NewTek

TriCaster 8000

USER GUIDE

Revised – Jan. 11, 2012

Chapter 1 CONTENTS

PART I (GETTING STARTED)

Introducing TriCaster – connections and registration, a top-level overview of primary features, and a hands-on tour to get you started.

Chapter 2 ABOUT THIS MANUAL

This manual tells you what you need to know to use your TriCaster™. It attempts to convey the essential information in a friendly, concise way, while also providing a deeper reference section that you can turn to when you really need the specific details.

Even if you are the hands-on, no questions asked type, please peruse this page, which explains the structure of the manual. If any questions about your TriCaster arise later, you may find the information here allows you to jump directly to information you want with a minimum of reading.

- *PART I – GETTING STARTED*

  Introduction to TriCaster™; connecting devices (cameras, monitors, etc.) and registration, ending with the Live Production Walkthrough – a brisk jog through fundamentals, about 60 pages (if you're a quick study, this may provide all you need).

- *PART II – REFERENCE*

  Chapters in this section cover every arcane detail related to using TriCaster (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.

Chapter 3 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. This chapter provides a quick tour of the major components of your new live production system.

SECTION 3.1 OVERVIEW

Not so long ago, live high definition television 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 revolutionary LiveSet™ virtual set system to provide you with network quality 'bigger than life' production capabilities.

TriCaster continues to set new benchmarks for "portable live production". Simply put it represents the most complete, reliable and efficient integrated system available for live production and web streaming. Its capabilities are equally well suited to broadcast center installations and remote production, and it requires just one person to operate. No matter what your live broadcast ambitions are, TriCaster can 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, recorded digital video, multimedia presentations from networked laptops, live web pages, digital photos and graphics, and much more.

TriCaster also supports the Apple AirPlay® protocol, allowing off-the-shelf mobile video devices (such as iPhone® and iPad®) to stream content wirelessly to TriCaster. Your presentations can simultaneously be displayed by video projectors, television monitors, broadcast by traditional means, and streamed in high quality on the Internet.

SECTION 3.2 STARTUP SCREEN

When you power up TriCaster the *Startup Screen* appears. This is your command center for initiating most other operations.

FIGURE 1

The *Home Page* of the *Startup Screen* allows you to define and open sessions, each of which can be customized for various productions or other purposes. Later, when you re-open a session, all of its assets and settings are remembered.

After creating a session (or opening an existing one), you are taken to the *Session Page*. Here you can launch the *Live Desktop* (for live production), or perhaps choose prepare *Graphics* (title pages), *Manage* content, or even create custom transitions.

SECTION 3.3 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, all in one integrated environment.

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

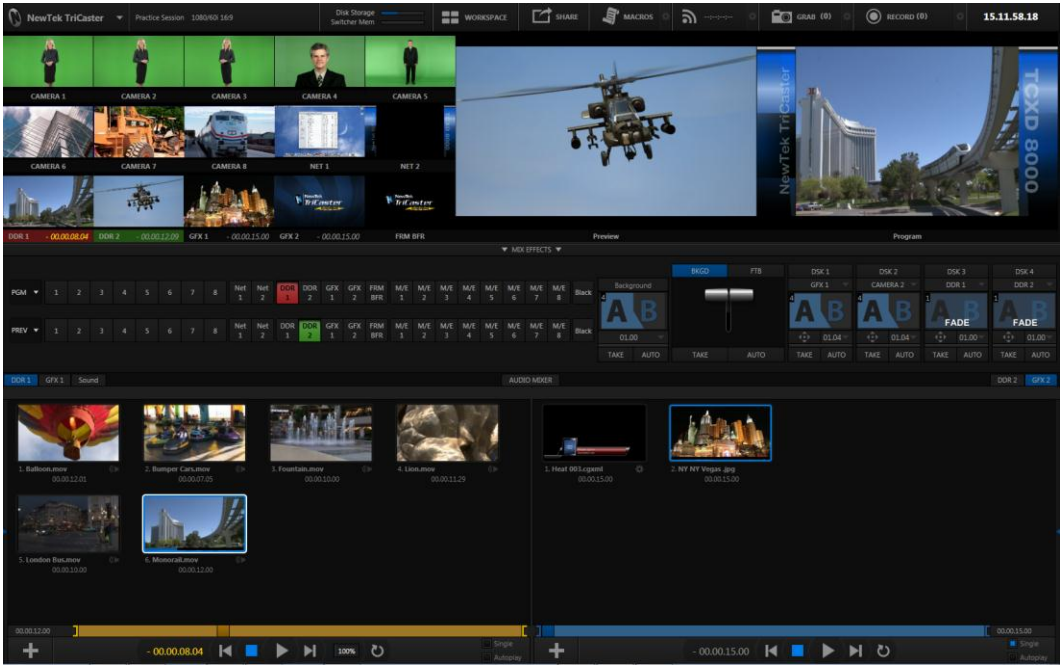


FIGURE 2

- 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*.

- The central *Live Control* section is home to the *Switcher*, *Transition, DSK* (overlay*)* and *M/E* controls (*M/E* controls can be minimized, and are hidden from view in Figure 2).
- The bottom third of the *Live Desktop* holds tabbed control modules, including featuring *Media Players* (*DDRs* and *Graphics* players) plus a *Sound player* and the *Audio Mixer*.

SECTION 3.4 FEATURES

Here's a brief overview of just *some* of TriCaster's key features:

3.4.1 PHYSICAL

- Rugged 4U rack-mount case with redundant power supplies ensures robust, reliable and quiet performance in fixed or mobile installations.
- Massive storage capacity – the internal drive holds approximately 50 hours of 1080i, and the removable drive bays can be used to multiply this capacity (TriCaster 8000 ships with a full complement of drives for this purpose).
- All audio and video, monitoring and network connectors are easily accessible from the rear for convenient installation in industry standard 19" rack-mount configurations.
- Audio and video connectors are industry standard (XLR, ¼" audio jack or BNC as appropriate), ensuring broad compatibility and secure, locked connections. Headphone output uses a standard 1/4" stereo jack.

3.4.2 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 (see Section 9.1.5) ensures that as long there is AC power, audio and video from the last input are routed to *Output 1* in a case of catastrophic software condition.
- If at all possible, streaming output and recording also continue even if all else fails.
- 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 image, or actually replace the internal drive with the backup drive if a complete hard drive failure occurs.

3.4.3 A/V INPUT AND OUTPUT

- Live switch up to eight live video sources (SDI, analog, or a mixture of each) plus internal and network sources.
- Connect supported video routers to greatly multiply input options.
- Professional BNC video connectors provide increased durability and reliability for camera connections.
- Freely mix 16:9 or 4:3 SD formats with HD sources live.
- Output HD sessions as SD (4:3 or 16:9) and HD 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's iVGA™ clients.
- Assign one or both *Network* inputs on the *Switcher* to receive AirPlay® streams and switch live or recorded content directly from your compatible Apple® mobile device or computer.
- Transmit output to another TriCaster across the local network.
- Create complex reentrant M/E effects using multiple sources and versatile virtual sets with live (virtual) camera moves.
- Use channel locking support to automatically harmonize video sources for multiple M/E effects, etc.
- Mix and route internal and external audio sources, including analog or SDI Embedded audio.
- Three video outputs plus HDMI, two additional *Display* ports, streaming output and *Network* output – all can supply independent feeds; designate between two fully configurable output mixes or individual sources at various resolutions up to 1920x1080 for output.
- Send either the main or a custom audio mixes independently to audio outputs 1-3, HDMI and the Internet stream.

3.4.4 TIMECODE

- Supports industry standard (LTC) external timecode.
- 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 this embedded timecode.

3.4.5 ALPHA CHANNEL I/O

- Alternate video inputs can be configured as key channels for Fill + Alpha sources.
- Alpha channel (key) output support.

3.4.6 MONITORING

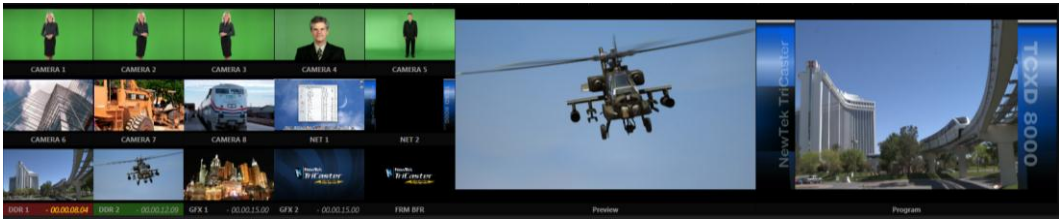


FIGURE 3

- TriCaster's *Live Desktop* includes a large *monitoring pane* offering multiple easily customized *Workspaces.* By default, it includes *Program* output and *Look Ahead Preview* monitors with associated controls.
- Configurable desktop monitor array allows you to keep an eye on all live and internal video sources, including *Media Players* and *Network* sources.
- *Waveform* and *Vectorscope* monitors help you calibrate your signal, to ensure your output meets broadcast standards and looks great.
- External *Multiview Workspaces* offer countless alternatives, including definable multi-bridge layouts, *Production Clocks* and custom logo display.

3.4.7 VIDEO PROCESSING

- *Proc Amps* and *White Balance* controls for every source preserve pristine image and color fidelity through the entire pipeline to final output.
- *Proc Amps* retain independent settings for different *Connection Types*.
- Individual *Proc Amp* controls for each output.
- Full 4:4:4:4 32-bit floating point internal processing of all video sources.

3.4.8 THE SWITCHER

TriCaster's powerful 24-channel switcher with native support for the popular line of video routers from Blackmagic Design® puts countless video sources at your fingertips.

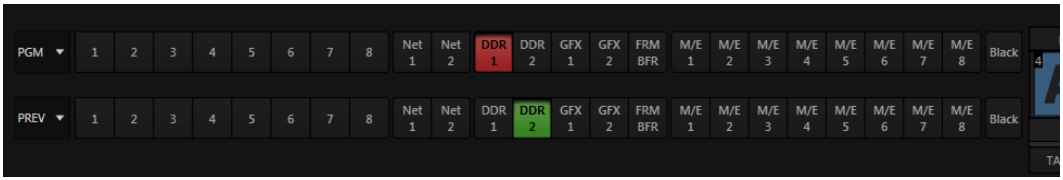


FIGURE 4

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.

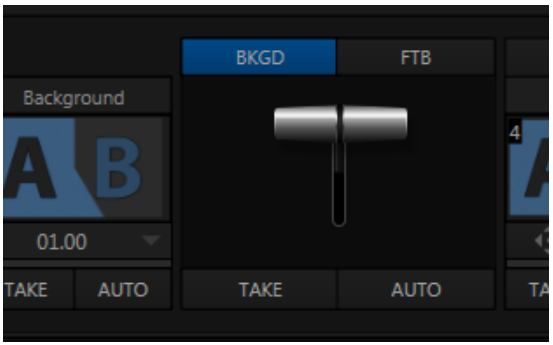


FIGURE 5

- Freely *hot-punch* or *transition* between external sources (*Cameras* or *Network 1 or 2*), internal sources (*Media Players*) and *M/E effects*.
- 4 *DSK* (Downstream Key) channels for the main *Switcher* and four more independent *Key* channels for each of the 8 M/Es provide scores of creative possibilities.

- Use any of the hundreds of transitions supplied to reveal video and DSK sources (such as title or graphics) with animated wipes, dissolves, warps and dynamic cloth effects, and sound.
- Create an unlimited number of custom transition effects with embedded sounds and full color overlays using the integrated *Animation Store Creator* application.
- Reveal combinations of delegated video layers, including *FTB* (Fade to Black) with one operation using the main T-bar or single-click *Take* and *Auto* buttons.
- Local Transition controls for *BKGD* (Background) and *DSK* layers provide flexible and independent configuration and control of these layers and their transitions.
- Select individual transition effects for every layer, and adjust *Transition Speed* (variable and presets), *Reverse* and *Ping Pong* options.

DSK CHANNELS

FIGURE 6

TriCaster's four main *DSK* layers support downstream overlays (note that each *M/E* sports four additional *Key* layers).

- Display *DSKs* channels together or independently, and swap them during a switch – again, with independent custom transitions per layer.
- Use TriCaster's numerous *Media* Players to overlay title pages, including scrolls, crawls and lower-thirds – or delegate a *Camera* feed or *Network* source as an overlay.

- Alternatively, use the *Frame Buffer* feature to assign a specific title or image to any overlay channel, and even update it in realtime over a network using external graphics or titling software.
- Independent *Crop*, *Position, 3D Rotation*, and *Scale* controls for each *DSK* channel permit you (for example) to configure up to four live sources as 'Picture in Picture' elements, revealing them with individual custom effects).

3.4.9 M/ES

TriCaster's eight reentrant *M/E* (Mix/Effect) banks provide powerful effects, virtual sets and secondary video mixing capabilities, including switching with TransWarp™ transitions, full alpha channel support and *LiveMatte*™ realtime keying technology for green/blue screen effects.

Each M/E bank composition supports:

- Up to four primary switcher sources.
- Four more *Key* overlay channels (with individual transition capabilities).
- *Mix* mode provides sub-mix capabilities, with individual transitions for A/B *Background* layers and all four overlays.
- Up to seven full keyers and five discreet effects per M*/E*.
- Individual *Scale*, *Position*, *Crop* and *Rotation* controls for all layers, with *Tracker* support.
- Convenient *presets* allow single-click access to pre-configured *M/E* setups.

3.4.10 VIRTUAL SETS

- Achieve the look of a large and sophisticated studio sets in a very small space with NewTek's astonishing *LiveSet*™ virtual set technology.
- Virtual sets supports up to 4 keyable video sources.
- *Zoom* and *pan* the virtual 'camera' during live production (without touching the physical camera).

- Customize virtual set animation targets right in the live production environment.

3.4.11 RECORD AND STREAM

- Record your live-switched production at full resolution to multi-platform and application friendly QuickTime® formats.
- IsoCorder™ technology lets you record up to eight a/v sources at once, including all camera inputs and both main outputs.
- Similarly, grab still images from *Output 1* or all inputs plus both main outputs.
- Quicktime® clips include embedded timecode.
- Optional secondary formats include MPEG-2, AVI, and H.264 (m4v).
- Record files with embedded timecode.
- Simultaneous output for broadcast, projector and live web stream to in-house and remote audiences.
- Stream using Windows Media® or Flash®, and archive your Internet stream locally.
- Connect to content delivery networks easily using the powerful *Configure Stream Connection* panel.
- Use NewTek's TimeWarp™ instant replay control surface to mark and play highlight clips even while recording uninterrupted *Program* (or 'clean') output.

3.4.12 MEDIA SHARING AND DISTRIBUTION

FIGURE 7

Sharing support makes it easy to publish content to *multiple* sites in one pass. TriCaster stores the account details and credentials for your media and upload sites, and provides a queue for batch uploading and file conversion.

Mixed media assets (clips and stills) from live sessions can easily be added to the queue without interrupting production. Optionally trim, and then upload to multiple hosting and social media sites (including Twitter®, Facebook®, YouTube®, and more) all with a single click when recording is still underway.

This is great for concerts, galas, sport events, game shows and more. The Sharing queue 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.

3.4.13 MACROS

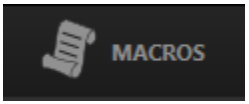
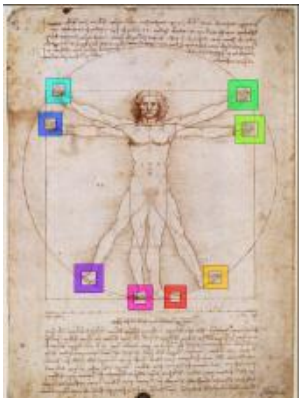


FIGURE 8

Record and play back macros, whether a simple operation or more involved series of events at the touch of a button. Assign shortcut keys to macros, and assign macros to be triggered by onscreen events using *Hotspots*.

3.4.14 HOTSPOTS, TRIGGERS AND TRACKERS



Define multiple onscreen *Hotspots* for different (chromakeyed) sources, and *trigger* macros whenever something opaque enters the hotspot. Set up "Minority Report" (2002, Steven Spielberg) style onscreen interactivity for all manner of imaginative applications.

Trackers follow defined color regions as they move about in the frame in realtime, and output the corresponding motion data to *TriCaster*. Lock other video sources to them using *Position* tools in the M/E banks and DSKs and watch them respond dynamically to live onscreen activity.

3.4.15 IMPORT AND EXPORT

IMPORT MEDIA

The integrated *Import Media* module 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.
- Optionally transcode selected files to formats ensuring smooth playback.

EXPORTING CONTENT

TriCaster's default Quicktime® video capture format makes cross-platform workflows a simple matter; in addition, a dedicated *Export Media* function allows you to create a batch list of files for export, optionally selecting new file formats for the exported media.

3.4.16 AUDIO MIXER

TriCaster provides extensive multi-channel audio control and management in two dedicated tabbed panels.

- Adjust individual audio sources (internal and external) and introduce them into your program manually or automatically.
- Control output levels for program, headphones, auxiliary output, recording, and stream separately.
- Convenient mixer presets allow single-click access to prepared setups.
- Audio follow video options.
- Seven-band equalization along with compressor/limiter for each source and also every output.
- Source grouping and multi-bus routing options.
- Configurable VU meter calibration:
    - Show VU meter scales using digital (dB FS) or analog (either dBVU or dBu) calibration.
    - Digital sources (*SDI* and *AES/EBU*), *Streaming* output and *Record* controls default to dB FS.

3.4.17 AUDIO REMOTE CONTROL

TriCaster 8000's *Audio Mixer* can be controlled by a companion Apple iPad® application. *Volume, Balance* and *Pan*, *Mic Gain* and level control for every input and output is provided.

Alternatively, connect an Avid® Artist Mix control surface to TriCaster, and give complete, hands-on control over the *Audio Mixer* to another operator.

3.4.18 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.

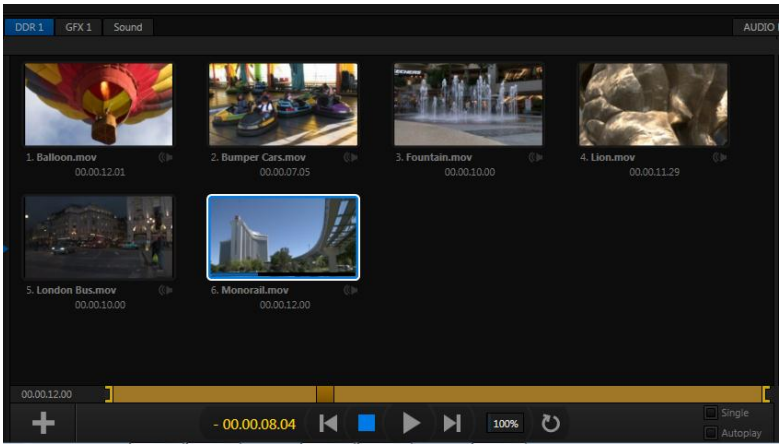


FIGURE 9

- Add a/v clips, sound files or still image files to *Media Player* playlists.
- Trim and re-order playlist entries.
- Store playlists as presets for easy recall.
- Flexible playback controls include variable *Speed* and *Loop* options.
- *Media Players* have volume and other audio controls in the *Audio Mixer*, along with convenient per clip level adjustments right in the *playlist*.
- *Autoplay* feature starts and stops playback manually or automatically based on *Switcher* activity.
- Control *Media Players* with *macros* triggered by other events.
- Assign titles, graphics or a/v clips to multiple *DSK* or *Overlay* channels.
- Edit titles live, even while 'on air'.

3.4.19 TITLES AND GRAPHICS

Also part of TriCaster's integrated software suite is LiveText™, NewTek's professional titling and graphics application. LiveText allows you to create your own custom title pages and motion graphics, including scrolls and crawls.

3.4.20 EDIT

The full version of NewTek's popular and versatile non-linear video editing program SpeedEDIT™ is available as a downloadable *Add-On* for TriCaster 8000 at no extra cost. SpeedEDIT provides powerful, professional tools to let you prepare movies for insertion into your live productions, or perform broadcast quality post production work on recorded programs.

- Edit, import and export in full HD resolution.
- Realtime external hardware project preview in HD or SD.
- Import and export file format support includes MPEG2 and QuickTime® for versatility in program delivery.

3.4.21 OPTIONAL CONTROL SURFACES

The TriCaster supplied 8000CS is designed as the perfect complement to your switcher, and makes 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 4 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 continue into the Live Production Walkthrough chapter that follows it.

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

- NewTek TriCaster™ & TriCaster 8000CS™ control surface
- Package of three (3) 2TB hard drives
- Keys to front panel of case
- Four attachable rubber feet (for desktop use)
- A/C power cable(s)
- BNC removal tool (to assist with cable connection and removal)
- DVI to VGA adapter
- NewTek mouse and keyboard
- Quick Start Guide
- NewTek 3PLAY™ brochure
- NewTek TriCaster registration reminder card
- New product letter

SECTION 4.1 COMMAND AND CONTROL

1. Connect an external computer monitor to the DVI port labeled *Interface* on TriCaster's backplate.

   TriCaster's interface requires a resolution of at least 1600x1050.

2. Connect the *mouse* and *keyboard* to USB ports on TriCaster.
3. Connect the *A/C power cords* from the three-prong connections on TriCaster's backplate to an external power receptacle (see *Hint* below).
4. Turn on the computer monitor.

5. Press the *Power* switch located on TriCaster's faceplate.

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.

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.

SECTION 4.2 ACTIVATING & AUTHORIZING WINDOWS®

(Your dealer may have performed this operation for you as part of his pre-delivery service.) When you see the *Welcome to Windows* screen:

1. Click *Next* at lower right.
2. Choose your time zone.
3. Accept the license agreement.
4. Enter your 25-digit key (generally, the sticker is affixed inside the front door of the case).
5. Decline automatic updates (by clicking "not right now").

6. Give TriCaster a distinct computer name for networking.

You can authorize your Windows® installation by network or by telephone. Assuming you have an Internet connection available, and have connected TriCaster to it with an Ethernet cable, the Internet is the fastest method of activation. (See Section 4.15 and Chapter 16 Network Sources for more detail.)

1. Click 'Obtain IP and DNS automatically'.
2. Agree to activate Windows®. This activation is permanent, and you won't see these screens again. (Registration with Microsoft is optional).
3. Assign a name to the *administrator* account. You may type your name, company, or perhaps simply "TriCaster".
4. Click *Finish*, and TriCaster will re-start.

After restarting and accepting NewTek's *User Agreement*, the interface will load automatically.

SECTION 4.3 LICENSE AND REGISTRATION

On launch, TriCaster presents an *End User License Agreement* dialog. After you accept this, the *Registration* dialog shown in Figure 10 is presented.

If necessary, enter the unique TriCaster *Serial Number* and *Product ID* for your system.

Note: TriCaster's video output displays a watermark until the system is registered and unlocked (by entering the registration code).

FIGURE 10

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 either by telephone, or online (directly from TriCaster or from another system connected to the Internet) as described next.

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.

4.3.1 ONLINE REGISTRATION

If you have connected your TriCaster to the Internet, simply click the button under *Step 2* in the registration dialog. This will take you to the *Registration* page (http://register.newtek.com) on NewTek's website, where you will find further directions.

Hint: More information on connecting TriCaster to a network can be found in Section 4.15 and Chapter 16 Network Sources.

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 at *Step 4* of the dialog.

Check your personal area of the site from time to time afterward; among other things, you'll be able to download any free software updates that are made available going forward.

4.3.2 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 very 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 registration code too; it could come in very handy if you ever need to restore the TriCaster software to its as-shipped state when you don't have access to the Internet.

ENHANCED SUPPORT (PROTEK)

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

SECTION 4.4 RACK MOUNTING TRICASTER

Your TriCaster is 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 of TriCaster 8000 is important; 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.

SECTION 4.5 INPUT CONNECTIONS

4.5.1 CONNECT A/V SOURCES

External audio and video sources are connected to the appropriate inputs on TriCaster's backplate.

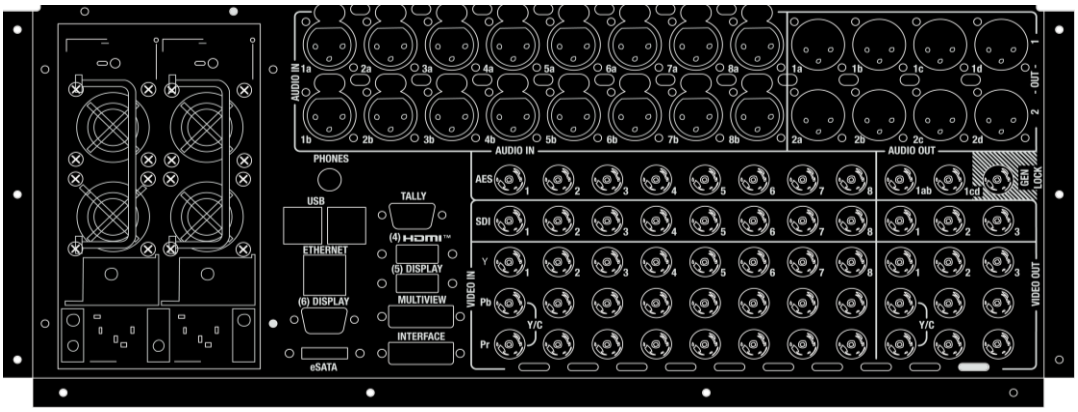


FIGURE 11

1. Connect *video* sources to suitable connectors in the *VIDEO IN* section, whether *SDI*, *Component*, *Y/C* (S-Video) or *Composite* (may require RCA to BNC adapter).

    a. *SDI* – Attach SDI source connectors to upper row of BNC connectors in the *Video In* group (marked *SDI*).

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

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

    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.

    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*).

    d. *Composite* – Attach the composite source's connector (may require 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.

2. To input *analog* audio along with the video, connect the external audio sources to the XLR or ¼" connectors in the *Audio In* group box.

   Two connectors, labeled "a" and "b", are provided for each input group. We'll discuss audio *Connection Type* options a bit later, in Section 4.13.

Note: SDI video sources with embedded audio do not need a separate analog audio connection.

4.5.2 CONNECTING A VIDEO ROUTER

With the appropriate software installed, TriCaster 8000 systems can control and access output from Black Magic Design® brand video routers.

- Download the latest version of the (BMD) VideoHub application software from http://www.blackmagic-design.com/support/), and install the software on your TriCaster.

  (You will need to exit the TriCaster environment to the Windows® Desktop to do this.)

- Update the router's firmware if required.

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

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

- Run the BMD utility to confirm that TriCaster can see the router. (If the router firmware is up to date but detection fails, please contact BMD support for assistance.)

SECTION 4.6 GENLOCK CONNECTION

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 4.14 regarding genlock configuration.)

SECTION 4.7 TIMECODE CONNECTION

TriCaster supports external linear timecode (LTC) input. Connect the cable from your timecode generator to one of the connectors in (audio) *Input 7*. External timecode is enabled and configured in the *Live Desktop* (see Sections Section 4.15 and Section 9.3).

SECTION 4.8 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 aspects are best considered before even beginning a TriCaster session.

4.8.1 A/V OUTPUT

TriCaster provides separate 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.

- Simultaneously send output to both analog and digital devices.
- Send program output, a secondary mix, or '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.

4.8.2 HD AND SD

As mentioned earlier, for HD sessions TriCaster supports *simultaneous* output of both SD (Standard Definition) and HD (High Definition) video.

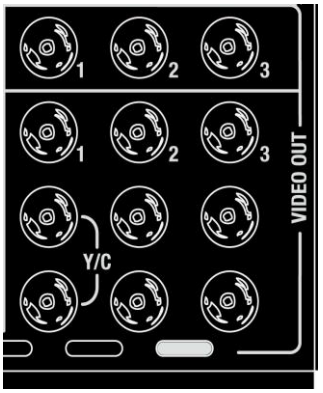


FIGURE 12

The *Video Output* section on TriCaster's backplate provides 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 6.1)
    - 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.
- *Output 2* is user-configurable, and can be set up in the *Live Desktop* (*Output Configuration* panel).
- *Output 3* can be used to mirror either of the two primary outputs, or transmit a completely different source in its original format.

FIGURE 13

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

   Please note that the latter two formats 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.

   b. SDI – Attach SDI connectors to the uppermost row of BNC connectors in the VIDEO OUT group, labeled 1-3.

   Hint: If your equipment supports SDI, this is the best alternative.

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

   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.

      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).

   e. *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. Note that there are two pairs of two connectors each:

i. Connectors *1a-1d* provide sound from the mix assigned to *Output 1* (defaults to *Master* in *Output Configuration*)
ii. Connectors *2a-2d* provide sound from the mix assigned to *Output 2* (defaults to *Aux* in *Output Configuration*)

These two output sections are configured and controlled separately – see Chapter 15, Audio.

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

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.

4.8.3 SUPPLEMENTAL VIDEO OUTPUTS

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 DVI connector located above the main *Interface* monitor connector. Again, connect a suitable monitor or display device.

   The new device should be recognized and enabled by the system automatically. This output offers a variety of optional monitoring layouts that can be selected at any time in TriCaster's *Live Desktop*.

2. *Output 4* provides 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. *Outputs 5* and *6* are labeled *(5) Display* and *(6) Display.* These ports are intended for use with projectors or similar large display systems, though of course they can serve other purposes as well.

Note: For best results in IMAG applications, it is important to configure Display outputs to the native resolution of the external devices.

4. *Outputs 7* and *8* (*Stream* and *Network*) require only a network connection.

Outputs 3 through *8* are similar as respects the optional video sources they can be configured to supply. You can choose to clone either *Output 1* or *2*, or transmit any single *Switcher* source (included a *Frame Buffer*) on any of these outputs.

Note: For Outputs 3-6, a mismatch of output format and connection type is possible at times. For example, a Graphics player might display imagery that does not correspond to the current output resolution.

Similarly, it would be inappropriate to clone Output 1 on Output 3 when the former is HD but the latter is configured for Composite + Y/C output. TriCaster will attempt to display the output despite mismatches, but may not always succeed in such cases.)

SECTION 4.9 TALLY LIGHTS

FIGURE 14

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.

4.9.1 CONNECTION DETAILS

Here is a pin-out listing for TriCaster's DB15 Tally connector:

- Pin1 – LED1
- Pin2 – LED2
- Pin3 – LED3
- Pin4 – LED4
- Pin5 – LED5
- Pin6 – LED6
- Pin7 – LED7
- Pin8 – LED8
- Pin9 – GND
- Pin10 – GND
- Pin11 – GPI1
- Pin12 – GPI2
- Pin13 – NC
- Pin14 – 3.3V (with 20 Ohms current limit)
- Pin15 – NC

ENGINEERING NOTES

- Pins 1-8 are 'hot' when the LED should be illuminated.
- Each LED pin (pins 1 - 8) has a 200 ohm current limiting resistor inside TriCaster.
- With no load (open circuit) pins 1 - 8 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 4.10 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 6.1 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.

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.)

FIGURE 15

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 6.2.1 for a discussion of session *Volume* options).

THE SESSION PAGE

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 16

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.

THE LIVE DESKTOP

Initially, as you have yet to configure input devices or add content, the *Live Desktop* will look a bit barren (Figure 17).

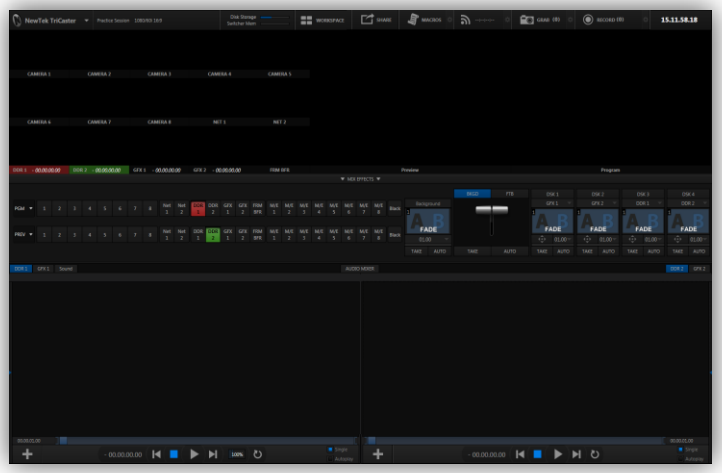


FIGURE 17

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 3.3, but we'll examine it more closely in Chapter 5, Live Production Walkthrough – coming up soon.)

SECTION 4.11 CONFIGURE VIDEO OUTPUT

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

For standard definition monitoring, several different connection types continue in service. These include *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.) To connect an *analog* standard definition monitor, you must specify its connection type in the *Output Configuration* panel.

Note: Analog connections for LiveText™ output (as well as the SpeedEDIT™ Add-On, when installed) are pre-defined. See Chapter 21 for details.

Let's take a closer look at configuration options.

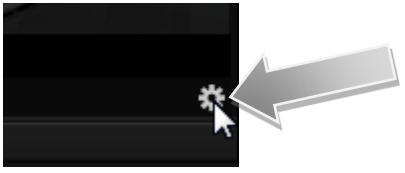


FIGURE 18

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

2. Click the *Configure button* (gear) that appears at right below the monitor pane (Figure 18) to open the *Output Configuration* panel.

This panel provides two tabbed panes, the first of which is labeled *Output*.

This is where the video signals present on each of TriCaster's video outputs, as well as the *HDMI, Display ports, Network* output and *Stream* options are configured.

There are various decisions to make for each output:

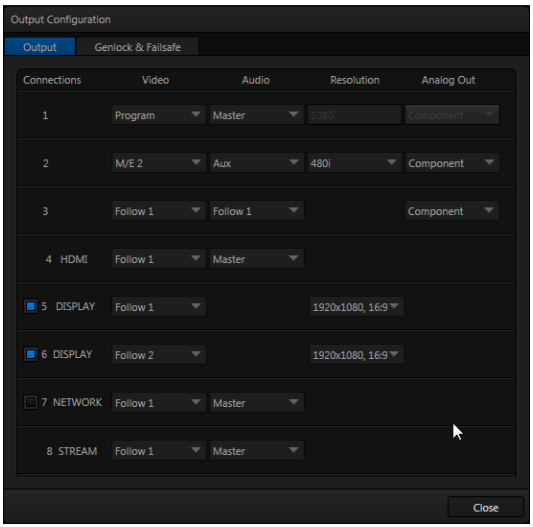


FIGURE 19

- What video source do you want to assign to that output?
- What audio source will accompany it on connection types that carry both signals?
- Which video format will be sent to the connectors?
- For video outputs, which connection type will be used to carry the signal – SDI, Component, Y/C or Composite?

And so on …

4.11.1 CHANNEL OPTIONS

Let's review *Video* source selection first. A drop-down menu by that name permits you to select different sources for TriCaster's two primary video output streams, referred to as *Output 1* and *2*.

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

Hint: Either (or both) of the a/v streams assigned to Outputs 1 and 2 are available for assignment to TriCaster's other outputs as well, by means of the Follow 1 and Follow 2 items in the respecitve source menus.

