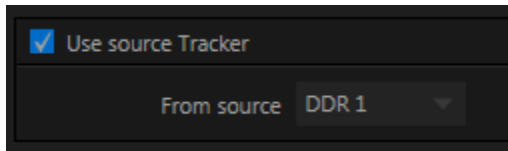
18. Enable *Follow Tracker* (Figure 14-8).

The result on your *Program* monitor should look much like Figure 14-9; 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 area being tracked can be made slightly larger to taste, to moderate this effect.*

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
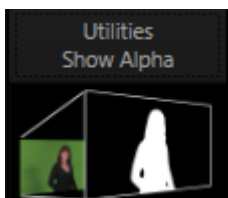
Effects can take other forms as well. We've looked into the *Default* effects group; now let's consider *Utility* effects.

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.

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.

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 surface 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.

SECTION 14.6 VIRTUAL SETS

We've considered TriCaster's *Default* and *Utility* effects. Let's move on to a more glamorous species, the *virtual set*, presented in TriCaster as *LiveSet™* effects.

FIGURE 14-13

FIGURE 14-14

LiveSet is one of TriCaster's most powerful tools, and can dramatically enhance a production.

With it you can achieve the look of a large, sophisticated studio setting (Figure 14-14) within a very small studio space (Figure 14-13), 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 label above the effect icon in the *M/E to open the Media Browser* (Section 11.2.2)*.*
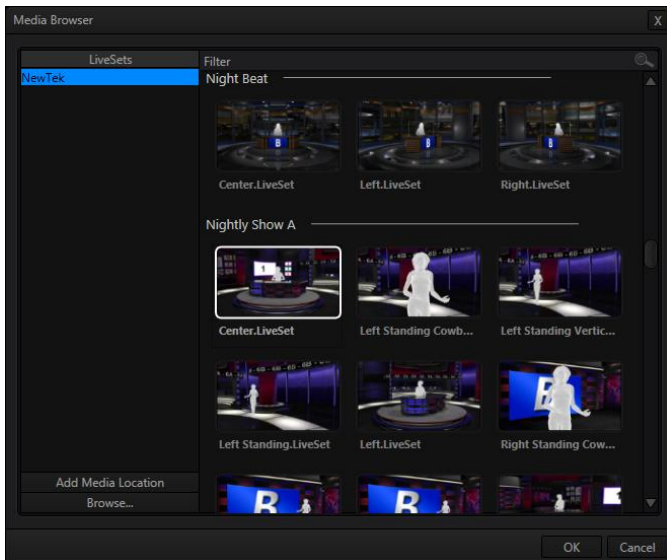
FIGURE 14-15

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 14-15 shows the content of the *NewTek* location under the *LiveSets* heading).

We discussed *Positioning* controls for *M/E* video inputs previously (Section 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 provided especially to make it easier for you to adjust cameras and position talent on your physical set to suit the design of typical virtual sets supplied with TriCaster.

14.6.1 HOLOGRAPHIC LIVESETS

A special variant of TriCaster's LiveSets are referred to as 'holographic'. These effects can be amazingly lifelike and convincing, and are relatively easy to create.

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 TriCaster's *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 TriCaster, and its instruction manual can be located in Startup>Help.

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 (see 9.4.1), 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*.

> *Note: The number of KEY channels provided in each M/E varies by model. TriCaster 8000, 860 and 460 provide four KEY layers for each M/E, while other Advanced Edition models offer two.*

14.7.2 AUGMENTED REALITY
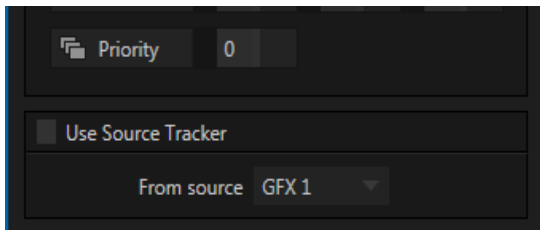
In one other unique and powerful departure from *DSK* features, the *Positioner* for *KEY* layers has an added feature labeled *Augmented Reality* (Figure 14-18).

FIGURE 14-18

> *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 14-19

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 14-19).

  (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 and 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 TriCaster's *Tracker* feature can also be used along with *Augmented Reality* and *Parallax* to produce uniquely dynamic motion graphic compositions.

SECTION 14.8 COMPS
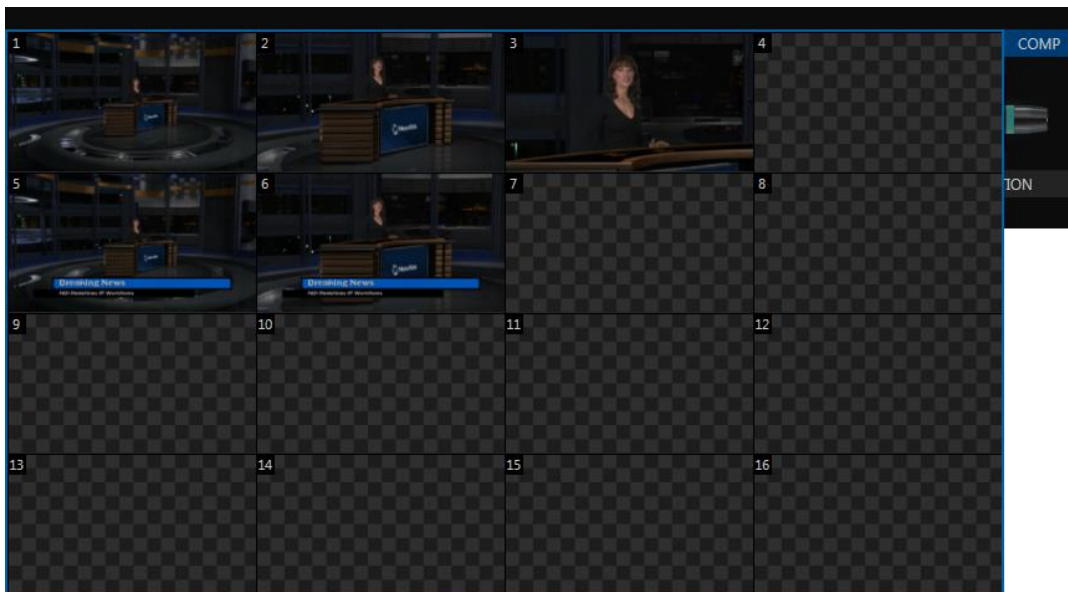
FIGURE 14-20

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: TriCaster models 410, Mini and Mini SDI provide a Preset Bin in place of the Comp Bin. These presets affect only the Background layer. Also, some LiveSets (e.g., double-box sets) do not support zooming and panning. In such cases, Comp/Preset selection and T-bar actions may be inoperative.

14.8.1 MANAGING COMPS

FIGURE 14-21

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*, and clicking an empty position in the *Bin*. 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 14-21) or by right-clicking the icon and selecting *Update* in the context menu that appears (Figure 14-22).
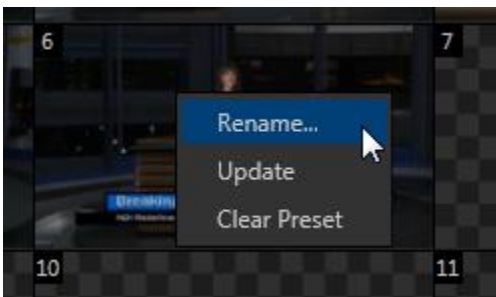
FIGURE 14-22

The context menu also allows you to *Rename* a *Comp*, or clear it entirely.

14.8.2 ANIMATION

Making a selection in a *Comp Bin* changes the current composition of layers displayed by the module to the new one. The change can be immediate, or animated over time. This is controlled by the duration set for individual layers in the numeric control below the thumbnail monitor for each layer.

It's worth noting that, since *T-Bar* states are stored and applied by *Comps*, TriCaster's 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.*

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.
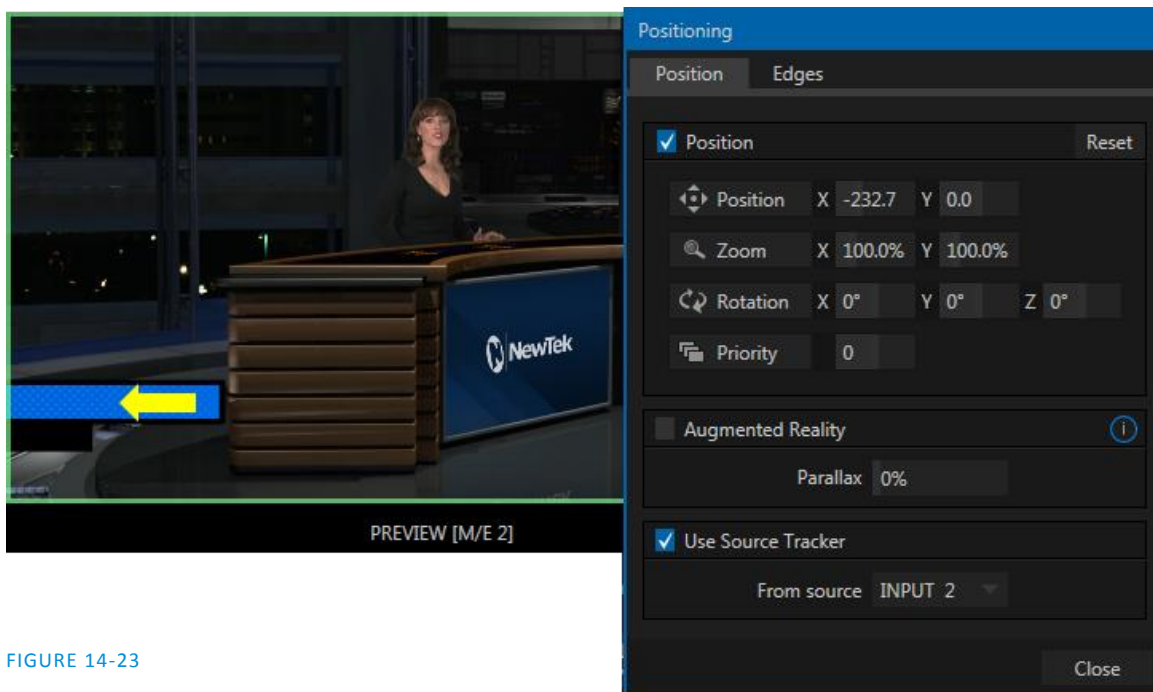
FIGURE 14-23

- 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 (Figure 14-23), 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*.

We should mention again that the duration of the animation from the current state/position of a layer to the one stored in a *Comp* is controlled by the effect duration controls for each layer. This means that each layer can be animated more quickly or slowly according to your wish.

Note: The effect duration for individual layers is <u>not</u> stored in Comps. Rather, any animation is governed by the current setting for the layer, as established in the user interface at the time a Comp is applied.

Chapter 15 AUDIO

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. TriCaster® provides 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 3.4.1 and 3.7.1. TriCaster® presents more precise control over individual audio sources and outputs in a tabbed pane labeled *Audio Mixer,* found just below the main *Switcher.*
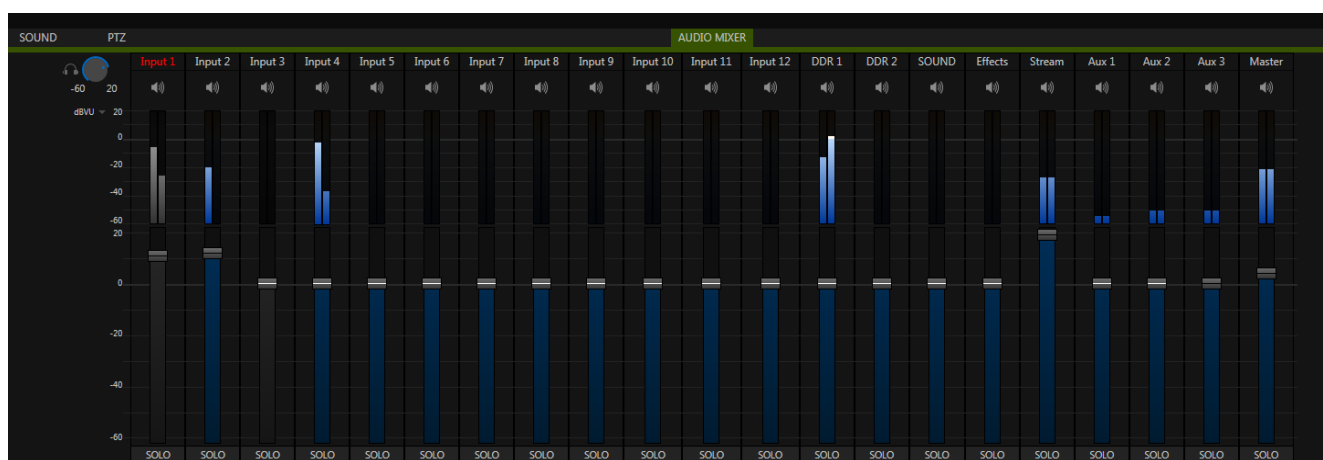
Compact sub-panels in this pane provide configuration and control for individual audio sources and also audio outputs as follows, from left to right:

- *External* audio sources – controls for Inputs 1-(8 or 12, depending on the TriCaster model).

- *Internal* sources – *Media Players*, and *Effects* (sound embedded in *Animation Store* transitions).

- *Stream* – controls TriCaster's web stream output.

- *Aux 1 to 3* – controls for TriCaster's two stereo *Aux* audio busses.

- *Master* – controls TriCaster's primary stereo audio busses.

- (Individual *Record* level controls are located in the *Record Configuration* panel.)

> NOTE: 2RU TriCaster systems do not provide analog output connections for channels 3 and 4. However the extra channels can be recorded, streamed, or output via SDI-embedded connections.

SECTION 15.1 AUDIO SPECIFICATIONS

TriCaster's 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 96 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.

> *Hint: An error message appears in the Status Bar above the main Program output monitor to warn you if clipping occurs – see Section 7.3; see also Section 15.7 (Advanced Configuration) and Section 15.8.1 (Headroom Notes).*

SECTION 15.2 HEADPHONES
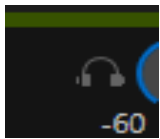
FIGURE 15-2

At the extreme left side of the *Audio Mixer* you will observe a simple volume control for the *Headphones* output. By default, headphones connected to this stereo output jack will carry the audio signal from the output designated *Master 1* – that is, the same audio carried by outputs marked *1a* and *1b* in the *Audio Out* group on TriCaster's backplane.

FIGURE 15-3

Remember that this output is also affected by source *Solo* switches. When *Solo* is enabled for one or more sources – or outputs – *only* the soloed sources are sent to the connector. (See *Solo* in Section 15.5.3 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.

Click the label below the *Mute* button in the *Headphone* control at left to open a small menu offering three options as follows:

FIGURE 15-4

- *dBVU* – most familiar to users of typical analog audio mixers

- *dBFS* – dB 'Full Scale' – the digital standard; see notes under 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)
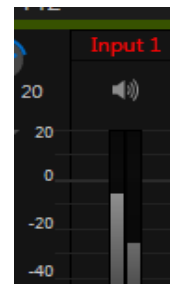
SECTION 15.4 EXTERNAL SOURCES

Columns in the first set of control groups are labeled for correspondingly numbered *Input rows* on TriCaster's rear connector panel (right-click to *Rename* audio inputs).

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 is not strictly enforced, however. You can connect directly to a different external audio source in the *Advanced Configuration* panel (see Section 15.7). Also, 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 Section 15.7.5.

15.4.1 CONNECTION TYPE

Individual sub-panel panels for external sources govern a group of physical audio connections including variously (depending on TriCaster model) two XLR inputs, an *AES/EBU* (AES3) BNC connector, and HDMI or *SDI Embedded* digital audio sources. In addition, NDI and Dante™ audio sources can be assigned to any control group.

Note: Dante support requires an inexpensive user license from Audinate™.
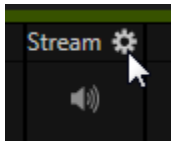
FIGURE 15-5

Naturally, only one connection type can be active for a given audio input group 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 the selection of one of the various sources.

- Local physical sources are listed as *IN 1* (Line, Mic, etc.), *IN 2*, and so on.
- Dante sources (network audio from systems supporting this protocol from Audinate™)
- Follow INPUT (1-n) – the default source selection; links the audio source for this control group to the same number video input.
- NDI audio sources.

Note: Channels 1 and 2 of TriCaster's Master and Aux 1 outputs are always sent to Dante channels 1-4.

15.4.2 AUDIO HARDWARE OPTIONS

If you choose one of the local hardware input sources, such as IN 1, you will often need to further specify which of several optional connectors grouped under that input is used to supply audio to this input. For example, you may wish to connect to XLR connectors, or use the SDI embedded audio from the same input group on TriCaster's chassis.
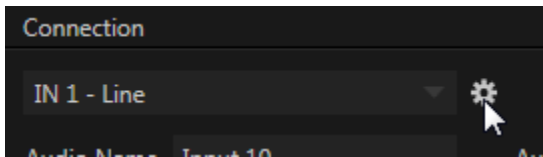
FIGURE 15-6

To choose this setting, click the configuration gadget (gear) shown at right beside your *Connection* selection in the *Advanced Audio Configuration* panel. In turn, this will open the *Hardware Configuration* panel's Input tab, allowing you to specify which *Audio Source* type you wish to use (Figure 15-7).
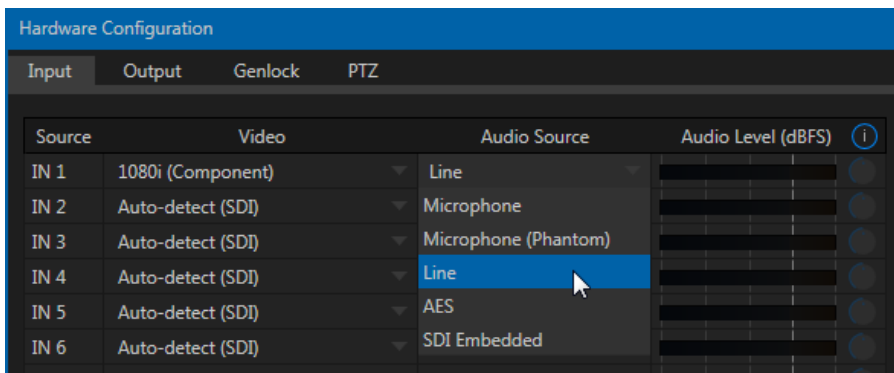
FIGURE 15-7

- *Microphone* – low impedance microphones and other common professional audio sources.

- *Microphone* (*Phantom*) – microphones (typically condenser mics) requiring supplementary DC power; not supported by TriCaster Mini.

- *Line* – generally consumer audio sources such as CD players, VCRs, etc.

- *AES* – digital audio (4RU models only).

- *SDI Embedded* (or *HDMI*) – digital audio embedded with digital video transmitted via a Serial Digital Interface (SDI) or HDMI connection (TriCaster Mini models).

<div align="center">

AUDIO LEVEL (dBFS)

</div>

For *Microphone* selections only, a *Gain* knob is enabled at right in the Hardware Configuration pane. This provides additional trim for inputs, allowing you to bring input levels into a suitable operating range.

<div align="center">

SECTION 15.5 COMMON CONTROLS

</div>

Many important features and optional settings are common to most source types, and some even appear for outputs. Let's review these before continuing.

<div align="center">

15.5.1 MUTE

</div>

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. TriCaster's IsoCorder™ feature lets you capture audio from the mixer, or directly from 'same number' inputs. That is, the audio recorded with the video is taken from the matching number audio input, and routed directly to the recording module *prior* to most adjustments in the *Audio Mixer* – including *Mute*.

> *Note: Audio 7 on 4RU systems is <u>automatically muted</u> when Linear timecode (LTC) is supplied (see Section 8.3). You can un-mute it briefly to adjust signal levels, but of course you don't want this signal to be audible during a live production – Solo might be useful in such cases.*

<div align="center">

15.5.2 TALK (TALK OVER)

</div>

It is often useful to reduce all other audio source levels so that an important announcement can be clearly understood by the audience. The *Talk* button (also known as "Talk Over") is only shown at the bottom of input groups when the *Connection Type* is set to one of the *Microphone* options. Enabling *Talk* for a source (typically a microphone) reduces the output level of all other audio sources by 20dB.

15.5.3 SOLO

Solo implementations and options vary widely in the audio industry, but broadly speaking, they provide several very useful functions. TriCaster's *Solo* feature offers remarkable flexibility without overly confusing complexity.

Consider a few basic design concepts:

- ❖ The *Solo* switch state has no impact on the audio mix (es) sent to other outputs.

- ❖ Enabling *Solo* for a source sends its (after-fader) sound to the *Headphones* output, and removes all other sources from that output.

- ❖ TriCaster's *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 latch', 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 15.6 INTERNAL SOURCES

Besides external audio sources, sounds played from TriCaster's 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.

15.6.1 MEDIA PLAYERS

Video and audio-only files in *DDR 1 and 2* 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.

15.6.2 EFFECTS (TRANSITIONS)

This control group governs the sound embedded in *Animation Store Transitions*.

The remaining control groups in the *Audio Mixer* are dedicated to TriCaster's various audio outputs. We'll come back to them in Section 15.8, but before we do so, let's drill further down into more advanced audio options and tools.

SECTION 15.7 ADVANCED CONFIGURATION
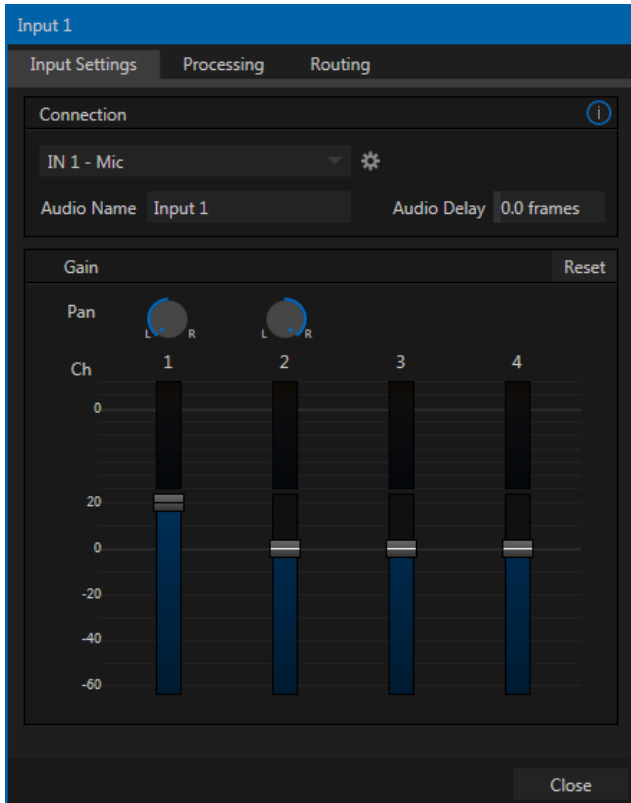
The controls for all inputs (including internal audio sources) as well as the *Effects*, *Stream*, *Aux* and *Master* output groups include a configuration button shown when you move the mouse over the input label.

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 Advanced *Audio Configuration* panel offers many more important features and controls, however. Let's explore these now.

15.7.1 AUDIO DELAY

Audio and video arriving at TriCaster inputs will maintain sync throughout the system to output or recording. However *upstream issues* can occasionally cause video to arrive at TriCaster's inputs later than the corresponding sound.

To mitigate this sort of external problem, TriCaster provides an adjustable *Audio Delay* setting.

> *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.*

15.7.2 PAN

The *Audio Configuration* panel also provides complete *Pan* control. *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.
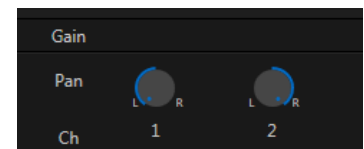
- When *Pan* is set to the extreme left position for *channel 1*, its audio is sent exclusively to the first channel for the *Input 1* group.

- Centering the *Pan* knob labeled 1 splits the sound from *Input 1* equally onto *channels 1* and *2*.

- Sliding *Pan* for *channel 1* all the way to the right results in that source only being audible on *channel 2*, removing it completely from its original channel.

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 (whereas Pan does permit this to occur).*

15.7.3 ROUTING

A main tab labeled *Routing* appears *Configuration* panel for all sources. The controls in this group determine output routing of the stereo pair(s) comprising the input group. Switches let you send input channels *1-4* to different channels on the internal audio buses maintained by TriCaster. Let's talk about what an audio bus is and how it is useful before proceeding.

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's 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?

> Secondary audio busses:
>
> Actually, beyond the primary busses mentioned here, TriCaster maintains a large number of secondary internal busses.
>
> For example, the *Solo* switch for each input (and output) is actually a 'send' that adds sound to a 'Solo bus'.
>
> Likewise, the IsoCorder™ module (on supporting models) permits discrete recording directly from the unmodified audio input associated with any single video source; really, this constitutes another up to eight additional audio busses.

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; its level, equalization, and compressor/limiter settings can be unique.

TriCaster 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.

For TriCaster purposes, an *output* may be physical, or virtual – i.e., it may involve a connector on the rear panel, or not. For example, the audio recorded by TriCaster does not necessarily require an output connector. Likewise, it may be analog or digital. Analog *Outputs 1* and *2* (note that *Output 2* is not a TriCaster Mini or Mini SDI feature) are permanently assigned to *Master*, and *Aux 1* respectively. In contrast, digital (or 'embedded') outputs are configurable in the *Hardware Configuration* panel.

At times you may require specially configured audio mixes, typically using one of TriCaster's two stereo *Aux* audio outputs. 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 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 you different remote interviewees.

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.

> *Hint: TriCaster Advanced Edition provides full 4x4 matrix routing for each source, allowing for much more sophisticated mixes than the simple example above.*

15.7.4 PROCESSING

The second tab in *Audio Configuration* is named *Processing*, and likewise holds very valuable features.

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.
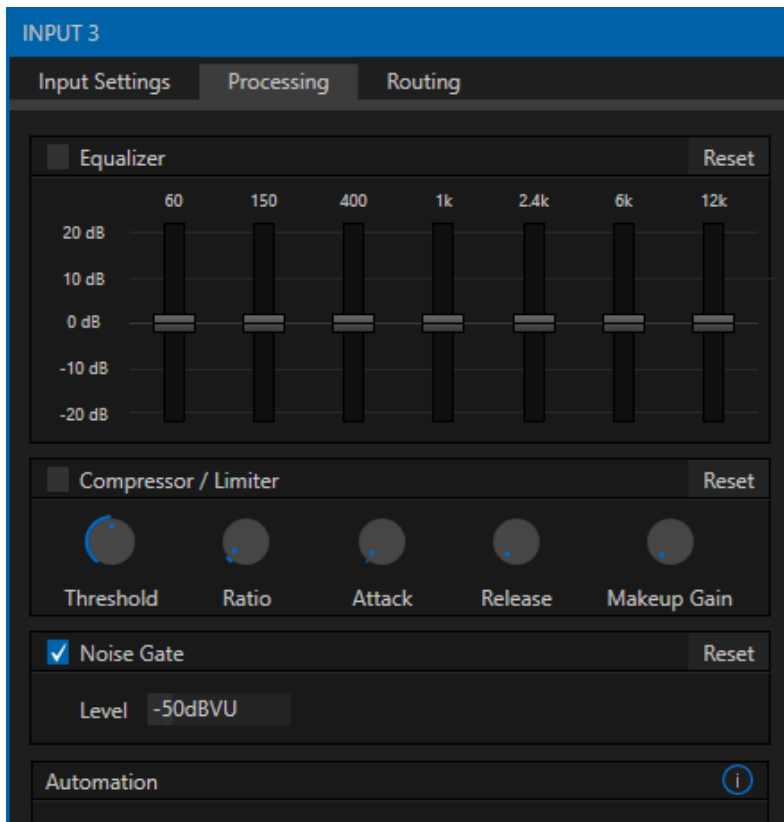
The effect applied falls off gradually as sound draws closer to neighboring frequencies on either side. Click *Reset* to return all sliders to 0dB.

> *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

The *Compressor/Limiter* is capable of preventing clipping (see Section 15.8.1) 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 (like Release) is labeled 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 similar to *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 include a configurable *Noise Gate* for each audio source, as well as all outputs. This lets you ensure that unwanted low-level sounds are prevented from inadvertently intruding into the mix.

15.7.5 AUTOMATION

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 TriCaster 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*.
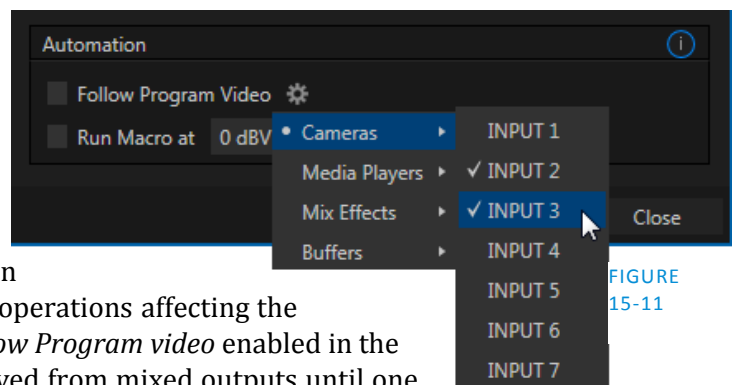
FIGURE
15-11

The nearby *Run Macro at* (value in dB VU) is part of TriCaster Advanced Edition'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.

SECTION 15.8 OUTPUT AND PRIMARY BUS CONTROLS

As has been discussed (Section 15.7.2), TriCaster provides four primary audio busses – *Master* and *Aux 1-3*. Each of these is represented by its own control group *Audio Mixer's* output section, and regulates sound sent to physical connectors or to 'logical outputs'.

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.

15.8.1 HEADROOM NOTES

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).
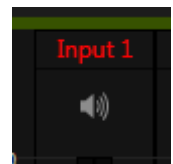
FIGURE 15-12

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.

TriCaster allows for any preference in this regard, by its provision of separate *Record* (and *Stream*) level controls discussed shortly. For example, *Record* levels set at -20dBFS (set in the *Record Configuration* panel) approximates typical professional practice. This has no impact on levels at TriCaster's audio outputs, but 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.*

15.8.2 STREAM

The *Stream* controls provide a method of independently adjusting levels and processing for (stereo) audio sent to the encoder when streaming is enabled.

SECTION 15.9 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 11.2.5). *MEMs* are a convenient way to quickly store and recall audio steps and settings for different venues, productions, and users.

Chapter 16 MACROS, AUTOMATION AND REMOTE CONTROL

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.) This chapter also covers Remote Control, which allows TriCaster operations to be synchronized for various purposes.

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.

TriCaster's 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 surface operation, or *HotSpot*.
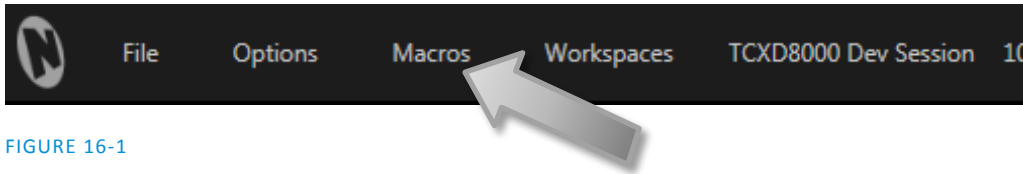
Macros can do almost anything; Preload and play content, modify audio settings, automate complex switcher sequences or perform synchronous operations. The compelling usefulness of macros justifies the prominent *Macros* menu placement in TriCaster's *Dashboard*.
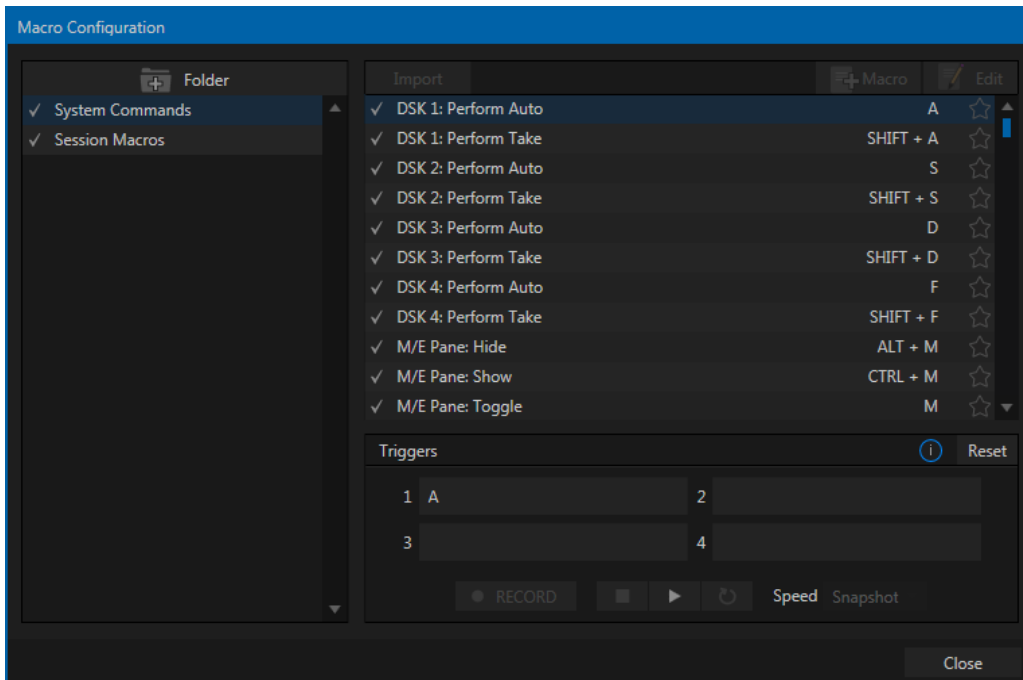
Click *Macros* to show a menu containing a *Configure Macros* item. This opens a large panel that allows to you create, organize, and even edit macros.
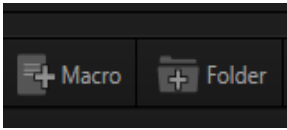
FIGURE 16-3

Creating a new macro is simple. Buttons at upper right let you add folders and macros. Click the first to add a folder and name it. Selecting a folder in the list (other than the *System Macros* folder) enables the *Add Macro* button (Figure 16-3). Click this button to add a new macro entry.