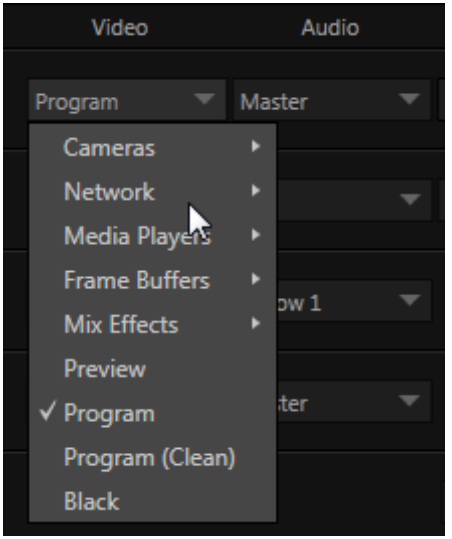


FIGURE 20

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

- *Program* output
- A clean *Program* feed
- The 'look ahead' *Preview*
- The direct output of any *M/E*
- *Frame buffer* content
- *Media Player* output
- Either network input source
- The feed from any camera input

Audio menu options include the *Master* and *Aux* mixes, any *audio group* (by color code), or the sound from any one of TriCaster's audio inputs.

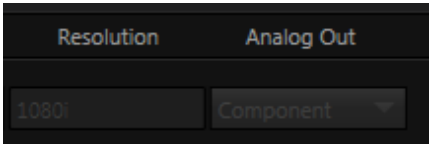


FIGURE 21

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.

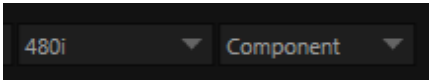


FIGURE 22

It's worth mentioning that SD formats offer different A*nalog 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).

Hint: Multiview, a versatile external display intended primarily for control room monitoring, is configured in TriCaster's Dashboard (click the Workspace menu).

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.

SECTION 4.12 CONFIGURE VIDEO INPUTS

Control over settings for video sources is provided in TriCaster's monitoring section. The individual monitor viewports on the *Live Desktop* can be flexibly assigned to show different video sources. Complete monitor layouts can be prepared, 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 4.5.1).

1. Click *Workspace* in the *Dashboard* (at the top of TriCaster's *Live Desktop*). Four monitoring *layout presets* are listed at the top of the menu as *Interface A* through *D.* Select *Interface A,* if it isn't already check-marked.

2. Assuming you haven't yet customized the default layout for this *layout preset* (*Interface A*), the monitoring pane contains individual monitors for each camera, with *Camera 1* at upper left. Confirm this by right-clicking the first monitor and checking (in the context menu that opens) that it is currently set to *Camera 1*.

3. To continue, you could select *Configure* from the same menu, but let's take a different approach. Having set the monitor viewport to display *Camera 1*, move your mouse back and forth over the monitor and notice that a *Configure button* (*gear* icon) appears beneath it at right.

4. Click this *Configuration button* to open a tabbed settings panel for *Camera 1* (Figure 23).

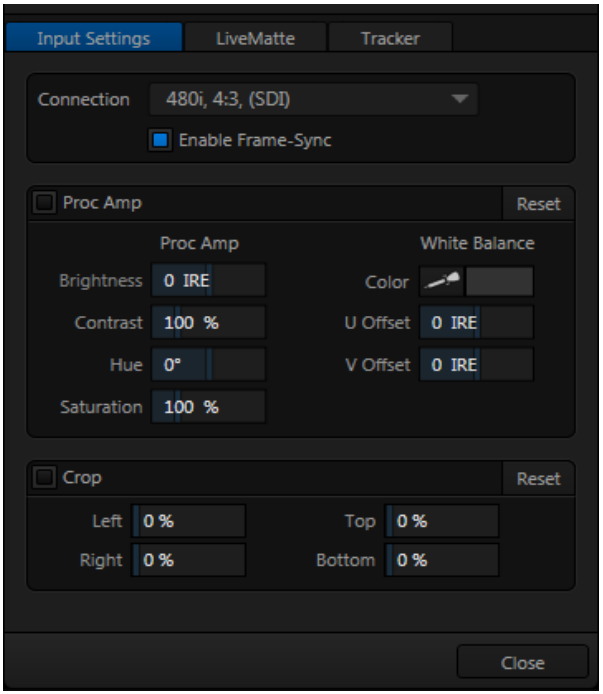


FIGURE 23

5. Click the *Connection Type* button to reveal a drop-down menu listing a variety of connection types. Select the correct format, such as *720p (Component)* or *1080i (SDI)*, for the video source you connected to *Video Input 1* on TriCaster's backplate.

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

7. Continue to configure all connected external video sources in the same manner.

We'll look at the other options and settings in the *Configuration* panel later (see Section 9.2), but at this point you should be able to view the video inputs you have configured on their respective monitors.

4.12.1 CONFIGURE A VIDEO ROUTER INPUT

Configure the input *Connection* to *SDI* (choosing the correct resolution for the device output) as discussed above, and then right-click on the *Switcher* row button for the TriCaster input where the router is connected (see Section 4.5.2) to select which router input will be transmitted to TriCaster.

SECTION 4.13 CONFIGURE AUDIO

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

FIGURE 24

This double-wide tab houses individual control panels for all of TriCaster's audio sources and outputs.

There is a source *Type* selector drop-down at the top of the control panels for each input (Figure 25). Clicking it reveals the *Connection Type* options available for the corresponding input.

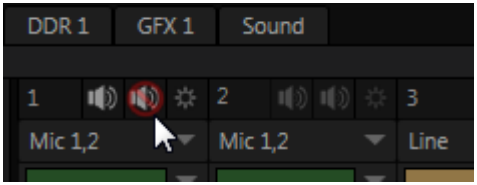


FIGURE 25

Optional connection settings include *Mic 1, 2* (with and without phantom power), *Line*, *AES/EBU*, *SDI Embedded*, and for alternate instances, *Line Quad*. (The latter option combines two neighboring input pairs as a one 4 channel source governed by a single *Gain* slider.)

After connecting audio sources to the input connectors (see also Section 4.5.1), the first thing to do is set the correct *Connection Type* using the drop-down menu:

- Select *Mic 1, 2* for professional grade microphones or similar low impedance connections (use the *Phantom* option for condenser microphones requiring supplementary power).
- Choose *Line* for higher impedance device connections (such as a CD player, computer audio output or VCR), or *Line Quad* where required.
- Select *AES/EBU* for digital audio from an AES/EBU (AES3) output.
- *SDI Embedded* provides digital audio from an SDI video source.

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

The *Volume* sliders (next to the *VU meters*) default to their lowest settings on first launch. After adding audio sources, slowly bring these sliders up to pass their signals through the system.

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

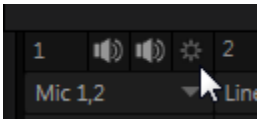


FIGURE 26

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.

To access these controls, open the *Advanced Audio Configuration* panel, by clicking the *Configuration button* (gear) in the titlebar for an input control group.

Use the *Gain* knobs (Figure 27) to bring the levels for microphones and similar sources into a useful range on the *VU meter*.

FIGURE 27

AUDIO HEADROOM

In digital audio systems, signal levels exceeding allowable values are 'clipped' (uniformly assigned the maximum level value). This inevitably results in audible issues that cannot be corrected later.

FIGURE 28

For this reason, it's customary to configure audio systems in such a way that the normal operating level (also referred to as the 'alignment level', and sometimes, 'nominal level') is well below the clipping limit – sufficiently so that occasional excessively loud sounds (say, loud laughter or applause) can be accommodated without risk of clipping.

This range above the nominal level, between it and the highest possible level, is commonly referred to as 'audio headroom'.

What is considered a suitable headroom allowance can vary slightly from one locale to another, in different industry applications, and even 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, typical analog mixers show levels on VU scales indexed as just described. In contrast, editing software and digital devices commonly display levels using dBFS (Full Scale) indexing, with 0dBFS – the absolute maximum allowable signal that can be recorded – at the top of the scale.

TriCaster's VU meters have user-configurable indexing, and default to showing analog inputs using a traditional dB VU scale, and meters for digital sources calibrated in dB FS.

Whatever scale you choose, use *Volume* controls (and, for *Mic* connections, the *Gain* controls in *Advanced Audio Configuration*) to avoid over-modulation.

TriCaster's *Compressor/Limiter* feature (also located in the *Advanced Audio Configuration* pane) is another powerful tool to help you prevent clipping – see Section 15.4.

SECTION 4.14 CONFIGURE GENLOCK

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

2. Access the *Output Configuration* panel by clicking the *Configure* button (gear icon) that appears below the main *Program Output* monitor when you move the mouse over it on the *Live Desktop*.

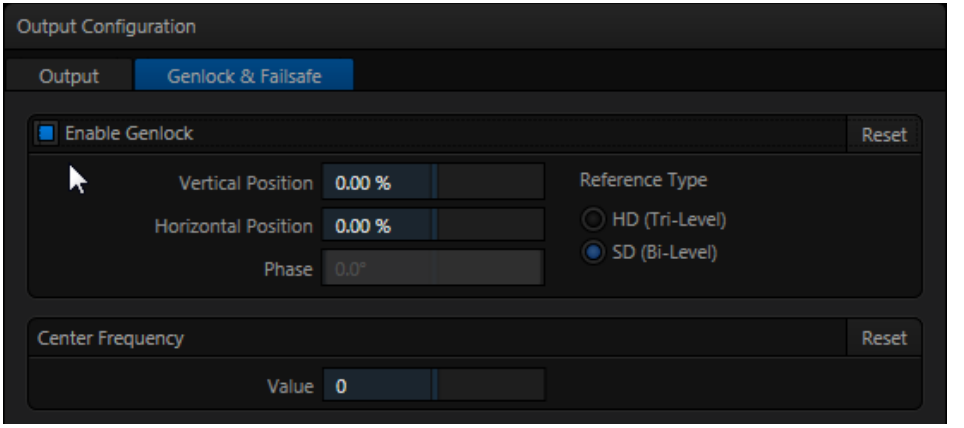


FIGURE 29

3. Click the *Genlock & Failsafe* tab in the *Output Configuration* panel (Figure 29).

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.

Ideally both the cameras and the 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 9.1.3.

SECTION 4.15 CONFIGURE TIMECODE

TriCaster can use the system clock to generate 'local timecode' for the time display shown in the *Live Desktop* and also embedded in TriCaster's captured Quicktime video clips.

To configure timecode, click the configure button (gear) located beside the timecode display at right in the *Dashboard*. Please see Section 9.3 for more detail.

If you have an external linear timecode (LTC) source, you'll probably want to use that timecode reference rather than the local (system) time. A switch is provided in the *Timecode Configuration* panel to enable this support (see Section 15.4 for more detail).

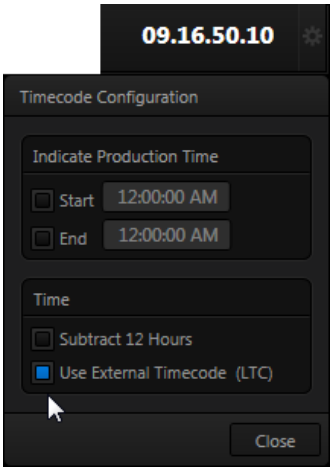


FIGURE 30

SECTION 4.16 NETWORKING

TriCaster is capable of displaying screens from networked computers running NewTek's iVGA™ client software, output from other supported applications (such as NewTek's own LiveText™), video streamed from additional TriCaster or 3Play™ systems on the network, or from Apple AirPlay®.

Generally, simply connecting a suitable cable from the Ethernet port on TriCaster's backplate to your external network is all that is required to add TriCaster to a *local area network* (LAN). In some settings, additional steps (beyond those mentioned when we discussed Microsoft Windows® activation in Section 4.2) 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 6.2.3. If further help connecting is required, please consult your system administrator.

The next section (Chapter 5 Live Production Walkthrough) will guide you through your first experience using TriCaster.

Chapter 5 LIVE PRODUCTION WALKTHROUGH

This chapter provides a quick hands-on tour of the major components and functions of your NewTek TriCaster™. 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, let's start your first TriCaster™ session, and skim through some important fundamentals:

- Startup and Import
- Monitoring and related features.
- Audio mixing (and the Follow feature).
- Network sources.
- Switching between video sources, and using transitions.
- Program Output and Recording.
- Playing stored clips using the DDR ('Digital Disk Recorder').
- Adding (and editing) title pages and graphics.
- Using an M/E to create a simple chromakey effect.
- Configuring a LiveSet (virtual set) shot.
- Streaming to the Internet.

SECTION 5.1 CREATING A SESSION

We ran through the basics of starting new *sessions* and configuring input and output devices in sections Section 4.10 through Section 4.14. If you need to review this information, go ahead and do so now. (We'll look at them individually again later in Part II (Reference), too.)

1. In the initial *Startup Screen*, create a new 1080i session - name it "*Practice Session*".

2. The *Session Page* will appear when you click *Start Session.*

3. Click *Manage* on the icon ring (Figure 31).

FIGURE 31

SECTION 5.2 IMPORTING CONTENT

Let's import a few files that we'll use later in our walkthrough:

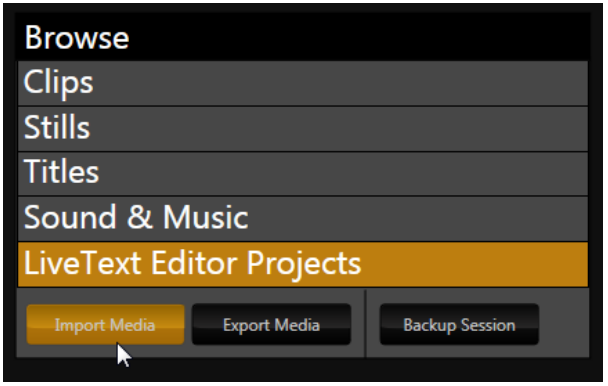


FIGURE 32

4. Click the *Import Media* button at lower-right.

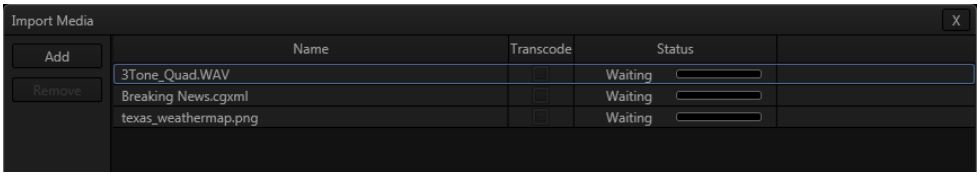


FIGURE 33

5. Click *Add* in *Import Media* (Figure 33) to open a system *File Explorer*.

4. Navigate to C:\TriCaster\Documentation\Walkthrough Content.

5. Press *Ctrl + a* (to multi-select everything in the folder shown in the *File Explorer*) – then click *Open*, adding these items to the file pane of the *Import Media* panel.

6. Click *Import* – different media types are automatically sorted into the correct destination folders as they are imported. We'll use these files later (see also Section 6.3.3).

Hint: Although you might well never even notice, a two minute initialization period begins after you start (or re-start) TriCaster.

This 'warm-up' period allows the system to stabilize, ensuring consistent performance of various components (for example, video clips playing in the DDR before the end of initialization could skip some frames).

We are ready now to commence our tour of the *Live Desktop*, beginning with further consideration of monitoring features and options.

SECTION 5.3 CONFIGURING SHARE ACCOUNTS

TriCaster's *Share Media* features allow you to publish clips and stills from events to social media sites or storage locations even while the live action and capture continue.

This is a unique ability that adds value to TriCaster productions that the 'other guys' don't offer. Taking full advantage of it requires a little configuration beforehand.

FIGURE 34

At the top of both the *Home* and *Session* pages in *Startup*, you'll see a row of icons (Figure 34) representing *Accounts* you can optionally publish your media to. These include popular social media sites like Facebook® and YouTube®, along with more prosaic but still very useful storage option.

Hint: Successfully configured accounts show a green checkmark icon.

Let's use a simple example to show how it works – one that doesn't require you to have an existing account with any social media provider.

1. Click the second icon from the left (this is the *File Copy* icon), to open the *Account Configuration* panel (Figure 35).

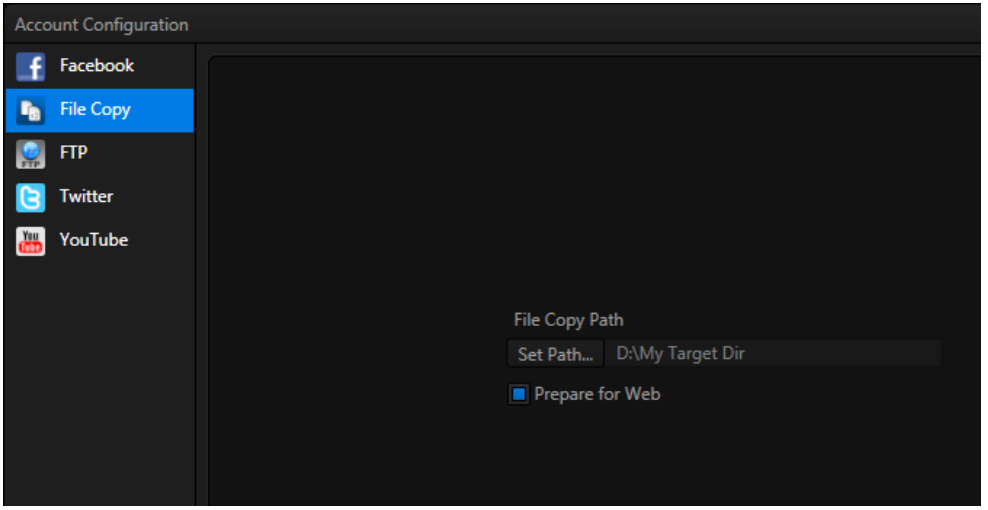


FIGURE 35

2. Click *Set Path*, and choose (or create) a destination folder for output.

3. If you like, enable the *Prepare for Web* switch.

Hint: Normally, for File Copy, and perhaps FTP destinations, you might well skip this last step. It causes shared files to be transcoded to a compact H.264 format suitable for uploading to social media sites when processed.

That's all you need to do. (Of course, if you have social media site accounts, you can configure them here too.) We'll use this a bit later in our walkthrough to demonstrate how to share media from the *Live Desktop*.

SECTION 5.4 MONITORING

5.4.1 PROGRAM AND PREVIEW

Inevitably, you'll be paying a lot of attention to the main *Program and Preview* monitors (Figure 36), occupying the right half of the *Live Desktop's* monitoring section by default.

FIGURE 36

TriCaster's 'Look Ahead' *Preview monitor* reflects the outcome of the upcoming switching operation.

The *Program monitor* displays what you are sending to downstream devices and your audience.

Situated just above the monitoring display is the *Dashboard*, offering controls for *Stream, Grab, Record,* a timecode display, and more. Let's briefly turn out attention to the centrally located *Workspace* menu in the *Dashboard*.

5.4.2 WORKSPACE PRESETS

Click the large *Workspace* button (Figure 38) to view a drop down pane allowing you to select and configure *Workspace presets*.

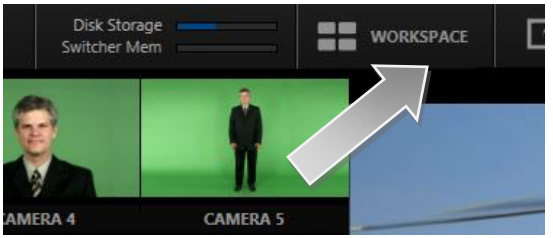


FIGURE 38

At the top of this pane are four *Interface* presets, labeled *A-D*, with accompanying graphics that depict the current layout of each preset.

1. Notice that, by default, the *Interface A* preset displays all camera inputs along network inputs and a number of other internal sources.

2. One by one, select successive presets in the *Interface* group, and note the effect on the *Live Desktop* monitors.

3. Select *Interface D*, making it the active preset.

4. Click *Workspace* again, re-opening the preset controls. Slide the mouse

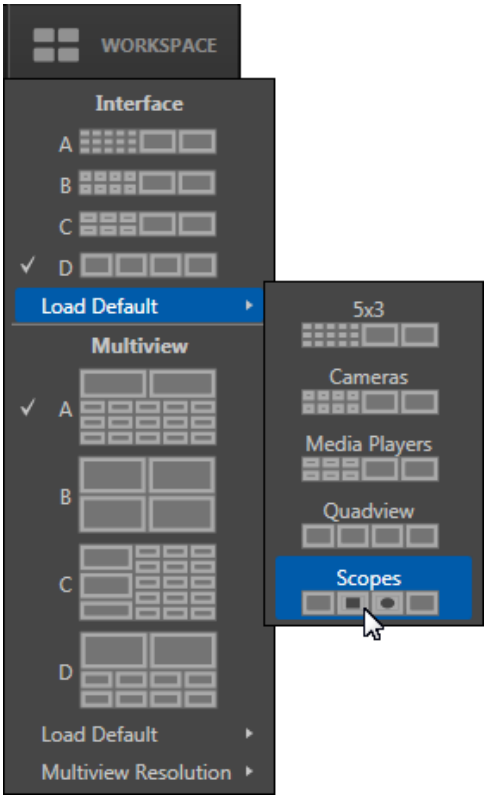


FIGURE 37

down to the *Load Default* entry, revealing a sub-menu showing different monitor layouts. Select *Scopes*.

5. Glance at the monitor display, and you'll notice that *Preview*, *Waveform* and *Vectorscope* monitors are now shown.

6. Switch to the *Interface A* preset, then back to *D.* Presets recall the last setting, so D continues to show *Scopes*.

Workspace presets can be modified beyond simply changing their monitor layout, too.

7. With the *Interface D* preset active, reselect the *Load Default* menu,

8. This time, choose the *Cameras* preset, populating the *Live Desktop* monitors with 8 camera input monitors, plus large *Preview* and *Program* monitors.

9. Move them mouse pointer over the monitor for *Camera 1* and right-click to open the *Monitor Setup* context menu (Figure 39).

10. Slide down to the *Mix Effects* entry, and select *M/E 1* from the sub-menu.

11. Repeat this operation for the remaining seven camera monitors, selecting a different M/E as source for each monitor.

The *Interface D* preset now displays individual monitors showing the output of all M/Es after the associated effects are applied (including virtual sets, overlays, etc.)

All monitors, including those in the Interface as well as *Live Desktop* monitors, can be customized in similar fashion.

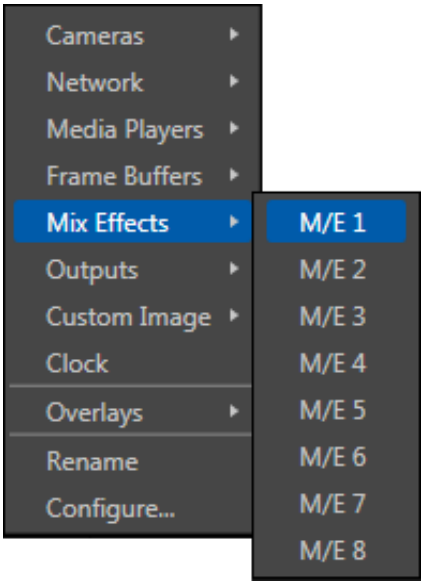


FIGURE 39

Hint: To restore default monitor layouts, simply activate the preset you want to modify, click Workspace and select your preferred Default Layout,

Let's look at a few more details of TriCaster's monitors before moving on:

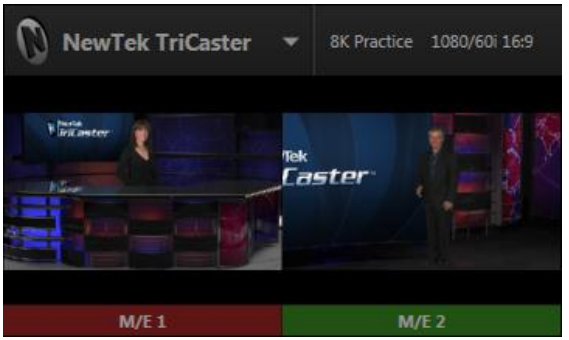


FIGURE 40

- The monitor labels for sources currently visible on *Program* output are highlighted in red. Labels for sources shown on *Preview* have a green tint.

FIGURE 41

- Monitors provide other controls and displays on rollover as appropriate, including things like *Play* or *Stop* (*Freeze*), current position (timecode) in a clip, and *Network* source selection (Figure 41).

- The *Monitor Setup* context menu (Figure 39) provides many options in addition to simple source assignment, including a *Checkerboard* background option for sources with transparency (Figure 41), VU meters, and more.

5.4.3 SCOPES

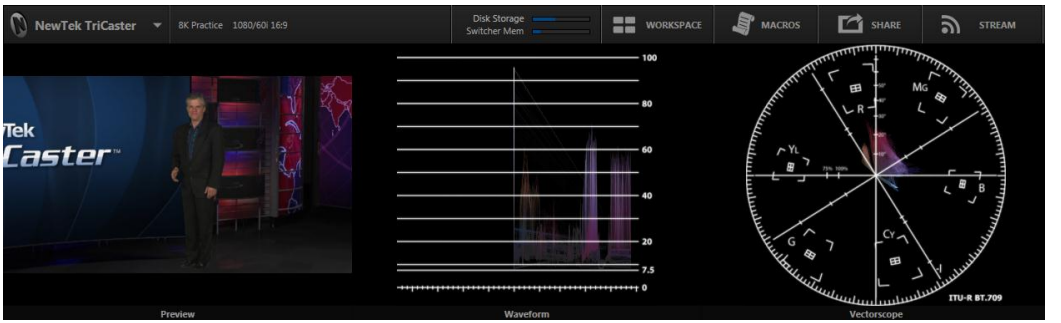


FIGURE 42

Display the *Scopes* again (if you've forgotten how, see the previous section). The monitoring area displays *Waveform* and *Vectorscope* displays (along with a full color *Preview* source video pane), invaluable for calibrating your video sources.

1. Move the mouse pointer over the *horizontal* divider separating the monitoring section from the *Switcher* area below – it becomes a double-headed arrow.

2. Drag downward at this location until you've got nice big scopes to work with (Figure 42).

3. Move the mouse onto the video monitor at left, and click the *Configure button* (gear) at right below to display the (source) *Configuration* panel for the video source.

Experiment with the *Proc Amp* and other controls in this panel; when you're finished, restore the monitoring panes to their default size as follows:

4. Move the mouse over the *Desktop* divider you previously dragged, and double-click it to restore its default position.

SECTION 5.5 AUDIO MIXER

Having previously connected and configured your audio inputs, let's explore a few of the standard features in TriCaster's *Audio Mixe*r.

Hint: You will need to have speakers connected to (at least) the first two connectors (channel 1 and 2) in the Output 1 (upper) row of TriCaster's Audio Out section (even better, if you have them handy, connect a pair of stereo headphones and put them on).

5.5.1 MUTE, MONO AND BALANCE

1. Click the *DDR 1* tab below the *Switcher* area of the *Live Desktop*.

2. Click the *Add* button at lower left in the *DDR 1* pane.

3. Click the *Practice Session* entry under the heading *Audio* in the *Location* list at left (this *Location* entry was created automatically when we imported files back in Section 5.2, Importing Content).

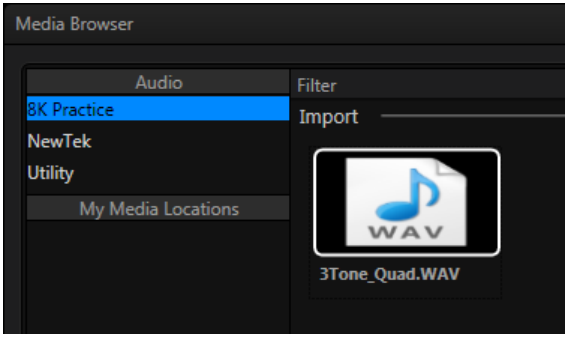


FIGURE 43

4. Find the icon named "3tone_quad.WAV" in the file pane. This is a four channel audio file, with a mid-range tone on channel 1, a higher tone on channel 2, while both channels 3 and 4 both carry a lower tone.

5. Select the icon for this file, and click *OK* to add this audio file to the playlist.

6. Turn on the *Single* and *Loop* switches below the *DDR 1* playlist; turn *Follow* off.

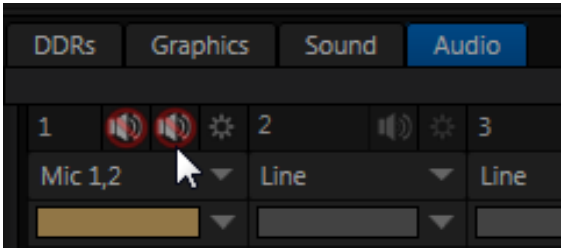


FIGURE 44

7. To avoid any confusion, click the *Audio Mixer* tab, and *Mute* any inputs that show live audio on their respective *VU meters* by clicking the *speaker icons* in the titlebar of each control group so they show a red stroke through them (Figure 44).

8. Make sure audio for *DDD 1* player is *not* muted.

9. Set *DDR 1's Volume* slider to *0dB* VU (you can do this quickly by holding down the keyboard *Shift* key while *double-clicking* the *Gain* knob).

10. Click the *DDR 1* tab again, and click the *Play* button in the *DDR 1* pane.

If you have stereo speakers or headphones connected, you should now hear two distinct tones – a mid-range tone from the left speaker (connected to Output *Ch. 1*) and a higher pitched tone from the right speaker (connected to Output *Ch. 2*).

Hint: If you happen to have a 'surround sound' speaker setup with front and rear speakers, you will also hear another even lower tone coming from the rear speakers.

11. The *VU meter* for *DDR 1* in the *Audio Mixer* tab will show matching levels for all four input channels.

12. Next, drag the *Balance* slider all the way to the left. Observe that the level shown for *channel 2* and *channel 4* are gradually reduced. At extreme left, these two channels are completely silent. Only the mid-range tone (on channel 1) is heard (in a stereo environment), and only from the left speaker at that.

    Moving the slider to the right (of center) has the opposite effect, reducing channels 1 and 3 without any effect on the other 2 channels. At the extreme right position, only the mid-range tone from the *DDR* file is audible (and only from the right speaker).

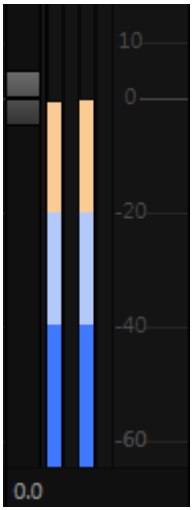


FIGURE 45

The lesson here is that (unlike either *Mono* or *Pan*, considered shortly) *Balance* does not 'move' audio from one channel to another. You *cannot* use *Balance* to 'blend' channel 1 with channel 2, for example. Rather, *Balance* regulates the levels for one pair of channels (1 and 3, or 2 and 4), not affecting the other pair when doing so.

Let's consider the effect of the *Mono* switch next:

13. Center the *Balance* control once again, so that you hear the mid-tone exclusively from the left speaker, and higher tone from the right only.

14. Click the *Mono* switch. Notice that now *a blend of* the (channel 1) mid-range tone and (channel 2) higher tone issue from *both* speakers.

15. To confirm that for yourself, slide the *Balance* knob to the extreme left. Although sound is now issuing only from the left speaker, you can hear both tones.

16. Click *Stop* for *DDR 1*.

Note: the Mono switch has no effect on channels 3 and 4. These two channels are never blended with channels 1 and 2 on output.

5.5.2 PAN

The Mixer's *Pan* controls look much like its *Balance* sliders, but have special abilities. Like *Talk*, *Pan* is only available when *Mic* input *Type* is chosen.

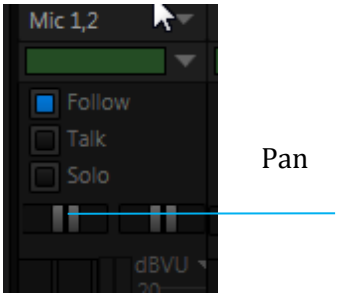


FIGURE 46

A *Pan* slider is provided for *both* channels of sources when *Mic* is selected. Sliding the *Pan* knob left or right actually moves (or 'pans') the audio from its original channel onto its neighbor.

For example, when the *Pan* knob for *Mic 2* is at the extreme right, all of the sound from that source is sent to output channel 2. Moving the slider leftward places an increasing amount of the sound from Mic 2 on output channel 1.

When the slider reaches the extreme left position, the sound from Mic 2 is now entirely sent to output channel 1.

Hint: In their default center position, the two Pan controls have exactly the same effect as clicking Mono. Actually, this is why a Mono switch is not needed in this case.

Pan thus provides precise control over where the audio from either Mic input is heard – whether exclusively on output channel 1, 2, or whether differing levels from either source is sent to both outputs.

5.5.3 TALK

Talk is an abbreviation of "Talk Over". The *Talk* feature is only shown for inputs when they are set to Mic.

17. Start *DDR 1* playing the audio tone file again.

18. With *Input 1* set to *Mic 1, 2*, enable its *Talk* switch, watching DDR 1's *VU meter* as you do so.

Enabling it causes the level for all *other* audio sources to drop off by 20dB, allowing Mic 1 and 2 to dominate output. This is very useful for public address announcements, which is its principal purpose.

5.5.4 FOLLOW

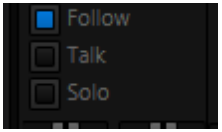


FIGURE 47

19. Connect cameras to both *Video In* rows 1 and 2.

20. Connect two (audibly different) audio sources to *Audio In* rows 1 and 2.

21. Enable the *Follow* switch in the *Audio Mixer* for both *Input 1* and *Input 2*.

22. Select the button for *Camera 1* on the Switcher's *Program* row.

23. Select the button for *Camera 2* on the Switcher's *Preview* row.

24. Click the *Audio* tab.

25. Click the Switcher's *Take* button – keep an eye on the VU meters for *Inputs 1* and *2* as you do so.

Notice that when the video source assigned to *Camera 1* is on output, you hear its associated audio input. When you perform a *Take* (placing *Input 2* on output) the audio source connected to row 2 in the *Audio In* section is heard.

When *Follow* is enabled for an audio source, its sound is automatically sent to output whenever the associated video source is displayed on output. In this case, the levels shown in the *VU meter* for that audio source are drawn in color.

When you switch away from the video source, the *VU meter* still shows its audio level, but the graph is drawn in grayscale (providing confirmation that audio is present, but indicating that it is not going live to *Program* out).

Hint: Follow even works when the associated video source is displayed on output via an M/E or DSK channel.

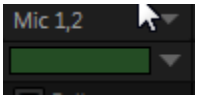


FIGURE 48

Each audio control group for has an additional drop-down located just below the *Connection Type* menu. This is the *Group* control, which employs color coding.

Grouping allows you to gang multiple audio sources together. When *Follow* is enabled for a group member, the sound from the entire audio group is heard whenever the corresponding video source is displayed.

Let's test this:

26. Supply live sound to audio inputs 1 and 2, and set both to a single group (color) using the drop-down *Group* menu in the tabbed *Audio Mixer* pane.

27. Enable *Follow* for *Camera 1* and *Camera 3* (but not *Camera 2*).

28. Select *Camera 1* on the Switcher's *Program* row. The audio from *both* input 1 and 2 should be audible.

29. Switch to *Camera 3*. The audio from inputs 1 and 2 is muted on output. (If audio input 3 has sound, you will hear it instead.)

30. Switch to *Camera 2*. Even though *Follow* is not turned on for input 2, you will nevertheless hear sound from *both* input 1 and input 2 again. (This is because another input in the same group does have *Follow* enabled.)

SECTION 5.6 NETWORK SOURCES

Perhaps you'd like to be able to add Microsoft *PowerPoint*® output, web pages, *Skype*™ video calls, application displays, titles and graphics from NewTek's *LiveText* or other exotic content to your productions. TriCaster supports all such displays from computers on the same network as *Network* (1 and 2) sources on the *Switcher*, via the supplied *iVGA* client application (not required for *LiveText*).

5.6.1 IVGA CLIENTS

1. For a Microsoft Windows® client, copy the iVGA PRO program from the *Extras\iVGA\Microsoft Windows* folder (inside C:\TriCaster) to the sending computer.

   For OS X® client systems, copy the correct *iVGA.dmg.zip* file appropriate for your system type from the similar folder named for Apple OS X® to your Mac.

   Unzip it by double-clicking it; mount the disk image (.dmg file) in the same manner, then drag the iVGA program icon into Applications. (See Chapter 16, Network Sources for more detail).

2. Connect TriCaster to the client computer via the local network.

3. Double-click the iVGA icon on the second computer.

After agreeing to the NewTek license (and a moment or two for the network connection to be established) the name of the remote computer is added (along with "Black" and any other networked systems with iVGA running on them) to TriCaster's network source list.

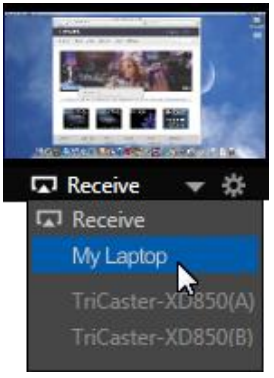


FIGURE 49

Note: Gigabit networking is highly recommended, and should be considered mandatory for HD sessions in particular.

When TriCaster recognizes qualified network sources, it adds them to a drop-down menu for quick selection (Figure 49).

4. Move your mouse pointer over a *Network* monitor in the *All Monitors* tabbed view.

5. Click the triangular menu button below the monitor to select a networked source (or change the current selection) from the menu that appears. (For iVGA PRO, you'll need to accept the connection at least once on the client machine).

Hint: iVGA displays a status icon on the client system. For a Windows® based system, the icon is in the task tray; on Macintosh® systems, it is shown in the dock. This indicates this computer's display is ready to send to TriCaster. The icon's appearance changes to indicate when the client is actually sending output to TriCaster.

See Section 16.1for more detail on the use of iVGA.

5.6.2 APPLE AIRPLAY®

See Section 16.2 for details on using devices and applications supporting Apple AirPlay as network sources for TriCaster.

5.6.3 LIVETEXT™

NewTek's (optional) standalone LiveText application offers features that are very similar to TriCaster's integrated *LiveText* (see Chapter 21 LiveText™ and SpeedEDIT™), but installs separately on a compatible Windows® computer.

A (networked) *LiveText* workstation effectively constitutes a dedicated CG and title solution for TriCaster presentations. (This is a wonderful addition for those times when you could really use another pair of hands.)

When running on the network connected computer, *LiveText* is listed in the *Network* selection drop-down menus (just as an *iVGA* source would be).

Select *LiveText* (and clicking the *Live* button in LiveText) provides the current title page in LiveText to the *Network* buttons on TriCaster's *Switcher, M/Es* or *DSK* channels.

Back in Chapter 4 Setting Up, you connected cameras to inputs on TriCaster's backplate and configured them. If you haven't already done so, let's explore basic *Switcher* operations.

5.7.1 SWITCHER ROWS

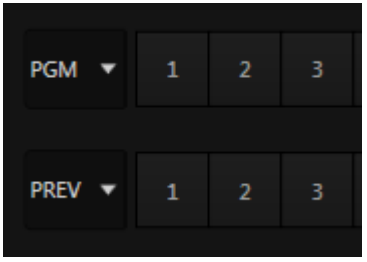


FIGURE 50

The main *Switcher* features 2 rows of buttons labeled *Program* and *Preview*. Each button on a *Switcher* row represents one of the many and varied video sources available.

The first button group at left on any row represents *Cameras*, while others represent other special sources (discussed soon).

FIGURE 51

Clicking a button in any row selects the active source for that row. *Program* and *Preview* row selections determine the content of the *BKGD* (Background) video layer, before the application of any overlays (*DSKs*).

VIDEO LAYERS

TriCaster video output often consists of multiple sources of imagery, added together layer on layer to form a composite. The *Switcher* and *Transition* controls allow you to manage these video layers to show the viewer just what you want him to see.

Background layer (and *FTB*) | *DSK 1* | *DSK 2* | *DSK 3* | *DSK 4*

The *BKGD* (Background) *video layer* constitutes the base of the video composition ultimately sent to *Program Output*.

Based on your selections, as many as five more primary *video layers* may be superimposed above the *BKGD* layer on output:

- The *DSK 1*, *2, 3* and *4* video layers are most commonly used to apply graphics or titles to the *BKGD* layer (*DSK* stands for 'Down Stream Keyer').

- *FTB* (Fade to Black) constitutes a final video layer prior to output – one that can obscure all others when called upon to do so.

Again, the *Program* and *Preview* row selections determine the content of the *BKGD* (Background) video layer. The *Preview* row selection is normally cued up for the next *Take* (cut) or *Transition* operation. Either operation, once completed, results in the original *Program* and *Preview* row selections exchanging places. Of course during a transition, portions of both the *Program* and *Preview* row selections can be seen in varying amounts.

The *BKGD* layer composition can include other content as well, as we'll see later in Section 5.10 (LiveMatte) and Section 5.11 (More About M/Es).

Hint: It can be useful to have the tab for a Media Player you select on the Preview row shown automatically. To employ this behavior, enable either of the "Tabs follow Preview … " items listed under Options in TriCaster's Live Desktop menu (at extreme left in the Dashboard).

CONFIGURING CAMERAS

Let's try out some of these concepts, shall we? (If you previously configured some cameras, feel free to skip ahead to the next sub-heading).

1. Select Interface preset A in the *Workspace* menu. By default, it shows all simple Switcher sources (i.e., all sources except *M/Es* and their associated *Frame Buffers*.)

2. First, confirm that the *Connection Type* selected for your video sources is correct.

    a. Move your mouse over an *Input* monitor.

    b. Open the *Configuration* panel for that input by clicking the *Configure button* (gear) that appears at right in the input label (footer).

    c. Choose a *Connection Type* setting that is appropriate for the camera, and close the *Configuration* panel.

3. Repeat the steps above for all connected cameras.

4. Click the *Switcher* button labeled '1' on the *Program* row to send *Camera 1* to TriCaster's *BKGD* layer (the button turns red, denoting its selected state).

    (For experimental purposes, feel free to use internal sources such as *Media Players* rather than live cameras if you like – see 0).

5. Click to select *Camera 2* on the *Preview* row (the button will light up in green).

6. Note that the monitor labels for the corresponding sources are now also tinted red and green, respectively.

DSK SOURCES

Let's assign sources to a couple of the *DSKs* (*Downstream Keyers*) now (we'll be using these shortly):

1. *Add* a title to the *GFX 1* playlist as follows:

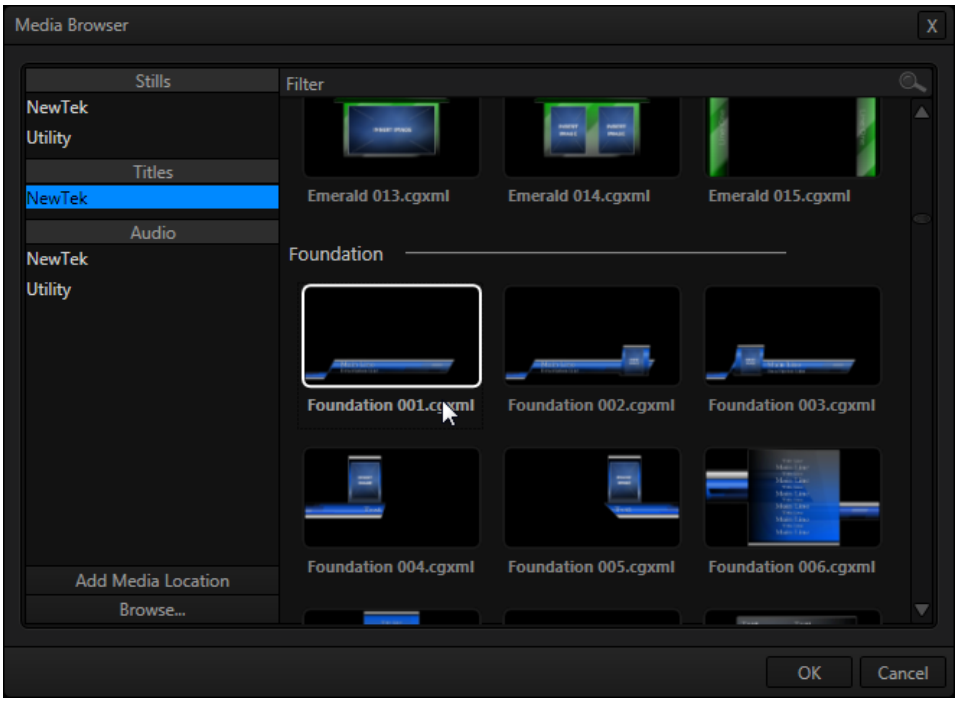


FIGURE 52

a. Click the *Graphics* tab, then click the large + button at left in the footer of the *GFX 1* player to open a custom *Media Browser*.

b. Click the NewTek *location* at left (under the *Titles* heading) in the *Media Browser*.

c. In the file pane at right, scroll down to locate a title that does not cover the entire screen (such as the one shown in Figure 52).

2. In the same manner, add a similar title to the playlist for *GFX 2*.

We're ready to configure the *DSKs* we want to use now.

The *DSK* controls are located to the right of the *Transition* control group (T-Bar) in the central (*Switcher*) area of the *Live Desktop*.

The name tag for the source currently assigned to each *DSK* channel is displayed below the *DSK's* own label. By default, *GFX 1* and *GFX 2* are assigned to *DSK 1* and *DSK 2* respectively.

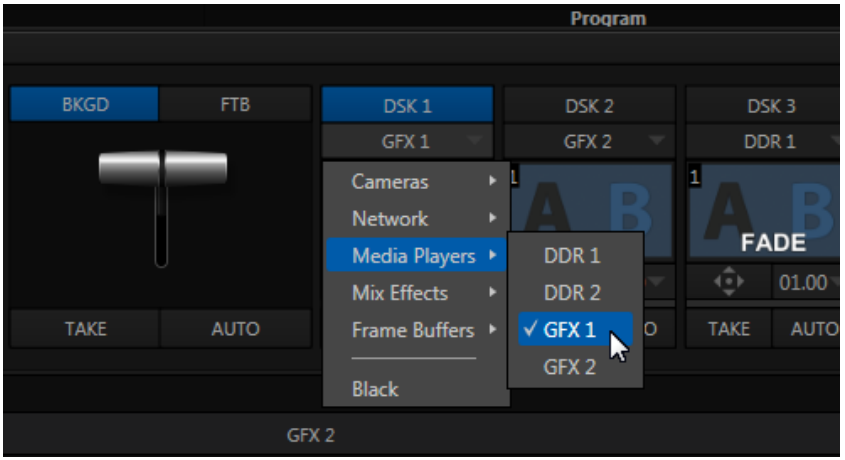


FIGURE 53

If necessary, click the source labels for *DSK 1* and *2* to open a menu allowing you to restore the default sources as above (Figure 53).

5.7.2 TRANSITIONS

Now we're ready now to try out the features in the *Transition* section, just left of the *DSK* section in the onscreen *Switcher*. Let's begin our exploration of switching with the *BKGD* (Background) layer.

1. Select *Camera 1* on the Switcher's *Program* row.
2. Select *Camera 2* on the *Preview* row.
3. Notice that the red and green highlighted monitor labels conform to the selections you just made.

FIGURE 54

4. Click the *BKGD* button above the *T-bar* in the *Transition* group – Figure 54 (this tells the *T-bar* to operate on the *BKGD* video layer).

5. Click the *Take* button below the *T-bar*.

    a. *Camera 1* is instantly removed from *Program Out*.

    b. *Camera 2* (previously the *Preview* row selection) moves to *Program* output.

    c. The *Camera 2* button is now lit up on the *Program* row.

    d. The *Camera 1* button is lit up on the *Preview* row.

    e. The red and green monitor label highlights have been swapped.

6. Now click the local *Auto* button. The *Program* and *Preview* row selections swap again, but this time, rather than a simple (and instant) *Cut*, the change employs the currently selected transition – by default, a *Fade*.

Hint: By default, the keystroke shortcuts Enter and spacebar perform the (main Switcher) Take and Auto operations, respectively.

7. To replace the current transition with a different one, follow these steps:

    a. Click the large *Fade* thumbnail icon to open the *Transition Bin*.

    b. Slide the mouse pointer down and click a different transition effect. Test it, by clicking *Auto*.

The *Transition Bin* provides quick access to a number of transitions, but TriCaster includes many others.

To replace an entry in the *Transition Bin* with a new effect, proceed as follows:

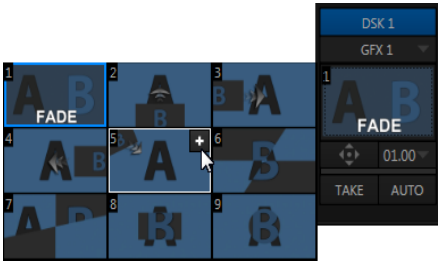


FIGURE 55

8. Open the *Transition Bin* again, and hover the mouse pointer over any thumbnail icon.

9. Click the *Browser* button (+ sign) that appears above the icon to open the custom Media *Browser*.

10. The *Media Browser* is context sensitive. It will show transition headings in the *Location list* at left. Choose a new transition to replace the current entry.

11. The current transition duration is shown beneath the thumbnail icon (shown as *seconds*: *frames*).

    Click the digits to edit them directly, or click the triangle button and select an entry from the menu (Figure 56).

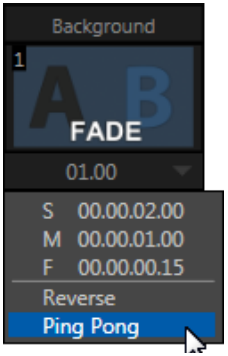


FIGURE 56

Hint: notice that the menu also offers Reverse and Ping Pong options, which control transition direction.

DSK TRANSITIONS

Having mastered the basic *Background* transition, let's take another look at the *DSKs*. Notice that each *DSK* channel has its own control panel to the right of the main *Transition* group in the *Switcher* (Figure 57).

FIGURE 57

Hint: DSK 2 appears 'in front of' DSK one, and so on, with DSK4 in the foremost channel from the viewer's perspective.

DSKs can each have their own transitions, and these can be set to different durations as well if you like.

12. Click the local *Auto* button for *DSK 1*.

Since *GFX 1* is assigned to *DSK 1*, the currently selected item in that *Media Player* transitions in to appear *above* the *BKGD* layer.

13. Click *Auto* for *DSK 2*. *DSK* channel content can be individually displayed or removed from view in this manner.

Hint: DSK (and M/E Key channel) transitions are always in Ping Pong mode. If you fly a DSK on with one operation, the next transition will always fly it back off again.

That's all useful, as far as it goes, but what if you want to remove one graphic and display another simultaneously?

14. Click *Auto* again to remove *DSK 2* from view (DSK 1 should still be onscreen).

15. In the *main Transition* control group (Figure 57), click the *DSK 1* button above the *T-Bar*. This delegates the controls below, including the T-bar, to affect the *DSK 1* video layer only.

16. Try it out by pressing the main *Auto* button; then press it again to re-display *DSK 1*.

Hint: Note that the progress gauge beneath DSK 1's Take button shows that DSK 1 is fully displayed.

17. With the *DSK 1* delegate button lit up, press *Ctrl* on your keyboard, and keep it pressed while you click the button for *DSK 2* – then release it. Two *Transition delegate* buttons are now 'lit' – *DSK 1* and *DSK 2*.

18. Click the main *Auto* button again. *DSK 1* (which was displayed above the BKGD layer) is removed from view, and *DSK 2* is displayed using its own transition.

Let's up the ante just slightly.

19. Press *Ctrl* on your keyboard while you click the *BKGD* delegate button.

FIGURE 58

Your *Transition Delegate* buttons should now resemble Figure 58, showing that three delegates are currently active.

20. Press the main *Auto* button again.

Let's analyze what happened, using the images below, which show the before and after displays on the *Preview* and *Program* monitors (from left to right).

FIGURE 59

In Figure 59, the *Program monitor* shows the composite result of *DSK 1* over the BKGD layer, the current *Program* row selection.

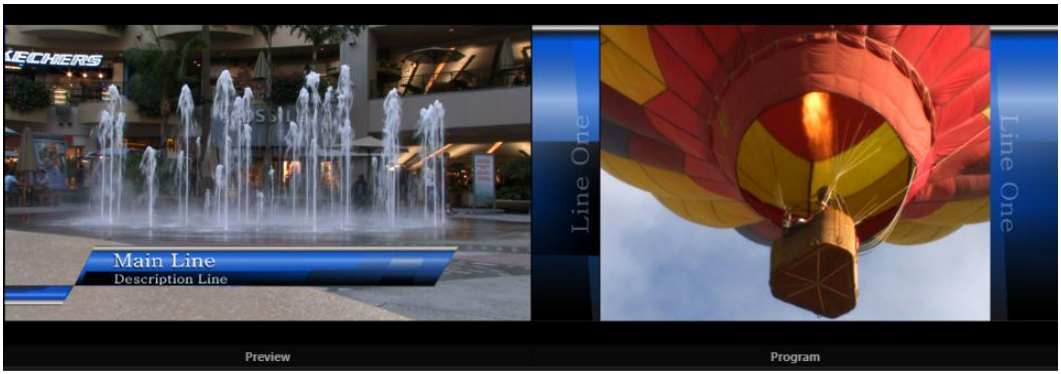


FIGURE 60

In obedience to the current *Transition delegate* multi-selection, one click of the main *Auto* button resulted in all of the following operations:

- A *BKGD* layer transition occurred, swapping the *Program* and *Preview* row selections.
- *DSK 1*, which had been displayed on output, transitioned out of view.
- *DSK 2*, which was previously unseen before the auto, was transitioned in above the *BKGD* layer.

LOOK AHEAD PREVIEW

Let's pause here to consider TriCaster's *Look Ahead Preview* monitor. Cast your eyes over the *Preview* monitor, and consider how it relates to the state of the *Transition Delegate* controls.

In Figure 60, the *Preview monitor* shows *DSK 2,* assigned to *GFX 2,* overlaid on the current *Preview row* selection. The *Look Ahead Preview* monitor (or simply, *Preview*) always shows us the composition that would result if a *Take* or *Transition* operation was performed respecting the current transition delegate(s) –a look into the future, if you will.

1. Hold down *Ctrl* on the keyboard again, and click the *BKGD Delegate* button (de-selecting it).

Note that, after de-selecting the *BKGD* delegate button, the *Preview monitor* no longer shows the Switcher's *Preview row* selection. Instead, it shows *DSK 1* over the current *Program* row selection.

Why is that?

Since only the *DSK 1* and *DSK 2* delegate buttons are active, only those two video layers will be affected by a main *Take* or *Auto* operation. In this state, the result of an *Auto* operation will be as follows:

- *DSK 2*, currently seen on *Program* out, will be removed from view
- *DSK 1* will be overlaid above *Program* instead.
- The *BKGD* layer – not being delegated – will not change in this case. Hence *Preview* correctly *depicts* the outcome of a *Take* or *Auto*, just as we've mentioned.

The *Look Ahead Preview* allows you to switch with real confidence; the *Transition delegate* features provide flexible and convenient video layer management, and thus enhanced control over your ultimate *Program* output composition.

SECTION 5.8 RECORD AND GRAB

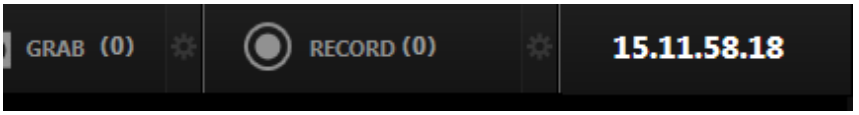


FIGURE 61

Record and *Grab* controls are prominently positioned immediately above the *Program* monitor (in its default position at upper right on the *Live Desktop*).

Note: The tools located above the monitoring section of the Live Desktop comprise TriCaster's Dashboard. In addition to Record and Grab, the Dashboard holds numerous other important features discussed a bit further on in this guide.

5.8.1 RECORD

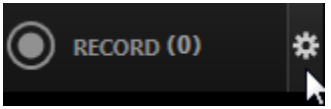


FIGURE 62

1. Roll the mouse pointer over the *Record* contr ol (Figure 62) in the *Dashboard* and click the *Configuration button* (gear) that appears to open the *Record Configuration* panel (Figure 63).

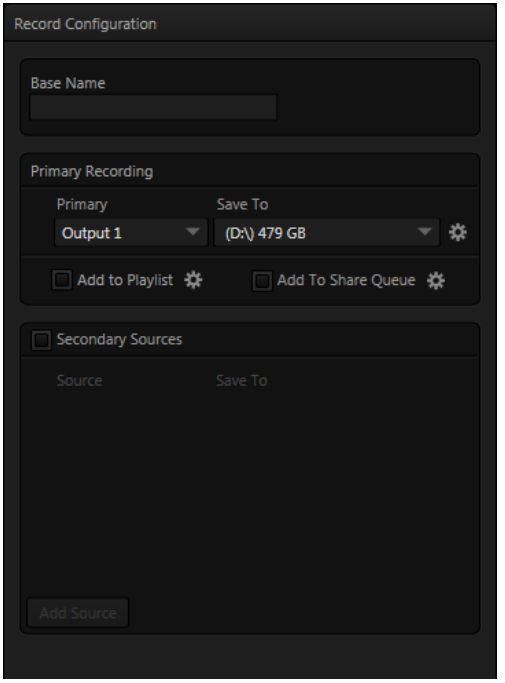


FIGURE 63

2. Click in the *Base Name* field, and enter a unique name for the captured file(s).

Hint: TriCaster stores recordings at (drive):\Media\Clips\sessionname\Capture (where "drive" and "sessionname" are appropriate for your system and session).

TriCaster's IsoCorder™ technology can capture multiple a/v sources simultaneously. The first of these sources is referred to as the *Primary* source. Additional sources in many combinations can be added in a *Secondary* recording group shown below. (Recording options are discussed in more depth in Chapter 20, Record and Grab.)

The default capture options will work just fine for our purposes, so let's continue:

3. By default, *Output 1* (the primary *Program* output) is the selected *Source* in the *Primary Recording* area of the *Record Configuration* panel.

Hint: You could optionally select either DDR 1 or DDR 2 in the nearby Add to Playlist menu, automatically adding newly recorded clips to a playlist – but let's not do that yet.

4. Click *Close*.
5. Make sure you have an active source playing on *Program* output.
6. Press the *Record* button (Figure 62) – it will illuminate, and the neighboring timecode field will begin keeping track of the duration of your recording.
7. After a little while, press *Record* again to stop recording.

This configuration will record everything that is displayed on *Output 1*, letting you capture your entire live production for posterity if you like. It also provides a way for you to capture clips for playback (from TriCaster's DDRs) *during* your live events.

5.8.2 GRAB

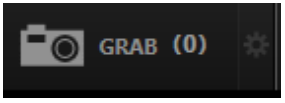


FIGURE 64

The *Grab* feature is similar to *Record*, just described - except of course that it grabs fresh still images from each time you click the *Grab* button. (Notice that the nearby counter increments with each *Grab* performed.)

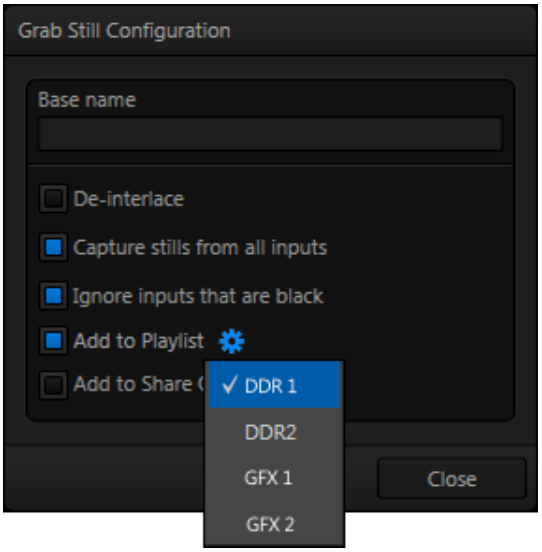


FIGURE 65

8. As before, click the *Configure* button (gear) to open a setting panel for the *Grab* feature.

   The *De-interlace* option smooth's the results for fielded format session, and is enabled by default.

9. Enter "test" (without quotes) in the *Base Name* field.

10. Enable *Capture stills from all inputs*.

11. Enable *Add to Playlist* and click the nearby gear button to select some destinations (be sure to include *DDR 1*).

12. Enable the *Add to Share Queue* switch, and click the nearby gear button to open the (share) *Stills* menu.

13. Checkmark the *File Copy* entry (we configured the target for this share account back in Section 5.3).

14. Also in the same menu, checkmark *Auto Upload*.

15. Close the *Configuration* panel, and click the *DDR 1* tab (so you can see what occurs next).

16. Click the *Grab* button.

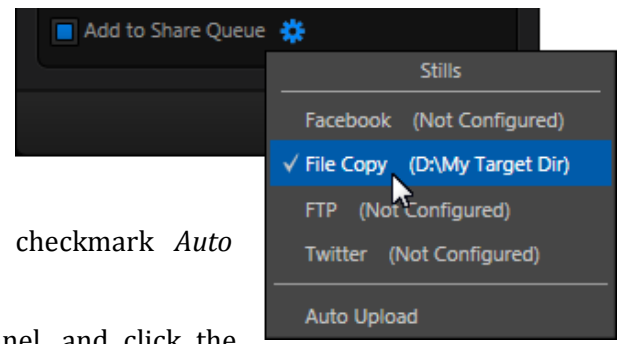


FIGURE 66

Let's consider the results of this single click:

- For a given *Base name*, the number in the *Grab* button's counter display rises by 1 each time you click *Grab*.

- The image(s) grabbed from output is stored at in a folder on the session drive at (*drive letter*):\Media\Stills*(session name*)\Capture.

- As well, a new thumbnail icon (named "test 1.jpg", etc.) appears in the *DDR 1* playlist; you'll see at a glance that it represents a still image from Output 1.

- Notice too that the newly grabbed frame is added to any other *Media Player* destinations you check-marked.

- As well, if you check inside the folder you configured as the *File Copy* target for the *Share* feature, you'll find a copy of the file there. Best of all, had you configured your Twitter® or Facebook® accounts back in Section 5.3, the still image would have been automatically uploaded to your devoted followers.

Note that only one thumbnail is added to the GFX 1 playlist, even though you enabled Capture stills from all inputs. The option did not fail, though. The same folder mentioned just above also contains sub-folders for each Grab you performed. You'll find the additional still image files inside these folders.

SECTION 5.9 MEDIA PLAYERS

5.9.1 THE DDRs

TriCaster's two *DDRs* are powerful *Media Players*, and can greatly enhance your live productions. (*DDRs* have siblings that we'll discuss a bit later – the *Graphics* and the *Sound* players.)

1. Show *DDR 1* by clicking its tab beneath the *Switcher*.

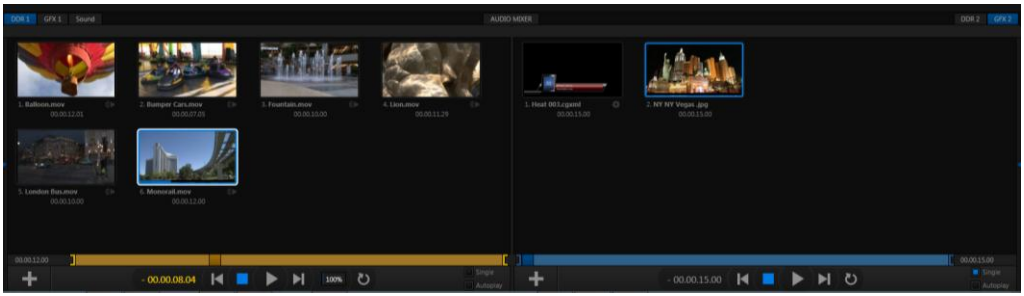


FIGURE 67

The tabbed pane shows two players side by side – *DDR 1* and *GFX 1, or DDR 2 and GFX 2* (Figure 67).

Hint: DDR stands for Digital Disk Recorder – a bit of a misnomer since TriCaster's DDR's don't record; Still the term continues in popular use to distinguish Media Players that can play 'clips' from those reserved for still image or audio-only tasks.

ADDING FILES

Let's add some clips to the playlist.

FIGURE 68

2. Click the + (Add) button in the *DDR 1* pane (Figure 68) to open a *Media Browser*.

3. Click the heading named for your current TriCaster session (*Practice Session*, if you've been following along) beneath the *Clips* header in the *Locations* column at left in the *Media Browser*.

Hint: Double-click in an empty spot in the playlist instead of clicking the + button. When using either method, hold down the Shift key to view a standard system file window instead of the custom Media Browser.

4. The file pane at right displays icons for recordings made in the session. It should list the file you recorded earlier (in Section 5.8.1) under a group header labeled *Capture* – click the icon to select it, and then click *OK*.

5. You may wish to add several more files to experiment with – sample files are provided. *DDR 1* and *2* also support most popular audio file formats.

TRANSPORT CONTROLS

FIGURE 69

6. Select *DDR 1* on the Switcher's *Program* row.

7. Click the newly added icon in the playlist, and press the *Play* button in the player's footer (to the right of *Stop* in Figure 69). The video clip you recorded should play on the *Program* monitor.

8. Click the *Stop* button.

Notice that if you move the mouse pointer over the *Speed* slider (shown as a numeric percentage) it changes to a double-headed arrow, indicating you can *drag* the slider to a new value if you wish.

1. Instead, try this: simply *click* inside the *Speed* slider (engaging direct edit mode), type "50" and press Enter to change playback *Speed* to *50%*.

2. Click *Play* again, and observe that playback is now in smooth slow motion.

3. Adjust *Speed* again – notice that you can even modify Speed *during* playback.

4. Click *Stop*.

5. Hold down shift, and double-click the *Speed* value to reset it to its default.

TRIMMING AND SCRUBBING

Let's spend a moment learning how to trim a clip in the *DDR*. To do this you will use tools in the *Scrub Bar* immediately beneath the playlist pane (Figure 70).

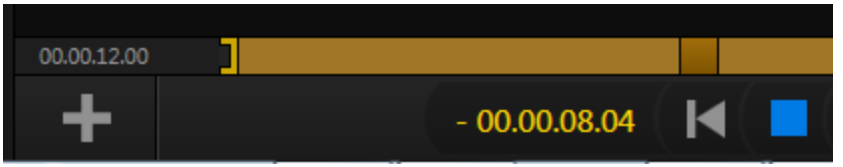


FIGURE 70

Drag the *Scrub Bar's* (square) knob left or right to change the current play position.

Trimming is accomplished by dragging the *start* and *end* points for the clip using the blue] and [bracket controls at either end. (The mouse pointer changes to a double-headed arrow when you move it over a trim control.)

6. Click the first (top-left) clip in the *playlist*, highlighting it.

7. Drag the trim controls to shorten the clip's runtime to 10 seconds (watching the *Duration* display to the right of the *Scrub Bar* helps when trimming).

8. *Record* a few more clips, if you haven't already done so, and add several to the playlist (either automatically or by using the + (*Add*) button).

SINGLE AND AUTOPLAY

9. Click the *Single* switch (Figure 71).

FIGURE 71

10. Double-click the first clip in *DDR 1's* playlist to play it (double-clicking is another way to engage *Play*). With *Single* mode engaged, playback automatically stops at the end of the current clip.

11. Select *Camera 1* on the Switcher's *Preview* row *(DDR 1* is already selected on the *Program* row).

12. Enable the *Autoplay* switch for *DDR 1*.

13. Play the first clip in the playlist again. This time, just as the clip approaches its end, the *Switcher automatically* performs a transition (the sources on *Program* and *Preview* are automatically swapped), leaving *Camera 1* on *Program* output.

14. After a few moments, click either *Take* or *Transition* in the Switcher's *Transition* section.

Notice that a transition is performed (returning *DDR 1* from *Preview* to *Program*) and, more importantly, the next item in the playlist begins to roll automatically. When it ends, another automatic transition occurs, restoring *Camera 1* to *Program* output.

Let's try *Autoplay* without *Single* mode:

15. Click *Stop* (if necessary).

16. Uncheck *Single*, leaving *Autoplay* engaged.

17. With *DDR 1* on *Program,* and *Camera 1* on *Preview*, highlight a fairly long clip (say, a minute or more).

18. Click *Play.*

19. After a few seconds, perform a *Take* and watch what happens:
    a. Naturally, *DDR 1* and *Camera 1* are swapped on the *Switcher*.
    b. *DDR* playback is stopped at the current frame of the current clip.

20. Perform another *Take.*

    a. As expected, *DDR 1* is restored to Program output.

    b. Playback re-commences at the next frame of the current clip; *DDR 1* did not automatically jump ahead to the next clip this time.

You may find *Single* mode your favorite way to use *Media Players*, but it can be useful to turn it off (as just described) at other times. Perhaps a live speaker is presenting a long clip, but wants to be free to interrupt it with live commentary at any time. Turning *Single* off (with *Autoplay* on) works perfectly in this scenario. The TriCaster operator can click *Take* or *Auto* freely, confident *DDR* playback will resume at precisely the right frame.

PRESETS

Let's consider one more powerful feature common to TriCaster's *Media Players* – the *Preset Bin*.

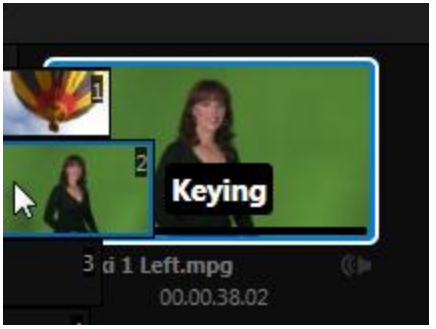


FIGURE 72

Preset bins run vertically down the outer edges of the various *Media Player* and *Audio* modules, providing instant access to custom playlists and configurations.

Normally hidden, *preset bins* fly out when you move the mouse pointer to the edge of the screen.

Presets store other information about the current state of the module, too, including playback position, selection status, and so on. In many ways, presets act like additional *Media Players*.

21. Move the mouse to the extreme left of the screen to open the *preset bin* for *DDR 1*.

22. Click an empty preset icon, and use the + (*Add*) button to populate its playlist.

23. Switch back and forth between presets, noting as you do how various attributes are retained.

Hint: Right-click a preset icon to open a context menu offering a number of useful features, including Rename.

24. Try copying and pasting playlist icons between two presets (right-click on an icon to access the context menu containing *Cut*, *Copy* and *Paste*).

25. Notice that if a clip is playing, a *Stop* action occurs when you change presets.

5.9.2 GRAPHICS 1 AND 2

TriCaster provide dedicated graphics players especially suitable for displaying still images and titles, including TriCaster's native (live-editable) *title pages*. These are quite similar to the *DDRs*, just discussed, but for the fact that they do not offer clip playback. Otherwise, the type of media files they support remains largely the same. All of these Media Players, regardless of title, can display TriCaster *title pages* and most if not all popular still image file formats.

Hint: The DDRs can play all of the above media types as well as video clips and sound files.

EXPLORING AUTOPLAY AND SINGLE

The controls of the graphics players are identical to those of the *DDR* apart from the omission of a playback *Speed* control (which would be superfluous and possibly confusing). Rather than cover these again, let's have a little fun:

26. Click the *DDR/GFX 1* tab, and then click any icon in the *GFX 1* playlist.

27. Press *CTRL + a* on the keyboard, to select all of the playlist entries.

28. Press *Delete* on your keyboard, clearing out the all playlist entries (this is a non-destructive deletion, never fear).