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 Surface* 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's entry in the list tracks playback progress.
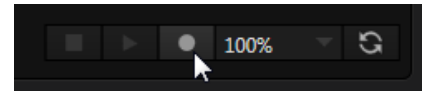
FIGURE 16-4

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 SNAPSHOT MODE

One option in this menu bears explanation early on – *Snapshot*. 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 TriCaster to a particular state.

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
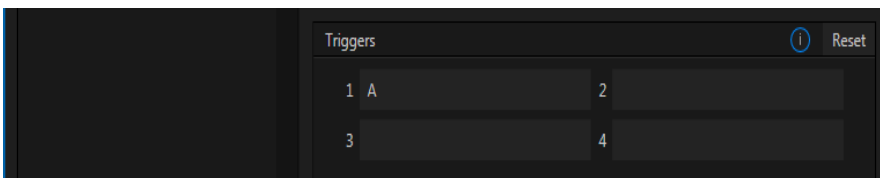
FIGURE 16-5

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. (See the accompanying Automation and Integration Guide for a more extensive discussion of triggering macros, including MIDI control and more.)

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* (share macros with other TriCaster users).

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 TriCaster Advanced Edition's automation features elsewhere in this Guide, notably in Sections 8.1.5, 11.2.1, and 15.7.5. Please refer to the accompanying *Automation and Integration Guide* for additional discussion of these powerful features.

SECTION 16.4 REMOTE CONTROL

(TriCaster 8000 only) In high-end broadcast applications and multimedia production environments, it can sometimes be quite important for redundant TriCaster systems to be operating synchronously.
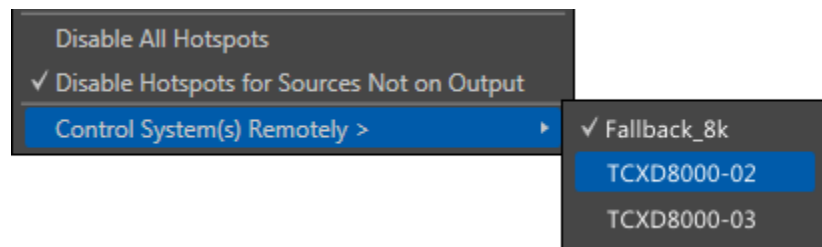
FIGURE 16-6

The *Options* menu (Live Desktop *Dashboard*) contains the item *Control System(s) Remotely*. Selecting a suitable TriCaster 8000 unit in this menu checkmarks it; subsequently, the all command operations given to the local unit are echoed to the controlled TriCaster, which will follow along submissively.

Tip: Mirrored systems should be running identical software versions, specifically Rev.1c or better.

16.4.1 'TWINNING' TRICASTERS

For most purposes, media content and all initial control states of both local and controlled systems must be absolutely identical in order for remote control (a.k.a., 'mirroring') to work as expected. Thankfully, achieving this 'twinned' state is not that difficult.

1. Configure the first TriCaster:

- o   Create a new session in the desired format.

- o   Go on to configure cameras, *Proc Amps*, media content, *Audio Inputs* and *Mixer* settings, *M/E* configurations, etc., just the way you want for your production.

2. Exit the session, and use TriCaster's *Backup Session* feature (see 5.3.3) to back it up, gathering all media assets in the process.

3. Click the *Shutdown* icon on the *Home Page*, and select *Administration Mode.*

4. From the *Administration Mode* screen, *Exit to Windows*, and locate the session backup file you created.

5. Transfer the session backup across the network to the remote system.

6. Use the *Restore Session Backup* feature (see Section 5.2.2) on the *Home page* of the remote system to open the backup session file, and launch the session.

7. Re-launch the original session on the controlling system, and enable remote control over the second system using the *Options* menu item as described earlier.

8. Configure Media Player playlist content to match the mirrored system (you may find the Export and Import features associated with Media Player presets useful here), and do the same for any Buffers.

That does it as far as configuring TriCaster goes. Obviously too, though, mirroring normally calls for upstream distribution amps to multiply camera feeds, attention to matching up audio routing, and so on. Likewise, in most cases, attention must be given to output routing (and sometimes, 'failover' device planning and connection).

In yet another approach to all of this, you might consider using an outboard network drive as the *Session Volume* for both systems.

> *Note: Normally, TriCasters operating under remote control retain autonomous local control response. You can actually enable bi-directional remote control by configuring two systems to control each other. This can be very desirable, such in cases where different operators are responsible for certain aspects of the production process.*

Chapter 17 STREAM

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, TriCaster® places you in the forefront of all the excitement.

SECTION 17.1 INTRODUCTION

Internet streaming for different purposes involves a wide variety of attributes; at times, too, account login details are required for your streaming service or CDN (Content Delivery Network). You may well maintain multiple accounts for different purposes, as well.

TriCaster's *Streaming Configuration* system supports the creation and configuration of all of the information and settings you are likely to need in this context. The information you enter for a given CDN or other streaming target is retained in a preset referred to as a *Connection.* These are easily accessed afterward from a convenient drop-down menu for selection or modification.

SECTION 17.2 THE WEB BROWSER

To open the *STREAM menu*, click the *Configure* button (gear) at right of the *Dashboard*'s large *Stream* button (Figure 17-1).

The menu provides several groups of options. At the top, the Web Browser item does just what you would expect – it opens the system web browser.

Note: We do not recommend using this browser for general purpose web surfing during live operations.

You can use this browser, for example, to visit your streaming service provider's site to create an account, modify its settings, or perhaps to verify your stream.

Hint: If the web browser is open, but becomes hidden from view because a Live Desktop operation took precedence, you can re-use this menu item to pull the browser window to the front again.

SECTION 17.3 CONNECTIONS

Existing *Connections* (or 'presets', as explained earlier) are listed just below the *Web Browser* entry in the Streaming menu. Initially, a default set of *Connections* that might interest you is shown (Figure 17-1).

These default *Connections* must be configured with your streaming provider account and similar details before they can be used.
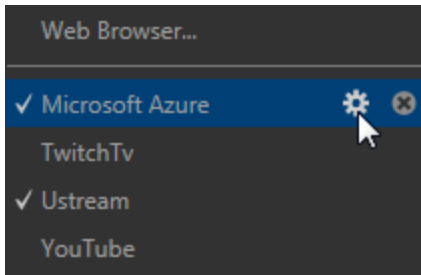
FIGURE 17-2

If you move the mouse pointer over a *Connection* entry in the menu, two new gadgets are shown at right (Figure 17-2).
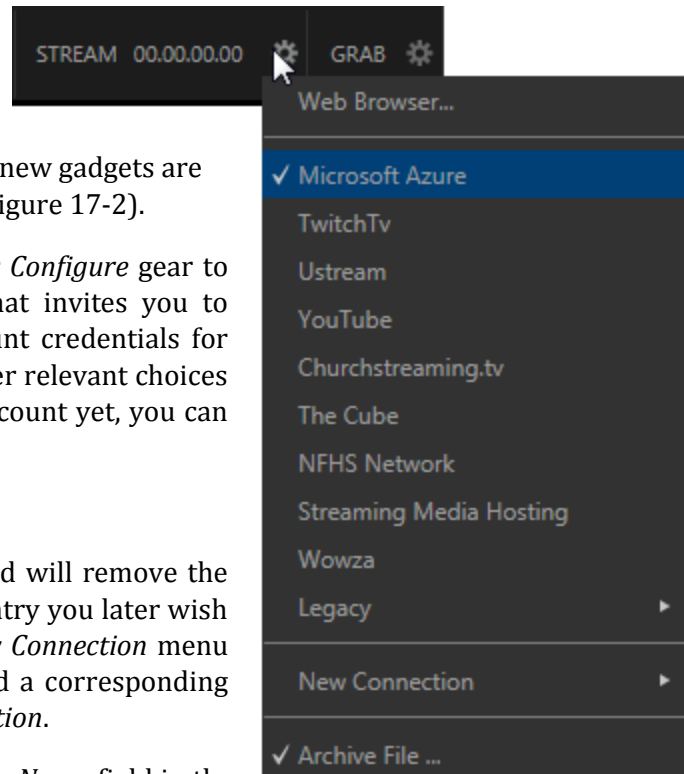
Click the familiar *Configure* gear to open a dialog that invites you to enter your account credentials for that site and *Sign In*, along with controls for any other relevant choices or settings that it requires. (If you don't have an account yet, you can click the *Sign Up* button.)

FIGURE 17-1

Not surprisingly, clicking the little (x) gadget instead will remove the *Connection* from the menu. If you delete a default entry you later wish to use, all is not lost. You need simply use the *New Connection* menu option to select the streaming service by name, and a corresponding dialog will allow you to create a suitable new *Connection*.

After selecting a *Connection Type* and clicking *OK*, the *Name* field in the main *Configure Stream Connection* panel is highlighted, to encourage you to supply a descriptive name for the preset.

17.3.1 CUSTOM CONNECTIONS

In addition to the many 'name brand' *New Connection* options listed, you will observe a menu item labeled simply *Custom*.

The dialog that this opens allows you to enter the details typically required by generic streaming services, to select between RTMP or RTPS encoding, and to choose an encoding profile that tells the encoder what resolution and bitrate to employ when sending a stream to this connection.

FIGURE 17-3

17.3.2 LEGACY

For backwards compatibility reasons, the *Legacy* menu point in TriCaster Advanced Edition's *STREAM* menu provides access to older *Connection* configuration options. These include the following:
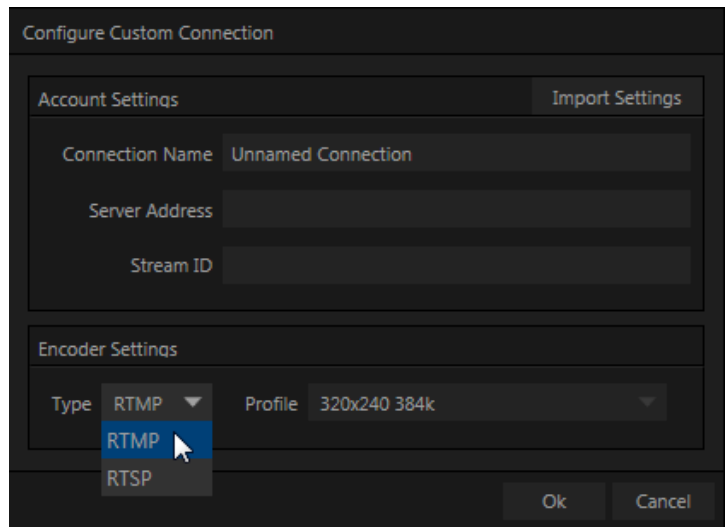
- Flash* - long a popular streaming choice, and still in common use.

* Service providers may supply you with a Flash streaming profile in the form of an XML file. If this is the case, you can click the button labeled *Import Settings From File*, navigate to and select the XML file, and TriCaster will automatically import the *Location* and *Stream ID* values for the *Connection*.

- Windows Media Pull - If you are streaming internally (to people in your building or inside your own corporate firewall), *Pull* streaming may well provide the easiest approach. Note that your stream may be constrained by lower bandwidth than a commercial streaming service typically offers, hence Pull streaming may falter when more than a few users are viewing the stream.

  The *Server Address* field attempts to automatically display the Internet address you would provide viewers, or in some cases, your streaming service provider. This is the IP (Internet Protocol) address of your computer on the network. This information will be provided as 'punctuated' numeric value. You can provide any clients or streaming providers this address for use in Windows Media Player™.

Note: Routers provide a measure of network security by masking the details of systems connected to them, thus preventing direct external access. If TriCaster is connected to the network by a router, the IP number shown in the location field is only valid for viewers connected on the same side of the router as your TriCaster (as they might be in a local intranet configuration.)

To find out how to provide external access to your stream in this configuration, please see Section 17.8, Diagnostics and Troubleshooting, for information on routers and "port forwarding".

- Windows Media Push - A Push *Connection* is more convenient than Pull when TriCaster is connected behind a firewall. The dialog allows entry of a (pre-arranged) host *Server Address*, *Username* and *Password*. Enabling the *Stream* button then "pushes" the stream from your location, logging into the pre-arranged web address using the username and password you provide.

17.3.3 ACT AS WEBCAM

The basic *Act as Webcam* connection option can arguably be thought of as the lowest common denominator, and also the least demanding approach in terms of learning curve. No local settings are required for this connection type (beyond the URL) of the streaming site you intend to use.

Many of the organizations providing streaming services offer free accounts with limited capabilities and options (often ad-sponsored). These arrangements can be just what you need to get started experimenting with live streaming, or may even satisfy all of your needs in this regard. Generally, companies also offer paid-for accounts as upgrades. The benefits may include such things as removing ads, more streaming options (such as higher bitrate and resolutions, or multi-bitrate streaming), two-way live chat, and so-on.

Note: The steps involved in creating an account with a streaming service provider and configuring the stream vary widely, and unfortunately cannot really be dealt with in depth here. Generally, though, they are pretty simple, and providers offer step by step information and support through their sites. And, of course, NewTek's own TriCaster forum membership can often offer helpful hands-on experience and advice.

Once configured on the remote site, you can audition your streaming broadcast using the *Stream* button in the *Dashboard* at the top of the *Live Desktop* panel. If you do not wish to archive your stream, disable the *Archive File* switch beforehand.

> *Hint: Some services may show you what they are receiving from TriCaster when you press Stream, but do not actually broadcast that stream until you indicate that you are ready to go 'on air', using controls on the website.*

For *Act as Webcam* streaming, the encoding of your program into a stream for transmission to the service provider (and ultimately beyond, to your Internet audience) is performed by an applet served by the remote website.

As mentioned before, however, this arrangement often doesn't give you as much control or as many options as you might want. Other *Connection Type* options are more hands-on in this respect, but may require you to manually select related settings, as discussed next for each type.

> *Hint: Password-protected streams are an option with certain CDN accounts. In some cases (where Flash is used to provide the client side password support), using this option will mean that iOS devices cannot view the stream. This is not a TriCaster issue, per se, but something you can discuss with your streaming service if it arises.*

SECTION 17.4 AUDIO LEVEL

Recall that the *Stream* control group in the *Audio* tab provides level control, equalization and *Compressor/Limiter* tools that can help you deliver the best possible sound to your listeners.

SECTION 17.5 CAPTURING THE STREAM

TriCaster can archive your live stream file as it is created. Enable the *Archive File* switch at the bottom of the menu, and supply a file name in the adjoining field.   A folder is automatically created (at D:\Media\Clips*sessionname*\SavedStreams) to receive the captured stream file.

> *Note: Act as Webcam streams are not captured by the Archive File feature, as this service is commonly provided by the CDN instead.*

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.

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

TriCaster permits you to record live 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 realtime, 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. As well, to ensure reliable delivery, you will ideally have some idea of the size of your audience. Nevertheless, for all cases, TriCaster gives you the tools to do the job.

Naturally, streaming video is highly compressed to reduce bandwidth demands and make it available to a wider group. TriCaster supports two popular and prolific encoding systems, Microsoft's Windows Media® and RTMP (Adobe Flash®).

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.).

❖ Windows Media® is well represented, but perhaps not to the same degree.

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 TriCaster'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 the stream at the bitrate you specified, 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 WINDOWS MEDIA® STREAMING

Let's talk briefly about the two Windows Media® streaming methods, known as *Pull* and *Push*. Choosing the best method for your needs is important. Let's review each, and consider what is best for your needs.

PULL BY END USERS

Simply put, the Windows Media Encoder® in TriCaster allows your (networked) audience to connect directly to it, and it distributes the stream to them.

Connecting in this manner requires you to have a connection with sufficient bandwidth to deliver a stream to each individual user. For this reason, the simple Pull streaming method rarely works well for more than 1 or 2 viewers.

❖ Advantages:

   o   When TriCaster is not behind a firewall or does not have a public IP address, this is a very simple way to let a few viewers watch your program stream.

❖ Disadvantages:

    o Requires either a public IP address or requires users to be on the same network. Facilities such as hotels or convention centers will usually not provide a public IP address. Even if they do, getting them to open holes in their firewall is next to impossible.

    o If TriCaster is behind a router, your router must be configured to 'port forward'.

    o Requires significant bandwidth -- for example, with TriCaster connected to the Internet by a DSL or Cable Modem line, upload bandwidth is often less than 400kbits/second. Allowing for network overhead, at best a 320kbit steam can be accommodated. This bandwidth would be fully consumed by two viewers watching 160kbit streams, or a single viewer pulling a 170-320kbit stream. (Even a T1 digital line can only handle four simultaneous 300kbit streams).

A variation on the *Pull* method involves using an external streaming provider. At one time the *only* method for streaming using such a provider was to have the server 'pull' it from the encoder. Under this system the server did not receive the stream until the first user requested it. Then the server would connect to the encoder, pull the stream to it, and finally begin re-distributing it to everyone requesting it. This method worked passably until firewalls became more common.

❖ Advantages:

    o Pull doesn't waste bandwidth; no signal is being sent out to the server unless somebody wants to view it.

    o If you lose your connection to the (provider side) server, the server will re-connect to your encoder automatically when Internet connection resumes.

    o Providers typically have significant bandwidth, and are able to meet necessary requirements to deliver stutter-free, high quality streams to large numbers of viewers.

❖ Disadvantages:

    o Like the "Pull by End Users" method above, this requires a public IP address, preferably a "static IP address" (which does not change dynamically if you need to reconnect) as well as open ports for the connection to be established. These requirements are becoming increasingly difficult to meet (given common security measures).

PUSH TO PROVIDER

Windows Server2003® introduced "Push" technology. With this method, the encoder sends the stream to downstream servers. This allows the encoder to establish a connection to the server on a specified port. Once this connection is established, additional network ports may be opened as required (since the Encoder established the connection, not the server.)

❖ Advantages:

- o Easy to connect to the provider. There are no requirements for open ports on your local system, or public IP's. In addition, firewalls do not get in the way.

- ❖ Disadvantages:

  - o Live streams that have no viewers are still consuming bandwidth. From a provider point of view, it is possible that all of our bandwidth could be utilized with no viewers. However, that is more theoretical than practical.

  - o Some external streaming providers prefer to Pull streams, as re-connection can be performed from their end automatically if necessary. But in many venues system administrators are very reluctant to configure their system with an open port to have your stream Pulled from.

17.6.3 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 TriCaster users for recommendations in NewTek's online discussion forums.

17.6.4 OTHER RESOURCES

If you're still struggling with the differences between Push and Pull streaming methods, you can find lots of online resources (in addition to excellent information available in NewTek's user forums!)

The popular web resource Wikipedia® hosts many articles on the subject, notably these two:
http://en.wikipedia.org/wiki/Push_technology
http://en.wikipedia.org/wiki/Pull_technology

Microsoft even hosts an animation on the subject at:

www.microsoft.com/windows/windowsmedia/knowledgecenter/wminaction/streaming_pushpull.asx

(Ignore the detailed discussion of configuring the encoder, and just enjoy the pretty pictures – your TriCaster makes that part easy for you!)

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 TriCaster's 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. TriCaster gives you 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 TriCaster 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 program stream from your TriCaster.

2. You can use TriCaster's integrated web browser, but you may want to 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…

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 TriCaster.

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 at 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.

2. Type "ping" (without quotes) followed by a space and the target IP number, as in the image below – then press Enter.

FIGURE 17-4

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 17-5. A success ping will display a report like Figure 17-6.

FIGURE 17-5

FIGURE 17-6

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.

PULL CONNECTION ISSUES

Note that - if you are *Pull* streaming from 'behind' a router – the IP number shown in the TriCaster's *Location* field will only be valid for other systems behind the router. You will need to derive the true external IP address to pass to your viewers (or service provider.)

> *Again, in this environment you may wish to consider Push streaming with the aid of a Content Delivery Network (a commercial service), as this is generally free of firewall and router woes that often require a friendly system administrator to resolve otherwise.*

You will also need to enable "port forwarding" on the router, as discussed next.

Port Forwarding

If you are streaming from behind a router, to preserve a reasonable level of security while allowing outside computers to connect to your system you will need to 'port forward' your router.

Port forwarding permits a sort of 'blind hand-off' between external clients (your viewers) and a local transaction port which you manually specify. (The router will pass requests to view the stream through to the TriCaster, without exposing the internal IP routing.)

To enable port forwarding, you need three pieces of information:

- The login information for the router. Your router's manual will have this information, which typically involves entering a specific IP number into your web browsers URL field, and perhaps also a password you have set previously.

- The specific IP local number that the router has assigned to your TriCaster. You can read this right from TriCaster's *Location* display. It will comprise the entire string of punctuated numbers before the colon (the colon separates the port number you chose for your stream).

- The port number just mentioned (the part *after* the colon).

Although the steps vary a bit by brand and model, generally you would proceed as follows:

1. Log into the router, so it shows its control panel in your web browser.

2. Select the port forwarding page of the router controls. These options may be found in an obscure place, such as the router's "Applications and Gaming" page (since online gaming often requires port forwarding).
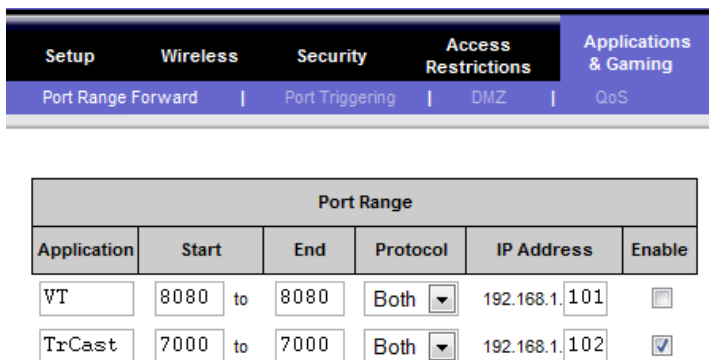
FIGURE 17-7

3. Enter an *Application* name, if required (this is for your own recognition purposes, so use anything you like).

4. Enter the *Start* and End *port* values – you can use the same port number in both fields, but of course it must be the one you set in TriCaster's *Port* field.

5. If possible, select *Both* for *Protocol* (or select *UDP*).

6. Enter the <u>full</u> (punctuated numeric) local IP address shown in the *Location* field of your TriCaster after you enable the stream.

7. Checkmark *Enable.*

There are countless makes and models of routers – for information on various models, and a great deal of help on port forwarding generally, we can recommend the following site:

http://www.portforward.com/english/routers/port_forwarding/routerindex.htm

Firewalls:

You may also run into software firewalls. Generally, these can be configured in similar to permit exceptions to the firewall policy, permitting specific ports or applications to be opened to the world. Information on exceptions in the Windows® Firewall can be found in its Help system.

FINDING YOUR EXTERNAL IP NUMBER

Again, the numbers assigned behind your router only work locally. In a Pull scenario, you need to supply the true external IP number (and port) for your TriCaster to viewers outside the LAN (Local Area Network).

You can find this number in several ways. For example, your router will display it as its "IP Address" in its Status page. Or, you may want to use one of several handy websites that will quickly supply your current IP number (one such is http://www.whatismyip.com). Simply go to the website in your browser and read the IP number from the screen. Append a colon and the port number you are using to this number and you've got everything you need for your viewers to connect.

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

17.8.2 IS IT REALLY A TRICASTER ISSUE?

With regard to streaming issues, don't overlook the fact that TriCaster is just one of the pieces of the puzzle. There are many others that are just as important.

Here are some useful things to try:

- Check the file:

  Archive the streaming output file locally, and then examine it to see if it has any problems. This file corresponds exactly to what TriCaster is sending the downstream server. In cases of sync problems, low frame-rate problems, audio popping problems, etc., if it's a TriCaster issue, the problem will be

seen in this file. On the other hand (if the file looks good), then the issue has to be up-stream of the TriCaster.

- Dropped Frames

  To really confirm that TriCaster is outputting the frame-rate you chose (i.e., not dropping frames) you can edit a profile inside Flash® to cause FMLE to write out frame-rate stats. These settings apply when using the TriCaster, which lets you verify that it is uploading the stream at the rate designated. (In FMLE, select the *Encoding* tab, and check mark "Log To File").

Chapter 18 EXPORT

TriCaster's Export features allow 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, TriCaster's *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 TriCaster's *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 user interface of TriCaster's *Export* feature 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 18-1).

At the top (where you would see *Web Browser* listed in the *Stream* menu), you will notice a *Export Bin* item. This opens the panel which allows you to manage media files you intend to export. We'll discuss this panel soon.
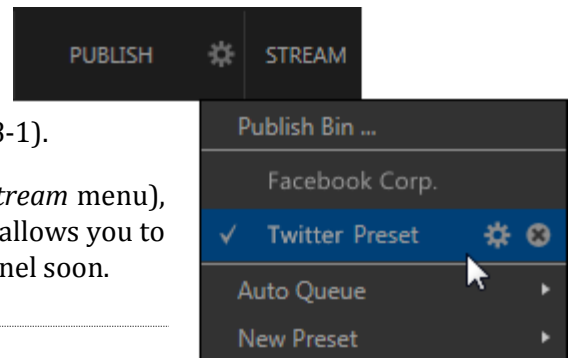
18.2.1 PRESET LIST

FIGURE 18-1

Below the *Export Bin* menu item is a list of presets you have configured as *Export* targets. (Before you actually create any presets for yourself, this list shows a single item labeled *No Presets Configured.*)

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 presets 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 skip over *Auto Queue* for a moment, and jump to 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

At the time of writing, TriCaster's *Export* feature can publish media to Facebook, Twitter and YouTube. Other connections may be supported as it becomes possible to do so.

> Note: See also A.4.3 , (How Do I) Avoid Delays When Session Media is Offline?

18.2.4 TRANSCODE AND FTP

The *Transcode* and *FTP* target options let you handle various file conversions and publishing to local (or networked) storage volumes. This is a very useful output alternative, 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.

Both *Transcode* and *FTP* exports provide powerful option to transcode video to different formats before sharing. You can select such options as AVI or Quicktime, or perhaps select a preset prepared specifically for a target device, such as optical media (*DVD*) or *Mobile Devices*.

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 BIN

Having discussed configuration of export accounts, let's move on to look at live operations. In the Dashboard's *File* menu, select the *Export Bin* item to open this panel (Figure 18-2), which allows you to manage the list of clips and still images you wish to export.

FIGURE 18-2

The features of the *Export 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 just yet (we'll explain why momentarily).
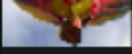
FIGURE 18-3

> *Hint: You can Add and even Upload files that you are currently recording, even before pressing Stop. These files will be found in Clips/Capture folder for the current session.*

18.3.1 METADATA

FIGURE 18-4

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 (Figure 18-5) allowing you to choose one or more *Export* presets (targets) for each individual item. A checkmark beside a preset in this menu indicates target is active.

Conveniently, multiple checkmarks are supported, and of course 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 module's processor.
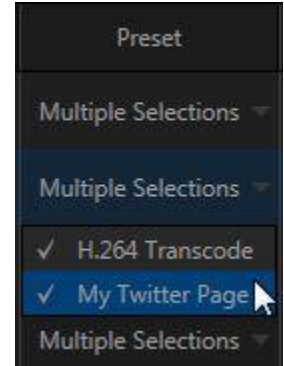
FIGURE 18-5

18.3.3 LIST MANAGEMENT
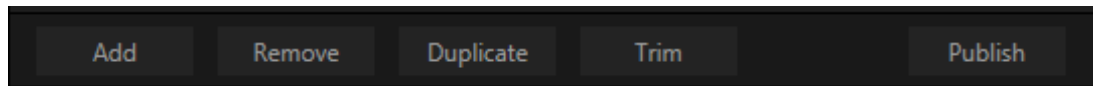
FIGURE 18-6

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. 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.

FIGURE 18-7

- Click the *Trim* button in the footer to open a trimmer pane (Figure 18-7) 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

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.

SECTION 18.4 EXPORT QUEUE

This raises the question, though: "When is a clip or still *really* 'ready to go'?" Consider:

- We've discussed the *Add* button (and we will consider additional methods of adding items to the *Export Bin* in Section 18.4.3).

- And you know that you can assign *Export presets* you have prepared to individual items in the Bin either manually (Section 18.3.2) or automatically (Section 18.2.1).

- Further, you can modify the Title and add a unique Comment to accompany each upload (Section 18.3.1).

- And you can trim a clip, or convert it to a still image (Section 18.3.3).

This brings us to the concept of the *Export Queue*. The *Queue* can be thought of as the complete list, at any given moment, the subset of all items in the *Bin* that are fully configured – and, thus, ready to export.

For our purposes, there are really only two criteria to meet for an item to be in the *Queue*:

- There must be at least one check-marked entry in its *Preset* column menu.
- The *Queue* switch (at right, beside the Preset column) for the item must be checked.

This last item calls for a little further explanation.
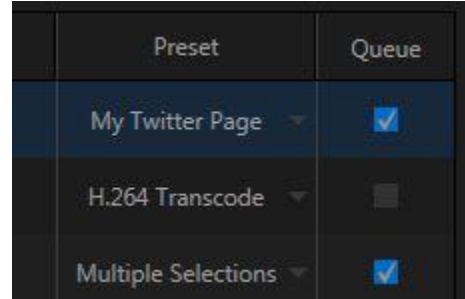
18.4.1 THE QUEUE SWITCH

The switch in the *Queue* column (Figure 18-9) for each item in the *Bin* serves as a local 'go/no-go' decision for the *Export* processor.

Thus, even when an item is otherwise fully configured and the *Export* switch is lit (meaning that the *Export processor* is hungrily looking for items it can consume), if the Queue switch for an item is not checked, the processor will bypass that item.

This provides you with a way to selectively postpone processing of certain items while freely publishing others. You can, of course, manually click the *Queue* switch to check or un-check it (and yes, multi-row selections are supported for this purpose).

Alternatively, though, you might prefer to take advantage of the *Auto Queue* feature, discussed next.

18.4.2 AUTO QUEUE
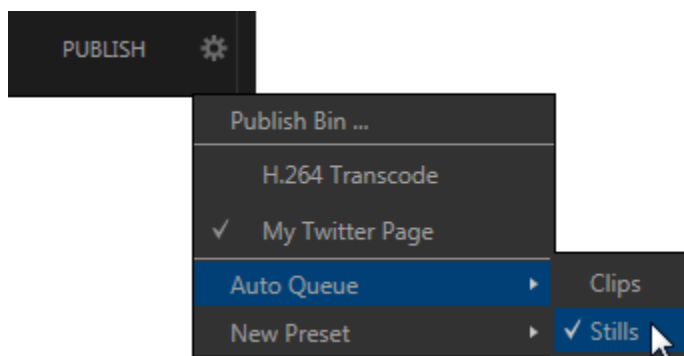
This takes us back to the *Export menu*, to consider the sole item in it that we have yet to discuss. When the mouse pointer is moved over the *Auto Queue* entry, a small sub-menu is shown (Figure 18-10). Here, you can checkmark either *Clips*, *Stills*, or both.

When you send a clip or still, respectively, to the *Export Bin*, a checkmark in this sub-menu causes its *Queue* switch to be enabled automatically. Assuming there is also at least one preset checked in the *Export* menu just above, any item you add is thus immediately qualified for export.

If the *Export* button is lit, that item will be processed in sequence without any further effort on your part. Otherwise (left un-checked), you can defer processing until a time of your choosing.

You might find it useful, for example, to defer processing of clips by leaving this item unchecked. While it's possible to process video uploads even as recording is underway, if there's a lot going in your production you may find it preferable to upload stills on the fly and handle larger uploads afterward.

> Hint: DataLink keys entered in Record and Grab can provide meaningful titles and comments to describe your uploads, possibly allowing you to export them immediately without having to enter data manually.

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, TriCaster makes it as simple as possible to share your media.

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:

- First, TriCaster lets you flexibly add both stills and clips to the *Export Bin* with a single click, keystroke or button press. You can easily add items from the playlist of a *Media Player*, or directly from the *Grab* and *Record* features (see the headings File Operations in Section 11.2.1, and Action in Section 0).
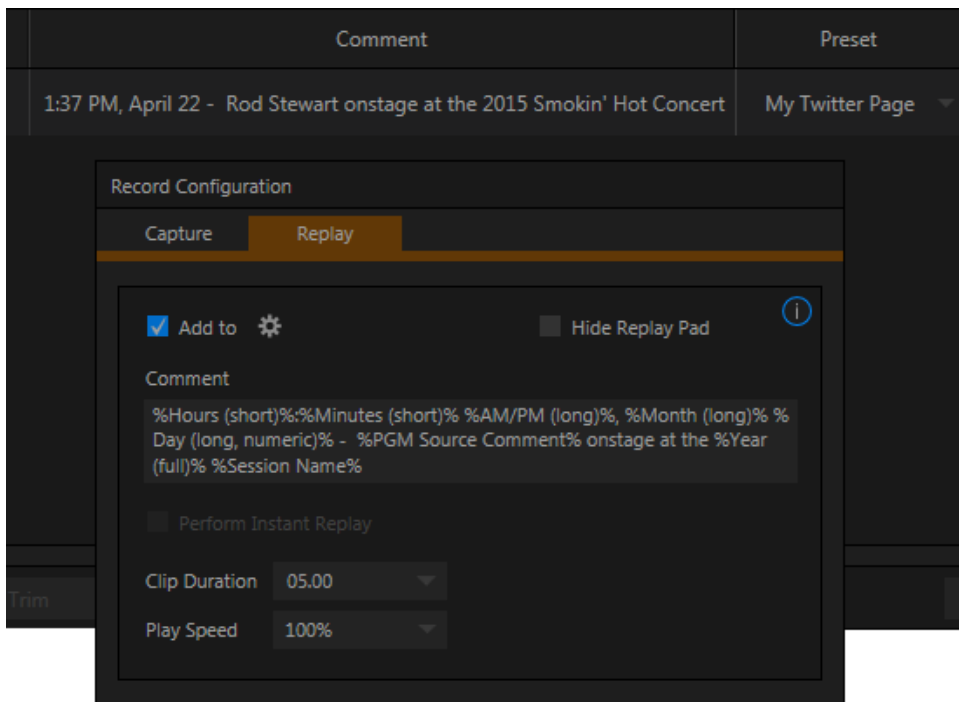
FIGURE 18-11

- 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 Queue additions.