29. Repeat the two steps above for *GFX 2*.

30. *Add* some image files (a dozen or more) to *GFX 1* (you can use some of the images from the *NewTek* group under the *Still* location heading for this example).

31. Click on one the icons about *halfway* through the playlist, highlighting it.

32. Hold down the *Shift* key, and click the last icon in the playlist. This will *multi-select* all of the files from the first one you clicked to the last one (the icons are given a lighter outline to show their selection status).

33. Right-click anywhere in the *playlist*, and select *Cut* from the *context menu*.

34. Right-click in the playlist area of the GFX 2, and select *Paste*.

35. *Hint: Instead of using Cut and Paste, we could simply have dragged the selected icons from one playlist to the other.*

Let's pause to review. To this point, we've prepared two *Media Players* with similar *playlists* consisting of a series of still images.

Hint: Still image files default to a fifteen second duration when added to a playlist.

Fine, but 'what about the aforementioned fun', you ask? Indeed, let us press on:

36. Turn *Single* and *Autoplay* on in both players, and make sure *Loop* is off for both *Media Players*.

37. Select *GFX 1* on the Switcher's *Program* row.

38. Select *GFX 2* on the Switcher's *Preview* row.

39. Click the first entry in both playlists (to set the current position).

40. Press *GFX 1*'s *Play* button, and watch the 'hands-free' slideshow.

Let's consider what is happening:

- When playback of the first *GFX 1* playlist entry reaches its end:
  - The *Autoplay* setting invokes an automatic transition to *Still, a*nd stops *GFX 1* playback.
  - Then, unseen on *Program* output, *GFX 1*cues up its next playlist item.

- Simultaneously, the *GFX 2* player's *Autoplay* setting initiates playback of *its* first playlist entry.

- When playback of *that* item is reached:

- *GFX 2's* own *Autoplay* function performs another transition, returning *GFX 1* to the *Program* row
- And stops *GFX 2* playback
- Then, unseen on *Program* output, the *GFX 2* player cues up its next playlist entry.

- Next, *GFX 1*'s *Autoplay* setting automatically starts playing *its* next playlist item. The cycle repeats until all items play through or is interrupted by user actions.

TITLE

TriCaster *title pages* can actually be added to any of the *Media Players* (apart from the *Sound* player). *Media Players* can also display bitmap files exported from third-party graphics applications (or overlay them in *DSK* channels, especially valuable when the files are either keyed or have an embedded alpha channel).

TriCaster's native title pages have some distinct advantages over a common still image, however. Let's try them out:

41. Click *Add*, and use the *Media Browser* to select a few of the prepared title pages from the *NewTek* location listed under *Titles* in the *Location* List at left.
42. Click an icon to highlight it in the *Media Player* playlist.
43. Display the title page on *Program Output* by selecting *the correct Media Player* on the Switcher's *Program* row.
44. Move the mouse over a *different* title page icon, and click the *Configure* button (gear) that appears in its lower-right corner.
45. The *Title Page Editor* shown in Figure 73 will appear.

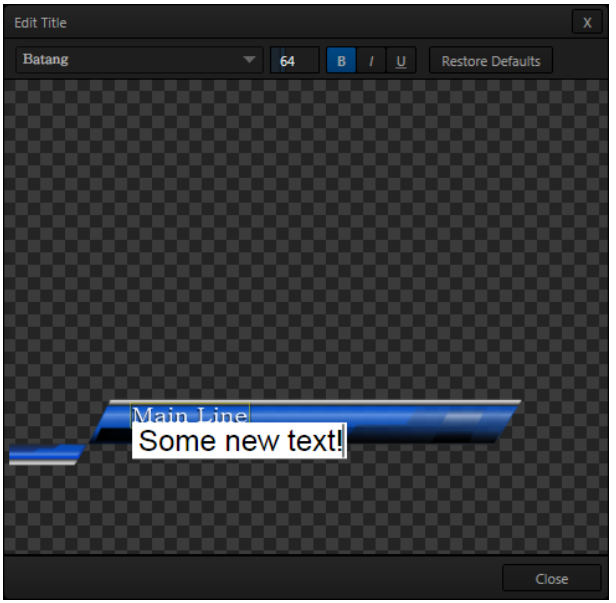


FIGURE 73

46. Move the mouse over the default text shown in the *Title Page Editor*'s preview pane, and notice that a white bounding-box appears as you locate editable items.

47. Double-click inside the bounding-box for a line of text to open a text entry field; type something different, then press *Enter* on the keyboard to accept the changes.

48. Notice that you were able to edit a page without disturbing the title already displayed on *Program Output* - Click the *Close* button.

49. Repeat your text edit operation, but this time modify the title that is displayed on *Program Output* – notice this time that the display updates immediately.

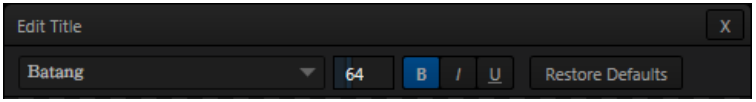


FIGURE 74

50. Try changing the *Font*, *Size* and other *attributes* for a line of text, using the tools in the Title Page Editor's titlebar (Figure 74).

51. Click the *Close* button.

SECTION 5.10 LIVEMATTE & M/Es

Let's try something different now – using *LiveMatte* to create a typical 'weather report' shot.

(We'll use a pre-recorded sample clip for this task, but of course if you happen to have a greenscreen studio ready to use, just skip the first three steps below, and select the appropriate *Input* button on the Switcher's *Program* row - instead of a *DDR*).

FIGURE 75

1. Change the Switcher's *Program* row selection to *M/E 1*, and enable the *BKGD* delegate button in the *Transition* section of the *Switcher*.

2. Remove any extraneous *DSK*s left from earlier operations from view using the local *Take* buttons in the *Switcher*'s individual *DSK* control groups.

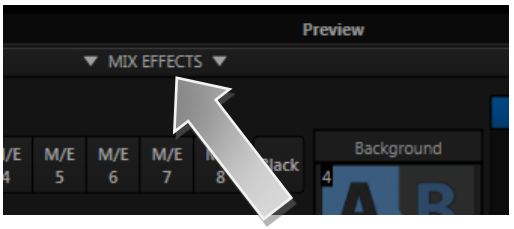


FIGURE 76

3. If necessary, click the *Mix Effects* label (Figure 77) between the *Monitor* and *Switcher* sections to expand the *M/E* pane.

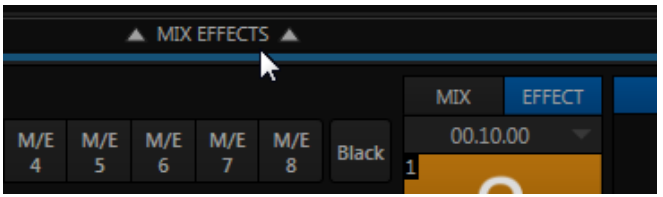


FIGURE 77

4. Click the tab for *M/E 1* (Figure 76) to reveal the controls for the first M/E channel.

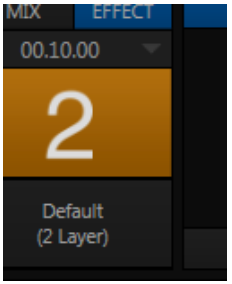


FIGURE 78

5. Click the *Effect* button in the M/E Effect control group (Figure 78). The default effect is named "Default (2 Layer)", and you should see the icon for this effect below the button.

   [Otherwise, click the current effect name and use the *Media Browser* to select Default (2 Layer) from the Default group in the file pane.]

6. Notice that the left half portion of the *M/E* panel contains two source (input) rows labeled *A* and *Input B*.

    a. Select *DDR 1* in the button row labeled *A*.
    b. Select the *DDR 2* button in the *B* row.

7. Click the *DDR 1* tab, and *Add* the video clip named *Kiki 1 Center.mpg* from the *Green Screen* group inside the *Clips>NewTek* location.

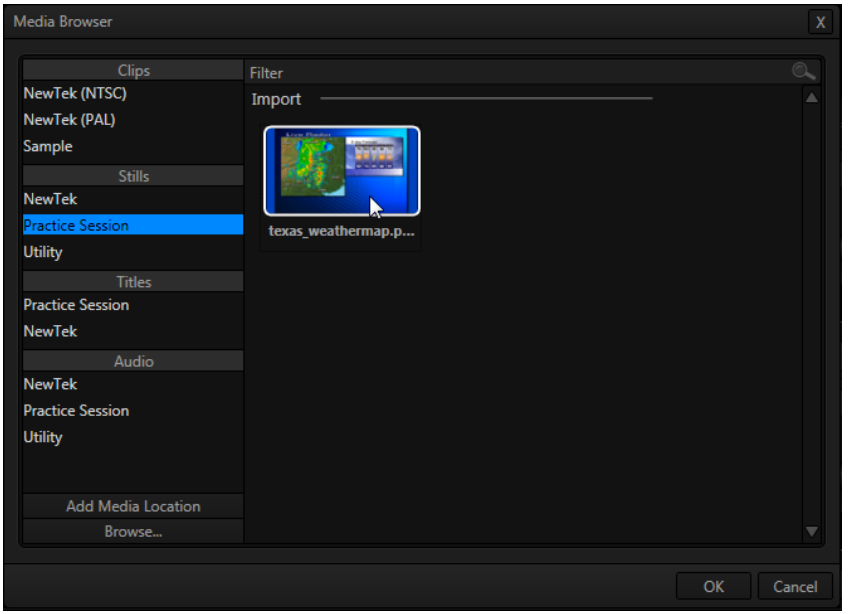


FIGURE 79

8. Click the *DDR 2* tab, and add the image named *texas_weathermap.png (*from *Practice Session,* under *Stills* in the *Location* list).

9. Move your mouse pointer over the desktop monitor for *DDR 1*, and click the *Configure* button (gear) that pops up at right in the label beneath the monitor.

10. Click the *LiveMatte* tab in the *Configuration* panel that opens.

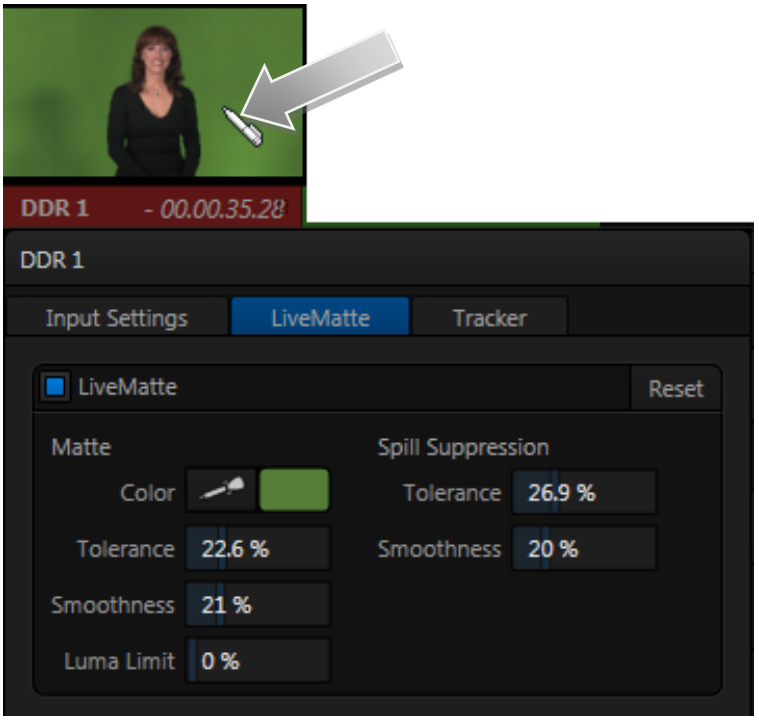


FIGURE 80

11. Click on the *Color* button in the *Matte* section of the panel, and keep the mouse button depressed.

12. Drag the *eye-dropper* pointer over the green background in the monitor, and then release it (Figure 80) to establish the primary key color (*LiveMatte* is automatically enabled when you select a color).

13. The default *LiveMatte* settings (*Tolerance* and *Smoothness)* are close enough for this little demonstration, so you can close the *Configuration* panel now.

We'll look at the details of *LiveMatte* in more depth in Part II (the Reference section), but already your result (as viewed on *Program* output) should look very similar to Figure 75. TriCaster doesn't stop here, though. Let's look a little more closely at TriCaster's powerful *M/Es*.

SECTION 5.11 MORE ABOUT M/ES

Eight *M/E* buttons sit innocuously on TriCaster's *Switcher* rows just like other video inputs, but in fact they possess very powerful features. M/E (Mix/Effect) rows permit a composition to be prepared from multiple sources as just seen, using keying and other effects. They can be used in many other ways too – perhaps as an additional 'switcher' to provide a supplemental video mix, or for more elaborate applications (including virtual sets).

In addition to the two sources just considered (*Inputs A* and *B*), TriCaster's M/E's also provide two more primary inputs (C and D) and four integrated *Key* (or *Overlay*) channels.

5.11.1 COMPOSING M/E LAYERS

When we ended the previous section, the simple 'weather map' setup (Figure 75) we created was on *Program Out*.

(Remember that *LiveMatte* is *already enabled* for the greenscreen shot from our previous exercise.)

We can use a few of the unique features of *M/Es* to dress up our production.

For example, we might want to transpose the greenscreen talent shot to one side, placing it off center in the result.

1. Click the *Position* button just to the right of the *A* row label to open the *Position* panel for that input.

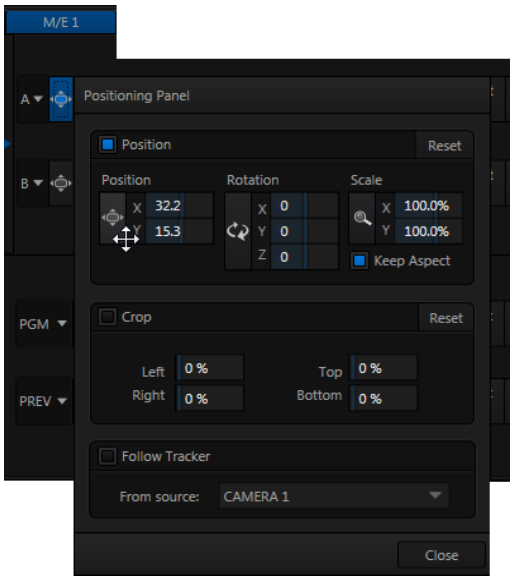


FIGURE 81

There are three sets of numeric sliders in the *Position* group in this panel: one with a four-pointed arrow button, a *Rotation* group, and Scale controls identified by a magnifying glass button. Experiment with these controls a bit to see how they work.

Hint: Shift + double-click a control to reset it to defaults.

You can drag the mouse over the buttons in each group to freely adjust *Position, Rotation* or *Scale* on multiple axes at once, or use the numeric mini-sliders to adjust just one property at a time. As currently configured, *Program* output displays the result of changes you make; of course, during a live production you'd likely use *Preview* to make these sort of modifications, instead.

Hint: When the Keep Aspect switch for the Scale controls is lit, vertical and horizontal adjustments are locked together – adjusting one affects both. Otherwise, the vertical and horizontal scaling factors are independent.

Drag vertically over the 'magnifying glass' button to modify vertical scale, or drag laterally to adjust the horizontal scale. Another way to constrain the action to one axis is to hold down the Ctrl key before dragging.

2. Click *Reset Positioning* to restore default *Position*, *Rotation* and *Size*.

3. Drag the horizontal (upper) *Position* mini-slider to the right, locating the foreground (talent) shot as seen in Figure 82.

FIGURE 82

Without having moved the physical camera, we have changed the apparent position of our talent relative to the virtual backdrop.

5.11.2 ADDING AN UPSTREAM OVERLAY

FIGURE 83

To the right of the M/E input rows, you'll see a T-bar and then four control groups (labeled K*ey1-2*), each with its own drop-down source selection menu along with other controls.

The *Keyers* feature in *M/Es* work very much like the *DSK* video layers we used back in Sections 5.7.1 and 5.7.2, the difference being that these key channels are embedded in the output of the M/E, and thus are *upstream* of the main *Switcher*. (In other words, content in these overlay channels appears beneath anything you choose to display in the main *DSK* channels on *Program Output*.)

4. Click the *Graphics* tab in the lower section of the desktop to access the *GFX 1 and GX 2* players.

5. Add the "*Breaking News.CGXML*" icon (imported back in Section 5.2) from the *Practice Sessions* folder to the *GFX 1* playlist

6. Edit the top line in the title to say "5 Day Forecast", as shown in Figure 84 (see the sub-heading Title in Section 5.9.2 if you've forgotten how to do this)...

7. Select *GFX 1* as the source for *Key 1* in the *M/E* tab, and display the corresponding overlay channel by clicking the *Auto* button below).

FIGURE 84

As you can see, we have replicated on our earlier composition, but with additional benefits:

- Using an *M/E* allowed us to offset (and even scale) the primary video source (and of course this works every bit as well with live camera streams).
- We've added a *title page* that can be displayed automatically or independently when you select *M/E 1* on the *Switcher.*
- We've got three more unused *Keyer* layers that can be used for other graphics relevant to this M/E setup.
- The primary *DSK* video layers are left free for still other applications.

As well, since the entire composition is now represented by a single button on the main *Switcher* (i.e., the *M/E 1* button), it is very easy to *Take* or *Transition* directly to it with a single click – and just as easy to transition from one *M/E* to another.

Of course, this is just one way to use the basic *M/E* features. The creative possibilities are endless.

5.11.3 LIVESET™

We've saved the best for last in connection with *M/E's*, however. This is also where we gain access to TriCaster's virtual set technology called *LiveSet*.

Actually, if you've been following along, you have already used a LiveSet – a very simple composition named *Default (2 Layer)*.

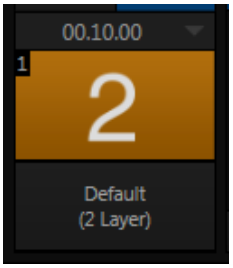


FIGURE 85

This simple effect produces a composite of the video source you select as input *A* displayed over top of input *B*.

In cases where *LiveMatte* is active for input *A,* or perhaps is a 32bit image file (with an embedded alpha channel), or for that matter if input *A* is scaled down or repositioned – input *B* will automatically show through transparent areas in the composition.

The currently selected LiveSet *group* and *shot* name is shown above the thumbnail icon (Figure 85). In this case, we see *Default* (the group name) listed above, with the label *Default (2 Layer)* – that is, the current shot in the group – just below.

Let's try something more sophisticated now:

1. Click *Take* in the *Transitions* section of the *Switcher*, to show *M/E 1* on the *Preview* monitor.

2. Add the file *TriCaster Spin Logo.avi* from the NewTek > Logos group to the playlist for *DDR 2*. Enable the *Single* and *Autoplay* switches for both *DDR 1* and *DDR 2*.

3. Click the current *LiveSet* name (above the effect icon) in the *M/E 1* tab to display a *Media Browser*.

4. Select *NewTek* in the left-hand column under the heading *LiveSets.*

5. In the file pane at right, click the thumbnail icon named *Center.Liveset* in the *World Update* group, and then click *OK* at the bottom of the *Media Browser*.

6. Select *DDR 2* as the source for *Input B*.

The icon in the *M/E* tab and the name above will update, showing that the current *LiveSet* is now *NewTek > World Update > Center*.

FIGURE 86

Assuming that you still have *LiveMatte* enabled for the *DDR*, *M/E 1's* input *A* selector set to *DDR 1* and *input B* set to *DDR 2,* a little adjustment in the *Positioner* for input *A* is all that it should take to produce a result similar to Figure 86 on *Preview*.

Input *A* is the primary input for the LiveSet, while *input B* serves as a secondary source – in this case assigned to the virtual desk-front monitor.

7. Enable the *BKGD* delegate (if necessary) in the Switcher's *Transition* control group, and click the *Auto* button beneath the *T-bar*.

   Both *DDRs* will begin running their currently selected clips simultaneously thanks to *Autoplay* (of course normally your foreground shot would be supplied by a camera).

8. Now, click the effect thumbnail icon in the *M/E* panel, to display the popup LiveSet *Shot selector*.

9. With one eye on the *Program* monitor, click the *preset* #3 in the *Shot bin* (Figure 87).

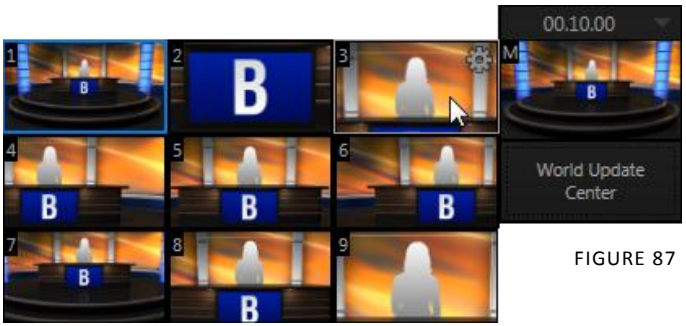


FIGURE 87

Observe that the view on the *Program monitor* now gradually pans/zooms to the degree represented by the zoom preset icon you clicked.

FIGURE 89

The animated zoom eases out nicely as the animated effect ends at its destination.

The animation duration is controlled by the menu beneath the icon (Figure 88).

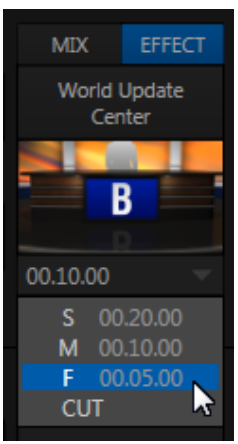


FIGURE 88

1. Click the duration, and select a different time for the animated zoom.

2. Click the thumbnail icon to open the *Shot selector*, and click a different preset icon to test the new setting.

Using v*irtual set effects* along with convenient zoom/pan presets, you can easily mimic a very large studio complex from a much smaller location.

To this point, we have used photos, graphics and titles from TriCaster's *Media Players* as sources for several different exercises. Of course, for *DSK* and *M/E Key* purposes, this approach requires you to carefully ensure that that the *current* playlist entry in the respective *Media Player* is the *right* one for the moment.

TriCaster's *Frame Buffers* provide an alternative workflow that not only prevents selection 'accidents', but also offers other benefits.

1. *Add* the image file *TriCaster Logo w. Bkgnd.png* from Still > NewTek > Logos to the playlist of a *Media Player*.

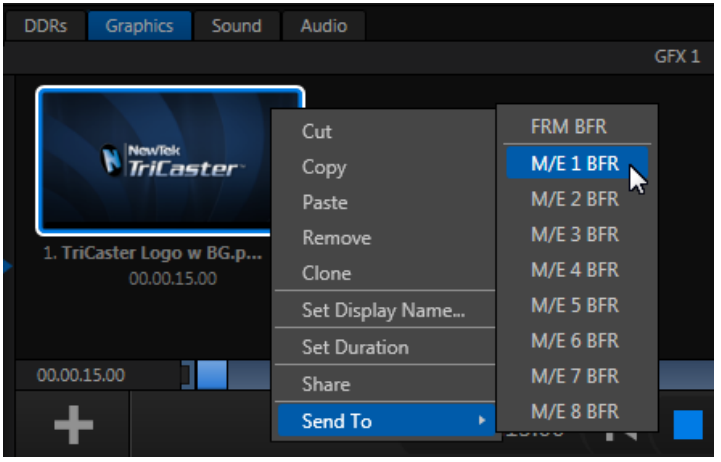


FIGURE 90

2. Right-click on the new icon in the playlist, and slide the mouse pointer down to the item *Send to Frame Buffer*. Select *M/E 1 BFR* from the sub-menu that appears.

3. Select the button labeled *M/E 1 BFR* as the input *B* source in the *M/E* tab.

4. Note that the image you sent to the *Frame Buffer* for *M/E 1* now appears on the virtual monitor in the *LiveSet*.

FIGURE 91

5. To finish up, right-click the original *TriCaster Logo w. Bkgnd.png* icon in the *Media Player*, and select *Remove*. Observe that the correct image continues to appear when the *LiveSet* is displayed, even though the original image file no longer exists in the playlist.

Actually, the *Send to Frame Buffer* function copied the source file and placed it in a special folder (C:\TriCaster\Effects\Frame Buffer*session_name*\). It remains available there, even when the original file is not only unavailable from the playlist, but has actually been deleted from the hard drive.

TriCaster provides separate *Frame Buffers* named for each *M/E.* These can be assigned to corresponding *M/E* inputs *A-D*, or as a source for any *Key* overlay (*DSKs* and *Key* effects provide access to *all* of TriCaster's *Frame Buffers*). An additional *Frame Buffer* is provided for use with the main *Switcher*.

Important Hint: Frame Buffer files can be updated across a network using any suitable application (including Adobe Photoshop™) when Share Frame Buffer on Network is enabled in the TriCaster Options menu, opened by clicking the NewTek TriCaster button at left in the dashboard. See Section 12.3 for more information on Frame Buffers.

Sending your output to the world (or the office) can be nearly as easy as connecting TriCaster to the Internet (or intranet), and pressing the *Stream* button (located right below the *Program* output monitor).

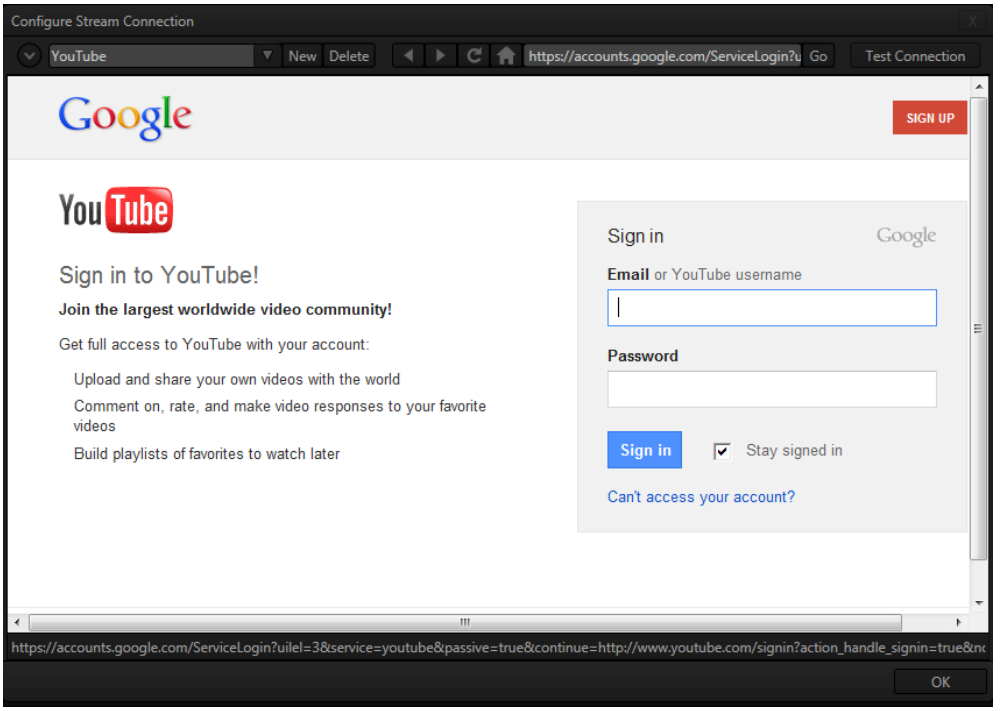


FIGURE 92

Note: A few frames may be dropped on video output the first time you enable streaming for a session as the encoder launches. (If you test your stream first, you'll avoid this.)

5.13.1 STREAMING CONFIGURATION

Click the *Configure button* (gear) situated next to the *Stream* (on/off) button to open the *Configure Stream Connection* panel, which lets you view and modify settings related to streaming your production across a network connection (Figure 92).

5.13.2 SIMPLE PULL STREAMING

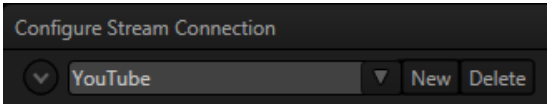


FIGURE 93

"Pull" streaming, though limited, is arguably the simplest way to get your production online:

1. Click the *New* button.

The *Choose Connection Type* dialog switches allow you to select between *Browser Based*, *Adobe Flash®*, *Windows Media Pull* and *Windows Media Push* streaming protocols.

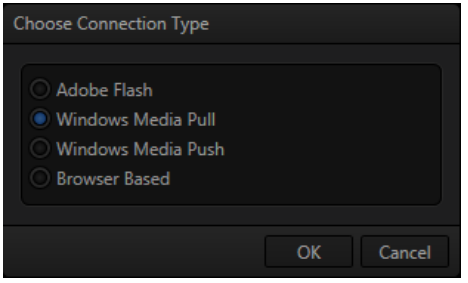


FIGURE 94

2. Select *Windows Media Pull*, click *OK*, and then supply a name for this *Connection* preset.

3. The next thing to do is to choose a *streaming profile* that provides a suitable resolution and bitrate from the *Resolution* menu (Figure 95).

4. Click the *Test* button.

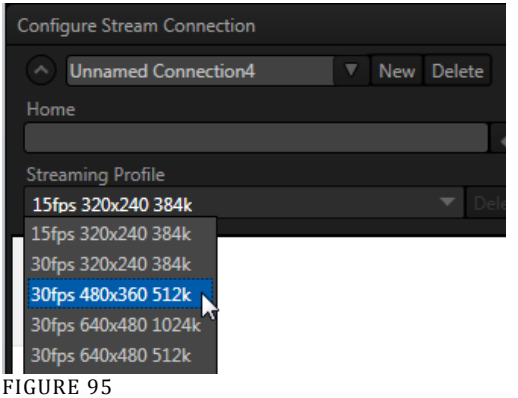


FIGURE 95

In a few moments, TriCaster displays the IP (Internet Protocol) address of your computer as viewed from the network. This information is provided as a 'punctuated' numeric value in the *Location* display field.

Hint: If your TriCaster is connected to the network by a router or is behind a firewall, it may be necessary to take further steps to provide external access. See Chapter 18, Streaming for a more elaborate explanation.

5. Close the *Configure Stream Connection* panel now, and click the *Stream* button.

You're streaming! You can provide clients (or streaming providers supporting *Pull* streaming) the *Location* address. Entering this into the *File* menu of *Windows Media Player*® (using the *Open URL* window) will direct *WMP* to show the stream from your system on client computer system(s) connected to the Internet (or intranet).

5.13.3 PUSH AND FLASH STREAMING

Browser Based, Windows Media Push and *Adobe Flash* streaming are slightly more complex, largely because they depend on external resources to distribute your stream to a wider viewing audience. These may be provided in house by your organization, or you may take advantage of a commercial (or advertising sponsored) Content Delivery Network (CDN). Arrangements and requirements of various external streaming hosts are diverse, but TriCaster's *Streaming Configuration* panel adapts to provide the necessary input and information fields for the various types. More detail on these matters, including connecting to a network and numerous useful tips on streaming strategies is found in Chapter 18, Streaming.

5.13.4 CAPTURING THE STREAM

Whenever you are streaming your output, TriCaster archives the live stream as a file. Files are saved to D:\Media\Clips*sessionname*\SavedStreams.This is a very useful feature. Among other things, it allows you to post the captured file to a website immediately after an event for 'video on demand' streaming purposes – for late arrivals or others who want to review the live event.

Note: Remember to turn off the Stream when your production concludes, or TriCaster will continue writing the stream capture file.

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 6 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 activity you wish to pursue by making a selection from an icon ring on the *Session Page*.

FIGURE 96

Your intention may be to begin a new live production, or to produce another episode of a live series. Perhaps you wish to do 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 a fundamental TriCaster concept, the *session*. What is a session, and why are sessions both important and valuable to you?

Hint: Social Media accounts and other details related to TriCaster's Share Media features are configured using controls in the Startup screen's titlebar. These matters are considered in Chapter 19.

SECTION 6.1 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 *output Proc Amps* to adjust the display sent to a projection system.
- What are your output device connection preferences? For example, will you send video to a local reference monitor using an S-Video or composite cable? 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 preset and playlists for clips in 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 all of the above collectively. If you do not deliberately delete the session, all of your session media and all of your session settings are ready for immediate recall and re-use. When you re-open an existing session, it's just as if you were continuing an earlier event. Thus, if you return to the same venue another day under similar conditions, simply re-open your prior session and you are virtually ready to go. (Of course, it's the course of wisdom to *test* everything before actually beginning the 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.

SECTION 6.2 THE HOME PAGE

Having discussed sessions, let's go on to consider how sessions are created, and how you choose which one to work on. These items, along with a few other top level functions, are found in the 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 97.

FIGURE 97

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

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 98 (Multi-standard TriCaster options shown).

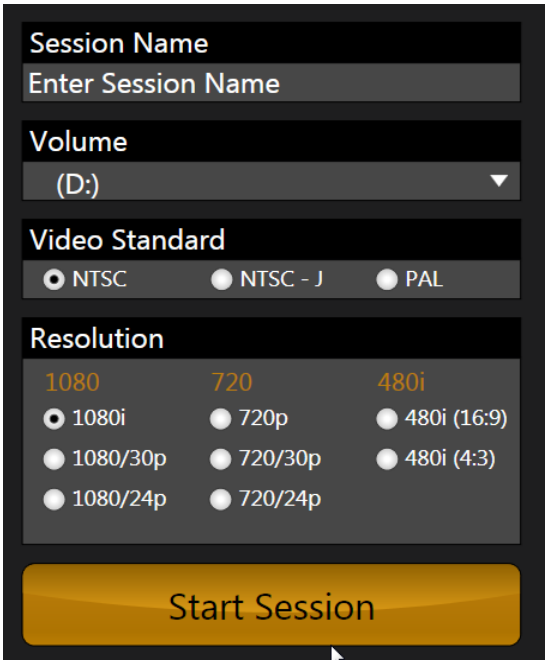


FIGURE 98

6.2.1 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 (Multi-standard model only – select NTSC, PAL or NTSC-J) and session format –1080i, 1080/24p, 1080/30p, 720p, 720/30p, 720/24p, 480/30i (16:9) or 480/30i (4:3). Multi-standard models offer PAL format equivalents.

SESSION NAME

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

VOLUME

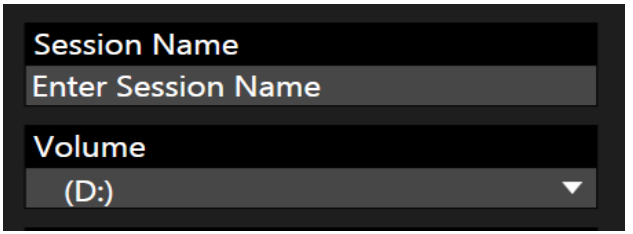


FIGURE 99

A control labeled *Volume* appears just beneath the *Session* name. Here you can choose which hard drive the session (and its associated content) will be created and stored on.

Note: When using TriCaster's Isocorder™ feature to record multiple clips, you will likely assign more than one hard drive to capture duties. The session keeps track of these clips too, providing easy access to them for live use.

Suitable hard drives inserted in TriCaster's removable drive bays 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.1.7 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 Section 9.1).

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 Section 9.1 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*.

EJECT

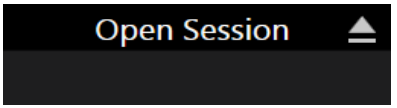


FIGURE 100

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.

6.2.2 OPEN (SESSION)

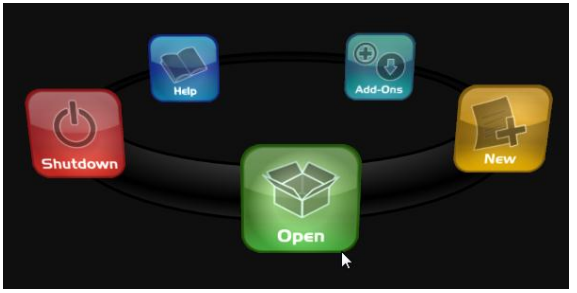


FIGURE 101

If there are existing sessions on TriCaster, the icon ring on the *Home Page* will default to *Open* (Figure 101).

Clicking *Open* causes the *Sessions List* to appear at right. This pane lists all sessions stored on qualified media currently mounted on TriCaster.

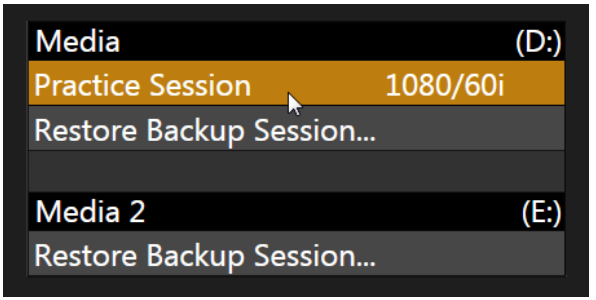


FIGURE 102

Available sessions are grouped under the names of the storage volume they are located on (Figure 102). 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*. 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.

RESTORE SESSION BACKUP

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 Session Backup* (Figure 103), and use the file explorer provided to select a *.SessionBackup* file.

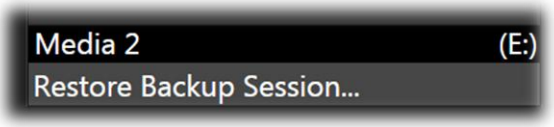


FIGURE 103

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 away from the *Home Page* to the *Sessions Screen*.

6.2.3 SHUTDOWN

This selection provides *Restart TriCaster, Shutdown TriCaster,* and *Administrator Mode* links. The first two options are presumably self-explanatory, but the latter calls for 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 104) that offers various functions and settings having to do with TriCaster system maintenance and management.

FIGURE 104

*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 4.3, 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* will automatically check for a more recent software version and offer to install it. This way you can be sure the very latest *release version* of the software for your TriCaster is installed.

Alternatively, you can go to the NewTek web site, click *My Account*, and use the login details you provided when registering your TriCaster to access your personal product page. Click the "my downloads" link at the top of the page, and check the list shown.

If you find an update, you can install it manually as follows:

1. Locate a suitable update in "downloads" and click on it.
2. At the dialog popup, choose *Run*.
3. Comply with any onscreen prompts that follow.

Advance software releases are also sometime posted on the 'downloads' page for manual download and installation. The versions, listed as "Latest" on the web page, will be newer than the automatic update version, and (although not yet approved for final release) might be well worth trying if you encounter a software issue.

Hint: If you wish, you can instead access the same webpage from a second computer connected to the Internet, then transfer update files to TriCaster using a network connection or perhaps a USB thumb-drive.

- *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 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.

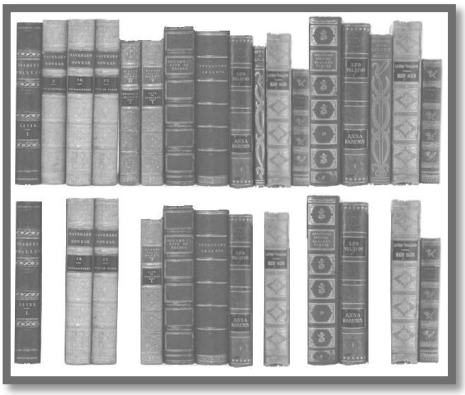


FIGURE 105

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

How much better it would be to slide the remaining books closer together, combining all the free space first. Unfortunately, computers are 'foolish librarians'. They tend to want to fill in all the gaps in their storage areas, even if this requires literally shredding your 'book' (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 A 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 and the production environment.

6.2.4 HELP

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

The primary User Guide and Control Surface manuals are found here, as well as documentation for other TriCaster features, 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.

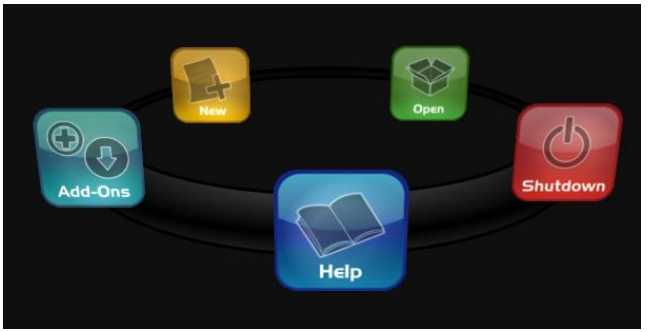


FIGURE 106

6.2.5 ADD-ONS

NewTek offers additional software tools to expand the power of your TriCaster.

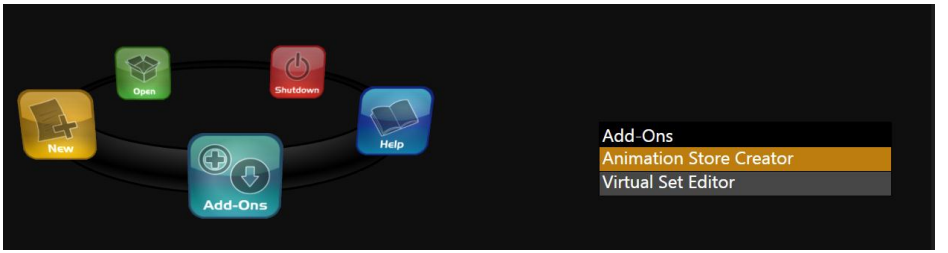


FIGURE 107

The icon labeled *Add-Ons* on the *Home Page* provides access to some of these tools. When you select it, links are displayed for installed software applications, allowing you to launch them. (For example, Figure 107 shows links to the included *Animation Store Creator* utility as well as a *Virtual Set Editor*™ demo.)

SECTION 6.3 THE SESSION PAGE

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.

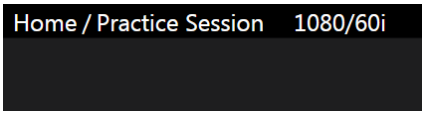


FIGURE 108

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.

6.3.1 LIVE

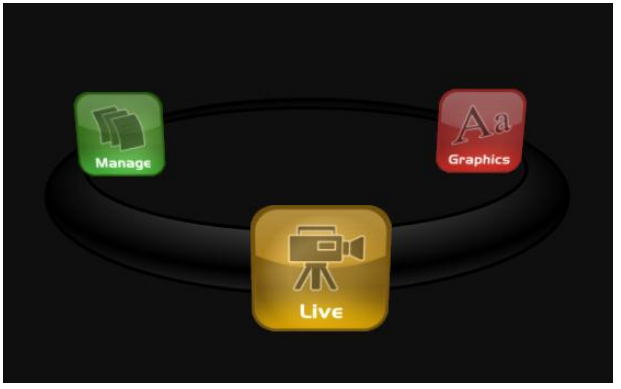


FIGURE 109

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*.

6.3.2 GRAPHICS

TriCaster includes an integrated version of LiveText, NewTek's standalone titling and CG application.

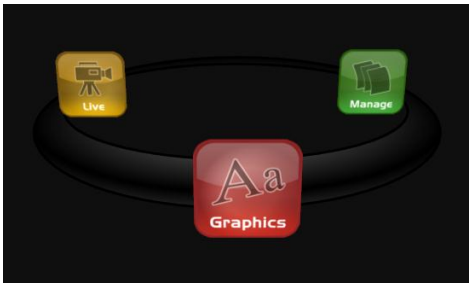


FIGURE 110

Selecting the *Graphics* icon displays a number of related items on the right-hand side of the *Session Page*.

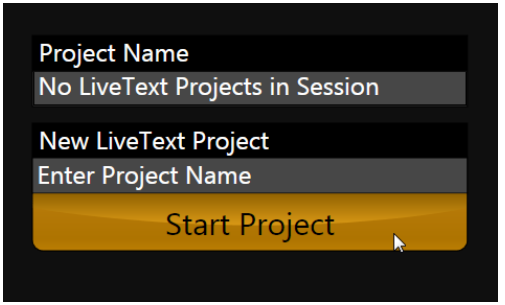


FIGURE 111

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 that 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*.

6.3.3 MANAGE

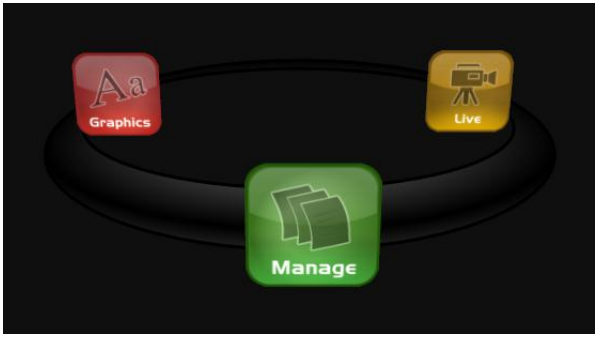


FIGURE 112

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.

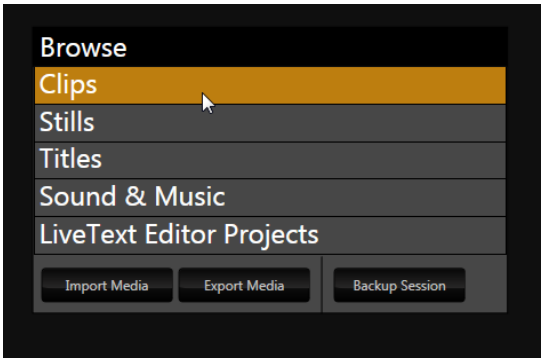


FIGURE 113

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, including *Import Media, Export Media* and *Backup Session*.

IMPORT MEDIA

We discussed importing media for using in TriCaster productions back in Section 5.2, so we'll just review briefly here. *Import Media's* quick processing makes this the fastest and most convenient way to pre-load a session with production assets.

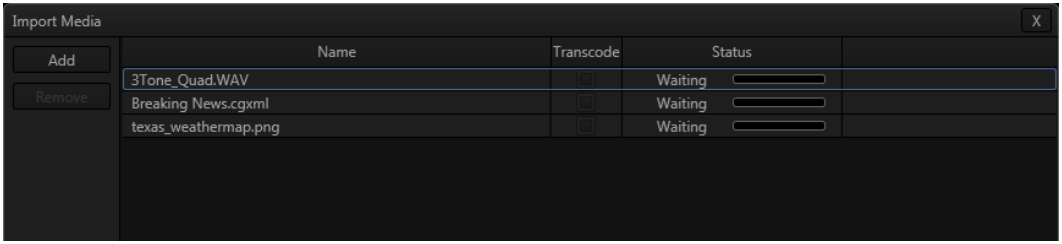


FIGURE 114

Clicking the *Import Media* link opens a custom import panel, offering batch import of files for use in TriCaster's *Media Players*. It even allows you to transcode files to high quality TriCaster-friendly file formats at the same time if you wish.

Click *Add* to open a standard system file window, and select (or multi-select) items to build a list in the *Import Media* file pane.

Some highly compressed video files may not be well suited to live playback. Enable switches in the *Transcode* column for files you wish to convert to a friendlier format on import. Files can be re-ordered by dragging their entries up or down with the mouse, or removed from the list by highlighting them and clicking *Remove*.

Once the batch import list is prepared, click *Import* to complete the operation. Files are processed quickly, and are automatically added to their proper locations (according to type) for easy access during live production.

Hint: Sections Section 5.2, 12.2.2, and A.4.2 discuss other aspects of importing media files.

EXPORT MEDIA

The *Export Media* function allows you to create a list of video files for export, select a new file format for these exports to be converted to (on a per file basis), and designate where to send them. Clicking the *Export Media* button opens a new pane.

Click the *Add* button at upper left to open a custom *Media Browser* (see Section 12.2.2 for browser details). Use this pane to locate and select (or multi-select) video clips for export.

Hint: The Export Media panel can be resized by dragging its edges or corners with the mouse.

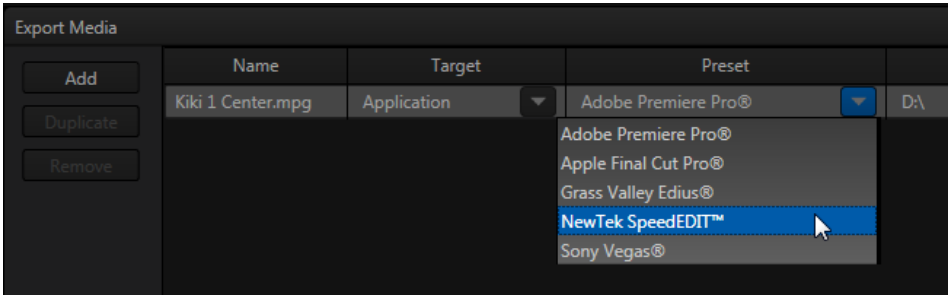


FIGURE 115

The file pane is much like a spreadsheet table, listing all files in the current export batch in its first column, then the current settings for each file in other columns. A *Status* column shows the current export status or progress for each file in the list.

TOOLS

The *Duplicate* feature is very useful for cases when you wish to export content to multiple target file formats or locations, for different purposes or specific software applications.

Note that *Export Media*'s file list pane supports multi-selection. When a file (or group of files) is selected, you may use the *Duplicate* and *Remove* buttons to clone or delete files from the list.

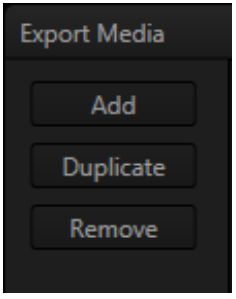


FIGURE 116

Hint: To multi-select files, you can use the familiar Shift-click or Ctrl-click techniques.

TARGET, PRESET & DESTINATION

Having prepared the file list, click the triangle button in the *Target* field to open a drop-down menu listing categories of device or application targets to choose from. Then select a specific encoding *Preset* in the next column.

Export presets vary according to what is appropriate for the session and file format.

Note: When presets that do not natively support HD are selected during an HD session, output is automatically scaled as required to fit the selected file format. This is a convenience, but be sure to select a Preset suitable for your ultimate needs.

A similar *Destination* button opens a system file browser to let you designate (or create) a location for file output. Each file to be exported can have its own *Target*, *Preset* and *Destination* settings.

Hint: It is possible to selected mapped network locations with a 'Drive letter' assignment as the Destination, saving time later.

Export file format options are updated from time to time to include popular new formats. Here are some examples, as they appear for an HD session (the list is not all-inclusive, as modifications and additions are made from time to time).

Target categories are in bold text, while *Presets* are italicized:

- *Application* (formats suitable for use with various popular NLE software)
    - *Apple Final Cut Pro® (.mov)* – very high quality M-JPEG encoding, full raster, 4:2:2 sub-sampling, high compatibility.
- *AVI*
    - *DV/ DVCPro (.avi) – moderate quality, SD only (NTSC 720x480, PAL 720x576), 25Mbit/s, 4:1:1 (NTSC) or 4:1:0 (PAL) sub-sampling, very broad compatibility.*
    - *MJPEG (.avi) – moderate quality, SD or HD capable, 4:2:0 sub-sampling, broad compatibility.*
- *DVD*
    - *(x) (*.mpg)* – SD-only MPEG 2, quality presets up to 9MB/sec bitrate (≈60 minutes) with 4:2:2 sub-sampling.
- *Flash/Flash 9*
    - A diverse collection of presets suitable for playback in newer or legacy Flash® players.

- *Mobile Devices*
    - Presets suitable for use with *iPad®*, *iPhone®* or *iPod Touch®.*
- *Quicktime*
    - Renderless Conversion – high quality 'wrapped' Quicktime® file.
    - DV/DVCPro (.mov) – moderate quality, SD only (NTSC 720x480, PAL 720x576), 25Mbit/s, 4:1:1 (NTSC) or 4:1:0 (PAL) sub-sampling, very broad compatibility.
    - h.264 Highest Quality (.mov)
    - h.264 Very Good (.mov)
    - MJPEG *(.mov)*
- *Same as Source* – file copy (no re-rendering)
- *Video Server*
    - Leightronix NEXUS\Ultra NEXUS – SD (NTSC 720x480, PAL 720x576), high quality, MPEG2 Program Stream, 9Mb/s variable bitrate, 4:2:2.
    - TelVUE Princeton – SD (NTSC 720x480, PAL 720x576), high quality MPEG2 Program Stream, 9Mb/s variable bitrate, 4:2:2, NTSC 720x480 (PAL 720x576).

Next, use the *Destination* field drop-down to designate a target folder for exported files to be sent. A *progress gauge* is shown during file processing. Click the *Export* button at the bottom of the dialogue to begin batch export processing.

Hint: The time an export takes is affected by numerous factors – the number, duration and resolution of the selected files, the speed of the device selected as target for the files, the designated format, and so on.

It is generally unwise to commence a file export shortly before a live event, since you cannot launch TriCaster's Live Desktop during export. If necessary, you can cancel the current export operation.

Clicking the *Backup Session* button opens a system file explorer that you can use to assign a storage location for the backup files. Backup operations can take some time, depending on the amount of content in the session.

For obvious reasons, then, it would be wise not to begin a major backup operation shortly before a scheduled live production. 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.

The backup operation feature will determine whether all media used in the session is *local* (i.e., located in folders named for that session), or whether some content is *external* – stored in other places on your system, and included in the session using *Add Media Location*, or from folders belonging to other sessions. If all session media is local the backup proceeds without further interruption.

When external media is used in the session, a dialog is presented stating "The following files are external to the session. Would you like to import these files?" The optional actions in the dialog are:

- *Backup without importing*
- *Import and Backup*
- *Cancel Backup*

Chapter 7 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 7.1 DISPLAY REQUIREMENTS

The *Live Desktop* requires a *minimum* screen resolution of 1600x1050.

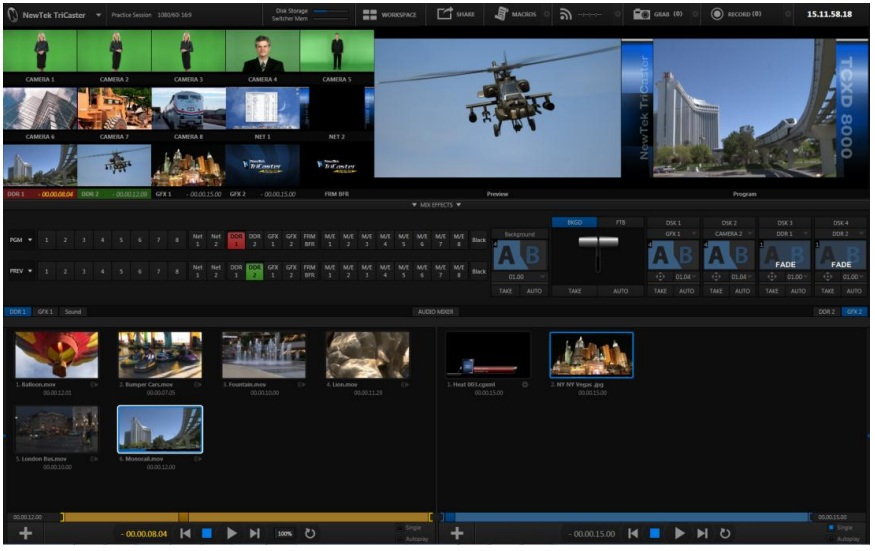


FIGURE 117

SECTION 7.2 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 *Record*, *Stream, Workspace* and *Share*, along with *Timecode* display and options.

2 - Monitors

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

3 - M/Es

- *Effect* mode – up to four primary video layers plus 4 overlay channels
- *Mix* mode – secondary switcher controls (including 4 overlay channels)
- Each M/E includes dedicated *Keyers*, transition generators and scaler/positioners

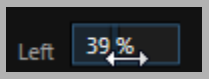
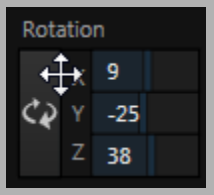
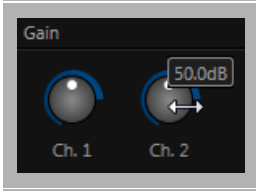
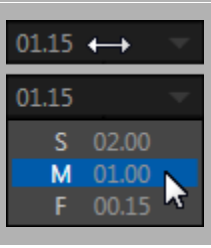
4 - Switching

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

5 - Media Players and Audio

- *Media Players* (*DDRs*, etc.)
- *Audio* (mixer) – input configuration, level control, *EQ* and *Compressor/Limiters*

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
	Numeric Slider	Gain, Balance	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.

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.

7.4.1 RENAME INPUT

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.

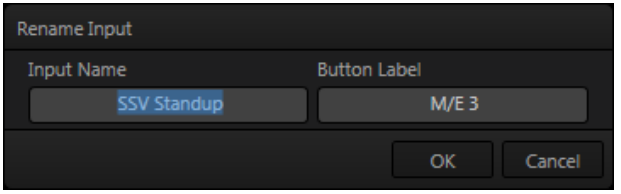


FIGURE 118

To do so, simply right-click on one of the following items to open the *Rename Input* dialog (Figure 118):

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

The *Rename Input* dialog has two editable text fields, *Input Name* and *Button Label*. The latter is a short name that will be shown on *Switcher* buttons, while the longer name is used in dialogs where more space is available.

7.4.2 WORKSPACES AND MIN/MAXIMIZE

We explored the use of monitoring *Workspace* presets back in Section 5.4.2 of the Live Production Walkthrough, and will review it in depth in Chapter 11. At this point, though, we want to mention a couple of related items.

You'll have noticed that four customizable presets labeled *Interface A-D* are provided for the *Live Desktop*; and that another four presets are provided to control the layout of TriCaster's native *Multiview* display. 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.

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 all 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. It's easy to set up complementary displays in the two monitor areas.

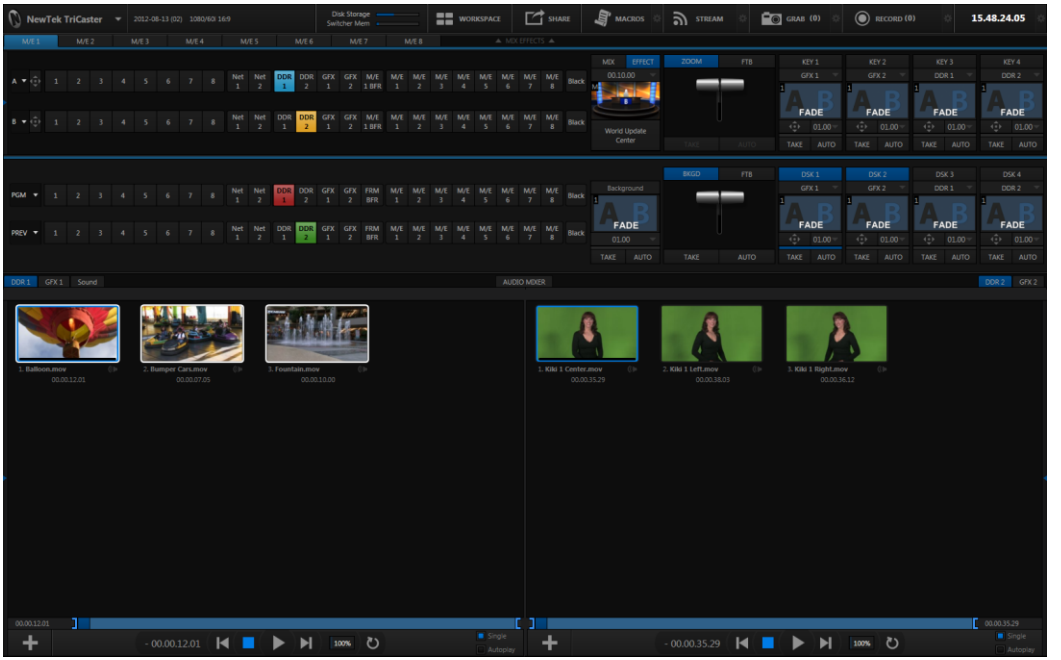


FIGURE 119

Notice too that you can also drag the horizontal divider between the *Live Desktop* monitor pane and the *Switcher* to adjust it. You can even move it all the way to the bottom of the *Dashboard*, thus hiding the *Desktop* monitor pane entirely (Figure 119), and providing much more room for other modules.

Hint: Reset the Live Desktop divider to its default location by double-clicking it.

We mentioned previously, as well, that clicking the *Mix Effects* label (Figure 120) between the *Monitor* and *Switcher* sections toggles display of the *M/E* pane.

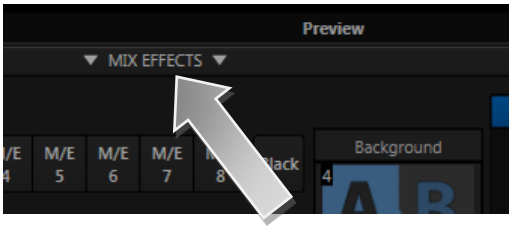


FIGURE 120

Hint: The keyboard shortcut to show/hide the M/E tab is "m".

A number of further workflow and interface options that can be very valuable are found in the *TriCaster Options* menu, discussed shortly (Section 8.1.1).

Chapter 8 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.

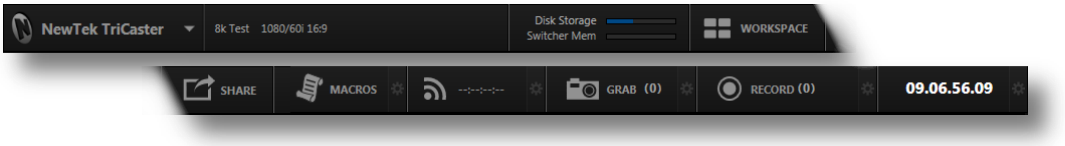


FIGURE 121

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. NewTek TriCaster (menu)
2. Information (display)
3. Workspace (see Chapter 11)
4. Share (see Chapter 19)
5. Macros (see Chapter 17)
6. Stream (see Chapter 18)
7. Grab (see Chapter 20)
8. Record (see Chapter 20)
9. Timecode (see Section 9.3)

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.

8.1.1 TRICASTER MENU

Open this menu by clicking the large button labeled *NewTek TriCaster* in the upper left corner of the screen.

EJECT

Move the mouse pointer over the *Eject* menu point to open a sub-menu that lets you safely disconnect selected storage volumes.

OPTIONS

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

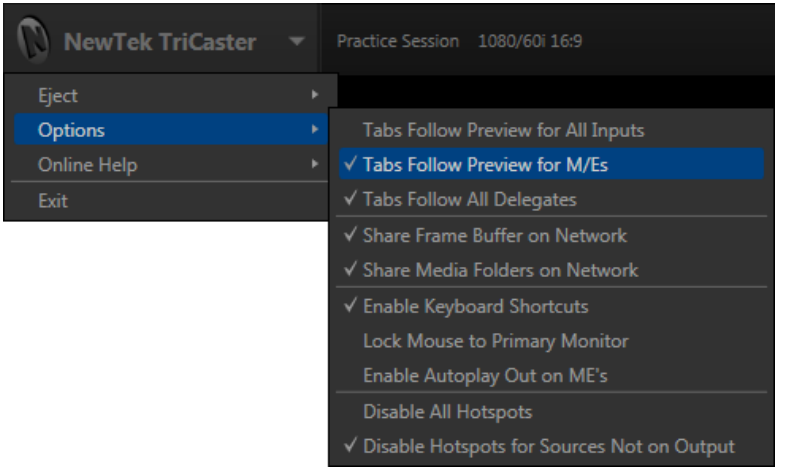


FIGURE 122

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

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

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 corresponding control surface Delegate button again to re-display the tabbed pane you are interest in.

- See Section 12.3.1 for a discussion of the *Share Frame Buffer on Network* option.

- See 12.3.2, *Share Media Folders on Network,* for a discussion of this option.

- Un-check the *Enable Keyboard Shortcuts* option when you wish to use a keyboard for text editing only, or to lock out *Macro* shortcuts.

- 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.

- The *Disable All Hotspots* option prevents macros from being triggered by any *Hotspot* activity.

- The similar option titled *Disable Hotspots for Sources Not on Output* avoids inadvertent triggering of events by unexpected off-screen activity.

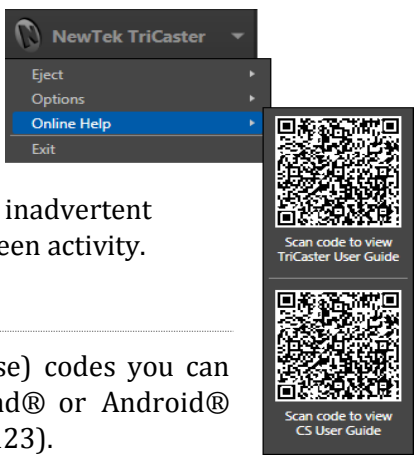


FIGURE 123

ONLINE HELP

Select this option to display QR (Quick Response) codes you can scan with your mobile device (such as an iPad® or Android® tablet) to view TriCaster documentation (Figure 123).

This provides an easy to use mechanism that lets you look up information about TriCaster without interfering with your live production.

EXIT

The final menu item is *Exit*. Select this to close your current live production session and return to the *Session* page of your TriCaster's Startup screen. All of your session settings are stored on exiting.

SECTION 8.2 INFORMATION PANEL

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

- (Session Name)
- (Session format)
- *Status message* display

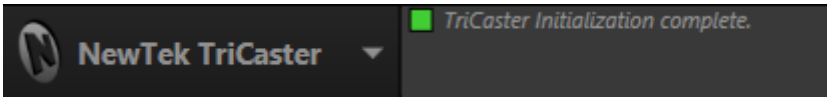


FIGURE 124

The *Status message* area coincides with the session information display, next to the *TriCaster menu*. 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 124, 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.

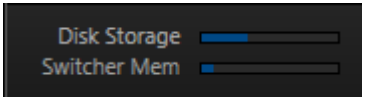


FIGURE 125

- *Disk Storage* – graphically displays how much of the total capacity of the 'most full' storage volume currently assigned to recording has been filled.

Hint: The remaining capacity for each individual storage volume is shown in the Save To menu in the Record Configuration panel.

- *Switcher Memory* – tracks how much system memory is required by currently selected virtual sets, transitions and the like. (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.)

Chapter 9 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.

In a break with orthodoxy, let's begin our discussion at the end – that is, with a consideration of TriCaster's plentiful *Output Configuration* features.

SECTION 9.1 OUTPUT CONFIGURATION

FIGURE 126

Roll the mouse pointer over the *Program* monitor to reveal a *Configure* button (Figure 126) at right in the titlebar below the display. Click it to open the *Output Configuration* panel (Figure 127).

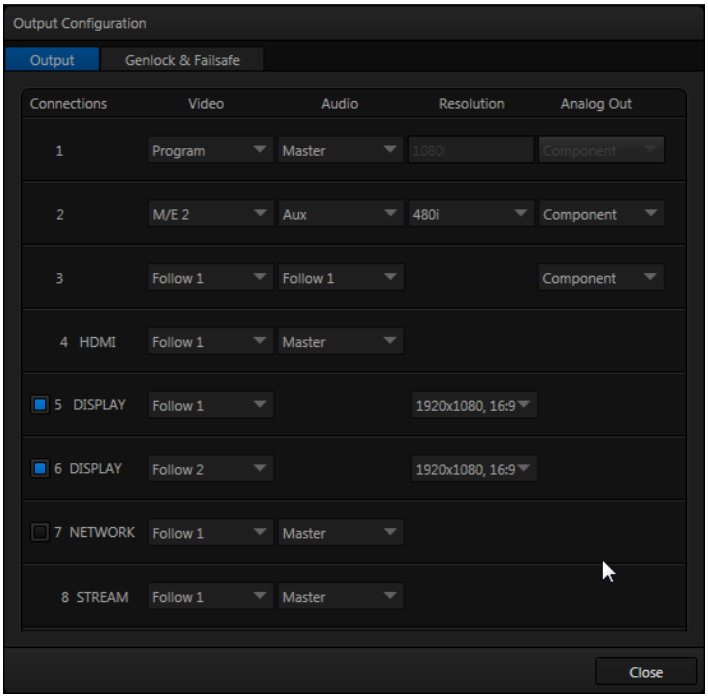


FIGURE 127

9.1.1 OUTPUT TAB

The *Output Configuration* panel contains two tabbed panes governing TriCaster's outputs as well as *Genlock & Failsafe* options and settings.

OUTPUTS 1 AND 2

The first tab, labeled *Output*, provides control over all of TriCaster's *Output* channels. Each of these is in some ways unique. *Outputs 1* and *2* are of particular interest, for several reasons:

- Of all of TriCaster's outputs, *Outputs 1* and *2* support the most diverse range of optional video sources.
- Any other output can be assigned to 'follow' the audio and video source selections of either *Output 1* or *Output 2*.

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

Let's consider the optional settings provided by these two important outputs:

- *Video* menu (Figure 128) – assign any source from the following list to either *Output 1* or *Output 2:*

  - Cameras 1-8
  - Network 1 or 2
  - Media Players
    - DDR 1
    - DDR 2
    - GFX 1
    - GFX 2
  - Any Frame Buffer
  - Output from M/E 1-8
  - Preview (look ahead)
  - Program
  - Program (Clean)
  - Black
  - *Alpha Matte – Output 2* only

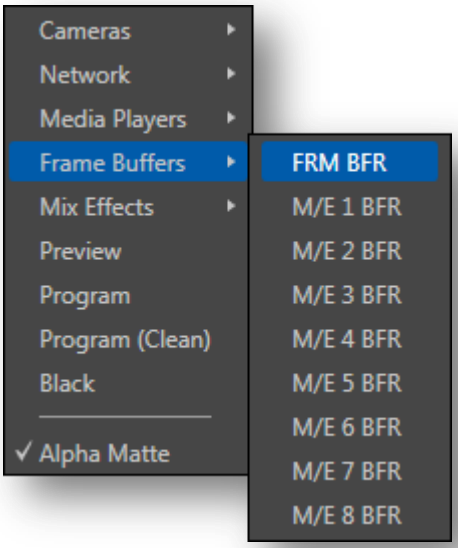


FIGURE 128

- *Audio* menu (Figure 129) – choose which audio is presented on the corresponding audio output connections on TriCaster's rear from the following list:

  - Outputs
    - Master
    - Aux
  - Color Groups – a color-coded audio group
  - Inputs 1-8 – sound from any single audio source

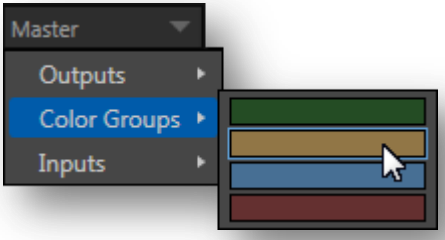


FIGURE 129

- *Resolution* menu – select the video format for downstream devices you intend to connect to the corresponding output:

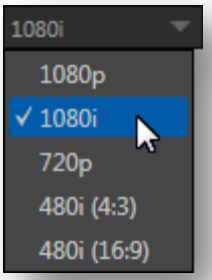


FIGURE 130

    - 1080p
    - 1080i
    - 720p
    - 480i (4:3)
    - 480i (16:9)
    - *576i (4:3) – Multi -format TriCasters only*
    - *576i (16:9) – Multi -format TriCasters only*

Note: Output 1 always transmits video in 'session format' – hence provides an information display in place of a Resolution menu.