  Better still, the *Name* and *Comment* fields in *Grab* and *Record* support *DataLink* (compare Section 11.3.3). 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 18-11).

Chapter 19 RECORD AND GRAB

You will often want to capture video clips from external sources, as well as to record your own live TriCaster® 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.

TriCaster® provides a great deal of flexibility when it comes to capturing your production, selected elements of it, and a wide array of internal and external sources (with embedded timecode).

FIGURE 19-1

This is all very helpful for post-production purposes or even for immediate playback from a *DDR* during your production.

TriCaster's unique native IsoCorder™ technology brings even more powerful capability to TriCaster's *Record* feature. With *IsoCorder*, it's possible to record up to eight video sources simultaneously (depending on TriCaster model), or a perhaps mix of sources and output channels, including any of the four *Outputs.*

As individual outputs are configurable, you can also capture *Program*, *Program (Clean),* or individual *Switcher* sources.

FIGURE 19-2

Recording is easily enabled by clicking the large *RECORD* button in the *Dashboard* (Figure 19-1). The 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.
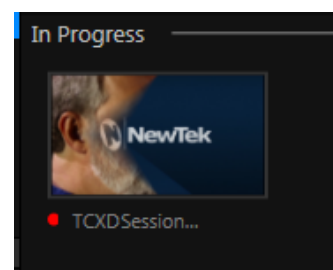
> *Note: It is not necessary to interrupt recording to add a clip that is being captured to a DDR playlist or the Export Bin. Clip icons show a red 'recording' indicator on clips currently being captured in playlists, the Export Bin, and in TriCaster's Media Browser.*

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. Settings and controls for recording are grouped in the *Record Configuration* panel. Click the popup *Configure* button (gear) in the Dashboard's *Record* control to open the *Record Configuration* panel.

The *Record Configuration* panel allows you to configure sources for up to 8 recorders. Let's review the features and settings found in the *Record Configuration* panel, starting from the top.
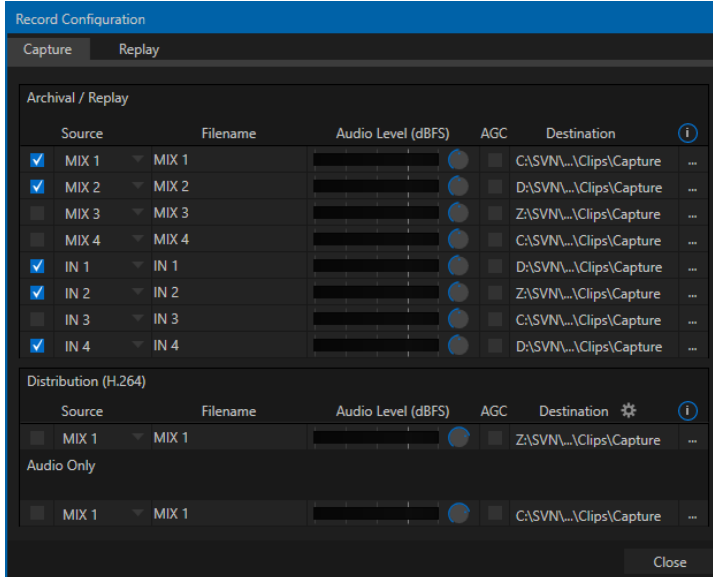
FIGURE 19-3

Record Configuration options are organized into two tabs – *Capture* and *Replay*. The first of these (Figure 19-3) allows you to define the individual recordings you want to capture.

FILENAME

TriCaster uses the source name with to supply the filename for each recording (names are numerically incremented automatically as well).

SOURCE

A drop-down menu labeled *Video* lets you choose which video channel will be captured. TriCaster provides numerous source options.

Selecting any *Output* gives you access to a variety of useful mixed video source combinations and formats, as defined in *Output Configuration*. In addition, local hardware inputs can be designated as a *Video* source. (Note that *Outputs* can be configured to use any single source, too.)

> Note: The same source cannot be selected for multiple recordings. For example: "IN 1" cannot be selected as the source for line one and two, the result will allow only one of the redundant lines to be checked. On earlier versions of the software you will end up with no files recorded if configured this way.

AUDIO LEVEL

The *Audio* Level control lets you set the volume independently for each source you capture.

DESTINATION

The drop-down menu in this column lets you select from a suitable path as targets for your recordings.

> 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. TriCaster does not prevent you from exceeding this limit, however, when you are confident that very fast volumes are capable of handling the load.

QUICKTIME

TriCaster records a high quality Quicktime file. The *Transcode* function in *Export* makes it possible to supply files in a wide 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.
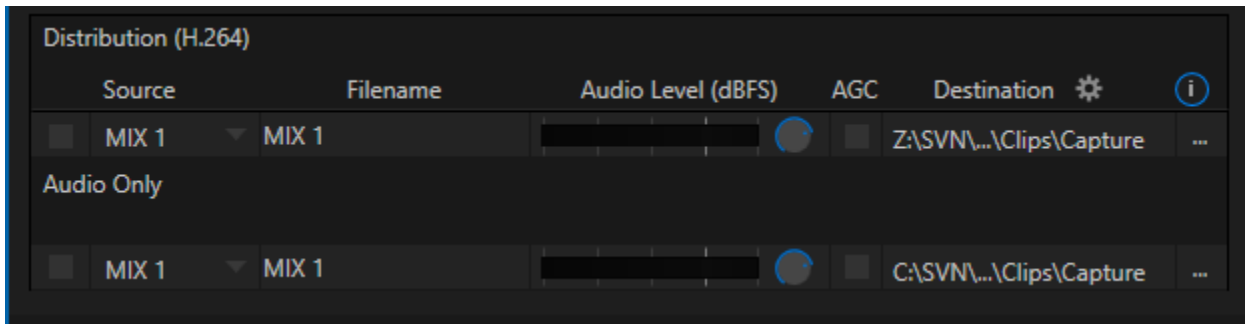
FIGURE 19-4

In addition to the primary recording capabilities provided in the *Archival/*Replay section of the *Capture* tab, two other recorders are available in the control groups labeled *Distribution* and *Audio Only*. These are particularly convenient when the need arises for compact distribution copies immediately after the production ends.

19.1.3 REPLAY TAB

In TriCaster Advanced Edition, features related to instant replay have been gathered into the *Replay* tab.
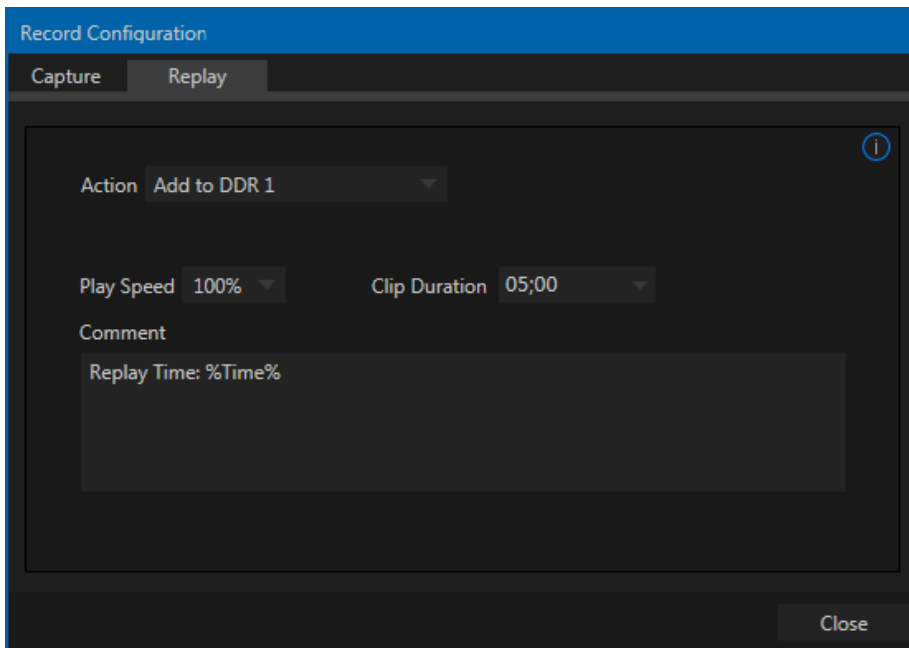
FIGURE 19-5

Let's examine these controls one by one, beginning with the *Add to* menu options.

Choose an *Add to* option from the Action menu to automatically send newly-created clips to the target(s) you choose in the menu that opens when you click the gear at right. You can choose either *DDR*, or collate the clips into different *MEM slots*.

Choosing *Add to DDR (1 or 2) and Show* takes advantage of the powerful *Show On* feature in TriCaster's *Media Players* to trigger an instant replay.

This means that, with one mighty click, you can:

- Send a clip of pre-determined length from any angle you are recording to a *DDR*
- Auto the *DDR* onto the Switcher's *Program* row (or a target *M/E*) using a custom transition
- *Autoplay* the clip at the pre-determined playback speed
- Then transition the *DDR* back to *Preview*, restoring the *Switcher* (or *M/E*) Background transition.

All of this without interrupting recording, which continues without so much as a hiccup.

Enabling the *Export* option will send clips to the *Publish Bin*, and – if *Auto Queue* is enabled for *Clips* – these will be immediately queued for handling by the *Publish* processor.

CLIP DURATION AND PLAY SPEED
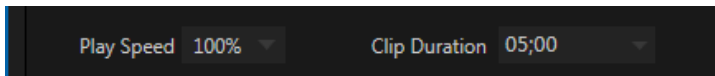
FIGURE 19-6

Let's spend a moment on these two controls before getting into the more interesting bits.

- *Clip Duration*, as you'd expect, determines the length of clips added to the *DDRs* or *Publish Bin*. (Note that this control accepts values typed directly, up to 30 seconds.)
- *Play Speed* affects clips added to *DDRs* only, pre-setting their individual playback speed to the value you select here.

THE REPLAY PAD

The *Replay Pad* is a *Dashboard* feature, and appear in the form of buttons appearing to the right of the main RECORD button.
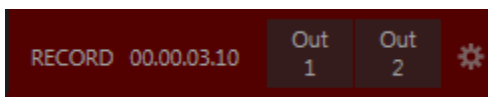
FIGURE 19-7

TriCaster Advanced Edition makes it easy to send clips from any recorder defined in the *Capture* tab to a *DDR* or to the *Publish* module. Notice the two buttons (labeled "Out 1" and "Out 2") just left of the configuration gear in Figure 18-10. This is the *Replay Pad* area. The button labels show which sources are assigned to the corresponding recorders. The *Replay Pad* can show up to four buttons.

Clicking any *Replay Pad* button adds the clip from that recorder to the targets defined in the *Action* menu. Alternatively, you can perform the same operation by pressing a number pad key on your keyboard. The *Play Speed* and *Clip Duration* you define are applied when clips are added to a *DDR*.

> *Hint: As mentioned elsewhere, clips added in this fashion will also retain the information from the Comment box (Replay tab).*

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 TriCaster's *Grab* function.

OUTPUT

Click the *Configure* button (gear) next to *Grab* in the *Dashboard* at the top of the *Live Desktop* to open the *Grab Still Configuration* panel. The options presented are mostly similar to those of *Record Configuration*, though a bit simpler. Choose which outputs will be grabbed by the Dashboard *Grab* button.
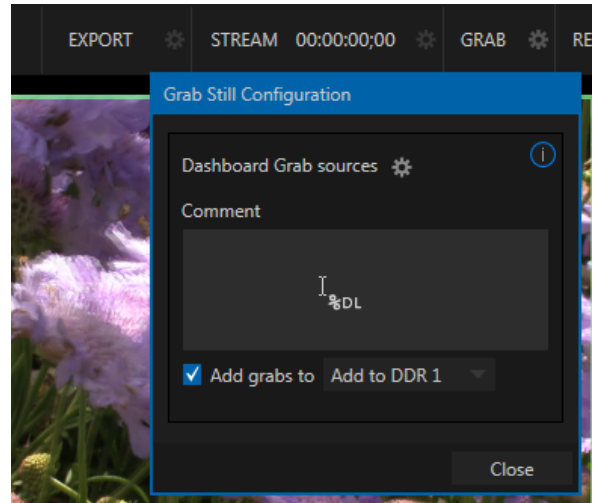
> *Note: De-Interlacing is automatically applied to avoid a 'comb' effect caused by inter-frame motion in fielded sessions.*

Enable the *Add grabs to* switch to automatically include newly captured images at the end of selected playlists, or to send them to a specific *Buffer*, ready for immediate playback during the live production. Likewise, enable *Add to Export* in this menu to immediately append the grabbed image to the *Export Bin*.

Close the *Grab Still Configuration* panel by clicking *Close*, or clicking outside the panel. Then click the Dashboard *Grab* button to capture the selected a/v source(s) to your hard drive. Image files are stored in a folder named for the session inside the main *Still* folder for the current session (sub-folders are created for the supplementary files captured when *Grab all inputs* is in use).

INPUT

To grab an image from any *Switcher* input, simply move the mouse over any source viewport and click the snapshot (camera) icon that is shown in the footer below the monitor.

FIGURE 19-8

> *Hint: Grab stores images from sources with embedded alpha complete with their transparency information.*

Chapter 20 AUTHORING TITLE PAGES

A networked computer system running NewTek's (extra cost) LiveText™ application delivers powerful live titles and CG pages to TriCaster's network inputs, and can also author pages that are editable in the Media Players of your TriCaster®.

TriCaster Advanced Edition includes an integrated version of LiveText, which retains offline the page authoring capabilities you need to create title pages with 'live-editable' text and image elements for use in the Media Players.

LiveText™ is a full-blown, powerful, professional program, and is also available at extra cost as a standalone application. The LiveText manual can be accessed from the *Help* icon in TriCaster's *Startup Screen*, or the TriCaster Resource webpage served by TriCaster to your local network and available in the web browser of any connected device.

> *Hint: The.pdf file is located in the C:\TriCaster\Configuration\Web\Documentation folder, in case you wish to print it out.*

In this section, then, we will review matters specific to LiveText in the TriCaster environment.

SECTION 20.1 SESSIONS, PROJECTS AND DISPLAY

LiveText *projects* are launched from the *Session Page* in TriCaster's *Startup Screen*. After creating a new session or opening an existing one, click *Graphics* on the icon ring (see Section 5.3). This reveals options and links at right, discussed previously in the Startup Screen chapter just mentioned.

LiveText uses the current session settings for output to TriCaster's video outputs, new projects (created within the LiveText *File* menu or from the *Session Page*) and bitmap file exports. If you use the File menu to *Open* a project whose settings do not correspond to the current session settings, TriCaster will attempt to display it on its hardware video outputs, if possible.

LiveText sends output from the canvas to TriCaster's outputs continuously while running. For this reason, the *Live Display* pane and associated tools that appear at upper-right (above the Pages Panel) in LiveText standalone do *not* appear in TriCaster's LiveText interface.

When LiveText is running, TriCaster's video outputs (rows 1-3) will all conform to the session format. That is, if the project is HD, the SDI outputs will all be HD, and the analog outputs will be Component HD.

Likewise when the project is SD, the SDI outputs will all be SD. As there are multiple connection options for analog SD video, please refer to the following table in this case:

Row Number	SDI	Analog BNC 1	Analog BNC 2	Analog BNC 3
1	SD	Y	Pb	Pr
2	SD	Composite	Y	C

Note: It is possible to use LiveText's File menu to open a project that does not correspond to the current session settings. TriCaster will attempt to provide video output, but it's possible that a given monitor may not display it correctly.

20.1.1 FILES/FILEBIN

LiveText's file dialogs (for File>Open, File>Add, File>Save and Save As) have pre-configured *QuickTabs* pointing to the following default paths *for the current session*.

Note: the Quicktab links refer to 'session-dependent' paths, thus are not permanent. That is, for a given session, the path the Quicktab refers to is established at launch time. For this reason, the TriCaster version of LiveText does not support user-added Quicktabs.

LiveText's *File* menu has two special items – *Send Current Page to Live*, and *Send All Pages to Live*.   (These take the place of other export options appearing in the standalone version of LiveText.) As you would expect, these functions creates files for use in the Live Desktop, automatically storing them in the correct place(s) for easy access.

Titles prepared in LiveText can be either still or motion pages. When you send a *still* page to *Live*, it becomes a *Title Page* file, with the characteristic filename extension ".cgxml". Title Page files can be edited in the Live Desktop's *Media Players. Send Current Page to Live* will automatically store exported title page files in the D:Media\Titles*sessionname**projectname* folder.

Motion pages (scrolls and crawls) that you send to *Live* are stored as bitmap animation files (with an .avi file extension), suitable for playback in Live Desktop's *DDR*. These are sent to the session folder inside TriCaster's main *Clips* folders. The content of motion pages cannot be edited in the *Live Desktop*.

When you select *Send All Pages to Live,* each page in the project is exported in turn to the appropriate format and location. This means they are readily accessible in the Live Desktop's *Media Browser* afterward, for easy addition to a *Media Player* playlist. Title Page icons will appear grouped under their project names in the Media Browser's *File Pane* when you select the session name in the *Location List* at left.

20.1.2 NAMING STAND-IN IMAGES

Among other things, the *Title Editor* in TriCaster's *Media Players* (DDR, Still and Titles) allows you to substitute a different image for stand-in (or "placeholder") images in Title Pages (.cgxml) exported from LiveText (working with stand-in images is discussed in Section 11.3).

When creating title pages for this purpose in LiveText, you may find it saves you time to add the string "_placeholder" somewhere in the filename of images you prepare for this purpose. For example, you might name an image "headshot_placeholder.png", or "_PLACEHOLDER_crest.jpg".

Images named in this manner will automatically appear as stand-in images (unlocked) in the Title Pages you export to TriCaster using the *Send to Live* options in LiveText's *File* menu.

PART III (APPENDICES)

A time-saving question and answer section, followed by an extensive listing of Shortcut Keys, schematic diagram and keyword index …

Chapter 21 CONTROL SURFACES

This chapter introduces the different control surfaces offered by NewTek®, helping you to see how they complement your TriCaster® and bring added ability to your production setup.

The section also includes brief notes on connecting TriCaster control surfaces for use with your live production system.

NewTek TriCaster® systems provide unrivalled live production power. With a TriCaster control surface in front of you, all of that power is right at your fingertips. These sleek yet rugged control surfaces deliver precise control over the video layers constituting your program. Quickly and confidently perform your switching operations, and extend your capabilities in a wide variety of ways.

This Chapter discusses multiple TriCaster control surfaces, including TriCaster 8000 CS, 460 CS, 860 CS, and others. Of these, two (TriCaster 460 CS and 860 CS) are virtually identical as respects operations and control layouts, so we will consider them together. Others sections cover specific control surfaces in turn.

We're very confident you'll find one or more of these devices to be excellent for your live production needs.

SECTION 21.1 SOMETHING FOR EVERYONE

TriCaster control surfaces can be grouped into two main categories, offering either primary switcher control or instant replay functionality.

21.1.1 PRIMARY CONTROL

Primary control surfaces manage transitions on a per layer basis, govern the background composition, overlay and overlay transitions, multi-layer *M/E* configuration and zoom, control multiple *Media Players*, record, stream and grab features, and even more. At the time of writing, three devices fall into this category, as follows:

➢ TriCaster 8000 CS: A full-function control surface designed to match to the TriCaster 8000 live production system.

➢ TriCaster 860 CS: A full-function control surface originally intended to complement TriCaster 860.

➢ TriCaster 460 CS: Similar to the above but, slightly more compact, originally designed for primary use with 2RU TriCasters.

➢ TriCaster 40 CS and TriCaster Mini CS: Compact control surfaces primarily intended for use with 2RU TriCaster's, but extended to serve with any Pro model; especially popular for mobile use because of their small footprints.

21.1.2 CONVENIENT ALTERNATIVES

Generally, control surfaces described in this chapter were designed for use with standard edition TriCaster software. Current Advanced Edition versions require that the surfaces more video sources than ever.

Since many TriCaster users have multiple units and, for one reason or another may wish to use a surface that was not designed for their TriCaster. Obviously, the controls on a compact surface may not map perfectly to a product with additional features. For example, a Mini CS cannot provide access to the full range of features and sources offered by a TriCaster 8000. Still, we go to great lengths to allow the different surfaces you may have to work with any TriCaster.

In the sections that follow, we provide tables listing the default mapping of controls for various TriCaster models supported by the CS under consideration.

21.1.3 INSTANT REPLAY

NewTek provides potent instant replay solutions in the form of its dedicated 3Play™ systems, but for less demanding installations many have found their TriCaster based TimeWarp™ control surfaces (which take advantage of TriCaster's integrated recording and playback capabilities) to provide just what they need.

➢ TriCaster 850 TW: The perfect complement to any primary TriCaster CS, this instant replay controller is equally capable of performing as a solo act alongside any high definition TriCaster live production system.

➢ TriCaster TW-42: This is NewTek's original TimeWarp™ device. While originally supplied for use with the standard definition TriCaster lineup, it also provides workmanlike instant replay functionality with high definition TriCaster models.

(In addition, TriCaster Advanced Edition provides extensive replay support via the user interface, macros and keyboard shortcuts.

SECTION 21.2 CONNECTIONS & POWER

Simply connect the TriCaster control surface unit to your NewTek TriCaster using the USB cable supplied. There is no need to install drivers, or configure the software. Recognition of the control surface is automatic.

21.2.1 POWER CONSIDERATIONS

The power requirements of TriCaster control surfaces vary, but generally speaking are not inconsequential.

• TriCaster 8000CS requires a standard AC power connection, in addition to its USB control connection.

• All other control surfaces are powered by their USB cable. In the latter case, connecting the unit using a USB cable longer than the one originally supplied can diminish available power to the point where problems could ensue, including connection recognition failure or operational problems.

Except for TriCaster 8000 CS then, we strongly recommend that if you *must* operate the control surface 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 <u>USB extenders are not recommended</u>, having proven less reliable than long USB cables (with powered hub, as discussed above). This is because each added connector in the circuit introduces 'reflections' that can degrade the signal. In this configuration, the control surface may <u>seem</u> reliable for some time, but then fail unexpectedly. (If this should happen, disconnecting and reconnecting the control surface may temporarily restore functionality).

SECTION 21.3 TRICASTER® 8000 CS

FIGURE 21-1

21.3.1 OVERVIEW

The TriCaster 8000 CS control layout closely conforms to the TriCaster 'standard edition' user interface, the principle exception being that singular *M/E* and *Position* control groups governed by delegate buttons serve the purpose of multiple controls in the UI. For TriCaster Advanced Edition, however, with its additional NDI source options, considerable remapping has been done.

Controls are comprised of grouped sets including the following hardware types:

- Backlit push buttons

- Twist knobs

- T-bars

- 3-axis joystick

21.3.2 SWITCHER SOURCE CONTROLS

DELEGATES AND SYNCHRONIZATION

The control surface uses *delegate* button groups to govern the assignment of other controls. Delegates often support multi-selection, permitting operations to be applied simultaneously to multiple modules.

Note that when you initially select multiple delegates, the settings and states of the individual members selected will often vary. For example, when you delegate several *M/Es* at once, the transition *Rate* for various layers in the selection could very well be different. Generally, wherever it makes sense to do so, settings for multi-delegated groups the settings are progressively synchronized as you make adjustments.

The control surface presents buttons representing various video source selections on its DSK, PROGRAM, PREVIEW and M/E rows. The number of sources available in NDI-enabled TriCasters is so extensive that sources are arranged in two banks, similar to the onscreen user interface. In this arrangement, each button does double duty, depending on which bank is currently being controlled.
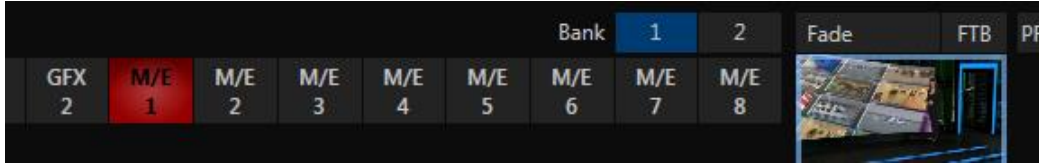
FIGURE 21-2

In the user interface, *Bank 1* is shown by default. Holding down *Alt* on the keyboard reveals *Bank 2* (Figure 21-2). Likewise, hold down *ALT* on the control surface to access the sources assigned to *Bank 2*.

> *Hint: The main Switcher (and M/Es with transition effects assigned) are able to show 'selection hints' beneath their rows when the active selection is in the opposite bank. On the control surface, however, no button is lit when the selection is in the alternate bank.*

Switcher row buttons are mutually exclusive, and the active selection button in the currently active bank remains lit. (The subordinate role of the *DSK* row is subtly reinforced by the use of slightly smaller buttons.)

> *Hint: Hold down CTRL when clicking a button on the PREVIEW row to toggle LiveMatte on/off for that source. Note that the source need not be actually selected on the PREVIEW row to do this, and multi-selections are supported.*

SOURCE BUTTON MAPS

The sources assigned by default to buttons in the different banks on the Control Surface for various TriCaster models are listed in the tables that follow:

8000 CS (TRICASTER 8000/860)

Bank 1

Button	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8	BLACK
A/B C/D	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8	BLACK
UTIL	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8	BLACK
PGM	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8	BLACK
PREV	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8	BLACK

Bank 2 (Press ALT)

Button	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA
A/B C/D	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA
UTIL	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA
PGM	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA
PREV	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA

8000 CS (TriCaster 460)

Bank 1

Button	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	M/E 1	M/E 2	M/E 3	M/E 4	BFR 4	BFR 5	BFR 6	BFR 7	BLACK
A/B C/D	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	M/E 1	M/E 2	M/E 3	M/E 4	BFR 4	BFR 5	BFR 6	BFR 7	BLACK
UTIL	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	M/E 1	M/E 2	M/E 3	M/E 4	BFR 4	BFR 5	BFR 6	BFR 7	BLACK
PGM	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	M/E 1	M/E 2	M/E 3	M/E 4	BFR 4	BFR 5	BFR 6	BFR 7	BLACK
PREV	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	M/E 1	M/E 2	M/E 3	M/E 4	BFR 4	BFR 5	BFR 6	BFR 7	BLACK

Bank 2 (Press ALT)

Button	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A/B C/D	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
UTIL	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PGM	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PREV	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

8000 CS (TriCaster 410, Mini, Mini SDI)

Bank 1

Button	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	NA	NA	NA	NA	BFR 4	BFR 5	BFR 6	BFR 7	BLACK
A/B C/D	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	NA	NA	NA	NA	BFR 4	BFR 5	BFR 6	BFR 7	BLACK
UTIL	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	NA	NA	NA	NA	BFR 4	BFR 5	BFR 6	BFR 7	BLACK
PGM	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	M/E 1	M/E 2	M/E 3	M/E 4	BFR 4	BFR 5	BFR 6	BFR 7	BLACK
PREV	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	M/E 1	M/E 2	M/E 3	M/E 4	BFR 4	BFR 5	BFR 6	BFR 7	BLACK

Bank 2 (Press ALT)

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A/B C/D	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
UTIL	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PGM	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PREV	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

❖ Buttons marked "NA" are not assigned.
❖ Buttons assigned to FX (Green), Gold, Blue and Red toggle the row's membership in a color group.

MAIN DSK DELEGATE
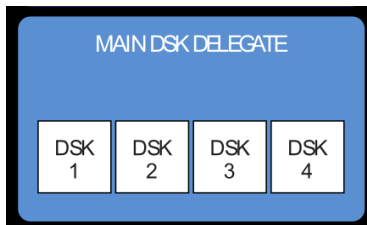
FIGURE 21-3

MAIN DSK DELEGATE button selections govern which *DSK* layer(s) the *row* is currently controlling (or, as viewed from another perspective, it governs which video layers the selected source is assigned to).

Note: Normally, button illumination states are updated when new delegate selections are first made. If settings for multi-selected delegates do not initially match (for example, if DSK1 and DSK 2 have different sources assigned) no buttons are lit on the UTIL row.)

21.3.3 MAIN TRANSITION GROUP

DELEGATE

The controls in this group are similar to those in the corresponding area on the *Live Desktop* (Figure 21-5), performing in much the same manner.

DELEGATE buttons determine what *video layers* the main *Take*, *Auto*, and *T-Bar* affect, and the scope of the *Select* and *Rate* knobs.

On the *Live Desktop*, layers are delegated for control by the main *T-Bar*, *TAKE*, *AUTO* and so on, by clicking the thumbnail monitor for the desired layer (or layers, by using *Ctrl* to multi-delegate). The current delegate state is indicated by a blue border around the thumbnail.
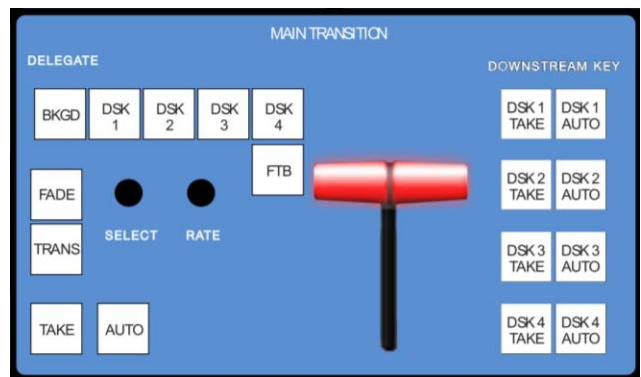
FIGURE 21-4
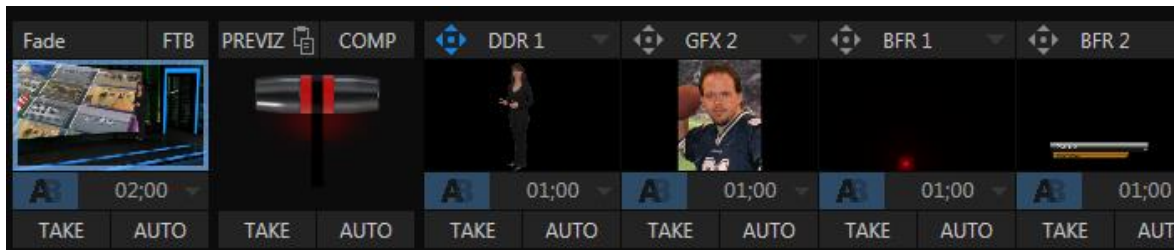
FIGURE 21-5

Similarly, *delegate* buttons on the control surface are lit when active. Multiple selections are performed by pressing one or more buttons at the same time.

<div align="center">FTB</div>

In one departure from the onscreen user interface functionality, note that *FTB* (Fade to Black), though located near the delegates, is <u>not</u> a delegate button – it is an action button. To perform a *Fade to Black* operation simply press the *FTB* button. The fade in/out duration for FTB is derived from the *BKGD* transition setting.

> *Hint: When FTB is displayed on Program Out, it obscures all other Switcher activity. To alert you to this important fact, the FTB button flashes for several seconds if you should make a new TRANSITION DELEGATE selection that does not include FTB.*

<div align="center">TRANSITION BIN CONTROL</div>

While the control surface does not have *Transition Bins* for individual video layers, as the onscreen *Live Desktop* does, it does support selection of transitions and control over their attributes.

SELECT

When a single layer, such as *BKGD*, is selected in the *MAIN TRANSITION > DELEGATE* group on the control surface, rotating the *SELECT* knob cycles the current transitions in the *Transition Bin* for that layer.

When multiple video layers have been delegated, turning *SELECT* affects the transitions for all layers as follows:

- When all delegated layers are currently on the same transition bin 'slot', the selection in the corresponding transition bins simply cycles left or right synchronously.

- Otherwise (when the *Transition Bin* slots for multi-delegated layers are *not* harmonized), rotating the knob moves the selection layer by layer as the knob turns until the selected slots *are* aligned.

- From that point, continuing to twist *SELECT* moves the transition selection in lock step.

The *SELECT* knob also acts as a push button:

- Push *SELECT* to toggle the *Reverse* setting for the *BKGD* transition.

- Push *SHIFT + SELECT* to toggle the *Ping Pong* switch for the *BKGD* transition.

RATE

The *RATE* knob operates in similar fashion to *SELECT*. Rotate the knob to modify the transition Rate for delegated layers. Or press the knob to cycle through the standard Slow, Medium and Fast presets.

Hint: You can assign the A and B rows of M/Es as well as the main PGM and PREV rows to color groups by turning the respective Select and Rate knobs with the Shift button held down.

FADE & TRANS

These two buttons provide a quick way to control the *Transition Bin* selection for the delegated switcher layer(s). The *FADE* and *TRANS* (Transition) buttons are mutually exclusive; selecting either one cancels the other, and only the currently active button remains lit.

Pushing *FADE* offers a quick and convenient way to select the Crossfade transition. Push the *TRANS* button to activate the last-used transition icons for a video layer (or layers. For new sessions, *TRANS* jumps to the first transition in the bin.
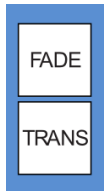
FIGURE 21-6

PERFORMING TRANSITIONS

Just as in the user interface, the TriCaster control surface provides both local and main transition controls.

MAIN T-BAR, TAKE AND AUTO

These controls correspond exactly to their *Live Desktop* counterparts, and affect all currently delegated video layers (*BKGD*, *DSK 1-4*) at the same time.

LOCAL TAKE & AUTO

Again, just as in the *Live Desktop*, local *Take* and *Auto* buttons are provided for *DSK 1 - DSK 4*. These perform a cut or transition respectively, affecting only the corresponding switcher layer.