- *Analog Out* menu – select the video connection type for downstream devices you intend to connect to the corresponding output:

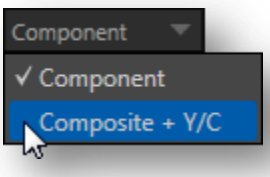


FIGURE 131

    - Component
    - Composite + Y/C

Note: The only analog connection type suitable for HD video is Component. The Analog Out menu for Outputs 1 and 2 are automatically set to Component and locked when the current Resolution selection for the row 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.

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 9.2.2).

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*; or even a pass-through from an upstream alpha channel source. Simply enable the switch in the *Output Configuration* panel, and select a suitable source using the same menu.

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

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), SD video from *Output 2* (and any output set to *Follow 2*) can use either a 16:9 image aspect or as (side-cropped) 4:3 video, as noted earlier when discussing the *Resolution* menu.

Hint: TriCaster's Record feature can capture video from Output 2, as well as Output 1 (and individual cameras). Output 2 is a particularly flexible choice for capture purposes, providing many useful alternatives – see Chapter 20, Record and Grab.

OUTPUT 3

Output 3 offers a subset of the options available for *Outputs 1* and *2*. *Video* menu options include:

- Cameras 1-8
- Follow 1 or Follow 2

Choosing either *Follow 1* or *Follow 2* causes *Output 3* to carry the same video source, at the same resolution, as the 'followed' output. For SDI output only, audio from output 3 can follow *Output 1* or *Output 2*.

Note: The Analog Output menu for Output 3 always shows both Component and Composite + Y/C options. As you would expect, the latter selection will not work properly when Output 3's video source is HD.

OUTPUT 4 HDMI

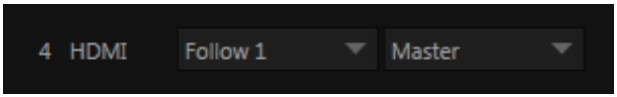


FIGURE 132

Output 4 is labeled *HDMI* in the *Output Configuration* panel as well as on TriCaster's rear connection panel. It's *Video* and *Audio* menu options are identical to *Output 3*. No analog connection options are provided.

Note: If the target HDMI device is unable to display video in the format of the source selected in Output 4's Video menu, it will typically show black.

OUTPUTS 5 AND 6

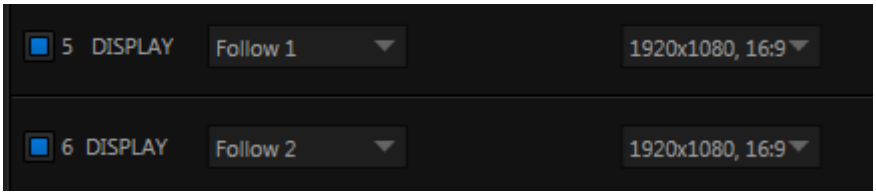


FIGURE 133

Outputs 5 and *6* are labeled *Display*, and are intended to supply video to projection systems or other similar display devices. These outputs are presented physically on TriCaster's rear connection panels as HDMI and VGA ports, respectively (*Output 5* is DVI-D internally). No audio is supplied to these connectors.

The *Video* source menu for both outputs provides the same options as *Output 3*. When a downstream monitor is detected on either port, the corresponding *Resolution* menu permits selection of a suitable resolution (typically, an incorrect selection here will result in an 'out of range' error message being displayed on the downstream device).

Switches provided at left in each row permit the *Display* ports to be selectively disabled when they are not in use.

9.1.2 OUTPUTS 7 AND 8 (NET AND STREAM)

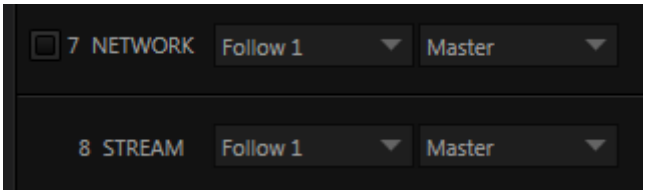


FIGURE 134

Network Output sends audio and video across a LAN (Local Area Network) to the *Net* inputs of another TriCaster, and is enabled or disabled using the switch at left. Like other output options, TriCaster's *Network* and *Stream* outputs can be independently configured to use different *Video* and *Audio* sources. The selections are the same as are offered for *Output 4* above.

Streaming Output is more complex, since there are so many different ways to stream. In this panel, you can configure the audio and video sources to be output. All other options and settings relevant to streaming are located in the *Streaming Configuration* panel – see Chapter 18 for a full discussion of this important topic.

9.1.3 GENLOCK

TriCaster's *Genlock* feature allows it to 'lock' its video output to a reference video signal (house sync, such as 'black burst') supplied to its Genlock input connector.

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'.

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 eight camera sources. 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 and ii) other video devices in the chain with a single reference is the best approach.

You could think of it this way:

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

- Supplying the same sync source to 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).

VERTICAL POSITION, HORIZONTAL POSITION AND PHASE

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).

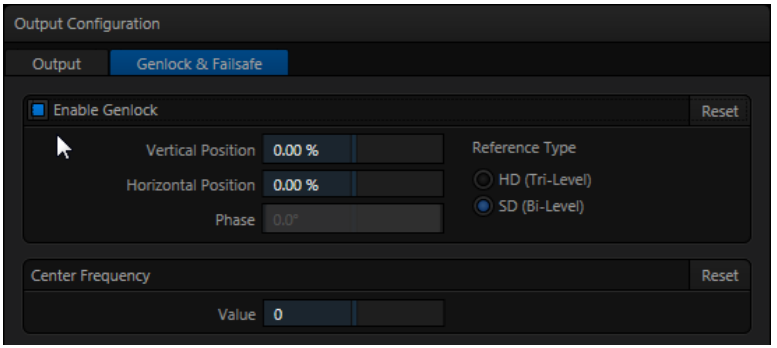


FIGURE 135

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).

REFERENCE TYPE

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

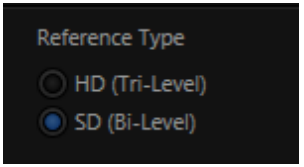


FIGURE 136

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.

9.1.4 CENTER FREQUENCY

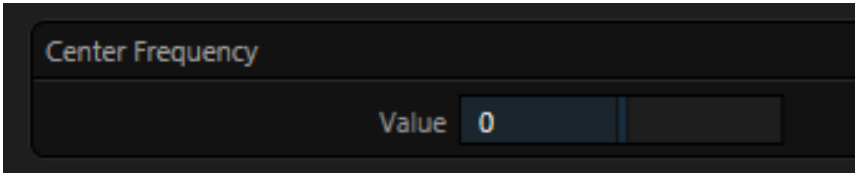


FIGURE 137

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 9.2.3, Frame Sync .

9.1.5 FAILSAFE

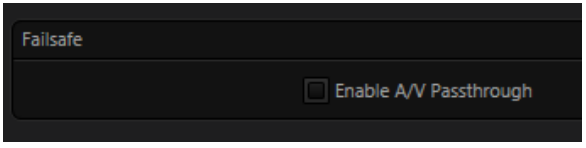


FIGURE 138

TriCaster's multi-tiered 'Always on Air' hardware and software failsafe systems (see Section 3.4.2) provide confidence that short of a complete power failure the show *will* go on.

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 such cases, 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* section has been added to *Output Configuration*. Its sole raison d'être is to provide a switch allowing you to 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.

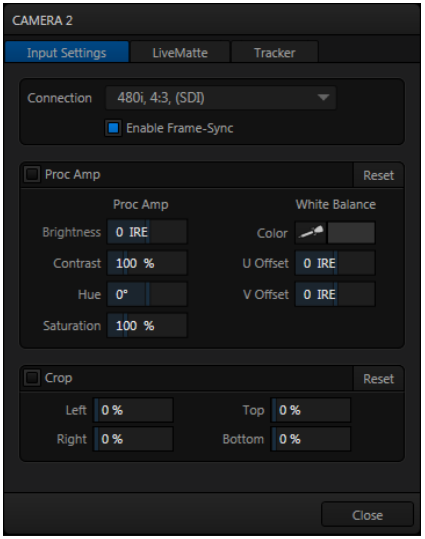


FIGURE 139

TriCaster's input monitors have contextual tools that appear when you roll the mouse pointer over in the footer (that is, the titlebar below each monitor). In every case, the right-most button is a *Configure button* (gear). Clicking it opens the *Configuration* panel for a specific source (Figure 139).

9.2.1 CONNECTION TYPE

The *Configuration* panel for the *Camera* inputs features a *Connection* type menu at the top of its *Input Settings* tab. *Connection* menu options vary depending on the *Video Standard* for the session. TriCaster *Multi-standard* provides *PAL* and *NTSC-J* session options, in addition to *NTSC*.

The *Connection Type* menu options for a PAL session list PAL HD and SD format options. Choosing *NTSC* as the *session Video Standard* results in *a Connection Type* list with appropriate formats, and it is similar for *NTSC-J*. Changing from one Video Standard to another requires opening a new session.

Hint: All connected cameras must conform to the current Video Standard for the session.

The standard options are:

1080i (Component)

- Analog source, high definition, interlaced
- 1080/60i or [1]1080/50i
- 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 [1]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), 1080/24PsF (SDI), [1]1080/25p (SDI), [1]1080/25PsF (SDI)

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

720/60p (Component), [1]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), [1]720/50p (SDI), [1]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 both 4:3 and 16:9 versions:

480/30i (Component)

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

[1]576/25i (Component)

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

[1]576/25i (SDI)

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

[1]576/25i (Y/C)

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

[1]576/25i (Composite)

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

[1] Multi-standard TriCaster PAL connection type

9.2.2 ACT AS ALPHA

TriCaster optionally allows 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 absolutely *invaluable* for installations employing video feeds from high end external CG and chromakeying systems (such as Chyron® and Ultimatte®).

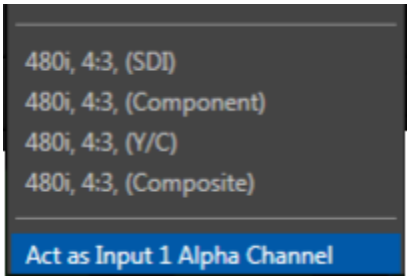


FIGURE 140

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.

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.

9.2.3 FRAME SYNC

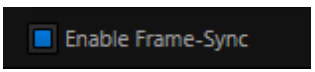


FIGURE 141

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. It is possible, however, 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 9.1.3) 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.

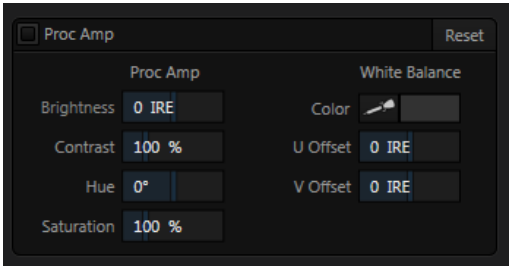


FIGURE 142

The *Input Settings* tab also contains *Proc Amp* (processing amplifier) settings. Input *Proc Amp* adjustments are applied *after LiveMatte* is processed, which can help when composing greenscreen shots to match a background or *LiveSet*.

You may also notice that changes to *Proc Amp* settings affect stopped (or frozen) sources, including live camera feeds.

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

Proc Amp practices:

Whenever possible, it is best to perform color adjustments at the source or target device. For example, it is preferable to calibrate a camera's colors at the camera, before sending the signal to TriCaster. Doing so will yield higher color precision.

TriCaster's Proc amps are available for occasions when no upstream color correction is available.

- *Brightness*: Adjustment range from -50 to +50 IRE (the default being 0). As reference, the full luminance range of the visible portion of a video signal can be thought of as '100 IRE units' (named for the Institute of Radio Engineers) – ignoring minor regional variations.
- Contrast – Adjustment range from 25 - 400% (default 100%).

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

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

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

Hint: your TriCaster system provides Waveform/Vectorscope monitors, an invaluable aid to calibrating your video sources.

White Balance – this secondary control group adds *U Offset* and *V Offset* controls to the *Proc Amp*.

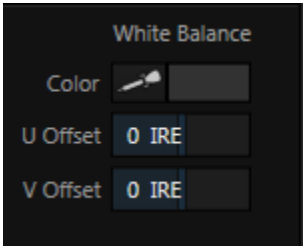


FIGURE 143

- 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.

To *automatically* white balance – click and hold the mouse button over the *Color* (eyedropper) button, and then slide the 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.

9.2.5 CROP

It is very common for a source to be supplied with unintentional inclusions; these are often items that remain after chromakeying (see 0) 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 can be used to remove such unwanted 'garbage' from the scene, or it can be used independently for other purposes – such as to isolate some portion of the screen for use as a Picture in Picture overlay source.

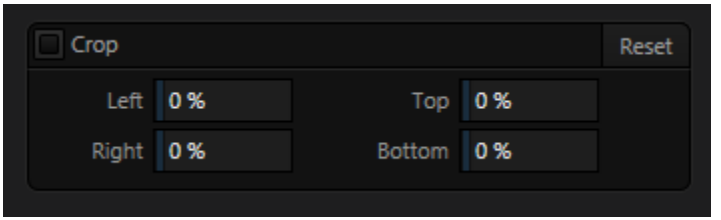


FIGURE 144

Essentially, the four 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 four controls will be completely cropped.

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

9.2.6 LIVEMATTE

The second 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.

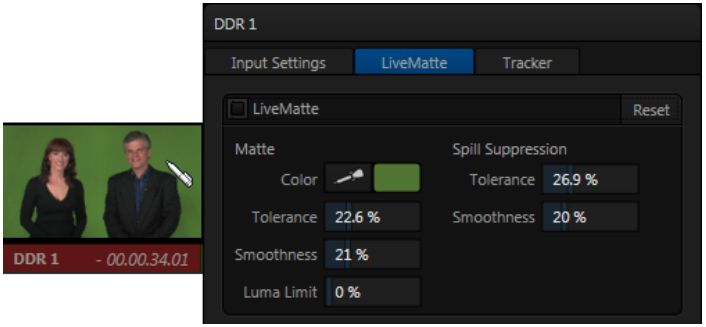


FIGURE 145

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.

9.2.7 HOTSPOTS

FIGURE 146

The lower portion of the *LiveMatte tab* in the *Input Configuration* panel is devoted to *Hotspots* – TriCaster's powerful interactive automation feature.

A *Hotspot* is a square, user-defined region of the screen that (when active) detects opacity changes inside its boundaries. This is why the feature is paired with *LiveMatte* in the TriCaster interface (Hotspots do not work without *LiveMatte* being 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 disappear from the region.

All manner of creative implementations are possible. *Hotspot* setup, options and use is discussed in depth in Chapter 17, Macros and Automation.

SECTION 9.3 TRACKER

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 9.2.6).

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).

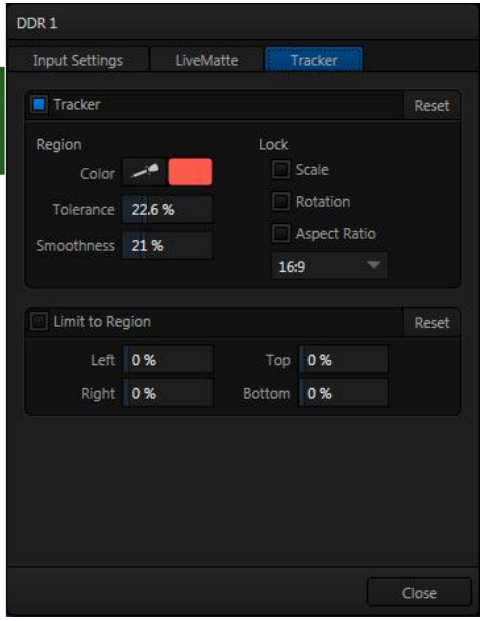


FIGURE 147

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 147). The color swatch updates constantly as you drag, until you release the button to make a selection.

FIGURE 148

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.

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 149):

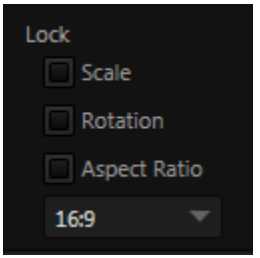


FIGURE 149

- 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

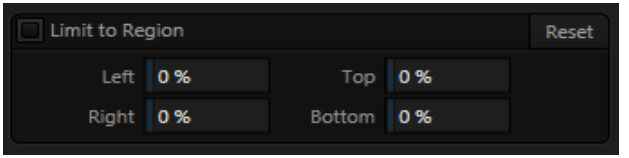


FIGURE 150

The *Tracker* is designed to follow the largest shape in a frame that meets the defined color criteria.

At times, similar colored articles or inclusions in the frame can interfere with *Tracker* output. The settings in this group allow you to limit the area of the frame the Tracker monitors, which can help you sidestep this issue.

We'll discuss the application of the *Tracker's* data stream when discussing the *Positioner* tools.

SECTION 9.4 TIMECODE CONFIGURATION

FIGURE 152

TriCaster can supply production 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.

TriCaster can optionally use an external linear timecode (LTC) reference to drive its 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 9.4.2).

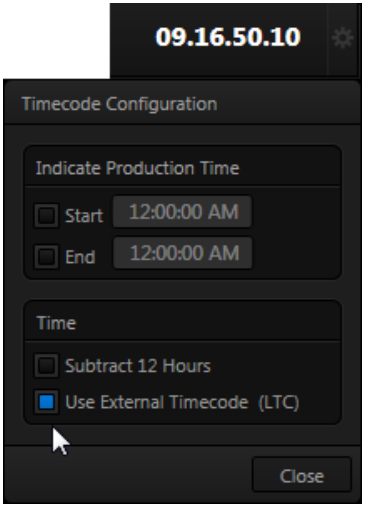


FIGURE 151

9.4.1 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 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.)

9.4.2 PRODUCTION TIME

Two more switches, under the label *Indicate Production 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 154) 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.

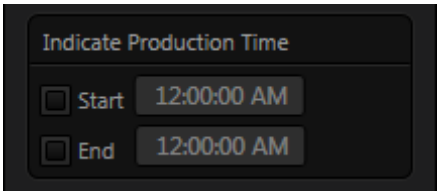


FIGURE 153

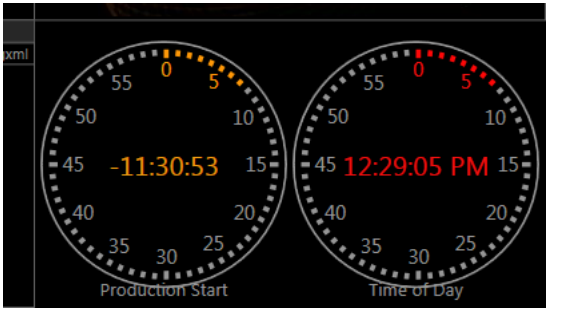


FIGURE 154

9.4.3 LTC TIMECODE

Linear timecode is by far the most common 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 uses *Audio Input 7* for this purpose (see Section 4.7)

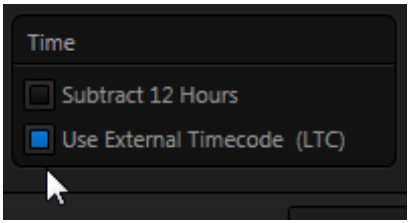


FIGURE 155

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. Enable linear timecode using the switch labeled *Use External timecode (LTC)* in *Timecode Configuration*.

Sound from the audio input tasked with supplying timecode is automatically muted for recording and output purposes when LTC timecode is enabled, but you can un-mute it briefly in the *Audio Mixer* to let you adjust input levels.

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 10 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 156).

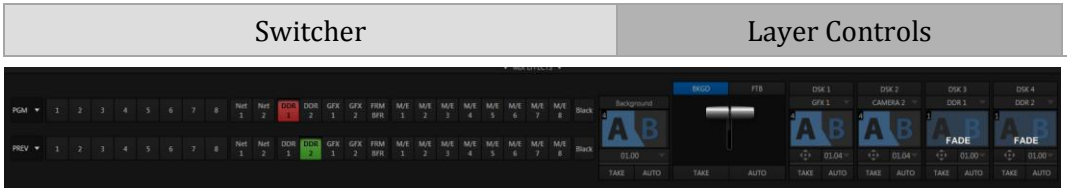


FIGURE 156

SECTION 10.1 SWITCHER ROWS

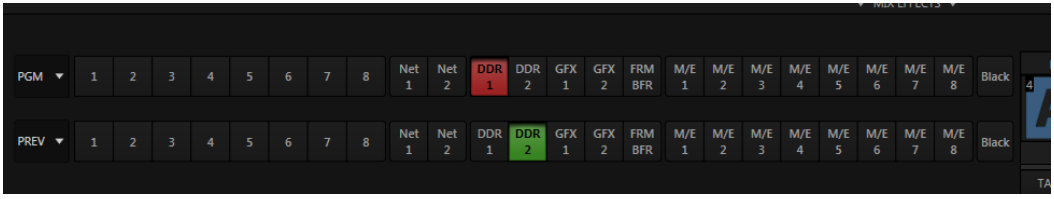
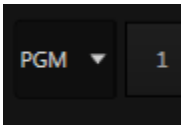


FIGURE 157

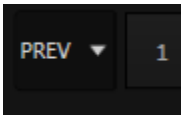
From top to bottom, the two *Switcher* rows are labeled *Program* and *Preview*. Clicking a button in the *Program* or *Preview* row selects the active video source for that row (audio sources may or may not be affected by *Switcher* activity – see Chapter 15 Audio).

10.1.1 PROGRAM AND PREVIEW



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.

Optional video source selections for the *Program* and *Preview* rows include all external (*Camera* and *Network*) inputs, internal sources (*Media Players*), and also the output from all eight of TriCaster's M/Es, represented on the *Switcher* rows by buttons labeled *M/E (1-8)* – see Chapter 14, Mix/Effect (M/E) Tools).

SECTION 10.2 VIDEO 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, five additional 'primary layers' can contribute to TriCaster's final *Program* output at any given moment:

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

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

- It may include mixed video from both the *Program* or *Preview* rows.
- Selecting an *M/E* as source on *Program* or *Preview* can bring many more sub-layers into the *BKGD* composite, including the M/E's *Inputs (A-D)* and the four dedicated M/E *Key* layers, which are similar to *DSK* layers.

Note: Since M/Es are reentrant, the BKGD layer alone can at times reach astronomical numbers of sub-layers in its composition!

10.2.1 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 four individual *DSK* layer controls, located at right in the *Layer Control* section of the *Switcher* section.

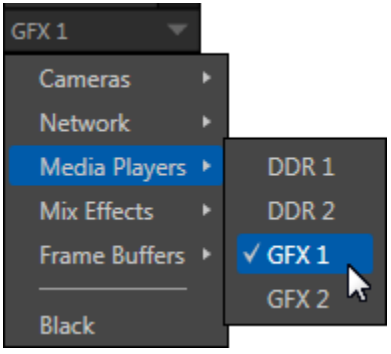


FIGURE 158

Hint: See Section 12.3 for a discussion of Frame Buffers, a special source option.

10.2.2 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 any M/E operating in Mix mode, show a downward pointing triangle to the right of the row label (Figure 159). Click it to open a menu that lets you create these linkages.

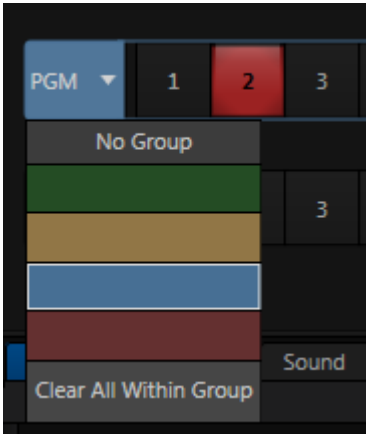


FIGURE 159

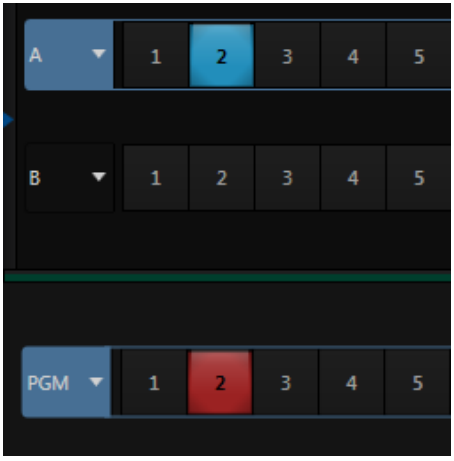


FIGURE 160

Rows assigned to any single color group are linked. Making a selection in any linked row updates the selection of all other rows in the group to match. Thus Figure 160 shows the *Input A* row for an M/E linked to the *PGM* row of the main *Switcher*.

The final menu item removes the links for all rows assigned to the current group.

SECTION 10.3 TRANSITIONS

We discussed video layers in Section 10.2. 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 four primary *DSK layers.*

FIGURE 161

Let's consider the individual *DSK Layer Controls* first, before proceeding to the slightly more complex main controls.

10.3.1 DSK CONTROLS

FIGURE 162

Pressing the local *Take* button for any *DSK* displays or hides the corresponding video layer (shown on top of the *BKGD* layer).

The local *Auto* buttons perform similarly, but apply the currently selected transition - that is, the effect represented by the thumbnail icon shown.

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 transitions provided for quick selection (Figure 163).

To replace an entry in the palette, click its label, or move the mouse pointer over one of the icons and click the "+" sign that pops up.

This opens the *Custom Media Browser* to let you choose from the hundreds of transition effects included with TriCaster, or even custom Animation Store effects that you prepare using the included *Animation Store Creator* application.

The selected effect will replace the current one in the palette.

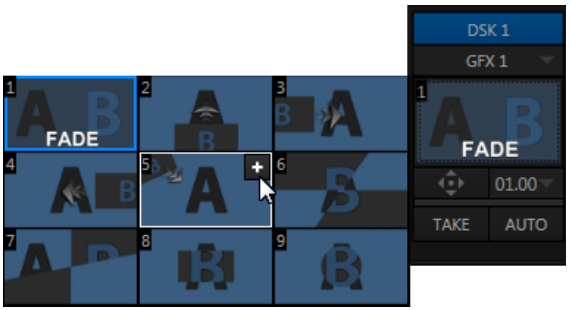


FIGURE 163

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

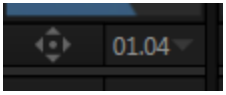


FIGURE 164

The duration of the transition is established using a numeric setting above the *Take* and *Auto* buttons. You can drag the mouse pointer left or right over the numeric display to set a custom time, or alternatively, click the numeric field directly to enable keyboard entry.

Another approach to setting duration allows you to quickly select a preset duration from the drop-down menu provided. The menu provides convenient two, one and ½ second presets.

Hint: the direction of Transitions applied as DSK (and M/E Key) 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 individual sounds for transitioning in and out (transition sounds are optional; also note that audio level control for *Effects* is provided in the *Audio* (mixer) tab).

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.

DSK POSITIONING

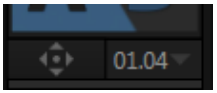


FIGURE 165

Each *DSK* layer has its own *Position* button and settings.

Click the titlebar button marked with a double-headed arrow to open the *Position* panel. This button is a toggle switch, and is lit when *Position* settings are active for the associated *DSK*.

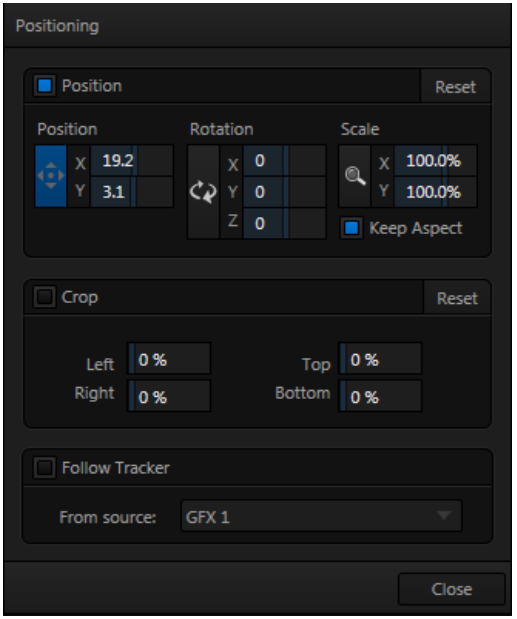


FIGURE 166

Position panel settings are organized into three groups from top to bottom:

1. *Position*
2. *Crop Edges*
3. *Follow Tracker*

The current settings for each group can be toggled as well, using the switch provided.

FIGURE 167

The upper-most section of the panel is devoted to *Position* settings. Across the top you will see three labels: *Position*, *Rotation*, and *Scale* (viewed from left to right).

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

Notice that by dragging left or right on either of the two numeric controls nearby, you can adjust the position on a single axis.

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

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

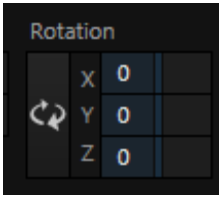


FIGURE 168

- 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 *Alt* down to rotate about the Z axis.
- Drag on a single numeric slider below, or hold down *Ctrl* while dragging to constrain rotation to one axis.

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

This frees you to tinker with positioning without the result appearing on output prematurely.

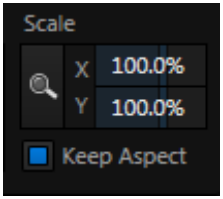


FIGURE 169

Dragging the cursor on the *Scale* button (magnifying glass) affects the size of the overlay.

When *Keep Aspect* is enabled, dragging in any direction affects scale equally on both axes.

Otherwise, dragging vertically on *Scale* changes the height, while dragging horizontally affects width.

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).

Again, if you drag just one of the numeric gadgets below the *Scale* button (with the lock *disabled*) or hold down *Ctrl* while doing so, you can adjust just one dimension of the corresponding *DSK* layer – width or height.

CROP

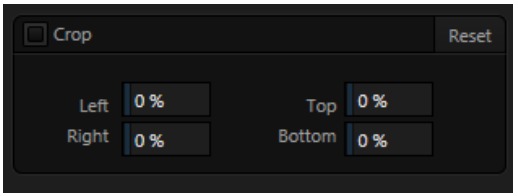


FIGURE 170

Crop controls for *DSK* layers are similar to the *Crop* settings in TriCaster's *Input Configuration* panel. However these local *DSK* settings are independent, and apply even when the similar option in *Input Configuration* is not active.

Individual settings can be reset by double-clicking with the shift key held down. To restore default settings to all parameters of the *Position* or *Crop* sections at once, click their respective *Reset* buttons.

FOLLOW TRACKER

Assign the motion data output from the *Tracker* for any video source to the current DSK layer by selecting it in this menu.

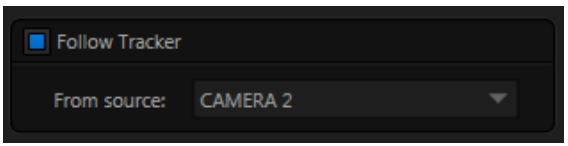


FIGURE 171

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*.

DSK TRANSPARENCY

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 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 172

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 172), or set up many other elaborate effects in this manner.

10.3.2 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 10.3.1), but there is one difference worth mentioning.

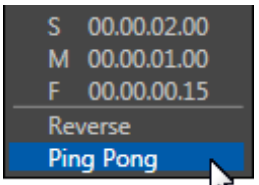


FIGURE 173

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

TRANSITION DELEGATES

An executive maxim suggests "Don't do anything yourself when you can delegate it". The familiar main *T-Bar*, *Auto* and *Take* controls occupying the *left* half of TriCaster's *Transition* control group are surmounted by a set of *Transition Delegate* buttons.

FIGURE 174

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 *BKGD* button in the *Transition Delegate* group.
- Click the main *Auto* button (below the *T-Bar*).

- Now, hold down the *Ctrl* key and click the delegate button for *DSK 1.* Or, press both *the BKGD* and *DSK 1* buttons in the *TriCaster CS (*control surface) *Transition Delegate* group at the same time instead.

You have just delegated the controls below to <u>two</u> *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 reflects your Transition Delegate selections, and allows you to configure video layers for upcoming switcher operations with great confidence.

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

FTB

Let's discuss the final button in the *Transition Delegate* group – *FTB*. The acronym stands for *Fade to Black*. The result of selecting the *FTB delegate* and displaying the video layer it controls will not likely surprise you very much. *FTB* offers a convenient method of doing precisely what its name implies, simply fading *Program Output* out completely (to black).

It might help to think of *FTB* as 'DSK 5', since it represents a final *video layer* added above all others before ultimate *Program* output. *FTB* has several unique characteristics, however. For one thing, *DSKs* can display colorful video sources (with or without transparency); the FTB video layer is always 100% opaque black, and completely obscures everything below it.

Note: Like the DSK layers, hiding or displaying FTB triggers both Autoplay and Audio Follow Video when these settings are active for Media Players. FTB also fades Master Audio to mute when displayed, and back up again when hidden.

Also unlike other video layers, *FTB* does not support custom transitions (pressing *Auto* simply fades it on or off) or timing; *FTB*'s fade duration is drawn from the *BKGD* layer setting.

Hint: Hold down Shift while pressing the (CS or onscreen) FTB button to directly initiate an FTB operation, rather than merely delegating the T-bar to it. As a memory aid , the FTB button pulses during operation.

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 in the *Transition Delegate* group.

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.

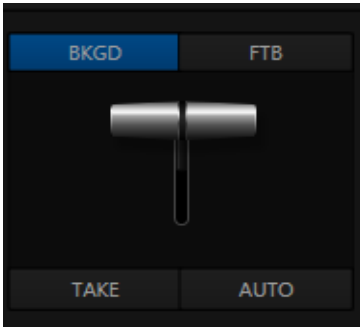


FIGURE 175

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 delegated video layers (see the sub-heading Transition Delegates above). 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.

Chapter 11 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™ provides extensive and versatile monitoring – just what is needed to control your live productions. Monitoring features can also warn you of conditions that might affect output quality, as well as providing access to adjustments providing quality control and creative alternatives.

Among others you will find *Proc Amp*, *LiveMatte, Hotspot, Tracking* and *Crop* controls. (To give some of these features the attention due, they are treated individually in Chapter 9 I/O Configuration, and elsewhere. Likewise, network inputs are discussed in Chapter 16 Network Sources.)

SECTION 11.1 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 176

FIGURE 177

As we saw way back in Section 5.4.2, the overall layout of each of these multiview monitoring areas is governed by two *Workspace* presets.

You can 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 external Multiview has an menu that lets you choose a Resolution supported by the display device you connect. Select the native resolution of the external display device for best results. Changing Multiview output options can cause frames to be dropped, so modifications during live production are discouraged.

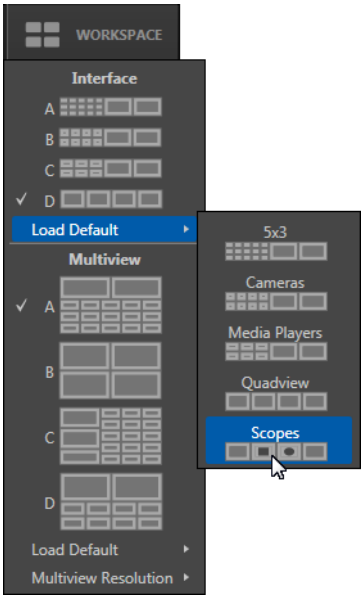


FIGURE 178

Let's consider the optional settings at your fingertips for individual monitor ports.