Hint: When a DSK layer is fully displayed on Program out, its local Take button (on the Live Desktop as well as the control surface) remains lit.

21.3.4 M/E CONTROLS
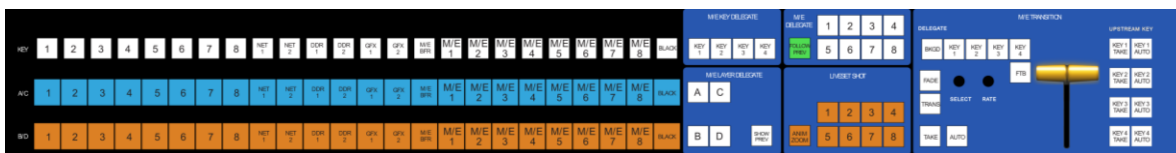
FIGURE 21-7

This section of the control surface corresponds to the tabbed *M/E* pane on the *Live Desktop*.

M/E DELEGATE

As you'd expect, the eight buttons in the *M/E DELEGATE* group (Figure 21-8) are used to select (or multi-select) which *M/E*(s) are being controlled.

Hint: Delegate buttons also toggle the visibility of the M/E pane.
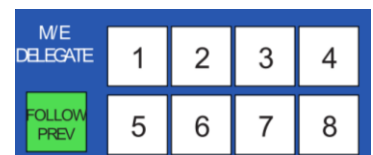
FIGURE 21-8

FOLLOW PREV (PREVIZ)

TriCaster Advanced Edition provides a unique *PREVIZ* feature which is, in essence, a specialized *ninth* M/E (albeit one that is never seen on video output). Among other things, *PREVIZ* serves as a sort of 'scratch-pad' where you can try out various *Main* switcher and *M/E* configurations without risk.

Use SHIFT+ *FOLLOW PREV* button in the *M/E Delegate* group to provide access to *PREVIZ*. See Section 21.3.7 for further details on using your control surface with *PREVIZ*.

M/E LAYER AND KEY DELEGATE
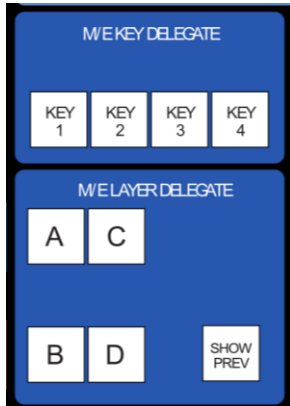
These two delegate button groups control the functionality of the source selection rows at left, allowing you to specify sources for any or all of the video layers of all currently delegated *M/E*(s). Naturally, the *M/E KEY DELEGATE* selection(s) govern the *KEY* row buttons at left.

Just beneath the *KEY* row you will notice two identical rows labeled *A/C* and *B/D*. The result of selections in the *A/C* source row is controlled by the *M/E LAYER DELEGATE* buttons labeled *A* and *C*. Likewise, *B* and *D* buttons in the *M/E LAYER DELEGATE* group govern the *B/D* row.

FIGURE 21-9

SHOW PREV

This buttons toggles the *Tabs Follow All Delegates* option in TriCaster, which in turn causes *M/E Preview* monitor panes to update when a new *M/E Delegate* selection is made.
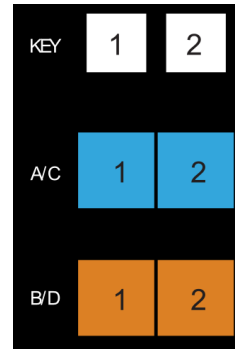
FIGURE 21-10

INPUT ROWS

All three input, or 'source selector' row rows provide buttons for all switcher sources, including each individual *Buffer* and *Black*.

M/E TRANSITION CONTROLS

The final set of delegates *for M/Es* is located in the *M/E TRANSITION* control group (Figure 21-11). This control group is a twin of the *MAIN TRANSITION* group, discussed back in Section 21.3.3. It allows you to manage all layers of a composite effect, or even produce a complete secondary switch for output.
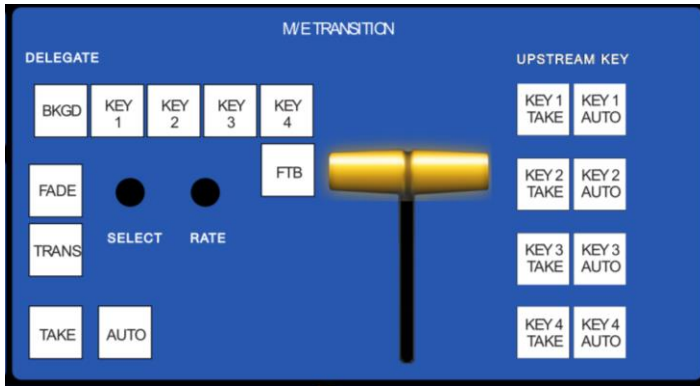
FIGURE 21-11

LIVESET SHOT

In TriCaster Advanced Edition, the *LIVESET SHOT* buttons labeled provide one way to apply *Comps* (see Section 21.3.6). For an *M/E* with a LiveSet effect loaded, the *ANIM ZOOM* button toggles the *CUT* (*Duration*) option for the Background transition duration.

> *Note: The Anim Zoom setting affects the timing of both transition and Comp operations.*

FIGURE 21-12

21.3.5 POSITIONER GROUP
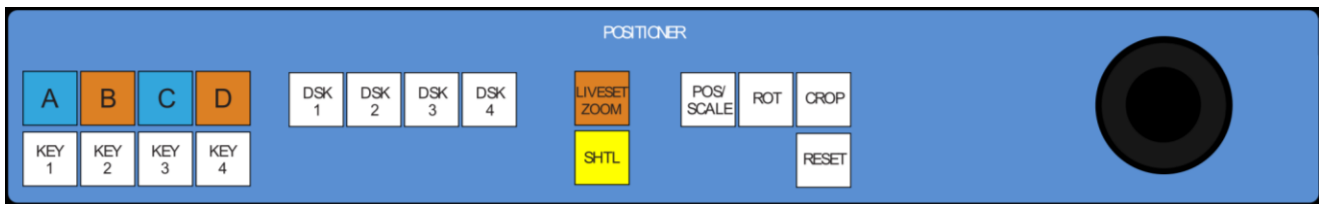
FIGURE 21-13

DELEGATES

The *Positioner* section allows you to adjust position attributes for video layers in the *Switcher* or *M/Es* using the *Joystick*. *Positioner delegates* are in two groups at left.

The first *Positioner delegate* group consists of eight buttons, one for each of the primary *M/E* input layers (A-D) and *KEY* layers. These delegate *Joystick* operations to the corresponding layers in the *M/Es* currently selected *M/Es* in the *M/E DELEGATE* group. The second *Positioner* delegate group relates to the four *DSK* layers of the main *Switcher*.

> *Hint: See Section 21.3.15 for information on controlling PTZ cameras with the joystick.*

The type of operation applied to delegated video layers is further modified by button selections in other sections of the control surface.

> *Hint: For finer control, hold down CTRL when operating the joystick. This will increase its sensitivity by a factor of 10.*
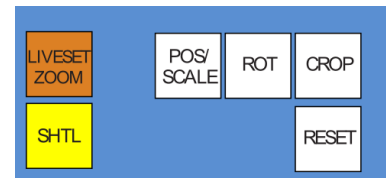
FIGURE 21-14

Two joystick mode buttons are placed separately at left. *LIVESET ZOOM* and *SHTL* (Shuttle) modes are special in that they dedicate the joystick to operations that are not strictly speaking 'position-related'.

> *Hint: The buttons in the other joystick mode group (such as POS/SCALE, discussed shortly) cannot be multi-selected with either LIVESET ZOOM or SHTL.*

LIVESET ZOOM

Selecting *LIVESET ZOOM* assigns the joystick to control the zoom level and pan position of the currently delegated *M/E(s)* when LiveSet effects are employed. Use the *joystick* to control zoom and pan as follows:

- To zoom in/out :
    - Rotate the joystick clockwise/counter-clockwise (as viewed from above)

- To pan:
    - Title the joystick backward, forward, left or right.

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.*

Let's turn now to the members of the second joystick mode delegate group.

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.

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*.

The two special delegate selections also work differently with *RESET:*

- When *VIRTUAL ZOOM* is delegated, the *LiveSet preset* for delegated *M/Es*) is reset to the #1 preset.

- When *SHUTTLE* is delegated, selected *Media Players* are reset to the starting point of the current item (or playlist).

MONITORING

While using the joystick in most *POSITIONER DELEGATE* modes, many adjustments are temporarily shown on the Live Desktop's *Preview monitor*. The *Preview monitor* reverts to its default display a few moments after releasing the joystick to its at-rest position, just as occurs when using *Positioner* tools on the *Live Desktop*.

21.3.6 MANAGING COMPS

Comps are one of the most exciting features of TriCaster Advanced Edition, and your control surface makes it easy to apply and manage them. The 16 *Comps* available for the main *Switcher* or each individual *M/E* are associated with the first sixteen buttons on the *DSK/ KEY* rows of your 8000 CS.

For example, to apply 'Comp 3' to the main *Switcher*, press and hold *CTRL*, then punch the third button on the *DSK* row, then release *CTRL*. The same thing goes for a delegated *M/E* row, save that you will press the appropriate button (from 1-16) in the KEY row.

> *Note: When M/Es are multi-selected, only the lowest index M/E is affected by CS Comp operations.*

You can also store or update the 16 Comps for the currently delegated M/E or main Switcher. To do so, press *SHIFT + CTRL* along with the *DSK/ KEY* row button corresponding to the target *Comp*.

21.3.7 PREVIZ

- To transfer the current state of the main *Switcher* to *PREVIZ*, press *CTRL* + the *BKGD* delegate button (located in the Transition control group). Note that for multi-selected M/Es, the state of the lowest numbered M/E only is sent to *PREVIZ*.

- To fetch the current PREVIZ state back to the main *Switcher*, press *SHIFT + CTRL* along with the *Switcher* BKGD button.

> *Hint: As mentioned previously, press FOLLOW PVW in the M/E Delegate to delegate the M/E rows to PREVIZ.*

21.3.8 MEDIA PLAYERS

DELEGATE GROUP
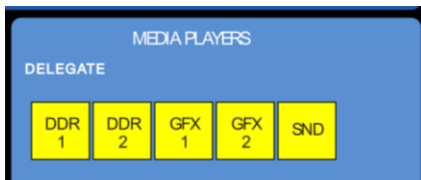
FIGURE 21-15

The *DELEGATE* group contains buttons for TriCaster's *DDR1, DDR2, GFX1, GFX2*, and *SND* (Sound) modules.

This selection determines which *Media Player* is being controlled at the moment. (Support for multi-selection allows you to do things like start and stop both *DDRs* at the identical moment.)

PREV/NEXT PRESET
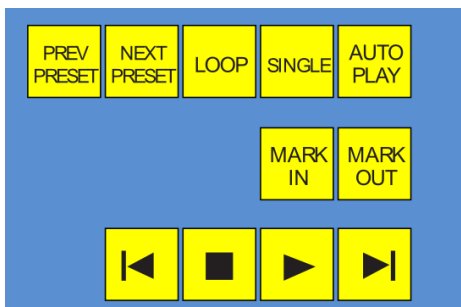
FIGURE 21-16

These two buttons let you to cycle backwards or forwards respectively through existing presets for the delegated *Media Player*.

Click these buttons to set the *in point* or *out point* for the current playlist item in delegated players to the current frame. Press *SHIFT* with the button to reset the end point to its full limit.

TRANSPORT CONTROL

- |◄ (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.)

MEDIA PLAYER OPTIONS

LOOP, *SINGLE*, and *AUTOPLAY* are mode buttons, and toggle the corresponding setting for all delegated *Media Players* as appropriate (for example, *the Sound player* has no *Autoplay* feature, so logically AUTOPLAY does not affect it).

> *Hint: Single, on by default in new TriCaster sessions, has the effect of turning the Playlist mode button in the user interface off.*

21.3.9 RECORD GROUP

Three buttons labeled *REC*, *STRM*, and *GRAB* are located in the *RECORD* group.

FIGURE 21-17

- *REC* – Pressing this button enables TriCaster's *Record* feature. As a safety measure, pressing the *REC* button when recording is underway does <u>not</u> stop recording.
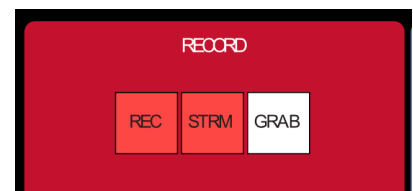
  Instead, the *SHIFT* button flashes to reminds you that you must hold it down at the same time as pushing *REC* to end recording.

- *STRM* (Stream) – Push to enable or disable TriCaster's live streaming feature.

- *GRAB* – Push to store snapshots from sources assigned in TriCaster's *Grab Configuration* panel.

> *Note: The 'Add to' (DDR) feature in the Record Configuration > Replay tab can be triggered by holding down CTRL while pressing the numbered button on the PGM row that corresponds to the specific recorder desired.*

21.3.10 SPECIAL BUTTONS

The *SHIFT*, *CTRL* and *ALT* buttons provided on the control surface support extended features and future expansion. To the extent that these buttons are currently assigned, they are described in context.
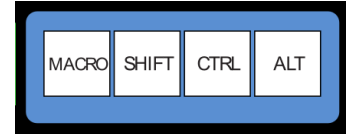
Note: You can disable most 8000 CS buttons to prevent accidental use when this would be desirable. Hold down *MACRO + SHIFT for a few seconds to light any currently locked buttons, or to toggle the locked/unlocked state of a button.

21.3.11 MACRO

The last button we will discuss offers spectacular convenience. TriCaster's powerful macro system is fully addressable from 8000CS. A macro can be assigned to any button on the control surface in much the same manner as it can be assigned to a keyboard button. The steps are as follows:

1. On TriCaster's *Live Desktop*, open the *Macro Configuration Editor*.
2. Select the macro you wish to assign in the onscreen lister.
3. Click the mouse in the *Listen* field at bottom left.
4. Hold down the *MACRO* button and press a suitable button on the control surface.

That's it – you can close the *Macro Configuration Panel* and test the result. To play back the macro at any time, press the *MACRO* button along with the assigned key.

21.3.12 T-BAR ILLUMINATION

TriCaster 8000CS uses colorful illumination to provide feedback and status updates your control surface selections and operations. The lighting schemes for both the M/E and MAIN TRANSITION T-Bars reinforce the 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.

21.3.13 M/E TRANSITION – LIGHTING

Control surface T-Bar illumination largely conforms to *M/E tab* color 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
Blue	Aqua	Soft Pink	Cinnabar	Dark Blue	Bright Pink	Chartreuse	Magenta

1. If *BKGD* is delegated alone, the *T-Bar* color is as shown in the table above, identifying which *M/E* is delegated in the *M/E DELEGATE* group. (When multiple *M/Es* are delegated, the first selected delegate determines the color.)

2. This color is at its brightest when the *A* source (effectively the *Program* row for a *Mix* 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.

3. In a mixed delegate situation (*BKGD* along with one or more *KEY* layers) the *T-Bar* is lit it medium blue, and conforms to the *BKGD* behavior described above.

4. 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.

21.3.14 MAIN TRANSITION

1. Just as you would expect, the illumination of this *T-Bar* uses red-green coloration, standard color coding for *Program* and *Preview* rows.

2. As for *M/Es*, described earlier, *DSK*-only delegate operations result in the *T-Bar* being lit in purple.

3. Mixed mode (*BKGD* plus *DSK* delegates) likewise result in blue illumination, just like the *T-Bar* behavior previously described for *M/Es*.

21.3.15 PTZ CONTROL

Pan, tilt, zoom control over connected robotic cameras is also provided using the joystick.

> *Note: Joystick operations do not affect stored PTZ preset values.*

To delegate the joystick to control a PTZ camera assigned to a specific TriCaster input, hold down *SHIFT* button on the control surface and press a button (*1-8*) in the *M/E Delegate* group. (Afterward, the button corresponding to the current PTZ camera selection will light whenever *SHIFT* is pressed.)

- Pan: With *SHIFT* depressed, tilt the joystick left-right.

- Tilt: With *SHIFT* depressed, tilt the joystick backward-forward.

- Zoom: With *SHIFT* depressed, twist the joystick clockwise or counter-clockwise.

- Focus: When *Auto* is off, and with *SHIFT + CTRL* both pressed, twist the joystick clockwise or counter-clockwise.

    o *Auto Focus* toggle: With *SHIFT + CTRL* held down, press the joystick button.

- Preset selection: Press *CTRL + LIVESET SHOT (1-8)* to choose a preset for the selected camera.

- Press *CTRL + RATE* (*M/E Transition* group) to adjust the camera's *Animation Speed*.

Hold down *SHIFT* and press the top joystick button to update the current *PTZ preset* (position, zoom and thumbnail icon).

The principle difference between these two control surfaces is the number of video inputs directly supported on their Main Switcher and M/E button rows. As well, a few control groups are in slightly different locations on the two control surfaces.

Apart from these distinctions, these two control surfaces correspond to one another quite closely, which will allow us to treat them simultaneously in the following discussion.

Hint: Since the expansion of sources available in (NDI-enabled) TriCaster Advanced Edition, some TriCaster 460 operators may prefer the 8000 CS and 860 CS over the 460 CS, given the greater number of Switcher and M/E row buttons.

21.4.1 OVERVIEW

The control layout on these two surfaces closely follows that of the *standard* TriCaster user interface. For TriCaster Advanced Edition, however (with its additional NDI source and other options), their capabilities have been extended by remapping various controls.

The controls are comprised of grouped sets including the following hardware types:

- Backlit push buttons
- Twist knobs
- T-bar
- 3-axis joystick
- LED indicators

21.4.2 SPECIAL BUTTONS

FIGURE 21-19

The *SHIFT* and *CTRL* buttons provided on the control surface support extended features, including *Switcher* row *Bank* selection, and future expansion. To the extent that these buttons are currently in use, they have been described in context.

Note: You can disable most CS buttons to prevent accidental use when this would be desirable. Hold down MACRO + SHIFT for a few seconds to light any currently locked buttons, or to toggle the locked/unlocked state of a button. (For an older CS lacking a Macro button, substitute ALT.)

FIGURE 21-20

The last button in this group offers spectacular convenience. A TriCaster macro can be assigned to any button on the control surface in much the same manner as it can be assigned to a keyboard button. The steps are as follows:

5. On TriCaster's *Live Desktop*, open the *Macro Configuration Editor*.
6. Select the macro you wish to assign in the onscreen lister.
7. Click the mouse in the *Listen* field at bottom left.
8. Hold down the MACRO button and press a suitable button on the control surface.

That's it – you can close the desktop *Macro* configuration panel and test the result. To play back the macro at any time, press the *MACRO* button along with the assigned key.

21.4.3 DELEGATES AND SYNCHRONIZATION

Both TriCaster's *Live Desktop* and the control surface supply *delegate* button groups to govern other controls. This is done both to extend the capability of other controls, and to support multi-selections – resulting in simultaneous operations.

When initially selecting multiple delegates, as often as not the settings and states of the individual members selected will vary. For example, when you delegate several *M/Es* at once, the *Overlay Transition Rate* of each member of the multi-selection could be different.

Generally, wherever it makes sense to do so, when you make adjustments to settings for multi-delegated groups, the settings will be progressively synchronized. For example:

- The *Zoom Rate* for M/E1 is "S"; M/E 2 is set to "M"; M/E 3's *Zoom Rate* is "F".
- You multi-delegate these three *M/Es*.
- You push the *Zoom Rate* button once. The rate for M/E 1 increments to "M". (M/E 2 and 3 are not affected.)
- You push the *Zoom Rate* button again. The rate for M/E 1 and M/E 2 are incremented to "F"; the *Zoom Rate* for all three delegated *M/Es* is now synchronized.

You will see this synchronization method applied to the following controls:

- Media Players > Loop, Autoplay and Single
- Transition>Rate
- Transition>Select
- M/E > (Overlay) Trans Rate
- M/E > (Overlay) Trans Select
- M/E > Zoom Rate
- M/E > Overlay display state

21.4.4 SWITCHER SOURCE CONTROLS

The control surface presents buttons representing various video source selections on its DSK, P*ROGRAM* and P*REVIEW* rows.

FIGURE 21-21

BANKS

The number of sources available in NDI-enabled TriCasters is so extensive that sources are arranged in two banks, just as in the onscreen user interface. In this arrangement, each button does double duty, depending on which bank is currently being controlled.

FIGURE 21-22

In the user interface, *Bank 1* is shown by default. Holding down *Alt* on the *keyboard* reveals *Bank 2* (Figure 21-2). As neither 860 CS nor 460 CS have *ALT* buttons, hold down *SHIFT* on the control surface to access the sources available in its second bank.

> *Note: By default, however, CS input labels have been respected (wherever possible), which means that the CS banks inevitably differ from those shown onscreen.*

PROGRAM AND PREVIEW

Switcher source buttons are mutually exclusive. In the user interface, the main Switcher (and M/Es with transition effects assigned) are able to show 'selection hints' beneath their rows when the active selection is in the opposite bank. On the control surface, however, no button is lit when the active selection is not in the currently controlled bank.

> *Hint: Hold down CTRL when clicking a button on the PREVIEW row to toggle LiveMatte on/off for that source. Note that the source need not be actually selected on the PREVIEW row to do this.*

UTIL (UTILITY) ROW

UTIL row buttons are also mutually exclusive. Their subordinate role is subtly reinforced by the use of slightly smaller buttons. Broadly speaking, source options conform to *Program* and *Preview* row mapping by product, with some limitations due to the number of buttons available on the surface.

UTIL BUS DELEGATE

FIGURE 21-23

UTIL BUS DELEGATE (Figure 21-23) button selections govern which *switcher layers* the *UTIL row* is currently controlling; or, from another perspective, which video layers the selected source is assigned to. The *AUX OUT* button corresponds to the *Output 2* source, while *FX* controls Switcher or M/E rows delegated to the Green (FX) group.

Note: Normally, button illumination states are updated when new delegate selections are first made. If settings for multi-selected delegates do not initially match (for example, if DSK1 and DSK 2 have different sources assigned) no buttons are lit on the UTIL row.)

M/E SOURCE ROWS

Just as in the *Live Desktop*, the *KEY* selection in the *M/E* group determines the source for the *KEY* layers of an *M/E*. However, since the control surface supports selection of multiple *M/Es* simultaneously, operations can affect more than one *M/E* at a time.

FIGURE 21-24

Likewise, *A* (Input A) and *B* (Input B) row selections determine sources for those layers for delegated *M/Es*.

Hint: Hold down the CTRL button to select sources for the C and D rows when an effect in an M/E supports these.

SOURCE BUTTON MAPS

The sources assigned to buttons in the different input rows on the Control Surface for various TriCaster models are listed in the tables that follow:

860 CS (TRICASTER 8000/860)

Bank 1

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	BLACK	FX							
A/B C/D	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	BLACK	FX							
UTIL	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	BLACK								
PGM	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	BLACK	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8
PREV	1	2	3	4	5	6	7	8	9	10	DDR 1	DDR 2	GFX 1	GFX 2	BFR 1	BLACK	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8

Bank 2 (Press Shift)

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8	NA							
A/B C/D	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8	NA							
UTIL	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8								
PGM	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	GOLD	BLUE	RED	NA	NA	NA	NA	NA
PREV	11	12	BFR 2	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	GOLD	BLUE	RED	NA	NA	NA	NA	NA

860 CS (TRICASTER 460)

Bank 1

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLACK	FX							
A/B C/D	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLACK	FX							
UTIL	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLACK								
PGM	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLACK	M/E 1	M/E 2	M/E 3	M/E 4	NA	NA	NA	NA
PREV	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLACK	M/E 1	M/E 2	M/E 3	M/E 4	NA	NA	NA	NA

Bank 2 (Press Shift)

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	M/E 1	M/E 2	M/E 3	M/E 4	GOLD							
A/B C/D	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	M/E 1	M/E 2	M/E 3	M/E 4	GOLD							
UTIL	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	M/E 1	M/E 2	M/E 3	M/E 4								
PGM	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	NA	NA	NA	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA
PREV	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	NA	NA	NA	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA

860 CS (TRICASTER 410, MINI, MINI SDI)

Bank 1

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLK	FX							
A/B C/D	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLK	FX							
UTIL	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLK								
PGM	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLK	M/E 1	M/E 2	M/E 3	M/E 4	NA	NA	NA	NA
PREV	1	2	3	4	5	6	7	8	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	BFR 3	BLK	M/E 1	M/E 2	M/E 3	M/E 4	NA	NA	NA	NA

Bank 2

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KEY	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA							
A/B C/D	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA							
UTIL	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED								
PGM	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA
PREV	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BFR 9	BFR 10	BFR 11	BFR 12	BFR 13	BFR 14	BFR 15	FX	GOLD	BLUE	RED	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

- ❖ Buttons marked "NA" are not assigned.

- ❖ Buttons assigned to FX (Green), Gold, Blue and Red toggle the row's membership in a color group.

- ❖ The M/E KEY row provides the ability to change the source for the KEY 1 layer <u>only</u>.

460 CS (TriCaster 8000/860)

Bank 1

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
KEY	1	2	3	4	5	6	DDR 1	DDR 2	GFX 1	GFX 2	FX			
A/B C/D	1	2	3	4	5	6	DDR 1	DDR 2	GFX 1	GFX 2	FX			
UTIL	1	2	3	4	5	6	DDR 1	DDR 2	GFX 1	GFX 2				
PGM	1	2	3	4	5	6	DDR 1	DDR 2	GFX 1	GFX 2	M/E 1	M/E 2	M/E 3	M/E 4
PREV	1	2	3	4	5	6	DDR 1	DDR 2	GFX 1	GFX 2	M/E 1	M/E 2	M/E 3	M/E 4

Bank 2 (Press SHIFT)

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
KEY	7	8	9	10	11	12	M/E 1	M/E 2	M/E 3	M/E 4	BLACK			
A/B C/D	7	8	9	10	11	12	M/E 1	M/E 2	M/E 3	M/E 4	BLACK			
UTIL	7	8	9	10	11	12	M/E 1	M/E 2	M/E 3	M/E 4				
PGM	7	8	9	10	11	12	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8
PREV	7	8	9	10	11	12	M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8

460 CS (T<small>RI</small>C<small>ASTER</small> 460)

Bank 1

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
KEY	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	FX			
A/B C/D	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	FX			
UTIL	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2				
PGM	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	M/E 1	M/E 2	M/E 3	M/E 4
PREV	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	M/E 1	M/E 2	M/E 3	M/E 4

Bank 2 (Press SHIFT)

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
KEY	5	6	7	8	BFR 3	BFR 4	M/E 1	M/E 2	M/E 3	M/E 4	BLACK			
A/B C/D	5	6	7	8	BFR 3	BFR 4	M/E 1	M/E 2	M/E 3	M/E 4	BLACK			
UTIL	5	6	7	8	BFR 3	BFR 4	M/E 1	M/E 2	M/E 3	M/E 4				
PGM	5	6	7	8	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BLACK	FX	GOLD	BLUE
PREV	5	6	7	8	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BLACK	FX	GOLD	BLUE

460 CS (T<small>RI</small>C<small>ASTER</small> 410, M<small>INI</small>, M<small>INI</small> SDI)
Bank 1

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
KEY	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	FX			
A/B C/D	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	FX			
UTIL	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2				
PGM	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	M/E 1	M/E 2	M/E 3	M/E 4
PREV	1	2	3	4	BFR 1	BFR 2	DDR 1	DDR 2	GFX 1	GFX 2	M/E 1	M/E 2	M/E 3	M/E 4

Bank 2 (Press SHIFT)

Button #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
KEY	5	6	7	8	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BLACK			
A/B C/D	5	6	7	8	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BLACK			
UTIL	5	6	7	8	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8				
PGM	5	6	7	8	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BLACK	BFR 9	BFR 10	BFR 11
PREV	5	6	7	8	BFR 3	BFR 4	BFR 5	BFR 6	BFR 7	BFR 8	BLACK	BFR 9	BFR 10	BFR 11

- ❖ Buttons marked "NA" are not assigned.
- ❖ Buttons assigned to FX (Green), Gold, Blue and Red toggle the row's membership in a color group.
- ❖ The M/E KEY row provides the ability to change the source for the KEY 1 layer <u>only</u>.

21.4.5 TRANSITION GROUP

The controls in this group (Figure 21-25) are analogous to those in the eponymous group in user interface, performing the same functions in much the same manner.

(In one deviation from the *Live Desktop,* switcher layer positioning is provided by a single, shared set of *Positioner* tools, discussed later.)

TRANSITION DELEGATE

As on the *Live Desktop*, active *delegate* buttons remain lit. Multiple selections can be performed by pressing one or more buttons at the same time. *DELEGATE* buttons determine what *video layers* the main *Take*, *Auto*, and *T-Bar* affect, and the scope of the *Select* and *Rate* knobs.

FIGURE 21-25

> Hint: Use SHIFT with DSK 1 and DSK 2 to access DSK 3 and 4.

M/E | FTB

As a convenience, it is possible to re-purpose the entire *TRANSITION* control group to control M/Es rather than main Switcher controls. To do this, press the *M/E* button at bottom right in this section.

While the *M/E* button is lit, the *BKGD* and *DSK* delegate buttons, along with other controls in the *TRANSITION* group that correspond to existing M/E and M/E KEY layers and effects, are diverted to the currently delegated M/Es. (Add *SHIFT* with *DSK* buttons to access *M/E KEY* layers 3 and 4.)

Note that when you hold down *SHIFT* while pressing this button, an *FTB* (Fade to Black) operation is performed instead. (*FTB* has no dedicated transition controls; its fade in/out duration is derived from the *BKGD* transition setting.)

> Hint: When FTB is displayed on Program Out, it obscures all other Switcher activity.

TRANSITION BIN CONTROL

The control surface does not have *Transition Bins* for the different video layers as such, but can nevertheless control the transition selection and attributes for delegated video layers.

SELECT

When a single layer, such as *BKGD*, is selected in the *TRANSITION DELEGATE* group on the control surface, rotating the *SELECT* knob cycles the current transitions in the Transition Bin for that layer.

When multiple video layers have been delegated, turning *SELECT* affects the transitions for all layers as follows:

- When all delegated layers are currently on the same transition bin 'slot', the selection in the corresponding transition bins simply cycles left or right synchronously.

- Otherwise (when the *Transition Bin* slots for multi-delegated layers are *not* matched), rotating the knob moves the selection layer by layer as the knob turns until the selected slots *are* aligned. From that point, continuing to twist *SELECT* moves the transition selection in lock step.

The *SELECT* knob also acts as a push button:

- Push *SELECT* to toggle the *Reverse* setting for the *BKGD* transition.
- Push *SHIFT + SELECT* to toggle the *Ping Pong* switch for the *BKGD* transition.

RATE

The *RATE* knob operates in similar fashion to *SELECT*. Rotate the knob to modify the transition *Rate* for delegated layers. Or press the knob to cycle through the standard *Slow*, *Medium* and *Fast* presets. Multi-delegate selections are handled the same as for *Select* (for both twist and push operations).

> *Hint: You can assign the A and B rows of M/Es as well as the main PGM and PREV rows to color groups by turning the respective Select and Rate knobs with the CTRL button held down.*

FADE & TRANS

FIGURE 21-26

These two buttons provide a quick way to control the *Transition Bin* selection for the delegated switcher layer(s). The FADE and TRANS (Transition) buttons are mutually exclusive; selecting either one cancels the other, and only the currently active button remains lit.

Pushing *FADE* offers a quick and convenient way to select the Crossfade transition. Push the TRANS button to activate the last-used transition icons for a video layer (or layers. For new sessions, TRANS jumps to the first transition in the bin.

PERFORMING TRANSITIONS

Just as in the user interface, the TriCaster control surface provides both local and main transition controls.

MAIN T-BAR, TAKE AND AUTO

These controls correspond exactly to their *Live Desktop* counterparts, and affect all currently delegated video layers (*BKGD*, *DSK 1*, *DSK 2*, or *FTB*) at the same time.

Note that two small LEDS are situated near the left side of the T-*Bar* – one at each extreme of its stroke. When a transition is in progress (or is halted partway), one LED is illuminated. This LED marks which direction to push the T- to complete the current transition.

LOCAL TAKE/AUTO

Local *Take* and *Auto* buttons are provided for *DSK 1* and *DSK 2*, but not *FTB*. These perform a cut or transition respectively, affecting only the corresponding switcher layer.

> Hint: When a DSK layer is fully displayed on Program out, its local Take button (on the Live Desktop as well as the control surface) remains lit.

21.4.6 M/E CONTROL GROUP

This section of the control surface corresponds to the tabbed *M/E p*anes on the *Live Desktop*.
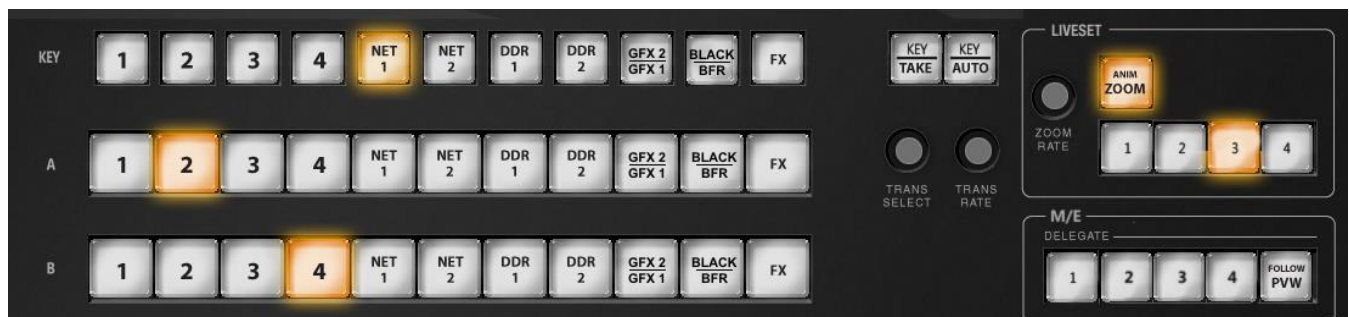

FIGURE 21-27

In contrast with the *Live Desktop*, your TriCaster CS adjusts position attributes *M/E* video layers using a single set of *Positioner* tools governed by *Delegate* controls (see Section 21.4.7).

> Note: Refer to charts under the sub-heading Source Button Maps in Section 21.4.4 to view the various sources assigned to these buttons in the different banks for various TriCaster models.

M/E DELEGATE

Your TriCaster CS provides an *M/E DELEGATE* button group to govern which *M/E(s)* are affected by operations. Selected *DELEGATE* buttons are illuminated and, conveniently, multiple selections are supported.

> Hint: When using a 460 CS with a 4RU TriCaster, add SHIFT to extend delegate selections.

FOLLOW PVW (PREVIZ)

TriCaster Advanced Edition provides a unique PREVIZ feature which is, in essence, a specialized *ninth* M/E (albeit one that is never seen on video output). Among other things, PREVIZ serves as a sort of 'scratch-pad' where you can try out various main *Switcher* and *M/E* configurations without risk.

- Punch SHIFT+ *FOLLOW PREV* in the M/E Delegate group to assign the *M/E* rows and controls to *PREVIZ*.

- To transfer the current state of an *M/E* to *PREVIZ*, press *CTRL* with the *BKGD* delegate button (this operation this requires the main *Transition* control group at front right to be assigned to *M/E* control). Note that for multi-selected M/Es, the state of the lowest numbered M/E only is sent to *PREVIZ*.

- To fetch the current PREVIZ state back to an *M/E*, press *SHIFT + CTRL* along with the (*Transition* group) *BKGD* button. This operation this requires the main *Transition* control group at front right to be assigned to *M/E* control.

<div align="center">M/E OVERLAY TRANSITIONS</div>

KEY TRANSITION SETTINGS

Rotate the *TRANS SELECT* knob with *SHIFT* pressed to cycle the transition bin selection through transitions currently available in the *Transition Bin* for the first *Key* layer. Use *SHIFT* with the *TRANS RATE* knob to modify the duration. Press the knob to cycle through the standard *Slow*, *Medium* and *Fast* presets.

> *Hint: Rotate the TRANS SELECT and TRANS RATE knobs with CTRL pressed to assign the A and B rows, respectively, for delegated M/E(s) to color groups.*

TAKE, AUTO AND KEY

For an *M/E* in *Mix* mode, the *TAKE* and *AUTO* perform the named operation between A and B input layers, treating the former as "program" and the latter as "preview" sources.

Press SHIFT + TAKE to show or hide the first *KEY* layer for currently delegated *M/Es*. Similarly, *SHIFT + AUTO* will transition the first *KEY* layer.

> *Hint: See also the sub-heading "M/E | FTB" in Section 21.4.5 for information on using main Switcher controls to govern M/Es in greater depth.*

<div align="center">LIVESET ZOOM</div>

FIGURE 21-28

In the TriCaster standard edition, the buttons labeled *1-4* (or *8*) select a LiveSet Zoom *Preset* for the currently delegated *M/E*.

ADVANCED EDITION PROVIDES A MUCH LARGER NUMBER OF PRESETS (COMPS OR PRESETS, DEPENDING ON THE TRICASTER MODEL). FOR EASE OF ACCESS AND CONSISTENCY ACROSS

- Hold down *CTRL,* and press one of the buttons on the *KEY* row (in the *M/E* section) to apply the corresponding *Comp* or *Preset.*

- Add *SHIFT* to the operation above to store or update the settings of a *Comp* or *Preset.*

When a LiveSet effect is loaded in the delegated *M/E* , the *ANIM ZOOM* button serves to toggle the *CUT* (*Duration*) option for the *Background* transition duration. Otherwise, the duration of animated zooms is determined by the *ZOOM RATE* setting. Rotate the knob to modify the duration of the effect, or push it to jump to a preset duration (Slow, Medium or Fast).

21.4.7 POSITIONER GROUP

FIGURE 21-29

POSITIONER DELEGATE

The *Positioner* section allows you to adjust position attributes for overlay and video layers using the *Joystick*. The *DELEGATE* group includes seven buttons. In some cases, the scope of application for a *DELEGATE* selection is further modified by button selections in other sections of the control surface.

For example:

- The *M/E A* and *B* buttons delegate *Joystick* operations to *Input A* and *Input B* of the *M/Es* currently selected in the *M/E DELEGATE* group.

- Similarly, the *M/E KEY* button assigns the *Joystick* to control position attributes for the first *KEY* layer of currently delegated *M/Es.*

- Again, selecting *VIRTUAL* ZOOM tells the *Joystick* to control the zoom level of the currently delegated *M/Es.* The *joystick mode* buttons (such as *POS/SCALE*, discussed shortly) are not lit when the *POSITIONER DELEGATE* selection is *VIRTUAL* ZOOM*.*

Use the *joystick* to control *Virtual Zoom as* follows:

- o To zoom in:
  - ▪ Push the joystick forward (as viewed from above), or twist the joystick clockwise.
- o To zoom out:
  - ▪ Pull the joystick back (as viewed from above, or twist the joystick counter-clockwise.

- Push *SHUTTLE* to delegate the *joystick* to shuttle the *Media Player(s)* currently selected in the *MEDIA PLAYERS DELEGATE group.* Use *CTRL* with the joystick for slower and more accurate shuttle speed. *Joystick mode* buttons are not lit when *SHUTTLE* is delegated.

Use the *joystick* to control *Virtual Zoom as* follows:

- o To *shuttle* delegated *Media Players*, move the *joystick* horizontally (as viewed from above).

The *DSK 1* and *DSK 2* delegate buttons provide direct selection for these video layers, and are *not* modified by selections elsewhere.

> *Note: Two of the delegates (VIRTUAL ZOOM and SHUTTLE) are set apart from their siblings. This is because neither of these options supports multi-selection (with other Positioner delegates) like the rest. (Nevertheless, you can zoom multiple M/Es simultaneously when these are selected in the M/E DELEGATE group, or shuttle several delegated Media Players.)*

<div align="center">JOYSTICK MODES</div>

Generally, changes resulting from joystick operations are governed by the current *Joystick Mode*. Mode selections are mutually exclusive (only one buttons is illuminated at a time).

Also note that when the active *Positioner DELEGATE* is either *Virtual Zoom* or *Shuttle*, the *Joystick Mode* is irrelevant, and is ignored.

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)

*W*hen the *POSITIONER DELEGATE* selection is anything other than *VIRTUAL* ZOOM or *SHUTTLE*:

- 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

Except when the *POSITIONER DELEGATE* selection is *VIRTUAL* ZOOM or *SHUTTLE*:

- Twist the *joystick* clockwise (as viewed from above) to crop delegated sources inward on all 4 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.

Hint: For finer control, hold down CTRL when operating the joystick. This will increase its sensitivity by a factor of 10.

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*.

The two special delegate selections also work differently with *RESET:*

- When *VIRTUAL* ZOOM is delegated, the Zoom preset for delegated *M/Es*) is reset to the #1 preset.
- When SHUTTLE is delegated, selected *Media Players* are reset to the starting point of the current item (or playlist).

MONITORING

While using the joystick in most *POSITIONER DELEGATE* modes, many adjustments are temporarily shown on the Live Desktop's *Preview monitor*. The *Preview monitor* reverts to its default display a few moments after releasing the joystick to its at-rest position.

21.4.8 MEDIA PLAYER GROUP

FIGURE 21-30

The *MEDIA PLAYER DELEGATE* group contains buttons for TriCaster's *DDR 1*, *DDR 2*, *GFX 1*, *GFX 2* (Press *SHIFT* with *GFX* to delegate *GFX 2* on the 460 CS), and *SOUND* modules. This selection determines which *Media Player* is being controlled at the moment. (Support for multi-selection allows you to do things like start and stop both *DDRs* at the identical moment.)

PREV/NEXT PRESET

These two buttons let you to cycle backwards or forwards respectively through existing presets for the delegated *Media Player*.

TRANSPORT CONTROL

- |◀ (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.)

MEDIA PLAYER OPTIONS

LOOP, *SINGLE*, and *AUTOPLAY* are mode buttons, and toggle the respective settings for all delegated *Media Players* as appropriate (for example, *Sounds* has no *Autoplay* feature, so logically *AUTOPLAY* does not affect it).

21.4.9 RECORD GROUP

FIGURE 21-31

Three buttons labeled *REC*, *STRM,* and *GRAB* are located in the *RECORD* group.

- *REC* – Pressing this button enables TriCaster's *Record* feature. As a safety measure, pressing the *REC* button when recording is underway does <u>not</u> stop recording.   Instead, the *SHIFT* button flashes to remind you that you must hold it down while pushing *REC* to end recording.

- *STREAM* – Push to enable or disable TriCaster's live streaming feature.
- *GRAB* – Push to store one or more still images from one or more outputs (as configured in TriCaster's *Grab Configuration* panel).

Note: The 'Add to' (DDR) feature in the Record Configuration > Replay tab can be triggered by holding down CTRL while pressing the numbered button on the PGM row that corresponds to the specific recorder desired.

21.4.10 PTZ CONTROL

Joystick control over pan, tilt, and zoom for connected robotic cameras is also provided.

Note: Joystick operations do not affect stored PTZ preset values.

To delegate the joystick to control a PTZ camera assigned to a specific TriCaster input, hold down *SHIFT* button on the control surface and press a button in the *M/E Delegate* group. (Afterward, the button corresponding to the current PTZ camera selection will light whenever SHIFT is pressed.)

- Pan: With *SHIFT* depressed, tilt the joystick left-right.

- Tilt: With *SHIFT* depressed, tilt the joystick backward-forward.

- Zoom: With *SHIFT* depressed, twist the joystick clockwise or counter-clockwise.

- Focus: When *Auto* is off, and with *SHIFT + CTRL* both pressed, twist the joystick clockwise or counter-clockwise.

    o *Auto Focus* toggle: With *SHIFT + CTRL* held down, press the joystick button.

- Preset selection:

    o Use CTRL + *LIVESET SHOT (1-4)*; *add SHIFT* to the above for presets (5-8).

- Press *CTRL + LIVESET ZOOM RATE* to adjust the camera's *Animation Speed*.

- Hold down *SHIFT* and press the top joystick button to update the current *PTZ preset* (position, zoom and thumbnail icon).

FIGURE 21-32

TriCaster 40 CS™ was initially designed for TriCaster 40 (not covered in this Guide), and its physical button labels reflect that layout. TriCaster Mini CS is virtually identical, but has an updated label set designed for TriCaster 40 version 2.

Although designed to support the TriCaster Mini, Mini SDI, 410, and 460 models, these units have been extended to work with *any* TriCaster model running Advanced Edition. This makes them suitable as convenient mobile or backup units.

21.5.1 DELEGATES AND SYNCHRONIZATION

Delegate button groups govern other controls on the control surface. Some delegates support multi-selection, allowing simultaneous operations to be performed. When initially selecting multiple delegates, as often as not the settings and states of the individual members selected will vary. For example, when you delegate both DSK's at once in the *TRANSITION DELEGATE* group, the *RATE* for current transitions for the two DSKs could well be different.

Generally, wherever it makes sense to do so, when you make adjustments to settings for multi-delegate features, the settings will be progressively synchronized, then advance in lock step.

21.5.2 SWITCHER DELEGATES

FIGURE 21-33

This delegate group dictates what the *FX/OVERLAY*, *PROGRAM* and *PREVIEW* rows will control, and also affects the transition (TAKE, AUTO and T-Bar) area. The options are mutually exclusive – that is, multiple selections are not supported. Choose one of:

- *MAIN*
- M/E 1
- M/E 2
- M/E 3
- M/E 4

(For 4RU models, press SHIFT + M/E 1-4 to delegate M/Es 5-8).

<div align="center">

MAIN
</div>

FX/OVERLAY ROW

When *MAIN* is selected in the *SWITCHER DELEGATE* group, operations in this row are further modified by the *OVERLAY DELEGATE* selection in the Transition (T-Bar) group. For example:

FIGURE 21-34

- When *MAIN* is selected in the *SWITCHER DELEGATE* group, if *DSK 1, DSK2,* or both are lit, making a selection on the *FX/OVERLAY* row sets the source for the related channel(s). (Add SHIFT with DSK 1 to access DSK 3, or when pressing DSK 2 to select DSK 4.)

- If *BKGD* alone is lit, a button selection in the *FX/OVERLAY* row assigns the 'FX' source (this is the same as setting the source assigned to the *Green switcher* row group).

- *FTB* is an action button, not a delegate. Press *ALT* with *FTB* to perform an (*Auto*) *Fade to Black* operation (use *SHIFT* instead to *TAKE FTB).*
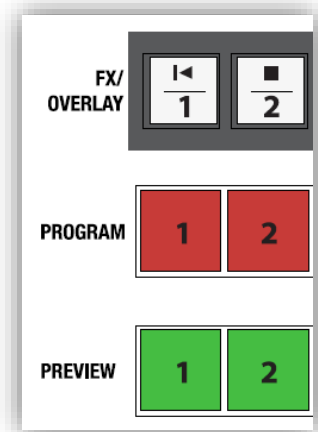
PROGRAM AND PREVIEW

As you would expect, when *MAIN* is selected in the *SWITCHER DELEGATE* group, *PROGRAM* and *PREVIEW* row operations perform just like their onscreen counterparts.

<div align="center">

M/E 1 – M/E 4
</div>

On the other hand, when an *M/E is* delegated in the *SWITCHER DELEGATE* group, the three rows beneath are re-purposed to correspond to *KEY*, *INPUT A* and *INPUT B* rows of the delegated M/E(s) by default.

> HINT: To access rows C and D, when required, press SHIFT + BKGD.

SHIFT is a 'qualifier button' (like *ALT*), providing access to secondary functions for certain buttons. (For example, *ALT + SHIFT +* (*Preview row* selection) toggles the Proc Amp feature for the designated video source.)

FIGURE 21-35

FIGURE 21-36

Holding *ALT* provides access to secondary functions for certain buttons. You'll note on inspection that the first four buttons in the *FX/OVERLAY* row have icons on their upper half representing transport and navigation features associated with TriCaster's *Media Players*.

Specifically, the supported control operations are:

- |◀ (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.)

You determine which *Media Player* to control by pressing *ALT*. Doing so lights one of the *Media Player* selection buttons in the *FX/OVERLAY* row – whether *DDR 1*, DDR 2, *GFX 1, or GFX 2*. Make a different *Media Player* selection while ALT is pressed (use *SHIFT + GFX 1* to select GFX 2). Then press one of the first four

buttons in the row along with *ALT* to perform the transport/navigation operation assigned, as listed above. Or press *NET 1* or *NET 2* to select the previous or next *playlist preset* for the delegated Media Player.

ALT AND SHIFT FUNCTIONS

Press *ALT* along with a button on the *PREVIEW* row to toggle *LiveMatte* for the corresponding video source. Add the *SHIFT* button with *ALT* button to toggle the source's *Proc Amp* instead.

21.5.4 TRANSITIONS

The transition control group offers familiar controls, including a T-Bar, transition selector and timing knobs, along with *AUTO* and *TAKE* buttons. These are all governed by delegates, as discussed earlier.

The *TRANSITION DELEGATE* buttons include *BKGD, DSK 1, DSK 2* buttons (*FTB*, as mentioned earlier, is an action button, and requires ALT to be pressed with it for safety). These can be multi-selected, and govern which video layers are affected by operations performed with the *SELECT* and *RATE* knobs, *AUTO* and *TAKE* buttons, and the *T-Bar*.

TriCaster's *Background layer* effectively comprises the program output before any DSKs (or M/E KEY) layers or FTB are considered.

FIGURE 21-37

When *MAIN* is selected in the *SWITCHER DELEGATE* group and the *BKGD* delegate button is selected alone, a *TAKE* swaps the source selected on the *PREVIEW* row for the one shown on the *PROGRAM* row. *M/E* selections in the *SWITCHER DELEGATE* group will cause transition controls to operate similarly on their respective targets.

If one or more *DSKs* is selected along with the *BKGD* delegate button, the display state for the delegated *DSK or KEY* layer(s) will be affected as well. Depending on their current status, this may bring them into view, or remove them from view. This allows you, for example, to simultaneously hide one *DSK* (such as a title page) while revealing another, even as you bring in a new *BKGD* source.
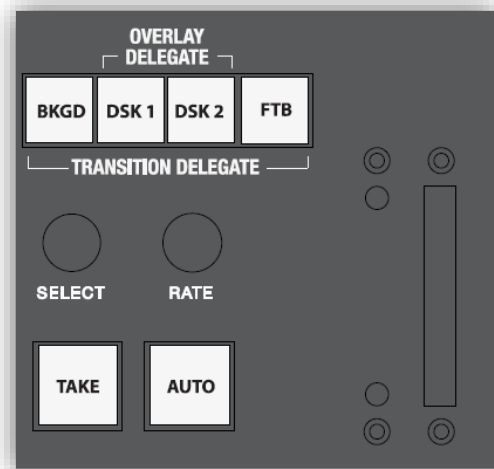
MORE SHIFT FUNCTIONS

The *SHIFT* key provides access to various supplemental features, such as selecting M/E 5 on a 460 CS when operating a TriCaster 860 or 8000 (press *SHIFT + M/E 1* in the *SWITCHER DELEGATE* group).

In addition, the following special functions are provided:

- *SHIFT + AUTO*: Reverse direction to fully remove or display delegated video sources left partially displayed by an incomplete prior transition.

These two buttons, too, are governed by the delegate buttons above (both *SWITCHER DELEGATE* and *OVERLAY DELEGATE* selections). Select *BKGD* and twist the appropriate knob to select a different *BKGD* transition from the onscreen bin, or to change its rate.

These knobs also act like pushbuttons. Push down and release *SELECT* to toggle the *Reverse* switch for the current *BKGD* transition.

> *Hint: Background transitions are the only type to offer a reverse option; DSK transitions automatically toggle their direction.*

Or – push the *RATE* knob repeatedly to cycle through the S (Slow), M (Medium) and F(Fast) transition speeds. Recall, too, that multi-selection is supported.

T-BAR INDICATORS

TriCaster's onscreen main T-*Bar* always snaps back to the top at the end of a transition. This is not true, of course, for the *T-Bar* on the control surface. To help you know what will result from moving the physical *T-Bar*, observe that there are green LEDs located near either end of its stroke. Normally, one of these is lit to indicate the direction the *T-Bar* should be moved to complete the last operation or perform a new one.

In some cases, transition operations can result in the onscreen *T-Bar* and its control surface counterpart being out of synch with one another. In such cases one of the LEDs begins to flash, and the *T-Bar* is deactivated. It will remain in this state until it is moved fully to one end of its stroke, re-synchronizing it with the user interface. Afterward, the *T-Bar* resumes control over the delegated sources.

SECTION 21.6 TIMEWARP™

This chapter discusses the use of two NewTek TimeWarp™ control surfaces 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 sleek 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.

21.6.1 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.

21.6.2 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 surface, 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 TriCaster's two *DDRs* as well as the recording of sources configured for capture.
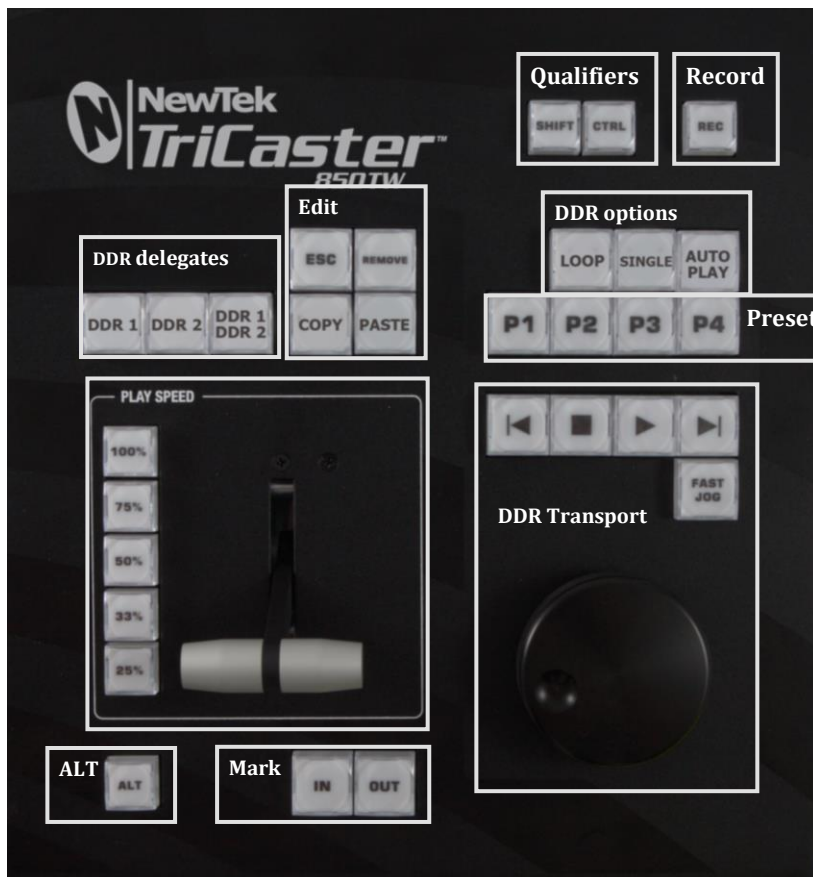

FIGURE 21-38

For convenience, related controls and buttons are grouped together on the control surface. 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 21-38):

- 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)

Let's take a closer look at the members of each control group and their purpose.

21.6.3 DDR DELEGATE

> 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.

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 surface to apply *DDR Transport* control group operations to both DDRs (see Section 21.6.11).

TW-42 NOTES There is no corresponding *DDR 1/DDR 2* button on TW-42. Multi-delegating DDRs is not supported with this control surface.

In general, these buttons operate on selected playlist content in the currently delegated *DDR* (see Section 21.6.3).

FIGURE 21-40

- *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.

- *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.

21.6.5 PLAY SPEED

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 surface 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.

21.6.6 MARKING GROUP
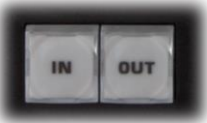
The *IN* and *OUT* buttons in this group allow you to indicate the *In points* and O*ut points* for events you wish to record for later replay.

FIGURE 21-42

(MARK) IN

Pressing *IN* actually performs several related functions. First, remember that TriCaster must be in *Record* mode for any instant replay marking purpose.

For this reason, if you should 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 Section 21.6.3).

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 Section 21.6.7) 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.

FIGURE 21-43

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.

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 Section 21.6.7) 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.

SHIFT + OUT

Hold down S*HIFT* at the same time as you push *OUT* to automatically trim the play start setting of the newly added clip to a frame five seconds prior to the *Out Point* (this is a non-destructive trimming operation. The duration of the file on disk is not modified.)

This feature is supported on TW-42 as well.

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*.

21.6.7 ALT AND QUALIFIERS

FIGURE 21-44

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've discussed one use of *ALT* in Section 21.6.6; see also Section 21.6.8. At the time of writing *SHIFT* and *CTRL* are reserved for as yet unspecified future purposes.

21.6.8 RECORD TOGGLE

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). <u>Simply pressing *REC* again does *not* turn *Record* off.</u>

FIGURE 21-45   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 <u>off</u>. 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 surface 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*.

21.6.9 DDR OPTIONS

The *LOOP*, *SINGLE* and *AUTOPLAY* buttons toggle their namesake features for the currently delegated *DDR*.

FIGURE 21-46

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*.

21.6.10 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 21-47

21.6.11 TRANSPORT (CLIP CONTROLS)

FIGURE 21-48

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 (Section 21.6.6), 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.

21.6.12 TIPS AND TRICKS

- *Primary and Secondary* – TriCaster's IsoCorder™ technology supports multi-source capture. TimeWarp utilizes the *Primary* recording channel, but does not prevent use of the *Secondary* capture channels for all manner of other purposes.

- *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 *LiveSet* - 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.

- *Zoom, Crop (etc.)* – Use the *Position* tools for *Overlay* and *DSK* layers to zoom in on the action in a replay.

- *Clip Organization* – It can be helpful, at times, to use the *MEM slot* options in the *DDR* to collate clips for different purposes.

SECTION 21.7 AVID® ARTIST MIX

TriCaster's support for the AVID® Artist Mix hardware surface brings a highly desirable level of convenience and creative control to a critical aspect of almost every video production – audio. This section explains how to connect and use this powerful third party device.

The AVIDI Artist Mix hardware surface provides great convenience, delivering hands-on external audio control to TriCaster operators. Adjust audio levels, channel panning, equalization, select mixer presets, and more.

The compact Artist Mix console provides excellent visual feedback, and delivers control beyond what can possibly be provided with the mouse and keyboard alone. Almost all adjustments are bi-directional – adjusting the control surface updates the user interface controls, and vice versa. Artist Mix communicates with TriCaster using a popular open control communication protocol named EUCON™ (Extended User Control); the control surface acts and feels like a physical extension of your software. Let's begin by discussing installation and setup.

AVIDI provides a utility called EuControl for use with the Artist Mix control surface. This software runs in the background, and is required for TriCaster to recognize and respond to the control surface.

1. From the TriCaster Startup screen, click the *Shutdown* icon, and choose *Administrator Mode*.
2. Select *Exit to Windows* to leave the TriCaster environment.
3. Obtain the EuControl installer by using one of the following two methods:
    a. With TriCaster connected to the Internet, download the most recent installer for the Windows 64bit operating system from the webpage below:
       www.avid.com/artistsupport (Requires Avid website account.)
    b. Otherwise, download the installer as above to a different computer, and transfer it to TriCaster's hard drive across a network or by USB flash drive (etc.)

4. Double-click the icon for the installer application (Install_EuControl.exe).
5. Follow the instructions displayed to complete the installation.

21.7.2 CONNECTING ARTIST MIX

After the software installation is complete, shut down TriCaster, and connect the AVIDI Artist Mix panel to TriCaster as follows:

1. Plug one end of the AC power cord into the power adapter and the other into an electrical outlet (push the AC power connector firmly into the adapter).
2. Connect the DC output cable from the power adapter to the DC input on the left rear side of the control surface.
3. Connect the control surface to TriCaster using the crossover cable supplied with the Artist Mix, or – as will often be true, in cases where TriCaster network connectivity is a requirement – to the same network subnet your TriCaster is connected to using a suitable Ethernet cable. In most cases you will wish to use a switch or router rather than a direct connection between the two devices, so TriCaster can also connect to the Internet, etc.
4. Power up TriCaster, and wait for the Start screen to appear; then press the POWER button on the control surface.

AVID symbols briefly appear on the OLED display above each fader at this point. When EuControl recognizes the control surface, the display shows rectangles in place of the logo icons to tell you the control surface is in a 'ready' state.

Connectivity Notes: If the control surface OLED display continues to show the AVID symbols, it has not been detected by EuControl. Try cycling the Artist Control power off and then on again. If this does not help, power Artist Mix off, restart TriCaster, and turn the surface on again.

If Artist Mix is still not recognized, double-check your connections. If more than one TriCaster is connected to the network, give each unit a unique system name. If this fails (or when multiple TriCasters or Artist Mix

devices are on the same network) you may need to Exit to Windows, right-click the EuControl icon I shown in the Notification Area of the Windows taskbar, select EuControl Settings and and use the configuration tools provided therein. Refer to the AVID® documentation for further details.

5. Launch a TriCaster session. The OLED rectangle icons are replaced by custom TriCaster audio control labels and displays.
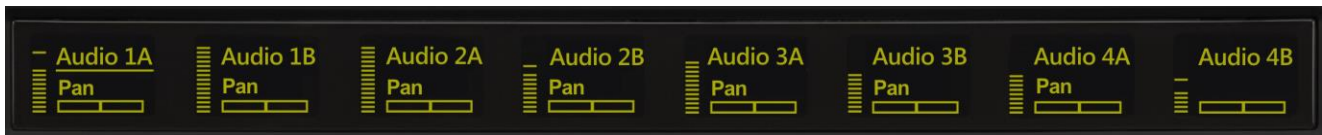
21.7.3 GETTING STARTED

When you first connect it to your TriCaster and open a TriCaster session, Artist Mix is automatically configured to TriCaster's default *Audio Mixer* setup. The OLED information display will look like Figure 21-49. Let's note in passing that this initial layout may or may not match the *Audio Mixer* setup in your current TriCaster session. We'll discuss how to customize this default configuration a bit later, but for now let's consider basic navigation.

21.7.4 PANEL LAYOUT

Figure 21-50 illustrates the control surface layout.
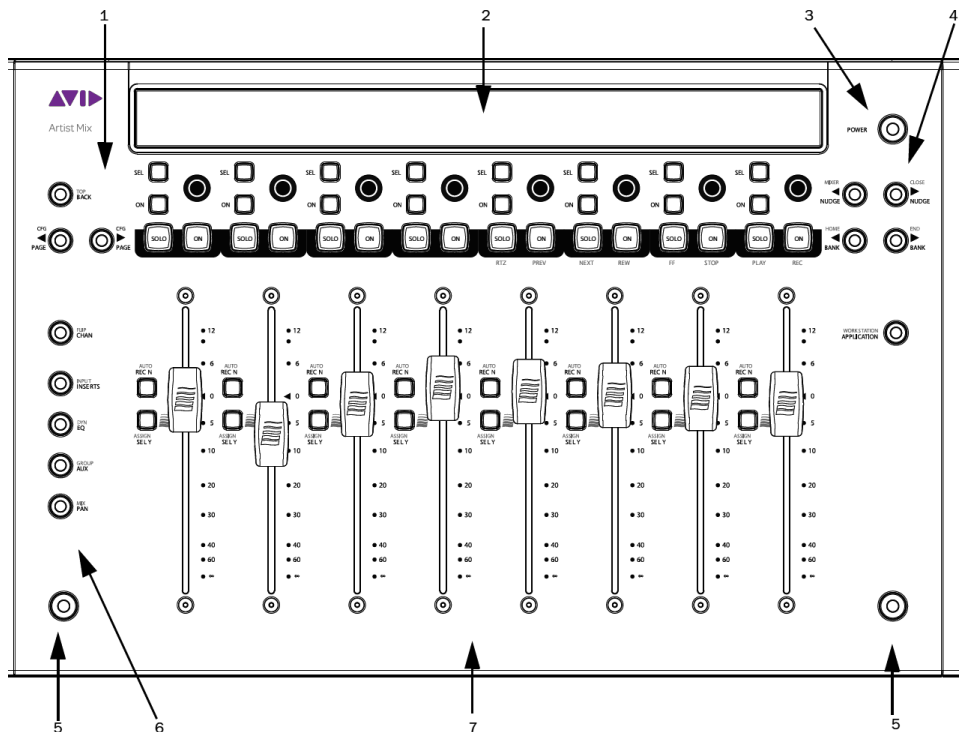
1. *Soft Key* navigation buttons
2. OLED *Display*
3. *Power* button
4. *Fader Navigation* buttons
5. *SHIFT* keys
6. *Knob Set* selectors
7. *Fader* strips

Of course, Artist Mix can be used with a variety of systems and software applications apart from TriCaster. You may already be familiar with its use for certain other purposes. The Artist Mix User Guide provides details regarding each control. In this manual, we'll focus on the controls as they apply to TriCaster only.

21.7.5 NUDGE

At any one time, Artist Mix can display controls for as many as eight of TriCaster's audio inputs, internal sources, and outputs. To access the other audio controls, use the navigation buttons located at right on the control surface, just beneath the **POWER** button (Figure 21-51).

FIGURE 21-51

Two **NUDGE** buttons in this group move the entire control group currently displayed one slot left or right from the current position.

Thus, from the default Input 1-8 view, pressing ▶ **NUDGE** updates the controls and display to govern TriCaster's *Audio Inputs 2-7* along with *Net 1*. (Push ◀ **NUDGE** to restore *Input 1* to the left-most slot.)

21.7.6 BANK

Below the two **NUDGE** buttons are two similar buttons labeled **BANK**. Pushing either of these buttons normally replaces the entire set of controls with their eight nearest neighbors.

So, for example, if you are currently viewing/controlling *Inputs 1-8*, pushing the ▶ **BANK** button swaps out those controls and replaces them with the next set of eight sources to the right, starting with *NET 1* at left and continuing to *AUX* in the eighth slot.

A number of buttons on the Artist Mix control surface have two labels. For example, the ▶ **BANK** button (Figure 21-52) has a secondary **END** label above.

FIGURE 21-52

The upper label denotes alternative functions for the button that are invoked when you hold down one of the two **Shift** buttons on the surface at the same time.

Note that the ▶ **BANK** buttons each have alternate functions when pressed with **Shift**, specifically **HOME** and **END**. These combinations jump past all other configured control groups to display the first and last entries respectively.

21.7.7 LEVEL CONTROL

As you would expect, adjusting the position of a given fader modifies the volume level of the corresponding control in TriCaster's *Audio Mixer*.

For example, pushing the control surface fader labeled *Audio1 A* raises the volume for the source labeled *Audio 1 A* in TriCaster's *Audio Mixer*.

21.7.8 KNOB SET SELECTORS

A set of *Knob Set* selectors (Figure 21-54) runs vertically down the left side of Artist mix (left of the first fader). Essentially, these are mode buttons that select which audio attributes are governed by the eight 'knob sets' – that being one OLED display group and the knob immediately beneath it, along with the two buttons to the left of the knob (**SEL** and **ON**) in that set (see Figure 21-55).

> *Note: The **FLIP/CHAN** button in this group is a special case, and can be selected even when another mode is active. Generally speaking, you will very likely find it best to leave this button off except for certain operations – notably for EQ and Mic Trim adjustments. We'll discuss these exceptions in context as we go along.*

The default *Knob Set* mode is **PAN**. For the most common production operations, this is the mode you will choose. In fact, at the simplest level, once you have configured the Artist Mix channels to take any *SDI* sources into account, you could likely be forgiven for never using another *Knob Set* mode.