SECTION 11.2 VIEWPORT OPTIONS

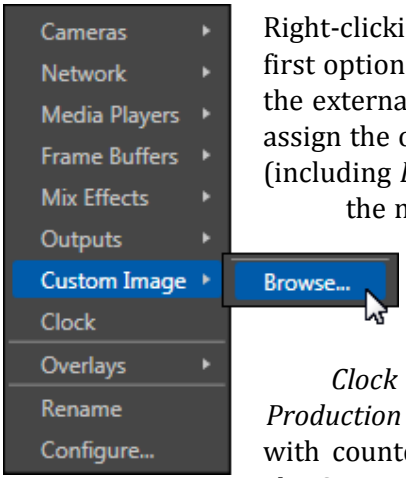


FIGURE 179

Right-clicking a monitor viewport 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 *Clock* selection supplants the video display with *Production Clocks* showing current time or LTC timecode along with countdown style *Start* and *End* clocks (see Section 9.4). The *Custom Image* feature lets you display a network logo.

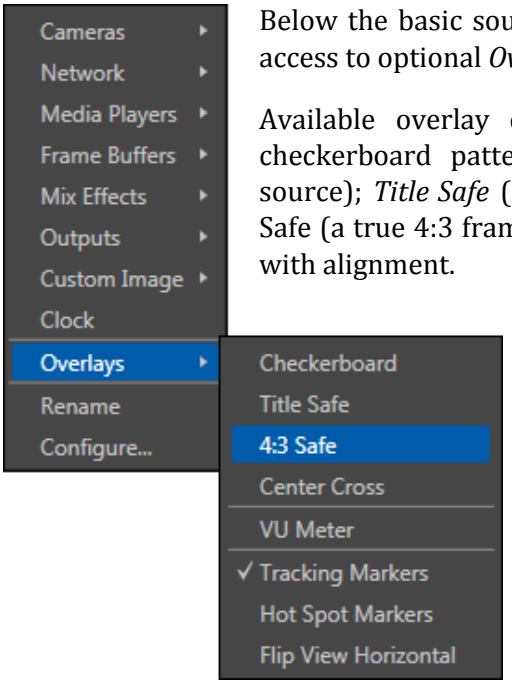


FIGURE 180

Below the basic source selection, you'll find a menu providing access to optional *Overlays* for the monitor port.

Available overlay displays include *Checkerboard* (shows a checkerboard 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), and *Center Cross* to help with alignment.

In addition, you may choose to display *VU Meters* with the source, *Tracking Markers* (see Section 9.3) and *Hot Spot Markers* (see Section 9.2.7).

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).

Note: Certain Overlay menu options are not suitable for all monitor sources, hence are not listed when innapropriate.

Two final items complete the monitor viewport options:

- *Rename* – click to open a small dialog allowing you to supply a custom name to be shown for the monitor viewport (as well as the associated *Switcher* row button) for appropriate sources.
- *Configure* – select to open the *Input Configuration* panel for the source. (This produces the same result as clicking the small 'gear' button that pops up in the monitor's titlebar when roll the mouse pointer into it.)

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

Media Player and *Network* input viewports provide additional features. Moving your mouse pointer over these monitor viewports pops up new controls in the titlebar.

FIGURE 181

Media Player monitors (Figure 181) display handy transport controls – *Previous*, *Play*, *Stop*, and *Next* (just like those found in the footer of the actual *Media Player*). As well, a timecode field is shown. Right-clicking the time field opens a menu allowing you to *Reverse Direction*, toggle *Warning Colors*, or use *Playlist Duration*.

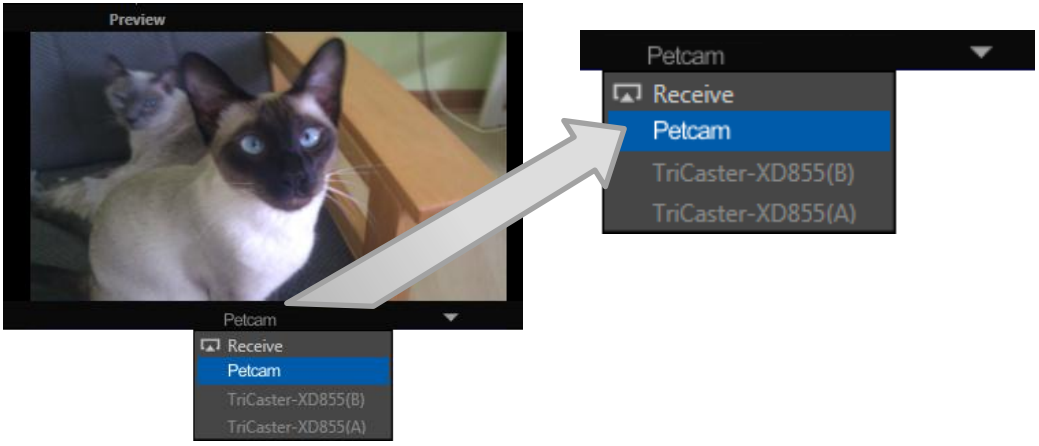


FIGURE 182

Click the triangle button that appears in the titlebar for *Network* input monitors (Figure 182) to select the active source from a drop-down menu listing all those currently detected.

Just as for other sources, a *Configure* (gear) button is shown on rolling over these monitor types; clicking it opens the *Configuration* panel for the related source (see Chapter 9 I/O Configuration, Section 9.2).

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

SECTION 11.3 PROGRAM MONITOR

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

FIGURE 183

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 *DSK 1–DSK 4*, or *FTB*) that are displayed above it.

Note: By default, Program output is sent to TriCaster's outputs, but this is subject to assignments made in Output Configuration. When you move your mouse pointer over a Program monitor, a Configure button (gear) appears at right in its titlebar. Clicking this button opens the tabbed Output Configuration panel (see Section 9.1).

FIGURE 184

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 10.3.2).

- 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 MONITORS AND PREVIEW

As mentioned earlier, monitor viewport s can also be assigned to display the output of TriCaster's *M/E*s.

FIGURE 185

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.

Complementing this feature, TriCaster provides *Look Ahead Preview* monitoring capability for *M/Es* as well (Figure 185). The *Viewport Options* menu group *Outputs* lists an *M/E Preview* option for this purpose (see Section 11.2).

Hint: All viewports assigned as M/E Previews show output from the same M/E. Making a tab selection in the pane M/E updates all viewports assigned to show M/E previews.

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.

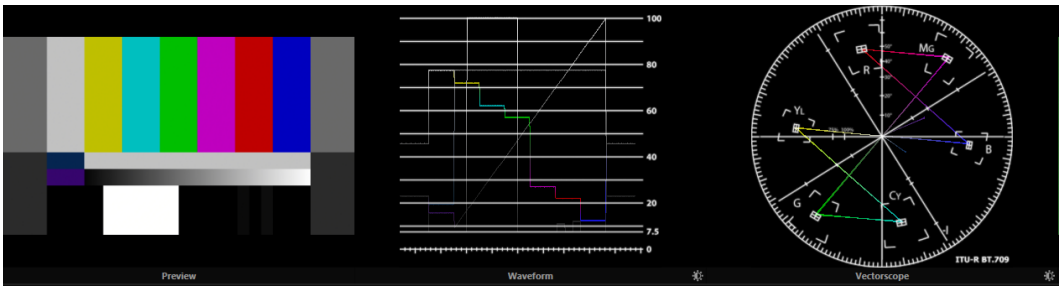


FIGURE 187

A further and very useful monitoring option is *Scopes*, 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.)

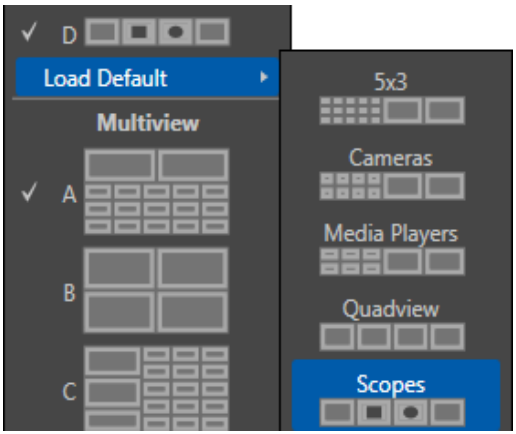


FIGURE 186

By default, the two scopes and their 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 *Program* output signal if you wish. The context menu also lets you adjust the *Brightness* for their display (*Shift + double-click* to restore defaults), or display the trace overlay in full or solid colors.

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

The titlebar for the video monitor in this *Workspace* shows a *Configure* button (gear icon) when the mouse pointer is over it. Click it to access *Proc Amp* and *LiveMatte™* controls for the current composition's *background* source (only).

11.5.1 CLOCKS

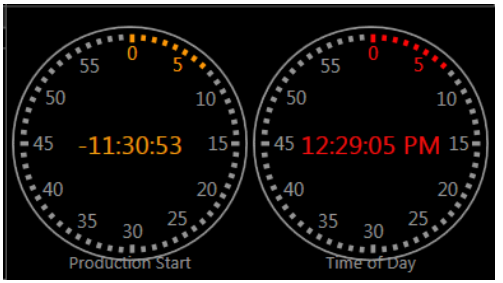


FIGURE 188

As discussed back in Section 9.4.2, TriCaster provides handy *Production Time* clocks.

One of these time displays is permanently in view at upper right in the *Dashboard*. It's possible to show clocks in any monitor pane, as well – whether in the *Interface* or *Multiview* displays.

As for any other display, simply choose the *Clock* option in the *Viewport Options* menu.

Hint: The Timecode Configuration panel in the Dashboard allows you to enter time values employed by Production Clocks.

11.5.2 CUSTOM IMAGE

It is often useful to include a network or corporate logo in the *Multiview* layout. The *Custom Image* item in the *Viewport Options* menu supports this requirement.

The *Browse* item in the menu opens a *Media Browser*, allowing you to select a suitable image for display. You can supply an image for this purpose in almost any common bitmap file format.

Chapter 12 MEDIA PLAYERS

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.

SECTION 12.1 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 1*, *DDR 2*, *GFX* (Graphics) *1 and 2,* and *Sounds* modules.

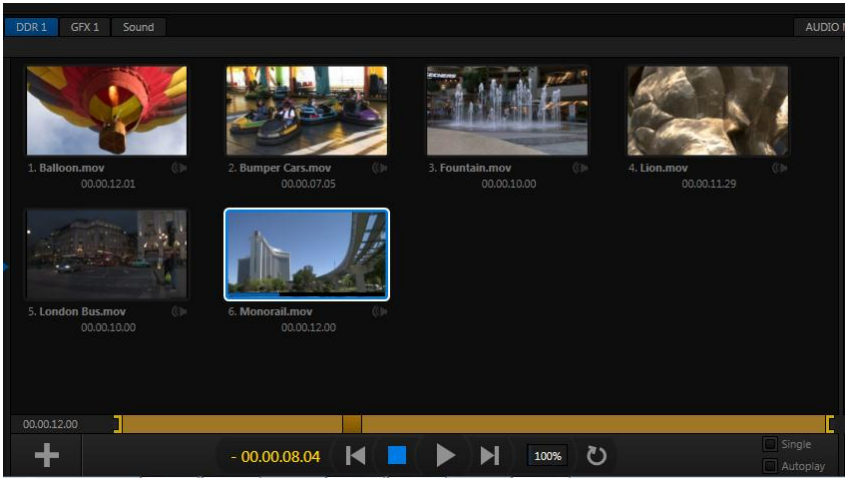


FIGURE 189

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).

The two *Graphics* players are principally intended for display and management of title pages (both those based on TriCaster's integrated titling system, and 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 it alone among *Media Players* is not represented by a *Switcher* row button. *Sound* will play back standard .wav or .mp3 format audio files, but does not support graphics or clips of any sort. Its controls are similar to *other Media Players,* with the exceptions that no *Autoplay* or *Speed* controls are provided.

Of the various *Media Players*, however, only the two *DDRs* have the capability to play video clips (including motion titles such as scrolls). It can also host images, title pages, or even audio files.

SECTION 12.2 SHARED FEATURES

Media Players of different types are accessed using tabs in the lower section of TriCaster's *Live Desktop*. (With the exception of *Sound*, pairs of *Media Players* of the same type are presented side by side.)

12.2.1 PLAYLISTS

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

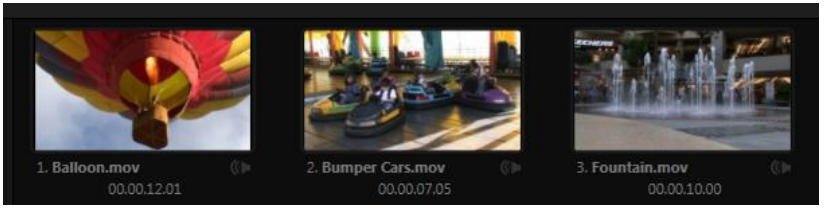


FIGURE 190

This arrangement offers easily visible thumbnail icons for each entry. A scrollbar at right accommodates long playlists when necessary.

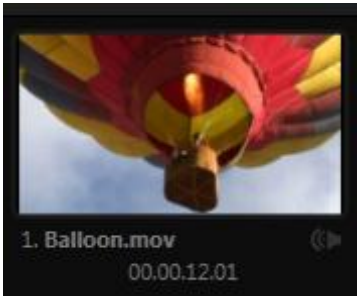


FIGURE 191

Icons in the playlist can quickly and easily be re-ordered 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).

The filename (with extension) of each item in the current playlist is displayed above the thumbnails, and its duration is shown below.

Hint: The duration shown is the play time after any trimming operations, and thus may at times be less than the file length on disk for video clips or audio files. 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 the *Media Player* is stopped, its output to video monitors tracks your selection and trimming operations. The current item is displayed as the *Media Player's* output, and in consequence appears on the corresponding monitor in the *All Monitors* tab. 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.

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

Note that even still images and static title pages added to the playlist are given a play duration. The default duration for these items is fifteen seconds. This 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 border around successive playlist items illuminate as each is played in turn. The playlist pane scrolls to display the icon for the currently playing

item if necessary. A progress bar is displayed beneath the currently playing thumbnail, and the *Scrub-Bar* knob also tracks playback progress.

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

FILE OPERATIONS

- Click the large + (Add) button beneath the playlist pane to open a custom *Media Browser* (see Section 12.2.2). 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*
    - *Set Display Name*
    - *Clone*
    - *Set Duration* (Still image and title icons)
    - *Edit Title*
    - *Send to Frame Buffer* (Still image and title icons – see Section 12.3)
    - *Set Audio Level* (clips with sound and audio icons)
    - *Share* – see Chapter 19.
- Standard *Cut, Copy, Paste* and *Delete* keystrokes are supported for playlist entries.

- Un-playable (missing, corrupt, or unsupported) file icons are 'ghosted'.

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

Interestingly, the playlist *Set Display Name* feature edits a local alias, or 'playlist nickname'. It 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.

FIGURE 192

ICON AUDIO SLIDER

The playlist of the two *DDRs* and *Sounds* offer an additional audio feature:

The icons of audio files (or clips with embedded audio) will display a small configure (gear) icon at lower right. Click this icon to pop up a small level slider (Figure 192).

SCRUB BAR

Just beneath the *playlist* pane is a full-width *Scrub-Bar* (Figure 193). 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.

FIGURE 193

Initially, *In* and *Out Point* handles at opposite ends of the *Scrub-Bar* are at their extreme positions, marking the actual limits of the file on disk. Dragging these handles adjusts timing for the selected item (multi-selections are ignored for Scrub-Bar trimming).

During playback, the *Scrub-Bar* knob traverses the span between the *In* and *Out Points*. The duration (taking into account trimming operations) is displayed in a timecode field just to the left.

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

ALPHA CHANNEL SUPPORT

For files with transparency (such as 32bit image files), use non-premultiplied alpha channels only 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.

12.2.2 MEDIA BROWSER

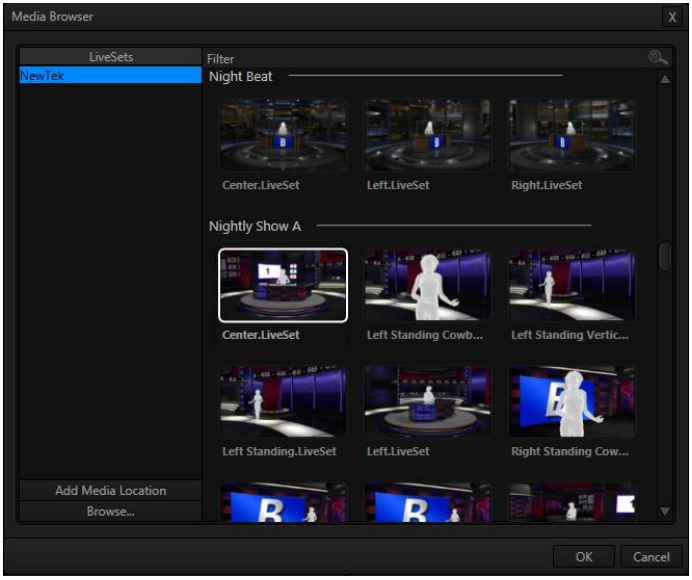


FIGURE 194

The custom *Media Browser* provides easy navigation to and selection of suitable 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.

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.

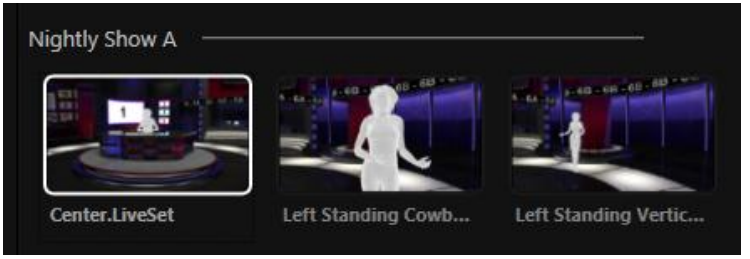


FIGURE 195

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 196

An additional filter appears above the *File Pane*. This is a smart filter, which 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* would display all content at the current location with that string as part of its filename. This would include any file with the filename 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.

12.2.3 PLAYER CONTROLS

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

FIGURE 197

TIME DISPLAY

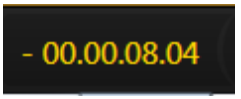


FIGURE 198

During playback, a timecode field beside the transport controls displays the *Current Time* for the player. This may be the current time position in the active playlist item (when *Single* mode is enabled), or relate to the duration of the entire playlist.

Left-click the field to type in a timecode, then press *Enter* to jump to that point in the file (*or* playlist).

If you right-click the timecode field instead, a menu allows you to choose to between showing *current time* and *remaining time* (*Reverse Direction*), enabling or disabling *Warning Colors*, or toggling *Playlist Duration* on and off (versus single playlist item duration).

Hint: With Warning Colors enabled, the time display 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 turn amber. With only five seconds left, numbers are red.

SINGLE

Media Player playback normally conforms to typical playlist practice – each item in the playlist playing back in orderly succession.

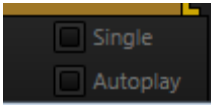


FIGURE 199

When *Single* mode is enabled, 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).

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

SPEED

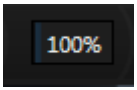


FIGURE 200

The *Speed* control is only found in the *DDR*. 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

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 8.1.1, as well as Section 14.2.)

Note: Unlike Switcher transitions, the DSK 'out' effect does not occur automatically as the end of play approaches.

In either case, when the *Media Player* is in *Single* mode, the current play position advances to the next item after playback is automatically stopped.

12.2.4 PRESET BIN

Another very useful feature shared by all of TriCaster's *Media Players* is the *Preset Bin*, which provides quick and convenient access to multiple playlists. As mentioned back in Section 5.9.1, presets also store the state of various *Media Player* controls.

To display the preset 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*, presets are presented on the left only).

When you change playlists by selecting another preset, it's almost as though you are accessing another *Media Player*. Use presets 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.

Presets are named, and conveniently display a small representative image (taken from the first entry in the playlist). As you move the mouse over preset icons they expand to provide an enlarged view of the icon for the first playlist item. To populate a new preset, simply click a blank preset icon.

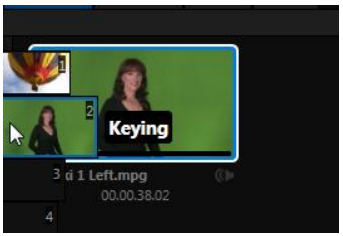


FIGURE 201

To modify the default name assigned to a preset, right-click a preset icon to open its context menu, and select *Rename* from the list. Other menu options include *Delete*, *Export* and *Import* (the file will be saved with the extension '.pst').

SECTION 12.3 NETWORK SHARING

12.3.1 FRAME BUFFERS

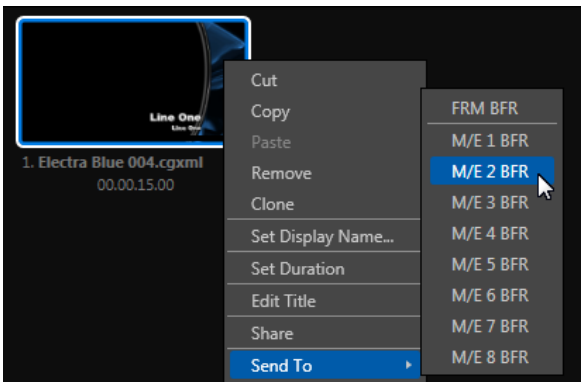


FIGURE 202

TriCaster's *Frame Buffer* system provides a convenient alternative source system for *M/Es* (including their associated *Key* channels), the *Switcher's* primary *Program* and *Preview* rows, and *its four DSK* channels.

Graphics (i.e., title pages or image files) assigned to *Frame Buffers* are independent from *Media Players*.

These sources are represented by the *FRM BFR* button on both primary *Switcher* rows, and in similar fashion, the *M/E 1 BFR* appears as a source on all *M/E 1* rows, etc. *DSK* and *M/E Key* channels have direct menu access to all *Frame buffers*, not just the one dedicated to a specific *M/E*.

Hint: We considered a Frame Buffer example back in Section 5.12.

Any still image or title page in the playlist of one of TriCaster's *Media Players* can be assigned to any one (or more) of the *Frame Buffers*.

- Right-click a playlist icon, and choose *Send to Frame Buffer* from the playlist context menu.

- Select *FRM BFR* or the buffer for the specific *M/E* you wish to the file to be assigned to from the hierarchical menu.

This actually *copies* the selected image into a specially provided folder located on the hard drive at C:\TriCaster\Effects\Frame Buffer*session_name*\. The copied image file remains available in that folder, even when the original file is not only unavailable from the playlist, but has actually been deleted from the hard drive.

Naturally, if an image has previously been assigned to this particular *Frame Buffer*, the current file is overwritten by the new one. This has no effect on the original *source* image or title page, however; only the Frame Buffer copy is affected.

Hint: Title pages sent to a Frame Buffer are converted to a snapshot – that is, an image – before the copy operation is performed. Modifying the source title page subsequently in the playlist does not affect the copy in the Frame Buffer. (To update the Frame Buffer copy, simply use the Send to Frame Buffer menu item again after modifying the source title page.)

Several characteristics differentiate *Frame Buffer* content from other sources (such as *Media Player* content). First, any possibility of accidentally displaying the wrong image or title (as might happen if the current playlist item was not the correct one) is eliminated. In fact, even when the original source file no longer *exists* on the system, the *Frame Buffer* copy can still be referenced on demand.

Among other things, this all means that you can effectively lock a specific title or graphic to an *M/E*. *Frame Buffers* have another extremely powerful feature – *network sharing*, discussed next.

SHARING FRAME BUFFERS

Another very useful advantage of this system is that, if you wish, you can share the *Frame Buffer* folder and its content across a network.

Share Frame Buffer on Network is easily enabled or disabled even during a live production using the *TriCaster Options* menu at the left-hand end of the *Dashboard*. TriCaster automatically presents the *current* session's *Frame Buffer* folder using the network share name "Frame Buffer".

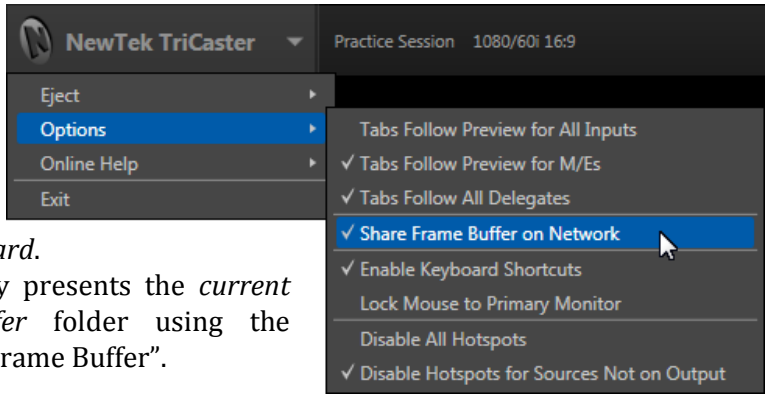


FIGURE 203

This allows *Frame Buffer* files to be individually updated across a network using any suitable graphics application (such as Photoshop®) or similar method.

When you save the edited image, the remote copy (on the TriCaster) is immediately updated – even if it is currently displayed live. This allows you to refresh an overlay virtually instantly using your graphics software of choice from any computer with a network connection.

Frame Buffer files are stored using the popular 32 bit PNG (Portable Network Graphics) image format. The specific file associated with any *Frame Buffer* is easily identified by its unique name – switcher.png, virtual_input_1.png, etc.

Note: This special share name assignment is dynamic. Network sharing is activated and the current Frame 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 Frame Buffer graphics for the current TriCaster session.

12.3.2 SHARING MEDIA FOLDERS

Just as *Frame Buffers* can optionally be shared across a network, other default media and content locations are also optionally accessible to network clients. The TriCaster menu item *Share Media Folders on Network* is enabled by default.

This feature allows users on the local network to view and modify content in media folders for the active TriCaster session as follows:

- Animation Stores
- Audio
- Clips
- LiveSets
- Stills
- Titles

When suitable content is added to these 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 shared files in the *File Pane* at right. This is a wonderful convenience, but one that should be approached with a measure of common sense as noted below. Please be judicious when taking advantage of this feature.

Caution: In almost all environments, network bandwidth has firmly established limits. TriCaster draws on that capacity for many purposes, including streaming, display of network feeds from a 3Play™, iVGA™, LiveText™ or third party software; it may have to contend with considerable other traffic on the network in doing so.

Further, transferring very large files (as video files often tend to be) across a network can be a time consuming task that may well have an impact on disk access times for other tasks. at the best of times

For these reasons, we cannot guarantee that attempts to transfer large quantities of data across the network during live production will not result in dropped frames on the stream or video outputs or, in extreme cases, sluggish response to controls.

On mouse-over, title page icons 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*.

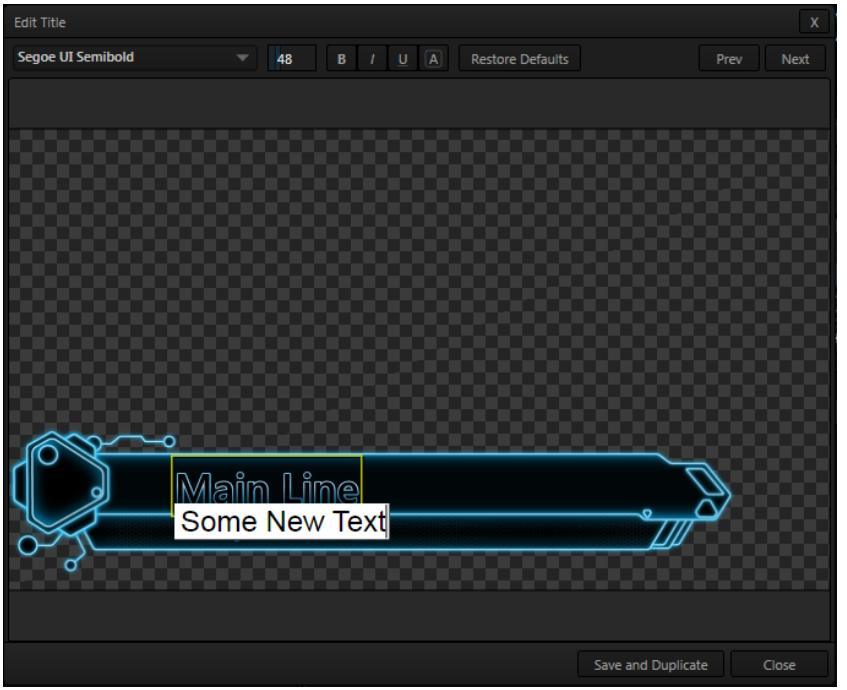


FIGURE 204

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. If you click once inside the box it turns yellow, indicating the text object is selected, and a text edit field opens.

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).

Hint: A red line under a character or word (Figure 204) indicates the spell-checker is questioning its spelling. Right-click the word to open a menu showing various suggested alternatives. Click one of these if you wish to update the original.

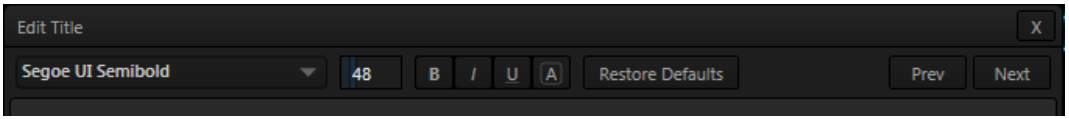


FIGURE 205

The titlebar of the *Title Page Editor* holds an assortment of text attribute controls. These include a *Font* selector drop-down menu, numeric *Size* control, and *Bold*, *Italic*, *Underline* and 'ALLCAPS' switches.

The *Prev* and *Next* buttons let you store your changes and move to another title page in the playlist without the tedium of closing the *Title Edit* pane.

SAVE AND DUPLICATE

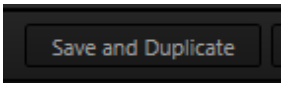


FIGURE 206

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 yellow border is displayed around the image, the image is a *stand-in*.

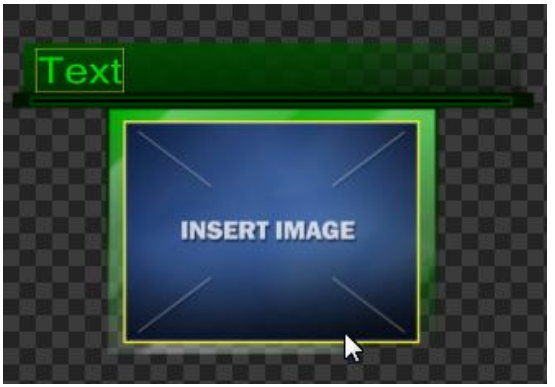


FIGURE 207

Click a stand-in to open the *File Browser*, allowing you to select a replacement image file.

You can find out which, if any images are unlocked (stand-ins) and which are locked, and toggle the status of any image:

> Hold down the *Shift* key while rolling around inside the *Title Page*. With *Shift* depressed, a red border is shown around any *locked* image under the cursor. *Stand-in* (unlocked) images display a green border on roll-over when *Shift* is depressed. To *toggle* the *stand-in/locked* status for an image, left-click it with *Shift* depressed.

If you right-click a stand-in image, a menu is presented that provides 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').

Chapter 13 LIVEMATTE

Although its controls are deceptively simple, TriCaster's LiveMatte™ is a very 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*™.

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*.

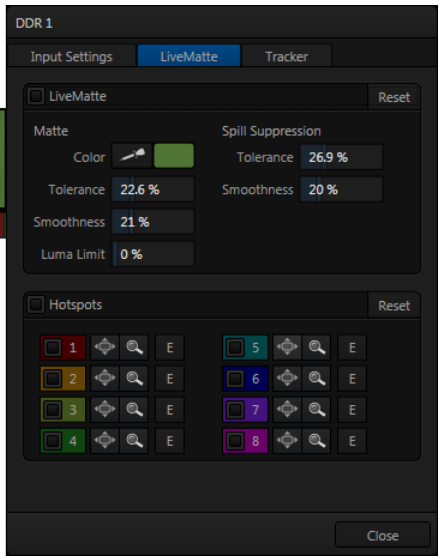


FIGURE 208

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 – see Section 9.2.5.

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 209

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.

SECTION 13.2 MATTE

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

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 210

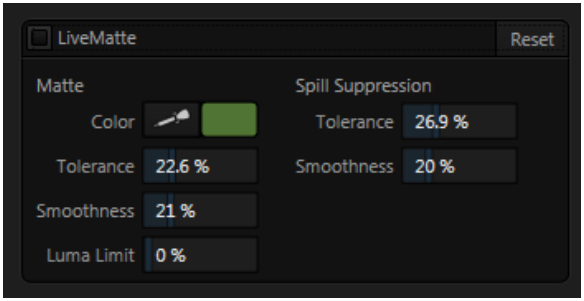


FIGURE 211

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 button (Figure 211) 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.

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* just beneath the *Color* picker.

The *Tolerance* setting allows you to broaden the range considered as the key color, including more 'near-neighbor' colors to be included in the matte. A low tolerance removes only color values close to the primary or key color. As you raise the tolerance, you extend the range of values on either side of the primary color that will be treated as transparent. This allows you to deal with those imperfections we mentioned.

On the other hand, it may be that there is (usually unplanned for) detail in the foreground that is somewhat similar to the key color. Reducing *Tolerance* may allow you to prevent unwanted holes appearing when the subject opts to wear his St. Patrick's Day tie.

13.2.3 SMOOTHNESS

Smoothness defines a further tolerance factor, and a very useful one. We want our keyed foreground to blend smoothly into the background – rather than to stand out in hard relief like a postage stamp or decal. *Smoothness* serves this purpose. 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

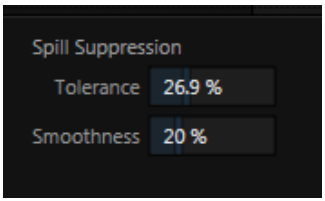


FIGURE 212

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.

The *Spill* 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.

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. 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 types of video signals.

- *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 two 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* back in Section 5.10 and Section 5.11 of the Live Production Walkthrough chapter. Now we'll look into these extremely powerful modules in greater depth.

SECTION 14.1 OVERVIEW

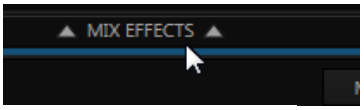


FIGURE 213

The *Mix Effects* label (Figure 213) beneath the monitoring pane on the *Live Desktop* is a toggle to expand or collapse the *M/E* interface (Figure 214).

FIGURE 214

When expanded, the *M/E* pane spans the upper-central part of the *Live Desktop*. The eight M/E's are presented individually in tabbed panes, each corresponding to a button in the main *Switcher.*

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, clicking an *M/E button* (labeled *M/E 1*, M/E 2, etc.) on the *Preview* row cues up that bank's composite output for an upcoming *Take*/*Transition* operation. This makes it easy to *Take* or *Transition* directly to, from, or between *M/Es* with a single click.

M/E buttons also appear on source selection rows in the source rows and Key source menus of *M/E* panels. This is why TriCaster's M/Es are referred to a "reentrant" M/Es, and represent an extremely powerful feature with endless creative possibilities.

Note: Self-referential reentrancy (i.e., assigning an M/E as one of its own sources) is not supported. However you can often mimic this sort of effect 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* mode: The default; a secondary switcher layout, with controls and options that are very similar to the main *Switcher*.

2. *Effect* mode: The *M/E* pane is configured for effects, including virtual set operations.

FIGURE 215

Autoplay and M/E modes:

One notable difference between an *M/E* in *Mix* mode and the main *Switcher* involves the *Autoplay* feature (see Section 12.2.3).