Generally speaking, the alternative *Knob Set* modes provide access to deeper audio configuration options and settings. We'll provide the details of their use in context as we go along.

21.7.9 PAN CONTROL

Several controls are nested above each fader, along with the matching OLED display group for that audio input or source. Looking at Figure 21-55 you'll notice that in the default operating mode (**PAN**; See the previous section) the *Audio 1A* track's display shows a *VU meter* at left, and a *PAN* graph below the input label. Rotate the knob below the PAN graph display to adjust *PAN* for the channel this source is on.

MULTI-CHANNEL PAN CONTROL

For a four channel source, such as an input set to *SDI Embedded*, TriCaster's level knobs each control two channels. An Artist Mix knob set can likewise be configured to control "Audio1 AB" and "Audio 1 CD" (for example) to control the two channel pairs for a single SDI source (see Section 21.7.17 for details).

In such cases, the *PAN* control knob adjusts the first channel by default (A, in this example) for the assigned pair. To adjust *PAN* settings for the other channel in the same pair, press the **SEL** button (just below the OLED

in the same *Knob Set* group). This lights the button, and re-assigns the *PAN* control on the surface to the associated channel.

Press the **SEL** button again to restore control over the first channel (the **SEL** button light will go out.

GAIN A AND B (MIC TRIM)

To adjust *MIC GAIN* for a channel, press the CHAN button. Then push the button labeled **SEL** located to the left of the fader for the channel you want to control.

The highlight behind the source label in the OLED display updates to show the newly selected source. In **CHAN** mode, an additional control (labeled *GAIN A* or *B*) appears at right of the channel's PAN control on the surface.

These *GAIN* controls correspond to mic trim controls found in TriCaster's input *Audio Configuration* panels (*Audio Mixer* tab). Press CHAN again to restore normal, single channel control, when done making adjustments.

> *Hint: Although the GAIN control is shown for other source types, it really only has any effect on inputs configured as Mic types in TriCaster's audio input source selector.*

FIGURE 21-56

21.7.10 TALK

Push the small **ON** button to the left of the knob to toggle the *Talk* (Talk Over) feature for *Mic* sources.

21.7.11 SOLO & MUTE

Two larger buttons labeled **SOLO** and **ON** (*Mute*) are positioned below the knob; that is, above each of the eight faders (Figure 21-56). These two buttons are outside the *Knob Set* group, and thus independent of the mode established by the of *Knob Set* selectors.

That's just a wordy way of explaining how it is that a **SOLO** button always toggles the *Solo* feature for its respective source; and likewise the **ON** (*Mute*) buttons always mute or un-mute them – even when you might be in a different mode.

> *Hint: As with most convenient rules, there is one exception to the above. If the SOLO and ON buttons are unresponsive, check to see if the SHIFT LOCK button (i.e., the left SHIFT button on the control surface) is lit; if it is, turn it off.*

At the time of writing, multi-selection of *Solo* is not supported on the Artist Mix surface (though it can be performed in the TriCaster user interface).

21.7.12 FOLLOW

Two other small buttons sit just to the left of each fader strip. These are labeled **AUTO/REC N** and **ASSIGN/SEL Y.** The latter is not normally relevant in (the default) **PAN** mode, but we are interested in the first – **AUTO/REC N.** This button (with the earlier caveat about **SHIFT LOCK** in mind) toggles the *Follow* feature on and off for the designated TriCaster audio source.

Having covered the basic control functions and settings, let's advance to consider the tools available in different *Knob Set* modes.

FIGURE 21-57

21.7.13 EQ CONTROL

FIGURE 21-58

TriCaster provides independent 7-band equalization along with *Compressor/Limiter* features for each source. And Artist Mix lets you access the controls without ever touching the TriCaster user interface.

To display EQ controls, it will probably come as no surprise by this point that you need to push the EQ button in the *Knob Set* control group.

FIGURE 21-59

The OLED display will now appear as seen in Figure 21-59. Normally, all 7 bands for a single input are shown in this manner. In this mode, the knobs below the graph in each group control the setting for a single EQ band, shown above.

Note that the label for one input is highlighted in the OLED display. (For example, Figure 21-60 shows a highlight behind the *Line 1* label; *Line 2* is not highlighted.)

FIGURE 21-60

This highlight identifies the currently selected source. Any adjustments made in this state affect the EQ settings for the selected source only. In this fashion, you can easily adjust all settings for one source. To select a particular source (such as *Input 1* or *2*) for adjustment, press the button labeled **SEL** to the left of the fader in the control surface slot with the corresponding label above.

The highlight in the OLED display updates to show the newly selected source.

To enable, disable or reset the EQ, press the EQ (Knob Set) button to enter EQ control mode, and press CHAN, to turn Channel mode off; the display should show the 60Hz level. Select an input (press the SEL Y button beside a fader), and press the SEL button just below the OLED to enable/disable EQ for this input; or press ON (just beneath) to reset the EQ for this input.

FIGURE 21-61

21.7.14 COMPRESSOR/LIMITER

To access TriCaster's *Compressor/Limiter* controls for the currently selected source, simply hold down a Shift key on the control surface and press the **EQ** button again (the label for the 'shifted' state of this button is **DYN**).

Again, the labels above the little graphs in each control surface slot update to show *Compressor/Limiter* settings – *Threshold, Ratio, Attack, Release,* and also *Mic Gain.* And naturally, the knobs beneath are delegated to control the corresponding attribute for the currently selected source.

Hint: Mic Trim (not the same thing as Mic Gain) is only shown for sources set to a Mic mode.

21.7.15 CHAN MODE

CHAN is short for "Channel". By default, this button is unlit, and Artist Mix operates in 'standard' mode. Standard mode (**CHAN** off) is the default operating mode for the **PAN** *Knob Set* mode that you will use for most 'non-configuration' *Audio Mixer* activity. It imposes one-to-one relationship between control groups and individual audio sources – each group governs one source exclusively.

Pushing the **CHAN** button changes this relationship. In channel mode, all knobs and faders are assigned to a single TriCaster audio source (or 'channel', from the Artist Mix viewpoint). The **SEL** switch, introduced in 21.7.13, determines which source has 'focus', and the various adjustable settings for that source are expanded across the entire control surface, with one Artist Mix 'slot' assigned to each.

We've seen how this works in **EQ** mode, where it expands the different equalizer bands for a single (selected) audio source across multiple knobs. In fact **CHAN** mode is so appropriate in this case that it is automatically activated whenever you press the **EQ** *Knob Set* selector.

(In **CHAN** mode, a 'grid' background is displayed in the OLED. And as we saw before, the label for the selected source is highlighted in the same manner).
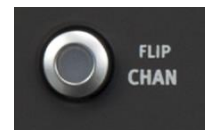
FIGURE 21-62

Hint: It is possible to switch to standard operating mode manually using Artist Mix to control EQ settings. Just press the CHAN button to toggle that mode off. In this state, the knobs in all eight control groups are assigned to a single parameter – so, for example, you could view (and adjust) the 60Hz EQ setting for all sources in the current Artist Mix bank at once if you need to quickly damp that low rumble your microphones are picking up when the air conditioning kicks in.

You will probably find that standard mode works best for most operations apart from EQ, however.

To enable/disable or reset the Comp/Limiter, hold SHIFT and press the EQ (Knob Set) button, then press CHAN, to turn Channel mode off; the display should show the Threshold level). Press the SEL Y button beside a fader to select an input, and press SEL button below the OLED to toggle EQ for this input; or press ON (just beneath) to reset the *Compressor/Limiter*.

21.7.16 FLIP MODE

The shifted state of the **CHAN** button is labeled **FLIP**. Like the former, **FLIP** also affects the mapping of the Artist Mix controls. In this case, the roles of the fader and the rotary knob are swapped. For example – in the default **PAN** *Knob Set* mode, the faders normally controls source levels, while the rotary knob adjusts *Balance* or *Pan*. When **FLIP** is active, it's the other way around.

While not particularly useful for most operations, **FLIP** comes into its own in **EQ** mode, allowing you to use the much larger faders to provide convenient control over the rather similar sliders in TriCaster's equalizer (don't forget to turn flip off when you switch back to normal **PAN** mode, though).

21.7.17 INSERT

The **INPUT/INSERTS** button serves several important purposes. It can be used to reassign the label for a slider input to a different TriCaster audio control by name, or to insert (or remove) a new (initially unassigned) control column on the surface.

Controls for unused inputs or outputs can be removed from the surface, or if you wish, you can re-order controls using the *Remove* and *Insert* features. To insert a new control strip on the surface, proceed as follows

FIGURE 21-64

1. Make sure **FLIP** and **CHAN** are both turned off, and then press the **INSERTS** button in the *Knob Set* group.
2. Rotate the knob for Input one clockwise, cycling through optional settings until the label above the knob says *Insert*.
   At this point, the small **SEL** button just left of the rotary knob begins to flash, to indicate that if you wish to confirm your selection you must press it (otherwise, press **MIX/PAN** to cancel the operation and revert to the original selection).
3. Press the **SEL** button to execute the insertion.
   This action inserts a new, unassigned control, pushing the original Artist Mix control group to the right to make room for the addition.

FIGURE 21-63

4. Slowly rotate the same knob again – this time, you could choose an option (such as *Master 1* option), and then press **SEL** once more to lock the input to TriCaster's *Input 1a* (left) input channel. Instead, just select *Remove* this time and press **SEL** to confirm.

Hint: Normally, if you insert a source that already appears elsewhere in the layout, the inserted control group is kept and the original is removed.

21.7.18 LOCKING CHANNELS

By default, Artist Mix presents control groups for each TriCaster audio source in their natural order from left to right. It can be very desirable however, to lock one or more sources in a fixed position, thus keeping it in view on the control surface at all times despite any use of the navigation buttons.

For example, you may well wish to consider locking the *Master* audio controls to the seventh and eighth slots, so that these important faders will always be available. To do so, follow these steps:

1. Navigate (using **NUDGE** or **BANK** buttons if necessary) to position *Master* in the furthest right control slot on Artist Mix.
2. (With **FLIP** and **CHAN** both off), press the **INSERTS** *Knob Set* button.
3. Press the small **ON** button located to the left of the *Master 1* knob (Figure 21-64).
4. Press the **PAN** button in the *Knob Set* selector group (to exit **INSERT** mode).

A small padlock icon appears in the OLED, indicating that *Master* is now locked in its current place on the control surface. If you use the navigation buttons to move left or right, *Master* stays right where you want it.

> *Hint: When locking multiple channels on the AVID Artist Mix, always lock the rightmost of the channels to be locked first.*

Unlocking a previously locked source restores it to its normal position.

> *Note: Locking sources has one slightly annoying side effect. You will see a clone of locked sources elsewhere in the Artist Mix layout. This does not pose a real issue, since the duplicate is fully synced with the locked one, and will operate as expected if you do use it.*

21.7.19 AUDIO PRESETS

MIDI Configuration Add-On:

The *Add-On* group in TriCaster's *Session page* (Startup) includes a link named *Ableton Novation Launchpad*. This link opens a simple configuration application that allows you to alter the colors used to illuminate buttons on this popular MIDI device.

Simply choose a specific device from the menu at upper left, choose a Fill Color, and click a button on the screen with the fill bucket mouse pointer. (Alternatively, each button has a right-click menu you can use to select the color for that button.)

Artist Mix implementation provides full access to TriCaster's *Audio Mixer* preset system. Keep in mind that these can be a very convenient way to store and recall different source layouts for Artist Mix, too. You can choose a preset or create a new one using either the user interface or Artist mix. To select a preset, proceed as follows:

- Press *Shift* + **INSERTS** (**INPUT**) to display the list of existing mixer presets left to right across the slots in the OLED display.
- Press the **SEL** button below the PLED label of the reset you want to select.

> *Hint: Rotate the knob below a preset on the OLED display to access copy and paste (preset) functions.*

SECTION 21.8 MIDI CONTROL

Another very useful (and often very affordable) control option available to TriCaster users is MIDI.

Literally thousands of devices of this sort are available. (Typically, MIDI devices are used in the audio industry in particular, but often they are used for other applications as well).

TriCaster's *Macro* system can 'listen' for button presses (only; at present, sliders, etc. are not supported) from most MIDI devices just as it recognizes input from other control surfaces or the keyboard.

For TriCaster purposes, many MIDI devices will provide 'plug-and-play' convenience. Some (including the example mentioned in the box at right above) do require the installation of third party device drivers.

Generally, adding device drivers to TriCaster is discouraged, since these may not have been prepared with the rigorous demands of live production in mind.

As we cannot guarantee suitability of third-party MIDI drivers for TriCaster use, it's good to know that a TriCaster Restore operation will restore normal operation if a driver you install has unintended consequences.

MIDI can be useful in many, many ways. Too, a wide variety of MIDI software and extensions are available for other devices. These can be used to create unique custom TriCaster control alternatives.

For example, the mockups below depict custom iPad® interfaces (created using third-party iOS® apps) providing wireless control over TriCaster's *Publish* features (Figure 21-65) and *DDRs* (Figure 21-66).

FIGURE 21-65
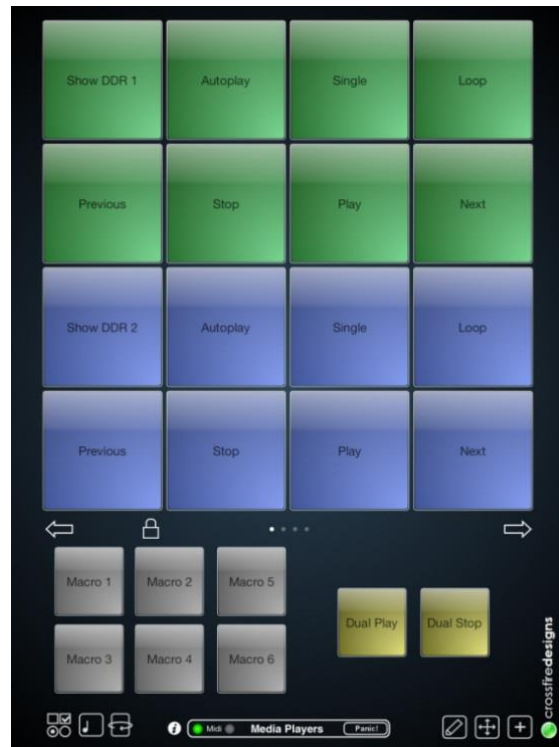
FIGURE 21-66

Countless other possibilities exist, too, of course.

SECTION 21.9 GPI CONTROLLERS

GPI, or General Purpose Interface, is long serving analog control signal system based on simple contact closure. GPI inputs and outputs are very common on professional production equipment.

The macro system in NewTek live production devices can take advantage of intermediary devices, such as the eBOX™ network/GPI hardware interface from JLCooper Electronics, to support both GPI signal input and output.

CONFIGURATION

For an external GPI device to communicate with a NewTek live production system, it must be manually defined by text entries in the file named gpi_setup.xml. This file can be located in the directory shown below as appropriate for your product:

- C:\TriCaster\Configuration\
- C:\3Play\Configuration\

The entry for a given GPI control device must contain an IP address and port, password, and custom name, entered as follows:

< *device* name="*name* " ip="###.###.###.###" port="##" password=" "/>

At the time of writing, the xml 'element name' signified above by the placeholder *device* should be "jlcooper", without the quotation marks.

The value for the "name" attribute that follows is a custom name of your choosing.

> *Hint: Normally, connected GPI devices are identified by unique names in this file; otherwise (if GPI devices share a single name) GPI commands are issued to them simultaneously.*

The remaining configuration attributes ("ip", "port" and "password") are set at the external hardware device (refer to the vendor's documentation for details); the corresponding values need only be transferred into the XML configuration file.

A typical entry might look like this:

<jlcooper   name="JLCooper1" ip="192.168.128.102" port="23" password=""/>

LISTENING FOR GPI TRIGGERS

Configured and connected GPI interface devices can trigger macros just like a keyboard shortcut, control surface, or MIDI button operation can.

To assign a GPI trigger to a macro, simply click a 'gesture field' in the *Shortcuts* group at the bottom of the *Macro Configuration* panel, then send the desired external GPI trigger to the system. The 'listening' control will recorded the GPI signal, and a suitable shortcut entry will be displayed.

SENDING GPI COMMANDS

A special macro command allows you to send GPI signals to external devices and systems via network-connected GPI interface devices (such as the eBOX™ from JLCooper Electronics).

GPI macro entries are formatted as shown below:

Delay (ms)	Shortcut	Value	Key 1	Value 1	etc.
####	gpi	*name*	*GPI_pin#*	*boolean*	

- **Delay** – the interval, in milliseconds, between the time when the command on the prior line (if any) was issued to the system, and execution of this line.

- **Shortcut** – Use the entry "gpi" in this field to send a GPI signal.

- **Value** – The shortcut value is the name of the GPI device (defined earlier in gpi_setup.xml) that you want the signal defined on this line to address.

- **Key # (0 – _n_)** – The value you enter in this field identifies a target pin on the external DVI device to receive a signal defined in the following field. The entry should be formatted as "pin#" (e.g., "pin1", without quotation marks).

- **Value # (0 – _n_)** – This value controls the contact closure state (on or off) for the GPI device pin identified by the preceding key. The value can be entered variously as "1" or "0" , "on" or "off", "true" or "false" (without quotations).

A typical entry might look like the following:

Delay (ms)	Shortcut	Value	Key 1	Value 1	etc.
500	gpi	jlcooper	pin12	1	

Hint: Multiple GPI pins can be targetted simultaneously by key/value pairs entered on a single line. Alternatively, some GPI devices require a GPI 'pulse' of a specified duration. In such a case, you might send an "on" command on one line, followed – after a suitable delay – by an "off" command sent to the same pin.

A HOW DO I ... (?)

In this section, we'll consider the most common questions TriCaster® operators 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.

If you've largely mastered your TriCaster® but have a specific question, this may be the best place to look first. The headings that follow list related questions and answers together, along with cross-references and other helpful remarks.

Hint: The NewTek website includes a comprehensive FAQ database containing a wealth of useful information on all of its products – please see http://www.newtek.com/faq/

How do I ... (?)

A.1 CONNECTIONS

A.1.1 CONNECT CAMERAS?

1. Connect video sources to the appropriately labeled BNC input connectors on TriCaster's backplate according to your camera's video output connection type (see Section 3.4).
    (Because of the 'busy' nature of the backplate, you may find the BNC removal tool provided with TriCaster helpful for this purpose).

2. Open a TriCaster session (or create a new one) from the *Home Page* of the *Startup Screen*.

3. Click the *Live* icon on the *Session Page* of the *Startup Screen*, and press *Enter* (or click the *Start Live Production* link).

4. Roll the mouse pointer over the monitor for the camera you want to set up, and click the *Configure* (gear) button that appears in its titlebar.

5. Choose an appropriate *Connection Type* for your camera in the *Input Settings* tab (see Section 0).

A.1.2 CONNECT FILL + ALPHA SOURCES?

1. Connect the Fill (color) source to an odd-numbered video input.

2. Connect the Alpha channel source to the adjacent (higher) even-numbered video input.

3. Open a TriCaster session (or create a new one) from the *Home Page* of the *Startup Screen*.

4. Click the *Live* icon on the *Session Page* of the *Startup Screen*, and press *Enter* (or click the *Start Live Production* link).

5. Roll the mouse pointer over the monitor for the camera you want to set up, and click the *Configure* (gear) button that appears in its titlebar.

6. Choose the appropriate *Connection Type* for the source attached to the odd-numbered input in the *Input Settings* tab (see Section 0).

7. Choose *Act as Alpha Channel for Input (#)* as the *Connection Type* for the even-numbered source in the *Input Settings* tab. (See Section 0).

A.1.3 CONFIGURE ALPHA MATTE OUTPUT?

1. Open the *Output Configuration* panel, by double-clicking the main *Program* monitor.

2. Click the *Output* tab in the *Output Configuration panel* which opens

3. Checkmark the *Alpha Matte* switch at the bottom of the *Video* source menu for *Output 2*.

4. Select a suitable source, again using the *Source* menu.

A.1.4 COLOR CORRECT MISMATCHED CAMERAS?

TriCaster permits the use of sources that do not match the current session format. You might connect an SD camera during an HD session, for example. The official broadcast standard for SD video is *Rec. 601*, but HD video conforms to *Rec. 709.* TriCaster's output color space is governed by the session format.

When the natural color space for a connected source does not match TriCaster's current output specification (in this example, Rec. 709), TriCaster automatically attempts to compensate – but as always, it's good to refer to the scopes for critical accuracy.

As required, TriCaster's *Waveform* and *Vectorscope* displays can be used to monitor corrections made using the *Proc Amp* tools. (Scope calibration automatically conforms to the broadcast color specification for the current session – HD or SD, and is appropriately labeled as a convenient reminder.)

A.1.5 CONNECT MONITORS?

COMPUTER MONITOR

With the power off, connect an external computer monitor to the *Interface* port on TriCaster's backplate, using an adapter if necessary.

TriCaster supports a *Multiview* output feature by means of the output connector labeled *Multiview*.

1. Connect the external device to the *Multiview* output on TriCaster's backplate using an appropriate cable (and/or adapter, if required).

2. Open a TriCaster session (or create a new one) from the *Home Page* of the *Startup Screen*, click the *Live* icon on the *Session Page* of the *Startup Screen*, and press *Enter* (or click the *Start Live Production* link).

3. Click *Workspace* in the *Dashboard* at the top of the *Live Desktop*, and click the *Configure* (gear) button that appears above it.

4. Select a suitable *Multiview Resolution* from the bottom of the menu shown to match the native resolution of the external monitor you wish to use.

SUPPLEMENTARY QUESTIONS:

Q1: *Why don't I see the Multiview monitor resolution I want listed in the Multiview Resolution menu?*

A: Normally the *Multiview Resolution* menu list is updated using DDC (Display Data Channel) information the monitor itself provides. In some cases this information may not be not available (e.g., a monitor switch or adapter might prevent the available display mode information from being supplied to the operating system).

If you are sure your monitor supports an unlisted mode, you can attempt to add it to the menu manually by editing an (XML format) configuration file supplied for this purpose. The file is named *multiview_resolutions.xml*, and is located in the folder at C:\TriCaster\Configuration. Comments in the file provide details of its use.

(Note that if your display hardware declines to work with additions you make to the menu, the *Live Desktop* status message display may show an 'unsupported display mode' warning, and the monitor may either revert to the previous mode or simply not show anything at all.)

> NOTE: Changing Output Resolution can cause frames to be dropped briefly. We <u>do not</u> recommend changing this setting during live production.
>
> Q2: After reconnecting monitors, my Multiview and Interface monitor configuration is messed up. What can I do?

A: If you disconnect (or power down) and reconnect monitors while on TriCaster's *Live Desktop*, the operating system can have difficulty with monitor recognition and configuration. To avoid problems, naturally it's best to leave display devices alone while live.

In the case of an accidental disconnection, avoid reconnecting both monitors at the same time. Rather, allow the display on the first monitor connected to stabilize before connecting the second.

Downstream video monitoring devices must be compatible with the video broadcast standard (such as NTSC or PAL) you intend to use in the TriCaster session.

1. Connect cables between downstream devices (whether monitors or other devices) and appropriately labeled connectors on TriCaster's backplate (see Section 3.7.1).

2. Open a TriCaster session (or create a new one) from the *Home Page* of the *Startup Screen*.

3. Click the *Live* icon on the *Session Page* of the *Startup Screen*, and press *Enter* (or click the *Start Live Production* link).

4. For SD display devices, you may need to adjust the connection options found in *Output Configuration*:

    a. Move the mouse over the *Program* monitor, and double-click to open *Output Configuration*.

    b. Click the *Output* tab, and select either *Composite + Y/C* or *Component* for *Inputs 1-3* according to the connection type used by devices connected to each output. (Please see Section 3.7 for more.)

A.1.6 CONNECT A SUPPORTED EXTERNAL CONTROL SURFACE?

Connect the USB cable from the *Control Surface* to one of TriCaster's USB ports.

SUPPLEMENTARY QUESTION:

Q: *The control surface has suddenly stopped working. What can I do?*

A: The foremost reason this might happen is if the cable (or extender cable) you are using between the control surface and the TriCaster failed to deliver sufficient current consistently. In the short term (if you are in the middle of a show), you can generally resolve this issue by simply unplugging and re-plugging the control surface.

However, please note that the use of so-called "USB extenders" is not recommended. Whenever possible, use a single USB cable of the correct length. Each added connector on the signal path is a potential connection problem, and also causes signal 'reflections'. Such an arrangement may seem to work for a while, then fail unpredictably.

If you are using a very long USB cable (or a poor quality cable), you should supply a powered hub at the end of the cable nearest the control surface, then complete the connection with a short USB cable from the hub to the control surface. (An unpowered hub will be of no help.)

A.1.7 MIRROR CONTROL OPERATIONS TO ANOTHER TRICASTER?

1. Connect the second TriCaster to the same network.

2. Refer to Section 16.4.1 for details of preparing the two TriCasters and enabling *Remote Control*.

A.1.8 INSERT/REMOVE A DRIVE FROM TRICASTER'S REMOVABLE DRIVE BAY

3. If TriCaster is running, and if applicable (not a TriCaster 410 feature) – Eject the hard drive you wish to remove (see Section A.1.10).

4. Open TriCaster's front panel.

5. Open the removable drive bay door.

6. Pull the hard drive currently in the drive bay (if applicable) to remove it.

7. Insert the new hard drive ('connector end' first)

8. Close the drive bay door.

9. Close TriCaster's front panel.

SUPPLEMENTARY QUESTION:

Q: *What hard drives are recommended for TriCaster's removable drive bay(s)?*

A NewTek supplied storage media has been carefully tested to meet exacting specifications, and can be expected to provide optimal performance and reliability.
Of course, you are free to purchase storage media from other sources. Keep in mind that manufacturer specifications and reviews may highlight favorable statistics, focusing on results from 'typical' (i.e., less demanding) operating environments. (Naturally, NewTek cannot guarantee that hard drives obtained from such sources will provide performance adequate to TriCaster's requirements.)

Here are some guidelines to keep in mind when obtaining hard drives from other sources:

- All else being equal, larger drives are normally faster – try to use 1TB drives or above.

- Use SATA 3.0GB/s drives with rotational speed of 7200 R.P.M. (or better).

- Drives should have a larger onboard cache (32Mb or better is recommended).

A.1.9 CONNECT AN EXTERNAL HARD DRIVE?

Connect a suitable USB cable from the external hard drive to one of TriCaster's USB ports. Note that the hard drive should probably be formatted using the NTSF file system (the FAT file system chokes on exported files exceeding 4 Gigabytes, as will often be the case).

A.1.10 EJECT A HARD DRIVE?

10. Launch TriCaster, and click the *Open* icon on the *Home Page* of the *Startup Screen*.

11. Click the *Eject* gadget at upper right on the screen, and select the hard drive you wish to safely disconnect, or...

12. Open the Live Desktop's *TriCaster Options* menu by clicking the label *NewTek TriCaster* at left in the *Dashboard,* select *Eject* and select the desired drive (see Section 7.1).

A.1.11 CONNECT TALLY LIGHTS?

External tally light devices and their connections vary widely. Please refer to Section 3.8 for details on TriCaster's tally light jack implementation.

A.1.12 CONNECT TO A NETWORK?

Please refer to Section 3.15.

A.1.13 ENABLE TERMINATION FOR VIDEO INPUTS?

TriCaster has full-time video termination. If you need to loop through (or t-off from) other video devices (such as an external monitor) prior to TriCaster in your video pipeline, you should ensure termination is OFF for earlier devices.

A.1.14 CONFIGURE WIRECAST® TO RECEIVE TRICASTER'S NETWORK OUTPUT?

To set up Telestream's Wirecast® software to recognize TriCaster's *Network* output as a source, follow these steps:

1. Double-click the main *Program* monitor to open TriCaster's *Output Configuration* panel.

2. Select the desired audio and video sources for *Network* output, and enable it.
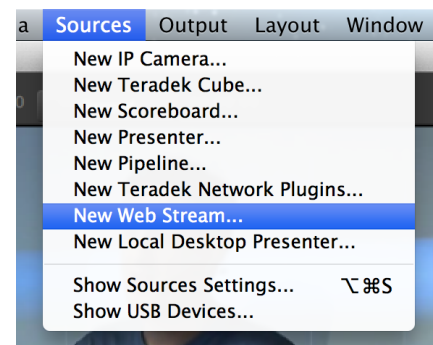
FIGURE 21-68

3. At the time of writing, Wirecast® does not fully support interlaced video, so you must also checkmark *De-Interlace* at the bottom of the *Network* video source menu.

4. Next, open the Sources menu in the Wirecast® interface (Figure 21-68), and select the "New Web Stream" option.

The Source Settings dialog will open.

5. Set Protocol to "HTTP".

6. Type the *Network* URL displayed in TriCaster's *Output Configuration* pane into the Wirecast® URL field.

TriCaster's *Network* video output should now appear in Wirecast®, ready to be added to a shot like any other valid source.
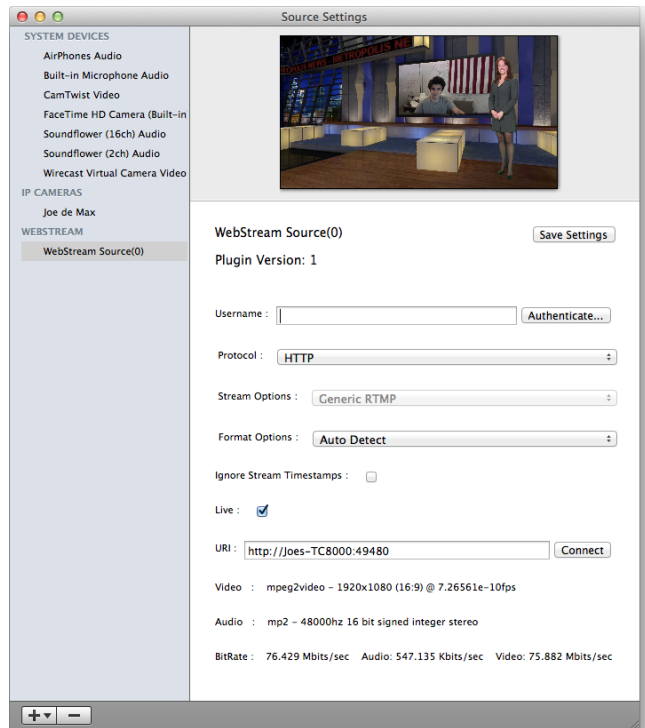
FIGURE 21-69

A.2 SESSIONS

SUPPLEMENTARY QUESTION:

Q: *What is a session?*

A: Sessions can be thought of as 'top-level presets'. They store all of the settings, playlists, device configurations, and so on for a given live production. See Section 5.1.

A.2.1 START AN SD SESSION?

1. Connect your SD sources to TriCaster's input connectors (see Section 3.4).

2. Connect your SD monitors to TriCaster's output connectors (see Section 3.7.1)

3. Select the *New* icon in the *Home Page* of the *Startup Screen*.

4. Click the *Enter Session Name* link (under *Session Name* at right) and supply a name for the new session.

5. Select a *Volume* (hard drive) for the new session.

6. TriCaster Multi-standard only: choose your local *Video Standard* (NTSC, NTSC-J or PAL)

7. Choose either *SD 4:3* or *SD 16:9* (widescreen) for *Resolution*, and click the *Start Session* link (lower-right).

(See also Sections Section 3.9 and Section 5.1.)

<hr>

A.2.2 START AN HD SESSION?

1. Follow steps 1-6 in the preceding section.

2. Select either *720p* or *1080i* for *Resolution*.

3. Click the *Start Session* link (lower-right).

SUPPLEMENTARY QUESTION:

Q: *What is the best session format for streaming?*

A: We strongly recommend that you use a progressive video format for sessions you intend primarily for streaming.

Doing so eliminates fielding artifacts that might otherwise occur due to converting fielded video to progressive video for streaming. This will generally result in noticeably better quality.

<hr>

A.2.3 WORK ON A STORED SESSION?

1. Click the *Open* icon in the *Home Page* of the *Startup Screen*.

2. Click the name of the session you want to re-open.

<hr>

A.2.4 BACKUP A SESSION?

1. *Open* the TriCaster session you wish to backup, then click the *Manage* icon in the Startup Screen's Session Page.

2. Click the *Backup Session* button (below the *Browse* list). If the session has external files in its playlists, choose one of the options from the dialog that opens next.

3. Use the system file explorer that opens next to select the location for the backup file, and click *OK*. This process can take considerable time if the session has a lot of content; in such cases, it's best not to commence unless time (before a production) permits.

A.2.5 RESTORE A SESSION?

1. Click the *Open* icon the *Home Page* of the *Startup Screen*

2. Click the *Restore Session Backup* link at the bottom of the *Sessions list* as right.

3. Navigate to and select the previously stored session backup file, and click *Open*.

A.2.6 DELETE A SESSION (AND ITS CONTENT)?

1. Right-click the name of the session in *Home Page* of the *Startup Screen*.

2. Select *Delete* from the menu.

This will delete the session, and any content that is local to the session, including associated LiveText projects (external data that has not been imported will not be deleted).

A.2.7 MANAGE SELECTED CONTENT INSIDE A SESSION?

1. Click the name of the session containing the content you wish to delete in the *Home Page* of the *Startup Screen*.

2. Click the *Manage* icon on the *Session Page*.

3. Under *Browse* at right, click the link for the type of content you wish to manage (see the sub-heading *Manage* in Section 5.3).

A.2.8 RENAME A SESSION?

1. Make sure all drives that have session data on them (such as captured clips) are inserted.

2. Right-click the name of the session you want to rename in the *Home Page* of the *Startup Screen*.

3. Choose *Rename* from the menu that appears.

A.2.9 DUPLICATE A SESSION?

It can be very useful to make a copy of a session. For example, it might often take less time to modify a copy of an existing session than to configure an entirely new one.

1. *Backup* a session.
2. *Rename* the current session.
3. *Restore* the backed up session.

A.3 LIVE PRODUCTION

A.3.1 MAKE CUSTOM TRANSITIONS AND LIVESETS?

The *Animation Store Creator* application is included with your TriCaster. Its documentation can be accessed from the *Help* menu on the *Home Page* in *Startup*.

As well, an optional, user-friendly, tool called TriCaster Virtual Set Editor™ is available. This tool makes it easy to modify LiveSets to suit your specific needs.

A.3.2 RESTORE THE DEFAULT LIVESET?

1. Click the *label* button [...] above the current LiveSet name to open the *Media Browser*.

2. Click the *NewTek* heading beneath the *LiveSets* heading in the *locations list* at left.

3. Select *Default (2 Layer)* in the *Default* group in the *file pane* at right.

A.3.3 SET UP THE 'NIGHTLY SHOW A' LIVESET?

As you may know, LiveSets for some TriCaster models support four primary video inputs, along with sources dedicated to Key channels. Other models provide less video inputs for effects. The 'Nightly Show A' LiveSet is special in that it *appears* to show many different video sources simultaneously (see Figure 21-70), even including a moving 'news ticker'.

FIGURE 21-70

This virtual multi-monitor effect depends on a single clip (played from a DDR) which is itself a montage composed of a number of different looping video clips composited into a single frame (e.g., Figure 21-71).

FIGURE 21-71
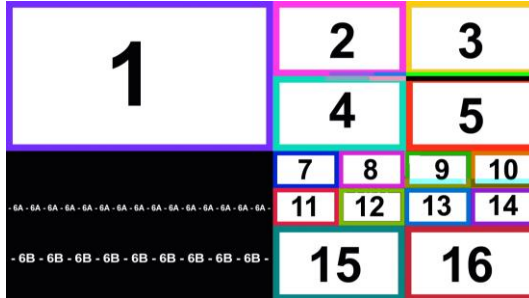
FIGURE 21-72

Hint: A template clip (Figure 21-72) is supplied in the Clips>NewTek folder (as are several looping sample clips). You can use the template as a guide to prepare similar clips with content positioned correctly for use with the Nightly Show set, using in the software of your choice.

To configure the effect:

1. Assign your talent shot to *Input A* in the *M/E* tab
2. Put the looping montage clip you prepared in a *DDR*, and select that DDR as *Input B*.

This particular set was designed to work with all TCXD model TriCasters, including those supporting just two primary sources. For TriCaster 8000 (only), which adds C and D inputs in M/E panels, the set has been updated as follows to provide more ability:

- *Input C* targets the 'virtual ticker'. Knowing this, you might for example use *Input C's* positioner to compose a LiveText feed (from a *Network* input) to correspond to the lower right quadrant of the template clip (as seen in Figure 21-72 above). This would then be mapped to the ticker, allowing you to update the virtual ticker remotely.

- *Input D* is mapped to the virtual 'control room monitor displays'. Position another source to conform to any of the numbered input areas of the template clip to replace the corresponding 'screen 'in the virtual control room. This allows you, for example, to send live video switched in another M/E to one of these monitors.

Hint: To use the set as originally designed, simply assign one looping 'montage clip' (like the provided samples) to all of inputs B, C an D.

A.3.4 SET UP THE 'NIGHT BEAT 3D' LIVESET?

Note: This effect requires TriCaster 8000, because it alone provides reentrant M/Es.

One of the sample LiveSets provided with TriCaster provides camera angles intended for use with the 3D Anaglyph effect. Here's how to set up the *Night Beat 3D LiveSet* for this purpose:

1. Select an unused *M/E*, and assign a keyed talent shot to *Input A*.

2. Assign another source, perhaps a full frame graphic, to *Input B*.

3. Click the button labeled *Effect* above the central *Effect* thumbnail.

4. Click the + sign that appears when you move the mouse over the label below the effect thumbnail to open a *Media Browser*.

5. Click the NewTek label under the LiveSet heading in the *Media Browser*, and choose "3D Center L.LiveSet" from the "Night Beat" folder in the file pane at right.

This M/E provides the left angle for the center desk shot of the ultimate 3D result.

6. Choose another free M/E, and set it up exactly as described above – but this time choose "3D Center R.LiveSet" from the "Night Beat" folder.

This second M/E provides the right angle for the 3D effect.

7. Set a third M/E pane to *Effect* mode, and assign "3D Anaglyph (Red, Cyan).LiveSet" from the "3D" folder to it.

8. In this third *M/E* pane, assign the left angle M/E prepared earlier to *Input A*, and the *M/E* you configured as the right angle to *Input B*.

9. Select this third M/E on the main Switcher's *Program* row, and view the result through red/cyan 3D glasses. (Note that the anaglyph effect is maintained even through a LiveSet zoom.)

Hint: If you assign suitable left and right images to the Input B rows of the respective left and right M/Es, the desk front monitor imagery will also be shown in 3D.

A.3.5 SET UP THE 'METROPOLIS A' LIVESET?

Note: This number of sources required for this effect limits its use to TriCaster 8000.

Metropolis is a 'million dollar set', and provides endless opportunities for creative use. There are actually two versions of this set, labeled A and B, with multiple shots in each group. The second of these groups ('B') employs tighter camera shots with less video sources visible at one time, and requires no special care to configure.

Metropolis A, however, is a complex set, with three different primary talent positions as well as numerous secondary displays. When viewed in its widest zoom angle, it can require as many as 8 different sources to supply all of these – not counting the Key (overlay) layers.

FIGURE 21-73

Since a single M/E accommodates four independent sources (*Inputs A-D*) at most, it requires two *M/Es* to take full advantage of Metropolis A. Here's how to set up the most complex shot in this network-class virtual set group:

1. Select an unused *M/E* – let's use *M/E 1* for our example.

2. Click the button labeled *Effect* above the *Effect* thumbnail in the M/E pane.

3. Click the + sign that appears when you move the mouse over the label below the thumbnail to open a *Media Browser*.

4. Click the NewTek label under the LiveSet heading in the *Media Browser*, and choose "Metropolis A Wide" from the "Metropolis A" folder in the file pane at right.

5. Assign keyed talent sources to *Inputs A, B and C*.

6. Assign another M/E (we'll use *M/E 2)* to *Input D*.

This last source – Input D – will provides the imagery for the live 'news tickers' in the scene, as well as the three large monitors behind the keyed talent sources.

7. Select the tab for the second *M/E –M/E 2* in our example, and set it to *effect mode* as well.

8. Click the + sign that appears when you move the mouse over the label below the effect thumbnail to open a *Media Browser*.

9. Click the NewTek label under the LiveSet heading in the *Media Browser*, and choose "Metropolis A Quad Split" from the "Metropolis A" folder in the file pane at right.

10. Assign video or graphics sources to *Inputs A-C*. These inputs supply the three monitors behind your talent shots.

11. Input D is meant to feed animated text (whether from a *DDR*, or perhaps a *Network Input* source such as LiveText) to the various news tickers in the scene.

Your animated text should be centered vertically in the frame, and presented over either a transparent or black background. The font size need not be overly large, but you can use the *Position* tools for the *Input D* layer to scale and reposition it as necessary.

Hint: If you temporarily select M/E 2 on Program output, you'll see how this quad source is arranged (prior to being fed to Input D of M/E 1).

A.3.6 INITIATE STREAMING?

1. Connect TriCaster to the Internet (see Section 3.15).

2. *Open* (or create) a TriCaster session (see Section 3.9).

3. Click the *Configure* (gear) button in the Dashboard's *Stream* control area.

4. Supply *Connection* parameters in this panel as required (passwords, username, etc.

5. Close the panel, and – when ready – click the *Stream* button.

   (See Chapter 17 for full details.)

A.3.7 FIND MY CAPTURED STREAM FILE?

1. Go to Locate the *Home Page* of the *Startup Screen* and click *Open*.

2. Click the name of the session you streamed at right.

3. Click the *Manage* icon on the *Session Page*.

4. Under *Browse* at right, click the *Clips* link. A system file explorer will open.

5. Open the *Saved Streams* folder in the file explorer.

A.3.8 RECORD MY PROGRAM?

1. Open (or create) a TriCaster session (see Section 3.9).

2. Click the *Configure* (gear) button in the Dashboard's *Record* control.

3. Choose your recording options (see Chapter 19, Record and Grab) and enter a *Base Name* for the file(s).

4. Close the panel, and – when ready – click the *Record* button.

A.3.9 FIND MY RECORDED PROGRAM FILE?

1. Got to Locate the *Home Page* of the *Startup Screen* and click *Open*.

2. Click the name of the session you streamed at right.

3. Click the *Manage* icon on the *Session Page*.

4. Under *Browse* at right, click the *Clips* link. A system file explorer will open.

5. Open the *Capture* folder in the file explorer.

A.3.10 CHANGE PLAYBACK SPEED FOR CLIPS IN THE DDR (MEDIA PLAYER)?

The DDR's *Speed* control adjusts playback speed between 25-400%. Simply adjust the slider knob to suit the need.

(Note that 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.) See Section 11.2.3 for more.

A.3.11 DEAL WITH DDR (MEDIA PLAYER) CLIPS THAT SEEM BLURRY?

When paused or stopped, TriCasters *DDR*s perform motion removal (to avoid unwanted flicker). This can make the image seem slightly blurred when paused, but it should look perfect during playback. (Recorded static title pages look their best when captured using the *Grab* function with *De-Interlace* turned off.)

A.3.12 GET STUBBORN CLIPS TO PLAY IN THE DDR?

First, note that TriCaster has a two minute warm-up period during which system software initializes. During this period, frames may be dropped during playback.

QUICKTIME®

At the time of writing, a 64bit version of Quicktime for Microsoft Windows® is not available. TriCaster provides internal support for many QuickTime file formats, but not all of them. If a QuickTime file fails to play smoothly (or at all) in the DDR, converting it to a friendlier format can help.

We recommend downloading and installing the NewTek TriCaster Codec Pack (Mac) from the downloads page of your personal registration area on the NewTek website (http://reg.newtek.com/Default.aspx). This will permit you to select from several NewTek SpeedHQ codecs (including 32bit formats with embedded alpha channel) from applications that render to Quicktime® formats.

Alternatively, Final Cut® users might consider M-JPEG, MPEG2, DVCPRO HD, or the DV Quicktime codec (for SD clips only, of course) as intermediate formats.

AVI

AVI codecs are plentiful. Most are suitable for DDR playback, but a few are not. For a given clip to play in the DDR, a corresponding 64bit codec needs to be available. However, we strongly discourage installing 'foreign' codecs, codec packs and the like downloaded from Internet sites, etc. For the sake of stability, if an AVI clip does not play well in the DDR, *please* consider converting it to a 'friendlier' format. We can recommend NewTek's own SpeedHQ, or perhaps DV (for Standard Definition clips), M2T or MPG – please continue reading for more information on file conversion.

REMUXING CLIPS

Even when a specific AVI exists and can generally be considered 'friendly', the manner in which audio and video data is multiplexed (or 'muxed', in the jargon) by some few applications can cause playback issues that are only evident under stress. That is, a clip that plays back adequately in a typical player or NLE application may not do as well when played in a DDR at times when many other concurrent operations are occurring simultaneously.

In general, *remuxing* such files is all that is needed to obtain good performance. One approach is to use any of a number of freely obtainable remuxing utilities. A quick Internet search for "remux avi" turns up several applications you could use, some free. Installed on an external system, these will remux AVI files losslessly, resolving the issue.

You may prefer one of several simpler approaches that can be performed right on your TriCaster. For example, if the clip will play properly in a DDR when the system is not heavily loaded with other tasks, you could simply put the DDR on Program output, click Record, play the clip, and stop recording. With a little trimming of the recorded clip you'll have a very usable file.

Or, you can use SpeedEDIT – its *Convert to SpeedHQ* feature (found in the *Filebin's* context menu) can easily convert a number of clips in a single operation.

F4V format files written by Adobe® Flash Media Encoder are incompatible with most video playback applications (even those from Adobe). The developer has explained the situation as follows:

"Adobe Flash Media Server version 3.5 and later and Adobe Flash Media Live Encoder 3 can record content in MPEG-4 (F4V) format using an industry-standard recording technology known as "fragments" or "moof atoms." Some MPEG-4 compatible tools and players do not support moof atoms, and therefore cannot recognize files recorded by Flash Media Server. The F4V Post Processor tool aggregates the information from all the moof atoms into a single moov atom and outputs a new file"

Unconverted F4V files imported will not play in TriCaster's DDR either. Conveniently, TriCaster can automate the conversion for you to a degree. If you locate the folder named Media\Clips*sessionname*\SavedStreams on your primary session drive, you will see the "raw" (unprocessed) streaming file(s) and a batch file (.bat) that can be used to convert all files in that folder.

Simply double-click the .bat file to initiate processing. (Note that processing can take some time, so don't do this just before a production.) Output files will be placed in the same folder after conversion.

> Hint: The .bat file supports several additional features if employed with command line switches. A readme file located in the same folder provides details of these alternatives.

If you prefer to perform this post-processing on another computer, you can transfer the raw files to it and use the Adobe F4V Post Processor tool, available from the URL below (requires an account to login):

https://www.adobe.com/cfusion/entitlement/index.cfm?event=custom&sku=FS0000522&e=fms35

A.3.13 CHANGE COLORS FOR AN ENTIRE TITLE PLAYLIST AT ONCE?

You can quickly alter the default colors for a complete playlist of *Title Pages* in a *Media Player* (such as *Titles*).

1. Select the button for the player containing the titles on the *Preview* row of the *Switcher*.

2. Click the *Configuration* (gear) button for the player's onscreen monitor to access the *Proc Amp*.

3. Click and drag the *Hue* slider left or right, swinging colors through the spectrum.

Observe that black and white graphics and titles are unaffected by the hue shift. In many cases, this allows you to modify background imagery without any effect on text objects (which are often white).

A.3.14 GET LIVE TITLE PAGES (.CGXML) TO RESPECT ALL LIVETEXT FONT ATTRIBUTES?

TriCaster's *Title Page* file format (.cgxml) presently supports *almost* every attribute that LiveText offers – but there are a few exceptions.

For example, multiple font styles on one text line are not supported, which means that different words on a single line cannot be different colors, or use different typefaces. (Of course you can achieve the same effect by using additional text objects as necessary.)

For similar reasons, text entered as paragraphs is automatically split into multiple lines in .cgxml *Title Page* files.

A.3.15 PREPARE A MATCHED GROUP OF M/ES?

Suppose you want to assign matching shots from one theme group of *LiveSets* to different M/Es (or MEM slot).

1. Prepare the first *M/E* – click its tab, use the controls to select a LiveSet, assign and position a *Key* source, and select a *shot* (position/zoom preset).

2. Move the mouse pointer to the extreme left of the screen, right-click on the *Preset* icon in the flyout preset bin, and select *Export*.

3. Supply a filename for the *Preset*.

4. Click the second *M/E* tab.

5. Right-click on a blank *Preset*, and select *Import* from the menu.

6. Select the file you exported above, and click *Open*.

   The *second M/E* will adopt the exact same settings as the first. Now all you need to do is replace the currently assigned *LiveSet* with a matching one by clicking *Add* at upper-right in the tab, choosing the LiveSet you want, and clicking *OK*.

A.3.16 IMPROVE THE QUALITY OF MULTIVIEW OUTPUT?

For best visual quality, be sure that the *Multiview Resolution* you choose in the *Dashboard's Workspace* menu corresponds to the optimum display size for the monitor connected (see Section 10.1).

NOTE: Changing Output Resolution can cause frames to be dropped briefly. Thus we do <u>not</u> recommend changing this setting during live production.

A.4 FILES

A.4.1 MANAGE FILES?

Please refer to the item (How do I) Manage Selected Content inside a Session? (Section A.2.7).

A.4.2 IMPORT MEDIA FILES?

Importing files implies copying them into the TriCaster session folders, making them *local* (rather than *external*). At times, imported files are also automatically transcoded to 'friendly' formats for realtime playback. To import media files:

1. Launch a TriCaster session.

2. Click the *File* menu in the Live Desktop's *Dashboard*.

3. Click the *Import Media* item.

4. Use the *Import Media* module that opens to create a list of files you wish to import into the current session, and click the *Import* button.

    Hint: You may know that external files can be used in a session without being imported, by adding them to Media Player playlists using the "Add Media Location" feature. However, such external files used in a session will not be included in session backups (unless they are deliberately imported during the backup process), nor are they deleted when sessions are deleted. Also, the transfer speed of many external devices is too slow for reliable playback of large clips, making it wise to use Import instead whenever possible.

A.4.3 AVOID DELAYS WHEN SESSION MEDIA IS OFFLINE?

Launching a session when content in Media Player playlists that is served across a network is offline or missing can result in lengthy delays, even making it seem as if TriCaster has 'hung'.

Normally (i.e., when dealing with local content) the operating quickly reports file status to TriCaster, and missing media is ghosted in the playlist bin. This process is more complicated when dealing with networked media.

For example, if a volume is missing the operating system will automatically scan the network in an attempt to resolve the path. After some time, the operating system gives up, and the file is marked as inaccessible. Unfortunately, though, this process now iterates for as many files as you have added to the playlist.

Fortunately, the potential delay involved during this process can be easily bypassed. By default, the system uses a full UNC ("Universal Naming Convention") path for all network connected resources (e.g., "\\myserver\myfolder\myfile.mov). Use the Windows "Map a Network Drive" feature to give the server (or folder) where your remote media is located a drive letter (e.g, "M:\", or "M:\myfolder\"). This results in much quicker path resolution, and effectively eliminates the problem.

A.4.4 SHARE FILES ON YOUTUBE®?

Although you have opened an account with YouTube® and correctly configured the account for TriCaster sharing, uploading may fail because you have not yet created a YouTube® "channel".

The basic YouTube® account lets you log in to watch existing content and make playlists. To create a channel, follow these additional steps:

1. Browse to YouTube®, login and click Upload at the top of the home page.
2. Follow instructions to add a channel to your account.
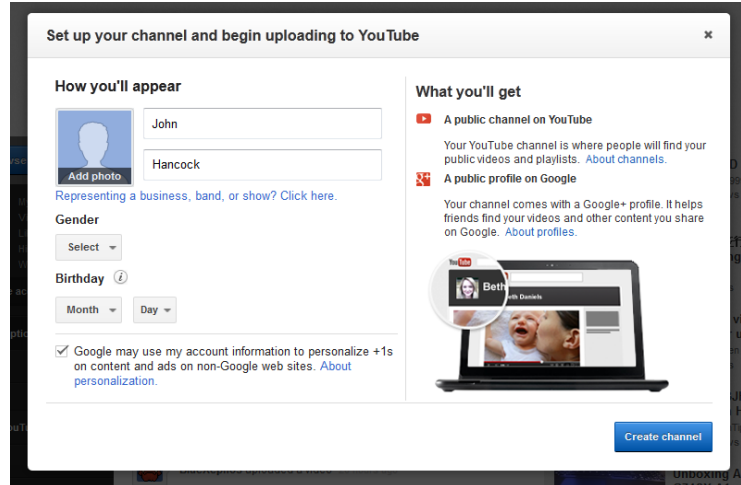
FIGURE 21-74

Afterward, TriCaster will be able to upload directly to your channel by means of its *Share Media* feature.

A.4.5 PREPARE CLIPS WITH EMBEDDED ALPHA CHANNEL?

Probably the best format to use for files with embedded alpha channel for use in TriCaster are those encoded using NewTek's own SpeedHQ 4:2:2:4 codec. This format can serve for either SD or HD clips, and represents a high quality, moderately compressed alternative. (As a registered NewTek customer, you can download the NewTek TriCaster Codec Pack for either Windows® or Mac® platforms from your personal Downloads page on the NewTek website.)

Apple® computer users have several other options available which support an alpha channel, including the Animation and PNG Quicktime® movie codecs (select "Millions of Colors +" in the codec settings to include alpha in the file).

A.4.6 ADD AN EXTERNAL FILE LOCATION TO THE FILE BROWSER?

1. *Open* (or create) a TriCaster session.
2. Click the *Add* button for a *Media Player* (*DDR*, *Still* or *Title*).
3. Click the *Add Media Location* button at bottom left in the *File Browser*.
4. Select the folder you wish to list as a location in TriCaster's *File Browser*, and click *OK*.

(See Add Media Location in Section 11.2.2)

A.4.7 REMOVE A LOCATION FROM THE FILE BROWSER?

1. Click the *Add* button for a *Media Player* (*DDR*, *Still* or *Title*)
2. Right-click the name of the location you wish to remove from the list, and select *Remove* in the menu that opens.

(See the sub-heading File Context Menu in Section 11.2.2)

There are several approaches to exporting media files from within TriCaster sessions. By far the simplest is to use the *Export Media* feature – see the sub-heading by that title in Section 5.3.3.

A.4.9 IMPORT/EXPORT FILES LARGER THAN 4 GIGABYTES?

This question may arise if you are using external media, perhaps portable hard drives or USB 'thumb' drives. These are commonly prepared using the FAT32 file system, which does not support files larger than 4GB.

As video files will often exceed this size, FAT32 is not very suitable for use in that context. You should reformat these drives using the NTFS system to eliminate this limitation (or you might consider transferring larger files to TriCaster over a network connection).

A.4.10 REPAIR DAMAGED RECORDINGS?

At times, a catastrophic event (such as a power outage) that interrupts recording will result in a damaged Quicktime® clip. Generally, such a clip can be repaired by simply adding it to a DDR playlist. (Note that this process depends on the clip being stored as-is within the NTFS file system at all times before repair. Operations like zipping the file, transferring it to a FAT32 drive and then back, etc., will make recovery impossible).

A.4.11 AVOID THE ERROR "…COPY THIS FILE WITHOUT ITS PROPERTIES?"

Windows® shows this error message when you export a media file from TriCaster to an external volume that does not use the NTFS file system. The warning is not really a concern (although we highly recommend using NTFS formatted storage, as noted in Section A.4.9). The files will copy just fine regardless.

TriCaster generates metadata attributes for media files for internal use. This metadata is only retained when you export to storage formatted as NTFS. That being said, the metadata is automatically regenerated if you use the files with TriCaster again later, so its loss poses no issue.

A.4.12 FREE UP SPACE BY DELETING THE DEMO CLIPS?

1. Go to TriCaster's *Startup Screen*.
2. Open a session (it doesn't matter which one).
3. Click *Manage* on the icon ring, and click the *Clips* link at right.
4. Use the system *File Explorer* that opens to navigate up one level in the folder hierarchy, to D:\Media\Clips.
5. Selectively delete content from the sub-folders you find in this location.

A.5 SOFTWARE, MAINTENANCE AND UPDATES

A.5.1 IMPROVE PERFORMANCE?

1. Click the *Shut Down* icon on the *Home Page* of the *Startup Screen*, and click the *Administrator Mode* link at right to exit the TriCaster environment.

2. In the *Administrator Mode* screen, click the *Defragment Hard Drive* link (under the *System Utilities* heading) and follow directions provided (see also the heading System Utilities in Section 5.2.3).

This process can take considerable time, so it's best not to commence unless time (before a production) permits.

A.5.2 RESOLVE SERIOUS INSTABILITY OR DROPPED FRAMES?

If the system becomes seriously unstable or is dropping frames with 'known compatible' video files (after the warm-up period), consider a full *System Restore* (see item A.5.7).

A.5.3 UPDATE TRICASTER?

1. Connect TriCaster to a valid Internet connection

2. Click the *Shut Down* icon on the *Home Page* of the *Startup Screen*.

3. Click the *Administrator Mode* link at right to exit the TriCaster environment.

4. In the *Administrator Mode* screen, click *Update TriCaster* under the *System Utilities* heading. This will open the Downloads and Updates page in your system web browser. This page lists update options appropriate for your system (see also the heading System Utilities in Section 5.2.3).

Note: Updates sometimes require changes to TriCaster configuration files. In such cases, the original (pre-update) files are automatically stored in a directory named "Configuration (Backup)" located at C:\TriCaster\Configuration, to avoid unintended loss of custom settings.

At times you might decide to restore one of these in place of the newer configuration file, to retain use of certain settings (or perhaps, macros). An advanced user might opt to cut and paste relevant lines from the older file into the new one (we suggesting backing up the newer file in this case, too, out of an abundance of caution).

SUPPLEMENTARY QUESTION:

Q: *Can I backup my TriCaster configuration files before a software upgrade?*

A: Backups of TriCaster's configuration files are automatically stored when the software is updated. The backed up files can be located inside the folder at C:\TriCaster\Configuration\Configuration (Backup).

A.5.4 UPDATE THE FLASH® AND/OR WINDOWS MEDIA ENCODER®?

TriCaster is not designed to be user-upgradable. For certain features to work correctly, specific versions of third-party utilities must be present. These applications are upgraded in timely fashion in official TriCaster updates.

It is quite likely that any attempt to update these manually will have unintended results, and you are strongly cautioned against doing so (unless otherwise directed by Customer Support).

A.5.5 INSTALL VIRUS PROTECTION?

Virus and malware protection applications can dramatically impact system performance. In general, once additional software or services are enabled on TriCaster, real-time performance cannot be guaranteed.

In a perfect world, we'd love to recommend that you do not install virus and/or malware protection software on TriCaster. Certainly you should *always* take sensible precautions to avoid introducing infected files into TriCaster by rigorously virus-checking media you plan to connect or import beforehand – ideally, do so on a laptop or other system *before* connecting to TriCaster.

Realistically though, in some settings you may feel the need for protection outweighs the risk. If you really feel you *must* install virus protection, switch all of its 'active scanning' operations off so that nothing can occur in the background while TriCaster's *Live Desktop* is running.

Anything that provides full-time protection will dramatically reduce memory and disk speed on your system, so you should disable those features. Then, only when you need to do so (perhaps on a daily or weekly schedule), perform a manual scan. Never let scanning continue into a live switching event, and do not assume that you can now omit pre-checking files and external media for nasty surprises.

> Hint: In the unfortunate event that malware ever does evade your defensive measures, you can always use TriCaster's Restore TriCaster function to completely rehabilitate your system.)

A.5.6 INSTALL MY FAVORITE SOFTWARE (OR CODEC)?

TriCaster is not a 'general purpose' computer. The installed software suite is finely tuned to provide reliable performance and amazing features. Anything you install apart from official TriCaster updates places these important goals at risk. Doing so is strongly discouraged.

Regarding codecs, TriCaster supports the vast majority of popular image, audio and video formats. That said, hardly a day passes without another new one appearing on the scene. If a file you would like to use does not play back well (or at all), consider converting it to a friendlier format.

If you feel the format is so popular that TriCaster should support it, please submit the details as a feature request. (Please also see Section A.3.12 above.)

SUPPLEMENTARY QUESTION:

Q: *Can I install the MainConcept AAC Encoder – Plug-In for Adobe® Flash® Media Live Encoder?*

A: This is not required.

A.5.7 CREATE A 'USER BACKUP' DRIVE

The *Backup and Restore* system permits you to create a bootable clone of TriCaster's system drive on another (same size) hard drive inserted into one of the removable drive bays or connected externally for this purpose.

The clone operation includes:

- The hidden, factory-prepared *Restore partition*
- The complete C partition (uncompressed)

Afterward, the backup drive can be removed and stored, to be used later if necessary to i) restore the internal drive should, or ii) in the case of a catastrophic drive failure, to be connected internally to completely replace the original drive.

> *Note: Since opening TriCaster's case is a breach of warranty, please call Customer Service to obtain direction before proceeding with an internal drive replacement.*

The actual creation process for the backup is discussed in the next section.

We firmly expect you will never need it, but isn't it good to know that comprehensive *TriCaster Restore* features are available in the event of an unforeseen problem? You can use one of two methods to access TriCaster's *Restore* features, depending on your situation.

To restore your TriCaster system software *after the system launches normally*:

1. Click the *Shut Down* icon on the *Home Page* of the *Startup Screen*.
2. Click the *Administrator Mode* link at right to exit the TriCaster environment.
3. In the *Administrator Mode* screen, select the link labeled *Backup or Restore System*.
4. Select the *Restore Factory Defaults bootup option*.

If TriCaster should ever fail to boot up properly, you may need to try a different approach to restore your TriCaster system software, as follows:

1. Select the menu item labeled *Restore Factory Defaults* from the black boot screen that appears shortly after powering TriCaster up. (If this screen does not automatically appear, reboot and press F8 a few times in quick succession, say once per second, immediately after powering up.)

Either method described above will ultimately present you with powerful system backup and restore tools. The management screen initially presents you with 3 options as follows:

-   *Restore System Partition to Factory Defaults*: overwrites the C partition (only) on the existing system drive from the disk image in its local Restore partition.

> *Note: Following a Reset to Factory Defaults operation, the Windows® system software must be re-activated. To do this, you will need the operating system serial number, which you will find on a sticker affixed to the exterior of your TriCaster.*

    This procedure restores your system drive ("C:") to its 'as-shipped' state. The "D:" drive, which holds content and sessions won't be modified. However any TriCaster software updates (possibly including optional TriCaster expansion packs) will be overwritten – so use this function only when necessary. When you do restore, remember to update the TriCaster software afterward.

-   *Create User Backup Drive*: create a bootable clone of the entire system drive (as it exists at the time) on either an external HDD or a drive mounted in a removable hard drive bay.

The clone operation includes:

- o The existing (factory-prepared) Restore partition
- o The complete C partition

In cases of catastrophic drive failure requiring drive replacement, a service technician can simply connect the *User Backup* 'clone' drive in place of the original internal system drive and you'll be back in production (prudence would call for creating a new *User Backup* drive as the first order of business.

- *Restore System Partition from User Backup Drive*: overwrites the C partition (only) on the existing system drive with the C partition on the external user backup drive. This allows you to insert a *User Backup* drive into a removable drive bay (or otherwise connect it), and regain a functional system partition as stored on the clone drive.

Note: This feature it is intended to allow a restore operation of the system drive that the clone was prepared on. It is not intended to allow restoration from a 'foreign' TriCaster. Using the 'Restore System Partition from User Backup Drive' in the latter manner will almost certainly cause multiple problems. In a dire emergency, however (such as if a system drive fails when no User Backup from the same unit has been prepared) a User Backup created on a similar model TriCaster can be helpful, as follows:

  - Install the 'foreign' User Backup drive to replace the defunct system drive.

  - Power up, and – at the boot selection screen – select 'Manage TriCaster'.

  - Choose 'Restore System Partition to Factory Defaults', and follow prompts.

It will be necessary to re-activate Windows, re-enter the registration unlock code, and possibly update the TriCaster software after the restoration process in this case. Be aware that the approach above is not encouraged, since minor hardware differences between the two TriCasters involved may well result in issues in the resulting Windows installation. As well, the new system drive will no longer have a factory restore partition. Still, it might be better than nothing in a crisis.

A.6 REGISTRATION AND TECH SUPPORT

A.6.1 REGISTER TRICASTER?

1. Read and accept the *License Agreement* shown when TriCaster launches.
2. Select and copy (Ctrl + c) the characters in the *Product ID* field in *Step 1* of the registration dialog that appears next.
3. If you have connected TriCaster to the Internet, click the button in *Step 2* of the registration dialog.
4. Follow the directions provided on the Registration *webpage* to obtain your *registration code*
5. If TriCaster does not have Internet access, call (or email) Customer Support with the *Product ID*:

   (US) 1-800-862-7837
   (Outside US) +1-210-370-8452

6. http://www.newtek.com/faq/index.php?contact=service
7. Enter the *Registration Code* provided into the Registration dialog at Step 3 (Please see Section 3.2 for more detail. Also, note that it's always good to check for updates after registration.)

A.6.2 CONTACT CUSTOMER SUPPORT?

Visit the NewTek Website to find the latest support information for your NewTek products, including *FAQs* and documentation, along with the Customer Support Department's hours of operation and contact details.

A.6.3 FIND TRICASTER'S HARDWARE/FIRMWARE REVISION NUMBERS?

Click the *Help* icon in the Startup Screen's *Home Page,* and select *About TriCaster*. This opens an information panel listing version numbers (at the bottom).

A.7 MISCELLANEOUS

A.7.1 ACCESS SYSTEM ADMINISTRATION FEATURES?

1. Exit the *Live Desktop*, and navigate to the *Home* page in *Startup.*

2. Click the *Shutdown* icon, and then click the *Administrator Mode* link.

A.7.2 RETURN TO TRICASTER FROM ADMINISTRATOR MODE

Click the *Return to TriCaster* link in the *Administrator Mode* screen to return to the TriCaster *Startup Screen*.

A.8 MORE QUESTIONS AND ANSWERS

A.8.1 CAN I DO ANYTHING TO IMPROVE LATENCY/AUDIO SYNC?

Latency might be defined as the 'transit time' for I/v stream. Each device in the video chain introduces some limited (transmission) delay.

TriCaster's latency is very minimal (as little as 1 frame), but you can take measures to keep it to a minimum – first and foremost, by genlocking your video devices – see Section 8.2.3. For genlocked sources, consider disabling TriCaster's *Frame Sync* – see Section 8.1.1.

In a *seemingly* related matter, note that audio and video passing through TriCaster are always synchronized. However, aspects of the physical design for IMAG (video projection) installations can make mimic a sync issue for viewers at some locations in the auditorium. These issues are discussed in detail in Section B.3, IMAG and Latency.

SUPPLEMENTARY QUESTION:

Q: *Why does latency seem higher for certain video formats (i.e. 24p, 25p, or 30p*)?

A: TriCaster passes frames through the switcher at the appropriate frame rate. When the session format calls for frames at 60Hz, displayed frames are refreshed much more often than (for example) a 24p format. Consequently, apparent latency will also be less than half what it would be at 24Hz.

In general, the lower the frame-rate of the session video format, the higher latency will seem to be.

A.8.2 WHY IS MY POWER SUPPLY BEEPING?

TriCaster 4RU systems provide redundant, replaceable power supply units. When you i) disconnect or ii) power down just one of the modules, or iii), if a PSU should fail, a beep is sounded to alert you. If you wish, you can mute the alert by pressing the green button on the back of the unit.
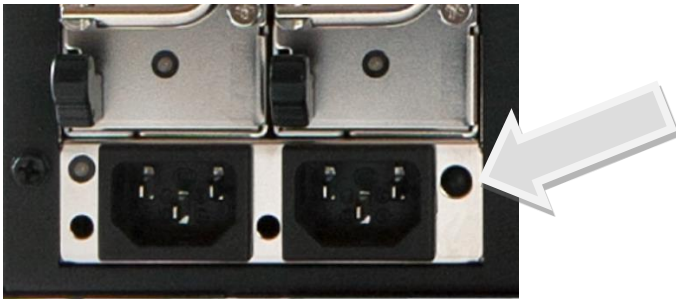
FIGURE 21-75 (4RU TRICASTER SHOWN)

SUPPLEMENTARY QUESTION:

Q: *Where can I obtain replacement or spare Power Supply modules?*

A: Contact NewTek Customer Support for information on purchasing TriCaster components.

A.8.3 WHY DO SOME THUMBNAIL ICONS LOOK WRONG?

Some file formats (notably AVI) do not provide embedded aspect ratio information. As a result, their thumbnail image in *Media Player* icons for may not be properly proportioned. Generally the problem does not extend to playback (the DDR will 'guess' the aspect ratio correctly).

B PERFORMANCE CONSIDERATIONS

Your TriCaster® has been carefully designed to faithfully execute its duties under any reasonable circumstances. Still, your production environment – especially in remote locations – may impose limitations that you are wise to consider. This chapter discusses a few matters that may help you get optimal performance in less than ideal settings.

B.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.

B.2 IVGA™ AND PERFORMANCE

Although iVGA™ is highly efficient, it does require *significant* system resources, especially when a large portion of the display is refreshed. This is not normally problematic as – for iVGA purposes – the client system is not required to perform other concurrent tasks. Its entire duties involve providing a video source for the (downstream) TriCaster via the iVGA client software. However, it is *very* unwise to install and run the iVGA client software directly on a TriCaster itself.

TriCaster's live video processing requires unhindered CPU and GPU access. Adding the resource demands of the iVGA client to TriCaster would almost certainly cause frames to be dropped on output, and should simply never be done. The same warning applies to other 'screen-sharing' or 'remote desktop' applications, which would actually be as bad or worse.

Of course iVGA benefits from the fastest possible network connections between remote clients and TriCaster even when "used as directed". This is especially true if you intend to stream high resolution motion graphics to TriCaster using iVGA.

B.3 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.

B.3.1 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!"

B.3.2 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 – <u>unless</u> 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.

B.3.3 LATENCY AND YOUR TRICASTER

TriCaster is a wonderful tool in the IMAG arsenal, but inevitably it is only 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.

TriCaster's portion of the total latency sum is well within acceptable standards for devices of this sort – roughly between 1.5 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 TriCaster's inputs 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 TriCaster section of the IMAG chain? One trick is to 'Genlock' your cameras to the TriCaster output (see Sections Section 3.5, Section 3.13 and 8.2.3). This allows TriCaster to bypass its input time-base correctors, ensuring latency is consistent during switching operations. For genlocked sources, consider disabling TriCaster's *Frame Sync* – see Section 8.1.1.

> *Hint: you can actually assess the latency of your TriCaster installation fairly easily. Run timecode directly to 1) a monitor and at the same time 2) through the TriCaster to a second (identical) monitor. Take a photograph that encompasses both monitors, and compare the timecode shown!*

B.3.4 OTHER SOURCES OF LATENCY

More often than not, significant latency is added by other devices in the IMAG chain that come *after* the TriCaster. 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 TriCaster to the projector – if at all possible, match the resolution sent from the TriCaster 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 TriCaster's Frame Sync – see Section 8.2.3).

C 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?
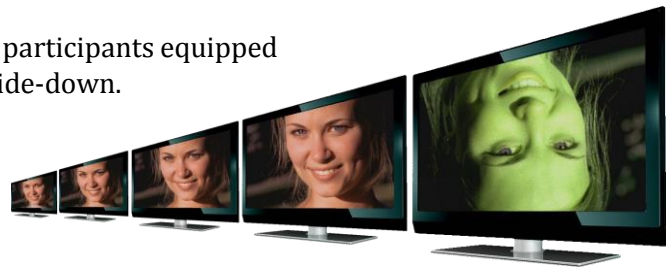
This built-in tolerance makes it difficult for us to judge whether the blacks in our video productions are really black –or just dark gray; whether reds are purple or tinged with a slight greenish caste, and so on. What we really need is a reference for comparison – just as we find it easier to pick the best-looking display from a row of television sets on a store shelf.

C.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 TriCaster 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 in TriCaster's *Preview Scopes* tab will help. We also need to give consideration to *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 (from TriCaster) video monitors are properly set up to allow you to make these judgments.

C.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.

C.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 TriCaster 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 TriCaster's Waveform scope.

> *Hint: TriCaster 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 TriCaster 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 TriCaster provides for that input to tweak black and white levels. (Of course it is always best to perform adjustments at the source if possible.)

C.2.2 ADJUSTING COLOR

We're going to move into color calibration next, but first we can actually use our black and white signals for some further tests.

VECTORSCOPE

While we're still working with black and white levels, we can introduce TriCaster's *Vectorscope*, and perform an initial test of the camera's color balance.

A vectorscope (Figure 21-76) can be likened to the familiar 'color wheel' (Figure 21-77) 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.
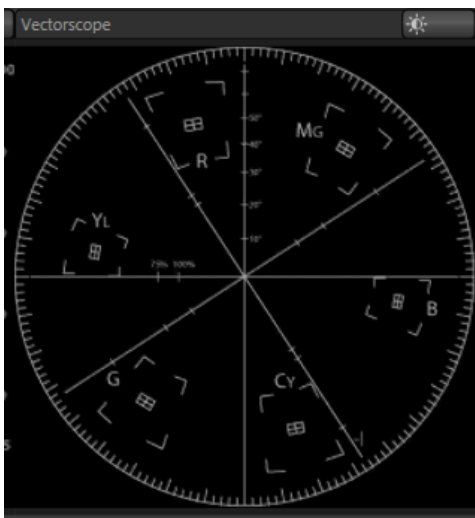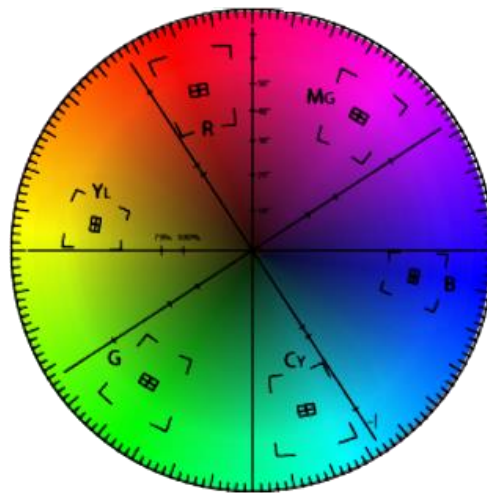
FIGURE 21-76   FIGURE 21-77

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, actually 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 *U Offset* and *V Offset* controls in TriCaster's *Proc Amp* 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.

C.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 21-78 is an example of the color bars used in NTSC countries, while Figure 21-79 is a PAL example, common throughout European nations.
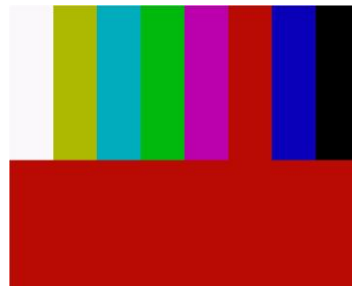
FIGURE 21-78 (NTSC)   FIGURE 21-79 (PAL)

You can use color bars in conjunction with TriCaster's *Waveform* and *Vectorscope* to make sure the video supplied to the Switcher 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.
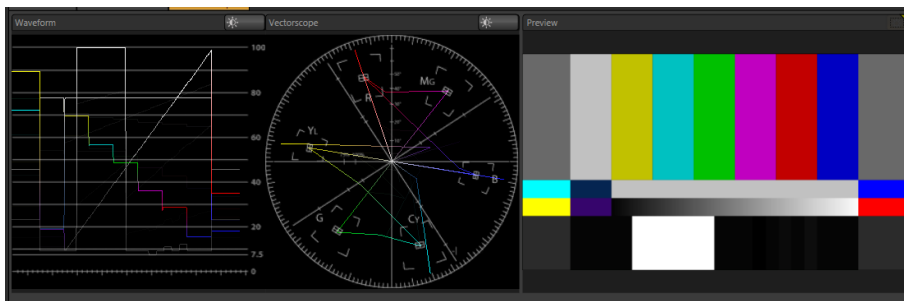
FIGURE 21-80

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 21-81).
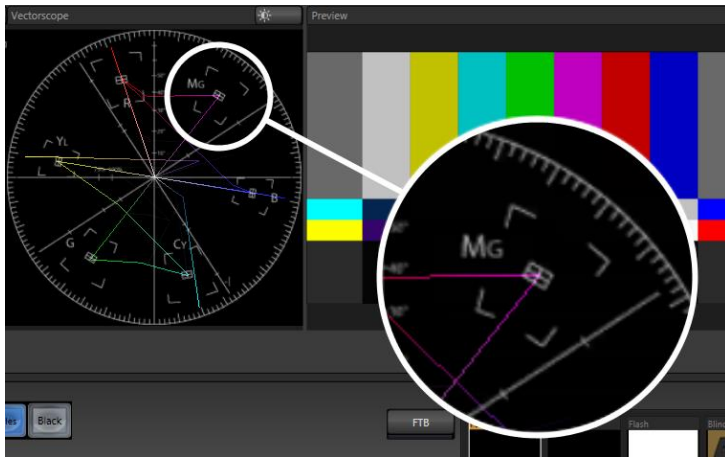
FIGURE 21-81

If the trace vectors do not line up as they should even after performing a white balance at the camera, you can use TriCaster's *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.

C.3 CALIBRATING YOUR MONITORS

In most cases, you will use a computer monitor of one type or another to display TriCaster's controls – the so-called 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.

C.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/

C.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 TriCaster's 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 TriCaster's *Media Players* for this purpose.

C.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 21-82).
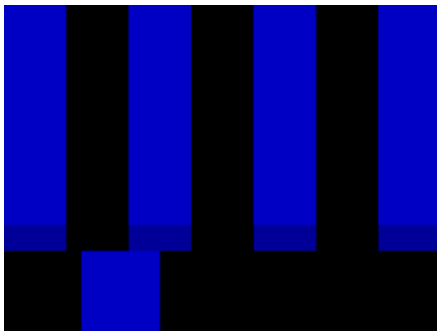
FIGURE 21-82

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.

<div align="center">PAL</div>

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 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.

C.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.

D KEYSTROKE SHORTCUTS

D.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

D.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

D.3 RECORD, GRAB, AND STREAM

Record on/off	r/ Shift + r
Grab (still image)	p
Stream Start	Ctrl + /
Stream Stop	Ctrl + Alt + /

D.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

D.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

D.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

D.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

D.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

D.7.3 MISC.

Cut	Ctrl + x
Copy	Ctrl + c
Paste	Ctrl + v
Delete	Delete Key
Show TriCaster version	Alt + b

E DIMENSIONS AND MOUNTING

	It's important when planning your installation to provide adequate support for the unit's weight, and pay particular attention to providing room for both cable access and adequate ventilation. This section provides physical dimensions and recommendations intended to inform and guide you when mounting TriCaster systems and related control surfaces.

SECTION 21.10 TRICASTER MINI AND MINI SDI
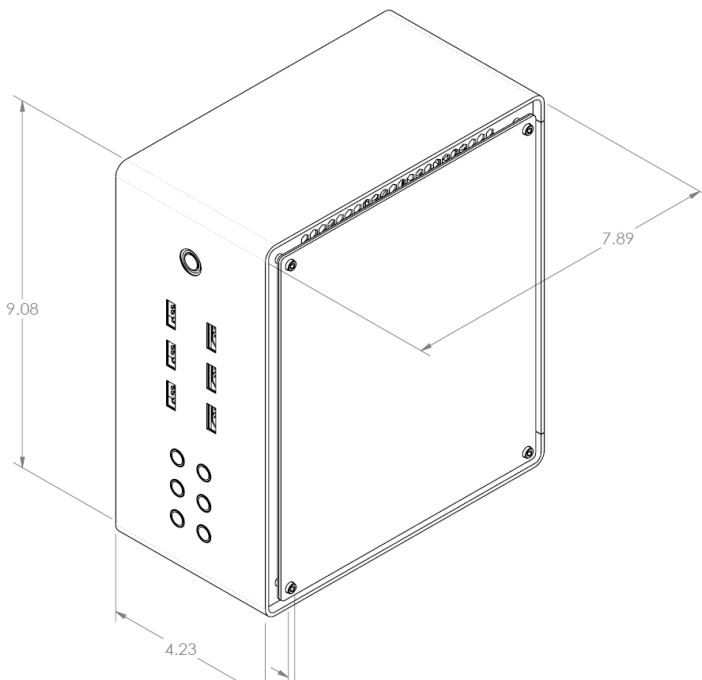
FIGURE 21-83

TriCaster Mini models are highly compact and portable. Of course, like any complex electronic device, it is wise to protect it against accidental damage, including dropping or falling, as well as static discharges.

The unit weighs 9 lbs. (4.1 kg). Passing HDMI cables through the removable 'handle' provides extra strain relief and security, but it's wise to ensure cabling is routed in the room to avoid creating a trip-hazard even so – especially in desktop installations.

Free airflow at TriCaster Mini's vented side panels is also important for system cooling.

SECTION 21.11 TRICASTER 460 AND 410

TriCaster 460 and 410 both ship in 2 Rack Unit (RU) enclosures supplied with 'ears' designed to permit mounting in standard 19" rack architecture (Figure 21-84).

The units weigh nearly 25 pounds (>11 KG). A shelf or rear support will distribute the load more evenly if rack-mounted. Good front and rear access is important for convenience in cabling, access to removable drive bays (TriCaster 460). In view of the top panel vents on 2RU models, at least one RU should be allowed above these systems for ventilation and cooling.

16.81" (42.7 cm)

3.5" (8.9 cm)

18.95" (48.1 cm)

21.5" (54.6 cm)
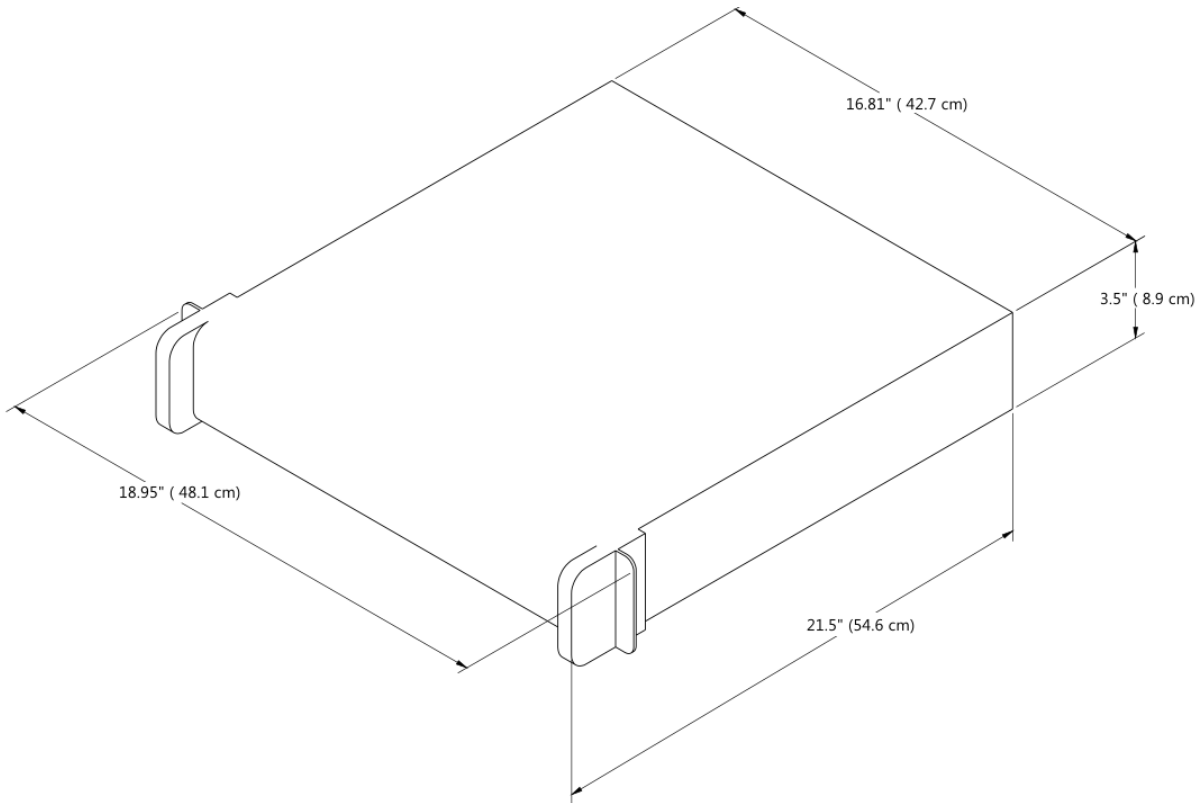
SECTION 21.12 TRICASTER 8000 AND 860

TriCaster 8000 and TriCaster 860 are encased in similar 4 Rack Unit (RU) chassis supplied with 'ears' designed to permit mounting in standard 19" rack architecture (Figure 21-85).

As these units weigh in at about 40 pounds (>18 KG), we strongly encourage you to provide a shelf or rear support to distribute the load more evenly if rack-mounting is planned.

Good front and rear access is important for convenience in cabling, access to removable drive bays, and should be considered mandatory for ventilation and cooling.

18.61" (42.7 cm)

17.31" (44 cm)

7.00" (17.8 cm)

2.55" (6.5 cm)

21.5" (54.6 cm)
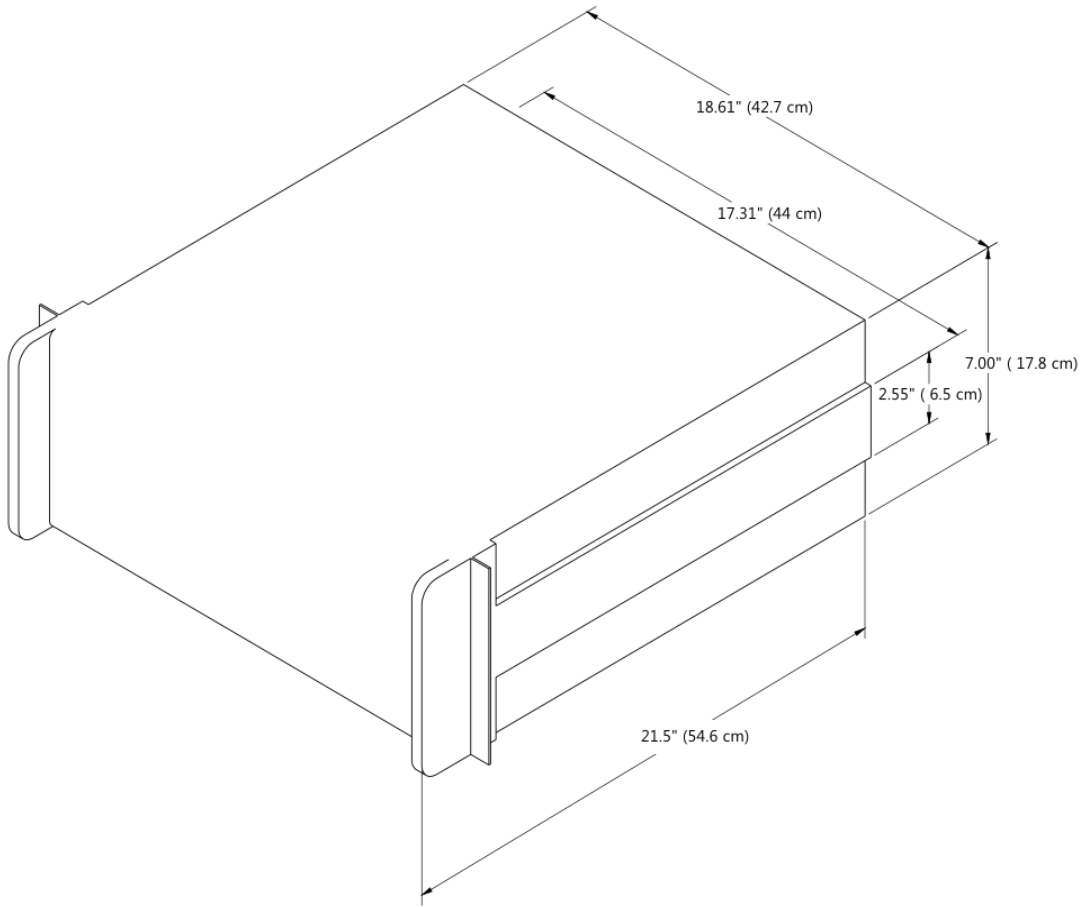
FIGURE 21-85

SECTION 21.13 TRICASTER 8000 CS

Normally, the 8000 CS is used in a table-top configuration. Otherwise, the ½" (1.2 cm) rabbet provided at the front and back of the panel (only) permits you to embed the base in a cutout prepared for the purpose.

4.21"
(10.7 cm)

A

A

5.63" (14.3 cm)

7.5°

3.68"
(1.4 cm)

13.90"
(35.3 cm)
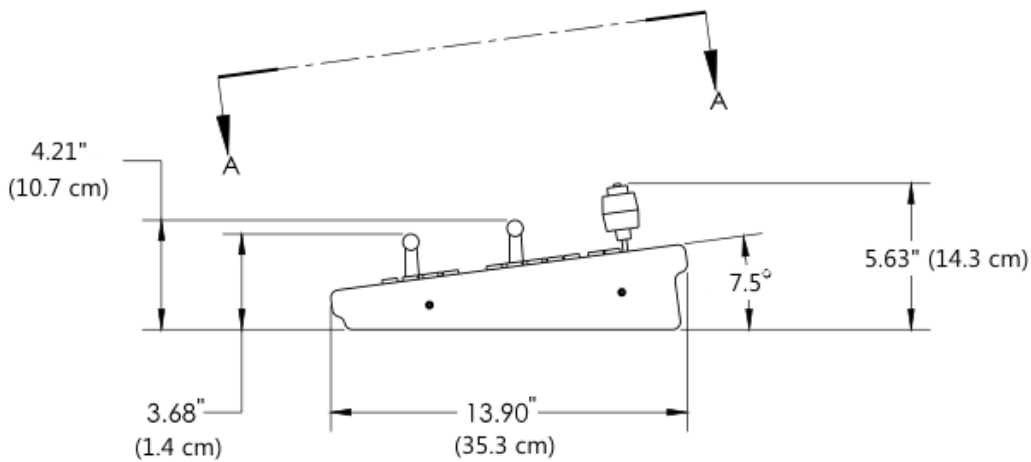
FIGURE 21-86

If you plan to mount the surface in the latter manner, take care that the thickness of the supporting material does not block access to the AC power connection and USB port at rear left on the control surface body.
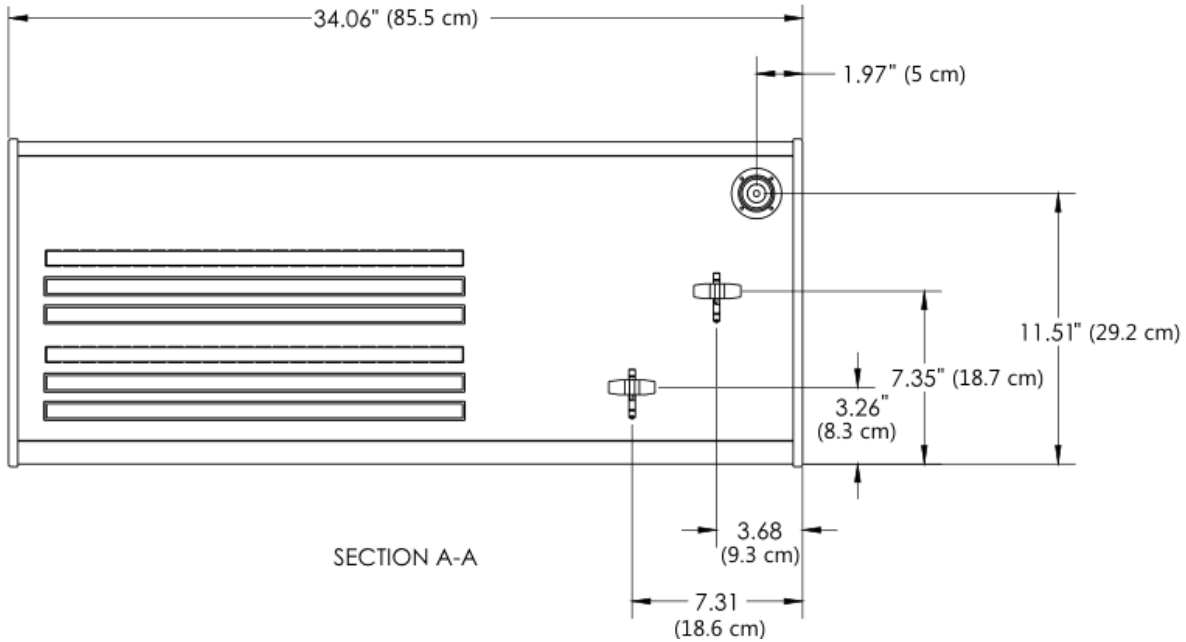
SECTION 21.14 TRICASTER 860 CS

Normally, the 860 CS is used in a table-top configuration. Otherwise, a rabbet on all four sides permits you to embed the base in a cutout prepared for the purpose.
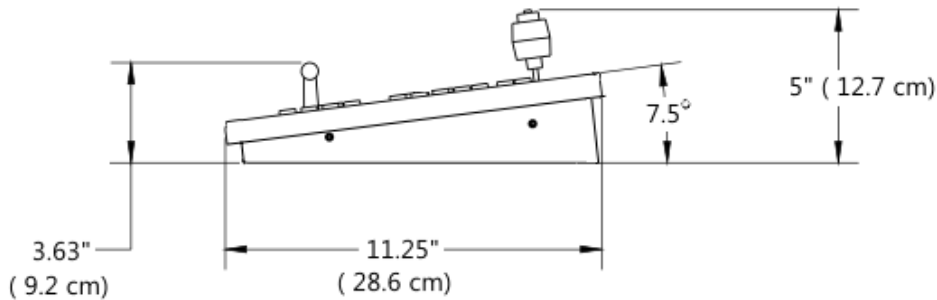
At the sides, a ½" (1.2 cm) ledge is formed for this purpose. The overlap provided front and back is narrower, about 5/16" (.31 cm).
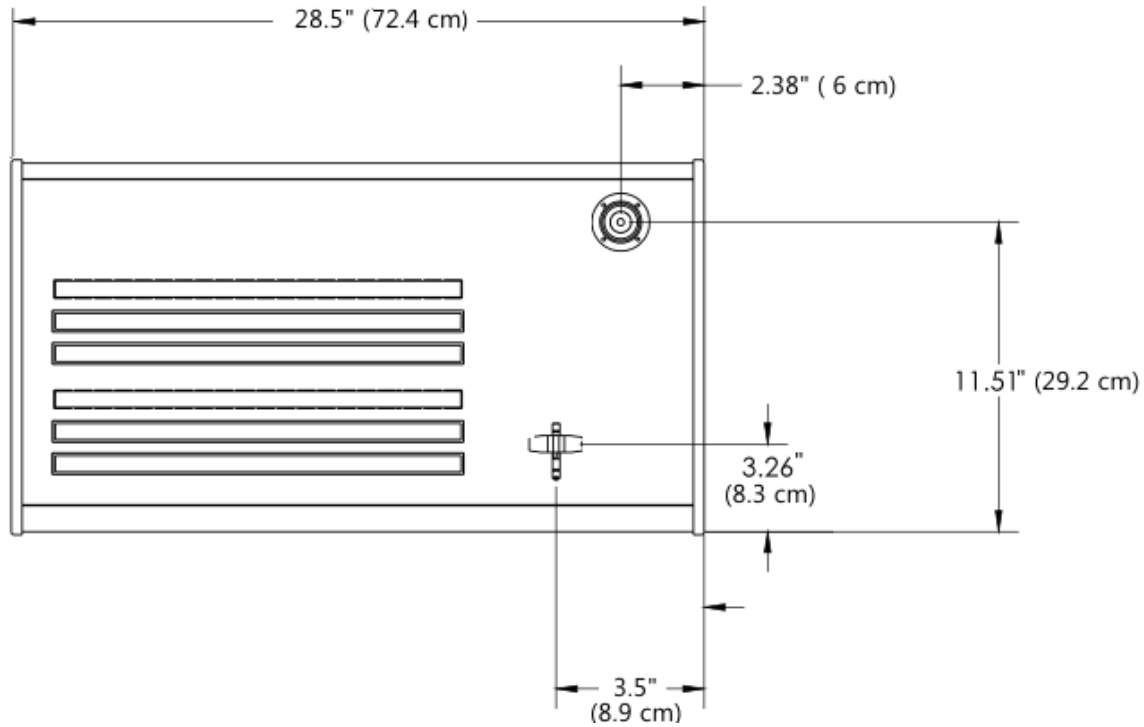
FIGURE 21-89

SECTION 21.15 TRICASTER 460 CS
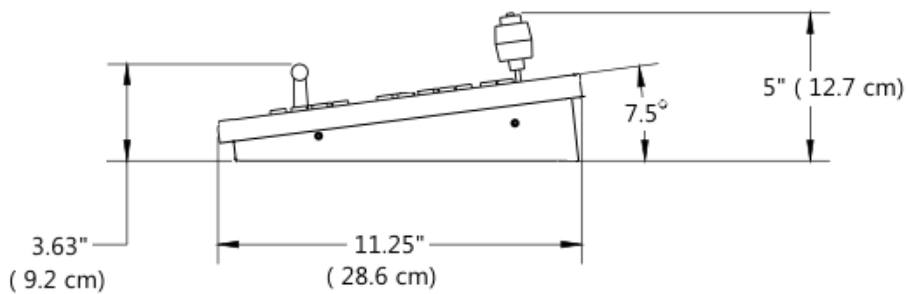
FIGURE 21-90

Normally, the 460 CS is used in a table-top configuration. Otherwise, a rabbet on all four sides permits you to embed the base in a cutout prepared for the purpose.

At the sides, a ½" (1.2 cm) ledge is formed for this purpose. The overlap provided front and back is narrower, about 5/16" (.31 cm).
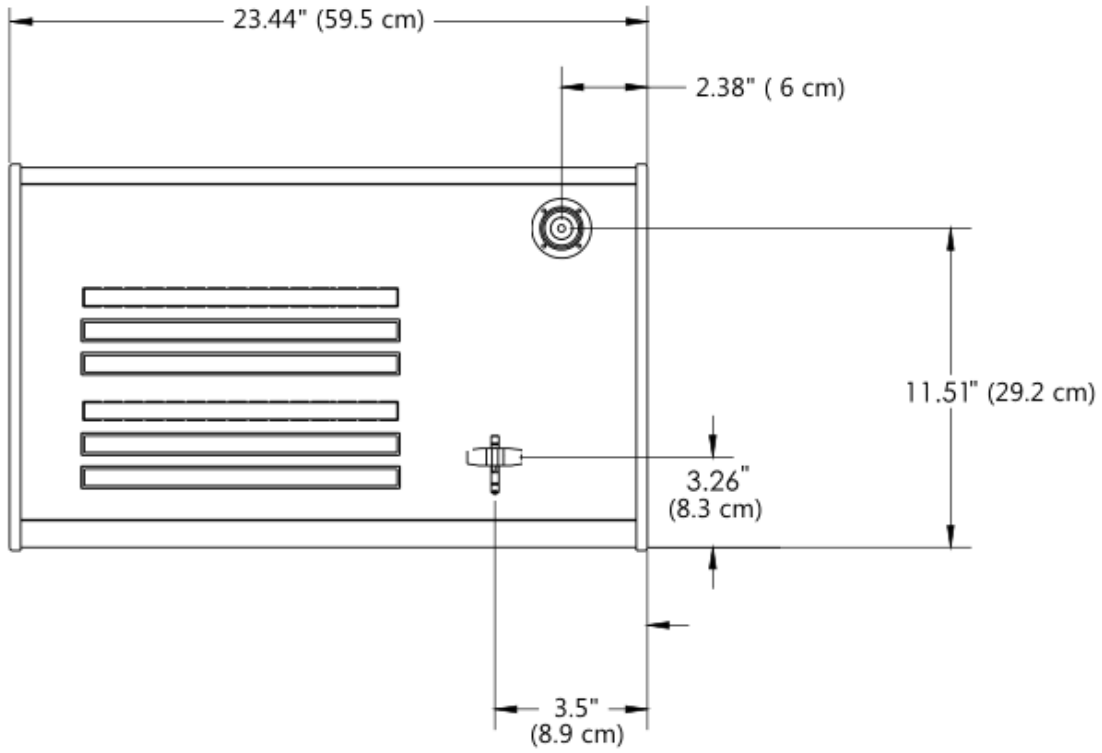
FIGURE 21-91

F 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 exacting test standards. For TriCaster 8000, 860 and 460, 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

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Chapter 22 CREDITS

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- FreeImage library http://freeimage.sourceforge.net/
- LAME library http://lame.sourceforge.net/
- FFMPEG library   http://ffmpeg.org/

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This tool makes use of the "redis-doc" library from http://redis.io/documentation in the intellisense comments, which is licensed under the Creative Commons Attribution-ShareAlike 4.0 International license; full details are available here: https://github.com/antirez/redis-doc/blob/master/COPYRIGHT

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This tool is not used in the release binaries.

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