To avoid undesirable consequences for *Media Player* content aired on the all-important *Program* output, only events involving *M/E* sources that are visible on *Program out* ever trigger *Autoplay* operations (in either *Mix* or *Effect* mode).

As well, a switch in the TriCaster options menu toggles AutoPlay's triggering of '*Auto* out' transitions.

The mode for each *M/E* is set using buttons in the central control group (Figure 215) of the panel. For the most part, you will initially see very little difference in the *M/E* panel when you change modes.

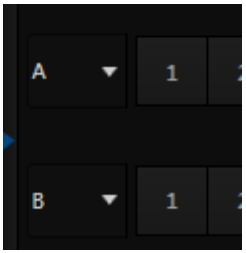


FIGURE 216

- By default, in either mode, you will observe two source button rows at left labeled input *A* and *B* (Figure 216).
- At right are four *Key* control groups, which are in most respects identical in appearance and practice identical to the *DSK* controls located in the main *Switcher* (see Section 10.3.1).
- Even the central control group mimics the main *Switcher*, with its *Transition* controls and options, *T-bar* and *delegate* buttons.

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 same manner
- *Key* channels stand-in for DSKs
- *M/E* output can even be routed to one of TriCaster's two main outputs (as well as the *IsoCorder* section).

14.2.2 EFFECT MODE

Careful scrutiny reveals some (outwardly) subtle differences in the controls when you change to *Effect* mode (Figure 217):

- The *Take* and *Auto* buttons normally located beneath the *T-bar* and *Transition icon* are hidden.

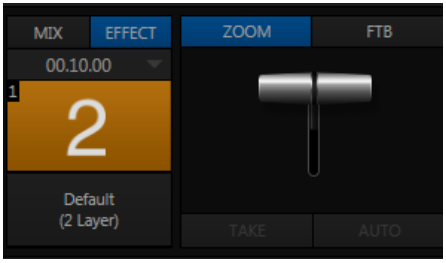


FIGURE 217

- A *Zoom* control button replaces the *BKGD* delegate.
- The current *Transition icon* is replaced by the default *Effect icon*.
- As many as 4 input rows may be shown.
- Position controls appear for each and every input layer (*A-D*).

Let's consider these reasons behind for these changes in the interface.

An *M/E* allows preparation of a composite of two or more video sources, whether for direct output, or as a source for the main *Switcher* or other downstream channels – including other *M/E*s.

Even in *Mix* mode, an *M/E* provides access to effects – including *Position* and transition effects (including *Animation Stores*). In *Effect* mode, however, an *M/E* asserts its realtime compositing and effects prowess more aggressively.

POSITION CONTROLS

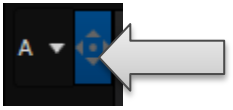


FIGURE 218

Position controls for all appear to the left of all input rows (Figure 218). Click this button to open the *Position* panel for the input. These controls and their operation conform precisely to those discussed previously under the sub-heading DSK Positioning in Section 10.3.1.

DEFAULT EFFECTS

To begin with, *Effect* mode supports up to four primary input layers (labeled *A-D*. The *M/E* doesn't *transition* between *A* and *B,* or *C* and *D*, though, 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:

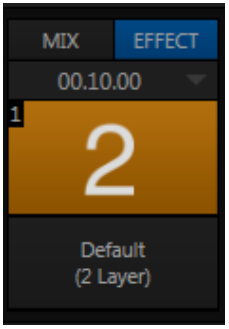


FIGURE 219

Click the *Effect* button (if you haven't already), and then click the label above the thumbnail icon to open the *Media Browser*. Select the *LiveSet* location at left, and use the scrollbar in the *File Pane* at right to locate the effect group labeled *Default*.

With one exception (*Advanced Tracking*), these effects are straightforward compositing effects involving 2-4 video layers. *Effect* output (i.e., the *background* prior to *Key 1-4* overlays) is simply the combined sum of all input layers. If the source assigned to input *A* is fully opaque, any content in the layers below is hidden. Or if input *A* is at least partially transparent, the source assigned to input *B* is blended into the *M/E* background layer, and so on for additional layers.

Hint: Don't overlook the fact that the input Position controls allow you to create more elaborate compositions even with these basic 2, 3 and 4-Layer Default effects.

The output of any active *Key* layers is then added to the effect output before passing the combined result onward to the final *M/E* output.

ADVANCED TRACKING

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.

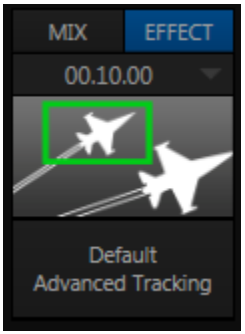


FIGURE 220

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 *Kiki Track Rectangle.mov* (NewTek location, Green Screen group) to the playlist for *DDR 1*.

3. Enable *Single* and *Loop* modes for *DDR 1*.

4. Add the clip named "*Bumper Cars.mov*" (Samples group) to DDR 2, set it to *Single* and *Loop* as well.

5. Add an attractive full frame graphic to the *Graphics 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.

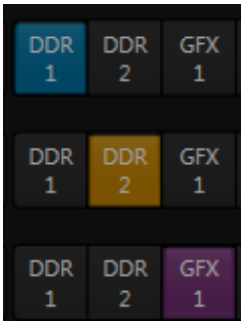


FIGURE 221

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 orange card is visible in the frame.

13. Switch to the *Tracker* tab, click the *Color* picker (eyedropper) and keep the mouse button held down to assign the card's orange 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 *From source* menu.

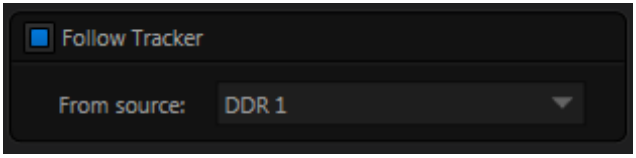


FIGURE 222

18. Enable *Follow Tracker* (Figure 222).

The result on your *Program* monitor should look much like Figure 223; 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.

FIGURE 223

Now would be a good time to test the effect of the *Scale*, *Rotation,* and *Aspect* controls in the *Tracker* tab for *DDR 1* (remember you can double-click the *DDR 1* monitor to open this panel).

UTILITIES

FIGURE 224

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 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 reveals wherever transparency exists in the foreground, white for full opacity, and shades of gray for in-between blends.

FIGURE 225

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 one more of the effects in the *Utilities* group, *Color Correction*. Replace the current effect with the *Color Correction* effect (again, click the *Effect* label above the icon to open the *Media Browser*).
You'll notice that M/E 1's output on the *Program* monitor is now rendered in monochromatic grayscale. Move the mouse pointer over the effect's icon, and click the gear button that pops up.

This opens the effect's *Shot Editor*.

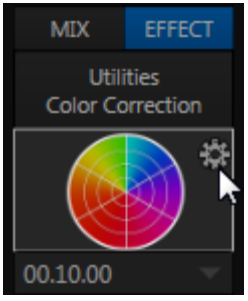


FIGURE 226

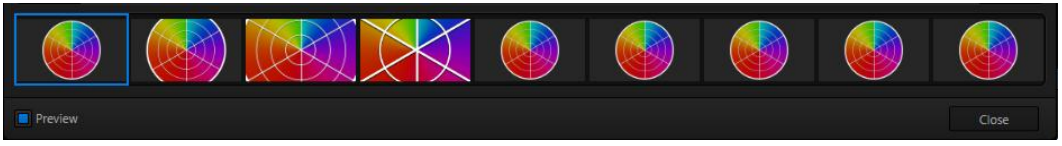


FIGURE 227

Across the bottom of this panel, you'll see a bind containing 9 thumbnail icons representing the different *shots* (position/zoom presets) currently configured for the effect. The current *shot* is bordered in blue. Clicking a shot selects it for editing.

Click the *Preview* switch at lower left to view the effect of adjustments you make on the *Program* monitor.

The large *Effect Preset Editor* canvas is interactive. Zoom in the *shot* you chose, using either the nearby *T-bar* in the M/E panel, or the mouse-wheel.

As you do so, observe that color is progressively added to the video scene (note that it's not necessary to open the *Editor* to zoom in this manner).

FIGURE 228

After zooming in, drag the mouse diagonally from upper-right to lower-left in the canvas to re-center the colored display (Figure 228). You'll see that the M/E output is tinted as you do so.

Close the *Editor* pane. The effect represented by the current shot icon is active. Click the icon itself this time, rather than its 'configure gear'. This opens the *Shot Palette,* which is much like the *Transition Palette* discussed earlier. Click to select a different shot for this effect; you'll see the *M/E* output change over time as the effect transitions from the settings represented by the original shot to those of the new one.

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.

FIGURE 229

TriCaster provide 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.

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 230

FIGURE 231

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 231) within a very small studio space (Figure 230), 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 12.2.2).

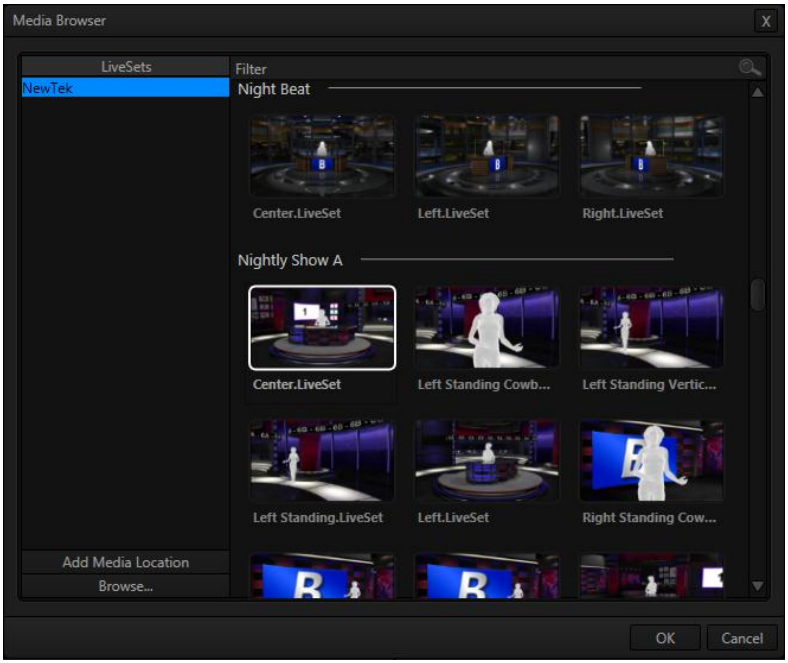


FIGURE 232

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 232 shows the content of the *NewTek* location under the *LiveSets* heading).

INPUT POSITION

We discussed *Position* controls for *M/E* video inputs previously (Section 0). It's worth adding here that *Position* options do affect the scale, rotation and position for *LiveSet* video inputs.

FIGURE 233

You can often use *Position* 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.

SHOTS AND ANIMATION

In LiveSet terminology, *shots* are different 'virtual camera' position presets, represented by 9 icons in the *Shot Palette* (Figure 234). Making a selection in this matrix begins the animated change from the current shot to the new one, over the duration set in the numeric control below the effect icon.

FIGURE 234

Note: Some LiveSets (e.g., double-box sets) do not support zooming and panning. In such cases, Shot selection and T-Bar actions may be inoperative.

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 2 minutes.

SHOT EDITOR

FIGURE 235

When the mouse pointer moves over a *shot* icon (whether in the *Shot Palette* or the icon for the current *effect*), a gear button is shown (Figure 235). As we observed when discussing more mundane effects, you can click this gear to open the *Shot Editor*.

While this tool provides control for some other effects too, its principle purpose is to allow you to create custom shots for virtual sets. In turn, this permits you to

perform great looking animated camera moves that center on various points of interest in the frame.

FIGURE 236

Operations in *Shot Editor* are very easy to perform. The current *shot* is bordered in blue in the *selector* across the bottom of the pane. Simply click to choose another shot to modify.

To change the zoom level of the *LiveSet* shown on the large *canvas*, roll your mouse wheel; or drag the M/E's *T-Bar*; or hold down the right mouse button while dragging vertically. To pan the preview on the canvas, left-click, hold and drag.

THE T-BAR

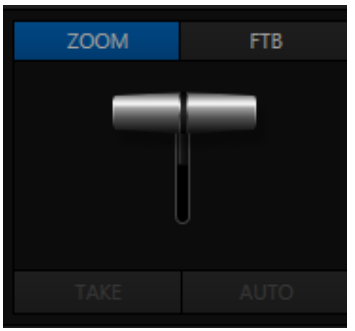


FIGURE 237

The *Zoom T-Bar* is located beside the *Effect icon*. Dragging it vertically adjusts the virtual 'camera distance' for the active *LiveSet*, between 0-100%.

When you click a *Zoom Preset*, the *T-Bar* updates to the zoom level of the new *shot*. Conversely though, adjusting the *T-Bar* does *not* update the current value for a *Preset*.

(When the current *T-Bar* position corresponds to the zoom value in the shot, its icon shows a blue border.)

It's important to realize that the *Key 1-4* (and *FTB*) *Delegate buttons* continue to serve their normal purpose in *Effect* mode – they perform an *Auto* affecting the associated channel(s). To wit, they do not perform a zoom on these layers. Only the *Background* layer (which includes the virtual set) zooms during an *Auto* operation.

SECTION 14.3 KEY CHANNELS

FIGURE 238

The *Key* channels in M/E panes match the *DSK* channels found in the *Switcher's* main *Transition* section in almost all respects.

Unlike the *DSKs*, though, they constitute a 'pre-*Switcher*' sub-layer. This means that *Key* channels are applied before that composition is sent to the *Switcher* (or another *M/E)*. Content in a *Key* channel appears beneath anything displayed via the two (*Switcher*) *DSK* channels.

Key channel selection and *Position* controls work just like their *DSK* cousins, discussed earlier (see 10.3.1), the sole distinction being that their behavior in connection with Autoplay mimics other M/E sources.

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 4.5.1 and 4.8.1. TriCaster presents more precise control over individual audio sources and outputs in a tabbed pane labeled *Audio* below the main *Switcher*.

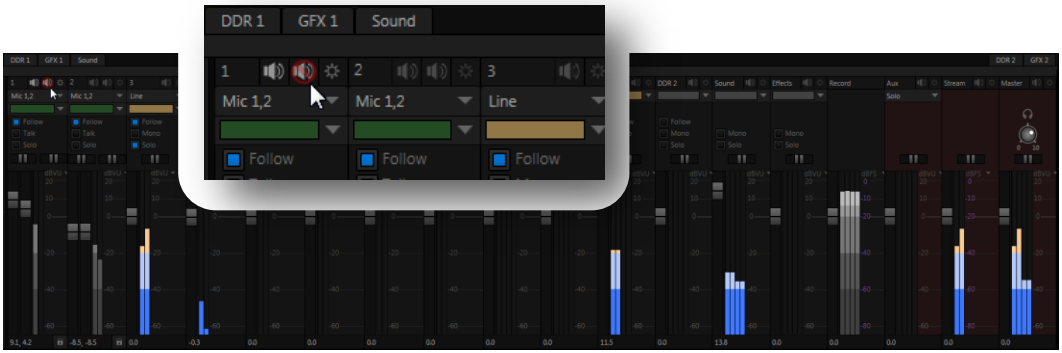


FIGURE 239

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 (digital and analog), along with *Network* audio sources.
- *Internal* sources – *Media Players* and *Effects* (the latter being sound embedded in *Animation Store* transitions)
- *Record* – controls levels for capturing *Output 1* and *Output 2* as a/v files
- *Aux* –controls for TriCaster's secondary audio output
- *Stream* – controls TriCaster's web stream output
- *Master* - controls TriCaster's *primary* audio output and *Headphones*

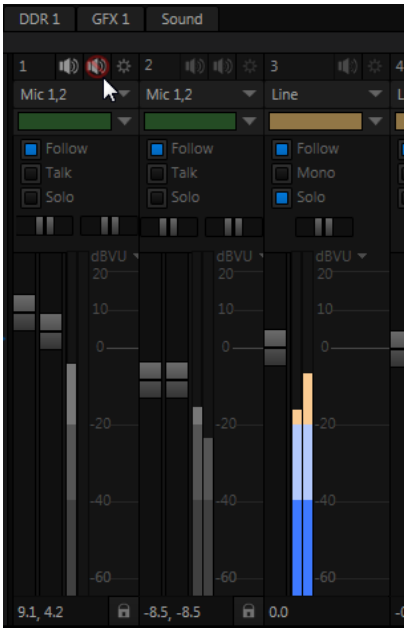


FIGURE 240

SECTION 15.1 EXTERNAL SOURCES

The eight sub-panels in the *external* control group are labeled for correspondingly numbered *Input rows* on TriCaster's rear connector panel.

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 (see the sub-heading *Follow*, below). However you are completely free to use them in various other configurations as well.

15.1.1 MUTE

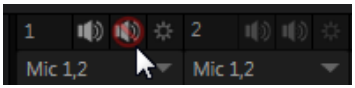


FIGURE 241

The labeled header for each input or source is also where *Mute* switches are located (Figure 241). Click the speaker icon in the header to toggle *Mute* on or off. A single button controls all channels associated with an input apart from those assigned as microphone inputs, in which case twin *Mute* switches appear in the header.

Enabling a *Mute* switch removes the sound from that source from the *Master* audio mix, and most all other internal mixes and outputs too. The two exceptions involve TriCaster's *Aux* and *Solo* features.

- TriCaster's multi-purpose *Aux mix* can be configured to duplicate the *Master mix.* In this case, the *Aux mix* respects the *Mute* settings of each upstream source. All other optional *Aux* sources ignore upstream *Mute* settings.

- The *Solo* feature always ignores *Mute*. If *Solo* is enabled for a source, it is heard on the *Headphone* output regardless of the *Mute* switch state.

This all provides meaningful flexibility. Let's consider an example:

- *Input 3* is assigned to the *Gold* audio group and muted.

- Naturally, sound from *Input 3* is excluded from the *Master mix*.
- *T*he *Gold group* is assigned as the *Aux* source – so the *Aux mix* does include sound from *Input 3* (along with other 'gold members').
- In consequence, assigning *Aux* to *Output 2* will send sound from *Input 3* to *Output 2* – even though it is muted.
- And, if you record *Output 2*, the captured file will include any sound from *Input 3*
- At the same time, if you directly assign the *Gold group* to *Output 8* (Stream), muting is enforced, since *Mute* is only ignored by *Aux and Solo*. So you will hear all members of the *Gold group* except *Input 3* in your streaming output.

Note: Audio 7 is automatically muted when Use Linear timecode (LTC) is enabled in Timecode Configuration. You can un-mute it briefly to adjust signal levels, but of course you don't want this to be audible during a live production – Solo might be useful in such cases.

15.1.2 CONNECTION TYPE

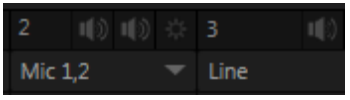


FIGURE 242

Individual sub-panel panels for external sources govern a group of audio connections comprised variously of two XLR or ¼" phone jack inputs, an *AES/EBU* (AES3) BNC connector, or an *SDI Embedded* digital audio source.

Only one input type can be operative for a given audio input group at any moment. A drop-down *Connection Type* menu at the top allows selection of one of the following options:

- *Mic 1, 2* – low impedance microphones and other common professional audio sources

- *Mic 1, 2 + Phantom* (power) – microphones (typically condenser mics) requiring supplementary DC power

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

- *AES/EBU* – digital audio

- *SDI Embedded* – digital audio embedded with digital video transmitted via a Serial Digital Interface (SDI) connection

- *Line Quad* – for convenience in some environments, neighboring *Line* input groups can be configured as a single quad input governed by one set of controls

15.1.3 MIC CONTROLS

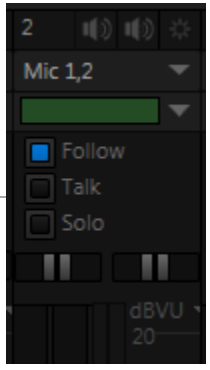
Certain controls are only shown when the *Connection Type* for is set to one of the *Mic* options (see also the heading titled Gain, in Section 15.4) as discussed next.

TALK

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* switch (also known as "Talk Over") makes this a simple matter. Enabling *Talk* for a source (typically a microphone) reduces the output level of all *other* audio sources by 20dB.

PAN

When the *Connection Type* is set to one of the *Mic options*, TriCaster presents two small *Pan* sliders, one above each *VU meter*.



Pan

Pan adjusts *placement* of the corresponding input sound on audio channels, progressively modulating levels in the process so that the overall volume neither rises nor drops as a result of adjustments.

FIGURE 243

Using *Pan*, one can send part of channel 1 to channel 2, and vice versa.

- When *Pan* is set to the extreme left position for *Input 1a*, its audio is sent exclusively to *channel 1* of the *Master mix*.

- Centering the *Pan* knob *splits* the sound from *Input 1a*, so that it is heard equally on *channels 1 and 2* of the *Master mix* (i.e., if *Master* is assigned to *Output 1* in the *Output Configuration* panel, sound from *Input 1a* is delivered to both *Outputs 1a* and *1b on TriCaster's* rear connector panel).

- Sliding *Pan* for *Input 1a* all the way to the right results in that source only being audible on *Program Output 1b*.

Hint: "Pan" is not the same as "Balance". The balance control for a stereo source varies the relative level of the left and right channels, but the sound from the left channel will never come out of the right speaker, or vice versa (whereas Pan can do this).

LOCK

Clicking the *Lock* button links the level sliders above relative to each other. This enables them to be adjusted in unison.

FIGURE 244

15.1.4 MORE CONTROLS

Most of the features that follow are common to all *Connection Types*, with exceptions as noted.

FOLLOW

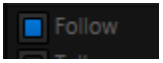


FIGURE 245

Enabling the *Follow* switch for an audio source directs TriCaster to track switcher operations for the related video source.

This audio for sources with *Follow* enable is muted until the associated video source is displayed on *Program Output* (whether as the Switcher's *Program* row selection, a *DSK* channel, or as an *M/E* source).

The *Follow* feature is especially powerful used in concert with TriCaster's *Audio Group* features –see Section 15.1.5.

Hint: When Follow is enabled but the corresponding video source is not displayed on Output, the audio level display on the VU meter is displayed as a grayscale, rather than in full color.

MONO

A *Mono* switch appears in the control panel for sources set to any *Connection Type* other than *Mic*. Enabling *Mono* centers audio sources on both channels.

For digital inputs (*AES/EBU* or *SDI Embedded*) with more than two channels, only *channels 1* and *2* are centered. (If present, two additional digital audio channels are passed through unchanged on channels 3 and 4.)

SOLO

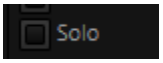


FIGURE 246

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 principles:

- The *Solo* switch state has no impact on the *Program* out audio.
- When no *Solo* is on, the combined audio mix from all sources is sent to the *Master mix* and *Headphones* connector.
- Enabling *Solo* for a source sends its (after-fader) sound to the *Headphones* output, and removes all other sources from that output.
- Enabling *Solo* for a source also sends its (after-fader) sound to the *Aux* mix whenever *Solo* is selected in the *Source* menu of the *Audio* tab's *Aux* control group.

Let's consider some practical applications using these options.

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 the *Master mix*.
2. Then enable *Solo* – allowing you to hear it on the *Headphones* output (and *Aux*, if *Solo* is selected as its *Source*).

ISOLATING A SOURCE

At other times, you may want to output specially configured audio mixes using TriCaster's *Aux* audio output. For instance – some installations call for sending the output 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 *Master mix*. This arrangement is often referred to as 'mix-minus.' It 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 *Master 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 *Input 1*. The audio from your interviewee is routed into another TriCaster input.

1. Enable the *Solo* switch for *Input 1*.
2. Select *Solo* as the *Source* for *Aux*.

This setup gives you a clean output consisting of just the interviewer's voice on *Aux*. By connecting the input of your remote call hookup to TriCaster's *Aux* output, you can send that clean signal to your remote caller, and control its level independently.

This eliminates annoying echoing, feedback and the like. Meanwhile, both participants can be heard on the main *Program* output.

Hint: TriCaster's Audio Groups feature (Section (15.1.5) can also be used for mix minus setups, but Solo provides an especially useful alternative when the use of grouping is already in use for managing sources for Follow purposes.

BALANCE

A *Balance* slider is likewise shown for all source types other than *Mic*. In a conventional stereo environment, centering the *Balance* knob will result in *Gain* being applied equally to the left and right channels. Sliding the knob to the left decreases the gain applied to the 'right channel' (channel 2), while moving to the right of center decreases the gain applied to the 'left' (channel 1).

Of course, TriCaster provides supports four audio output channels (quad). When considering how *Balance* works in this configuration, it may help to think of these four channels as comprising two independent stereo (left/right) pairs – channels 1 and 2 (or a and b, if you like) forming one pair, and 3 and 4 (c and d) the other. Sliding *Balance* to the left decreases levels for channels 2 and 4 (the notionally 'right' channels), and so on.

VU METERS AND LEVEL

The largest portion part of the individual control panels is devoted to *VU* (Volume Unit) *meters* with *Volume* control knobs. The *VU meters* displayed vary depending on the *Connection Type*.

The default *calibration scale* shown for individual meters likewise depends on *Connection Type*. At first, you will see the meters for different sources and outputs indexed as follows:

- Sources
  - *Mic, Line, Media Player, Net and Effects* – dBVU scale
  - *AES/EBU and SDI Embedded* – dBFS scale
- Outputs
  - *Record* – dBFS
  - *Aux & Master* – dBVU
  - *Stream* – dBFS

The calibration shown for any individual meter can be changed to suit a need or preference. Click the label above the current scale (Figure 247) to open a small menu offering three options as follows:

FIGURE 247

- *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 4.13
- *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)

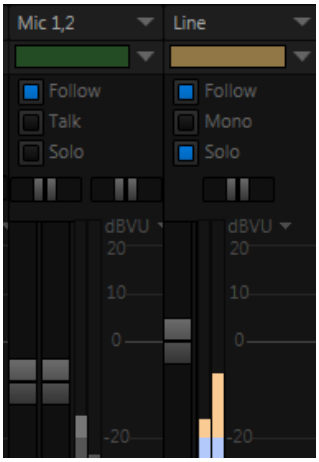


FIGURE 248

Two channels are displayed when an analog *Connection Type* is set to a *Mic* option, with individual knobs to control the *Volume* for each input channel (Figure 248).

When the *Connection Type* is *Line*, the *VU meter* still displays levels for two channels, but these are controlled by a single *Volume* knob. Also, *Pan* sliders are replaced with a *Balance* control.

Other connection *Type* selections and sources display a *single* VU meter with either two or four channels controlled by a single *Gain* knob.

AUDIO LEVELS

TriCaster's analog audio conforms to SMPTE RP-155. The maximum input/output level is +24 dBu. Nominal input level is +4 dBu (-20dB FS), 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 8.2; see also Section 15.3.1 (Headroom Notes) and Section 15.4 (Advanced Audio Configuration).

15.1.5 AUDIO GROUPS

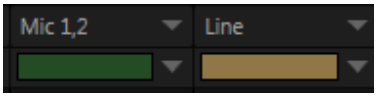


FIGURE 249

Audio control panels for all sources have a drop-down *Group* menu that allows you to link individual members together by assigning them to different groups identified by colors.

Audio Groups are especially useful in two respects:

- First, a selected *Audio Group* can be assigned as the source for TriCasters *Aux* bus (see Section 15.3.1) individual outputs (Section 9.1), and recording.

- *Audio Groups* are also very useful in the context of TriCaster's *Audio Follow Video* feature (see Section 15.1.4). Enabling the *Follow* switch for any member of a group affects the way the Follow feature works.

  When a *video source* that corresponds to <u>any</u> group member is displayed on *Program Out* (whether it is selected on the Switcher's *Program* row, or perhaps via a *DSK* or *M/E*), the total contribution of the all members of the same *Audio Group* will be heard on output.

Audio Groups are very useful in connection with *Follow*. Consider a typical scenario:

- Two participants are behind a sports desk. Cameras 1, 2 and 3 are left, center and right views, and there are individual close up cameras as well – 4 and 5.
- An external audio mixer is connected to TriCaster at Audio Input 1.
- Video clips will be played back from the DDR on demand.

Audio from Input 1 needs to be heard whenever <u>any</u> camera (1 through 5) is on output. When we switch to the DDR, we want to hear DDR output exclusively.

FIGURE 250

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* (*DDR*, etc.) can be added to the output mix.

Separate sub-panels are provided to control audio added to TriCaster's various internal mixes by the *DDR* and *Sound* media players.

15.2.1 NET 1 AND NET 2

The *Net 1* and *Net 2* audio control groups affect sound associated with the *Switcher* sources by the same name. At present, AirPlay®, 3Play™ and network feeds from another TriCaster 8000 *Source* selections support audio (see Chapter 16, Network Sources).

15.2.2 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 streams are ignored. The options and controls in these sub-panels are similar to those in the input control panels, with the obvious exception that a *Connection Type* menu is unnecessary.

Note: See also Sections 15.1.5, Audio Groups, and the heading Follow in Section 15.1.4.

15.2.3 EFFECTS (TRANSITIONS)

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

SECTION 15.3 OUTPUT CONTROLS

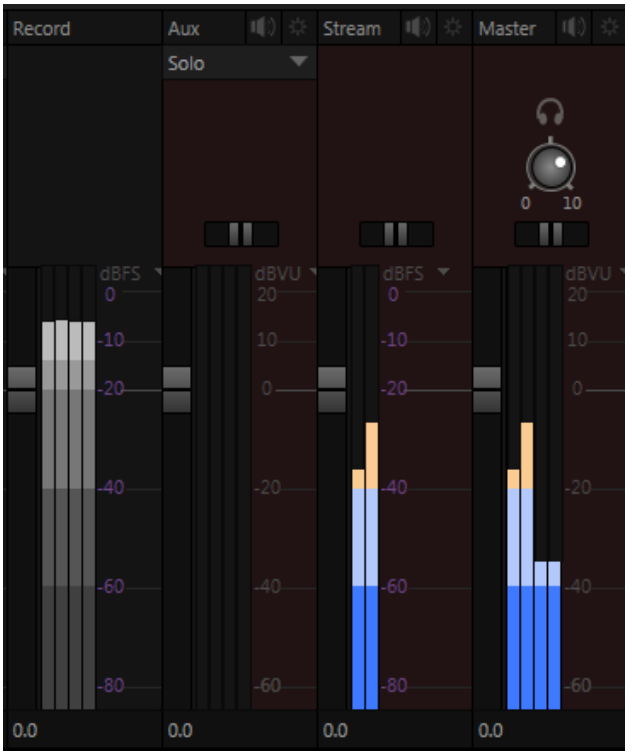


FIGURE 251

Each of the audio *sources* discussed earlier provides its own contribution to TriCaster's audio output mixes (and, of course, the outputs these are assigned to).

Settings in the *output* control panels take effect downstream from all audio sources, further governing audio levels sent to the internal *Aux* and *Master* mixes, headphones, a/v recordings, and the Internet stream.

Hint: Shift + double click Volume knobs to restore their default values (0dB).

15.3.1 HEADROOM NOTES

In digital audio systems, signal levels that exceed maximum values are uniformly assigned the maximum value, a condition known as "clipping". This inevitably results in annoying audible issues. Worse, clipping that may not be apparent while listening to speakers during live production may nonetheless appear in recorded file. This is often true even when levels *appear* to be below the ceiling level (0dBFS, the maximum allowable digital level).

For this reason, 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, dropping the *Record* slider to -20dBFS (our base recommendation, by the way) approximates typical professional headroom 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 go no higher.

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.

15.3.2 RECORD

The *Record* control group provides dedicated level modulation over the audio *recording* chain applying to *most sources assigned to *Output 1* and *Output 2* in the *Output Configuration* panel. Again, it has no effect whatsoever on levels sent to outputs. Similarly, it has no impact audio levels in files which are configured (in *Record Configuration*) to capture anything other than *Output 1* and *2*.

** When Output 1 and 2 are assigned (in Output Configuration) to use audio directly from a designated TriCaster audio input (Input 1-8), the audio signal recorded is 'pre-mixer', that is the so-called 'wild' audio for the source.*

Let's consider examples to illustrate the audio recording pipeline: *Camera 3* is an SDI source, the *Connection Type* for audio *Input 3* is *SDI Embedded*, and *Input 3* is assigned to the 'gold' audio group.

1. In *Output Configuration*, you assign *Camera 3* and the gold audio group as video and audio sources for *Output 1*.
    - When you record *Output 1*, its audio level *is* affected by the *Record* control setting.
2. Now you assign *Camera 3* and *Input 3* as sources for *Output 2*.
    - When you record *Output 1*, its audio level is not affected by the *Record* control setting (or other mixer controls).
3. Finally, you directly configure recording from *Camera 3 i*n the *Record Configuration* panel.
    - The recording ignores the *Record* control (and other mixer controls, too)

15.3.3 AUX

TriCaster's *Aux* mix provides an alternate internal mix for use as an optional source for direct output and recording. Its control group features a *Source* drop-down menu, which allows you to supply sound to the *Aux mix* exclusively from one of the following selections:

- *DDR 1* – The *Aux mix* is derived from the first 4 channels of *DDR 1's* output.
- *DDR 2* - The *Aux mix* is derived from the first 4 channels of *DDR 2's* output.
- *Sound* – The *Aux mix* is derived from the first 4 channels of the *Sound* output.

- *Internal* – This is a unique configuration, providing support for a number of interesting and useful situations.

    - The first two channels from *DDR1* are blended with output from the *Sounds* player and placed on the first two channels of the *Aux mix*.

    - The first two channels from *DDR2* are placed on channels 3 and 4 of the *Aux mix*.

- *Master* – The *Aux* mix provides a completely independent supplementary program feed with independent level control.

- *Solo* – When this option is selected, the *Aux mix* is a blend of all soloed sources (i.e., audio inputs that have their respective *Solo* switches enabled).

- (Color) *Group* – The selected group is the source for the *Aux mix*.

15.3.4 STREAM

The *Stream* sub-panel provides a method of independently adjusting (stereo) audio levels sent to the encoder when streaming is enabled.

15.3.5 MASTER (AND PHONES)

FIGURE 252

The main program mix is controlled by the *Volume* knob and *Balance* control in the *Master* sub-panel, located at far-right in the *Audio tab*.

Just above this is a simple volume control for the *Phones* output. Remember that both *the Phones* output and, optionally, the *Aux* mix are affected by source *Solo* switches. When *Solo* for one or more sources in enabled, *only* those sources are sent to *Aux* (in *Solo s*ource mode) and *Headphones*.

Each audio input (including internal sources) as well as every internal mix control group (*Aux*, *Stream* and *Master*) also sports a configuration button in their respective mixer panels. Clicking the familiar 'gear' icon opens the new *Advanced Audio Configuration* panel.

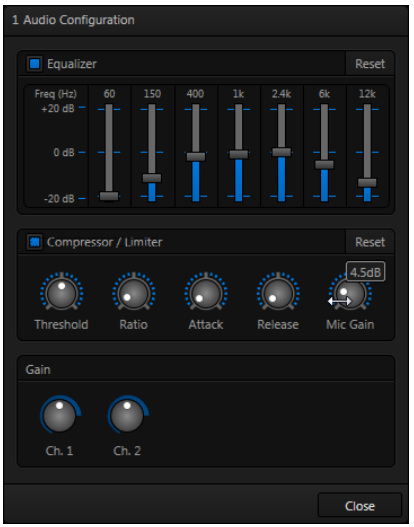


FIGURE 253

GAIN

FIGURE 254

For audio inputs whose *Connection Type* is set to one of the *Mic* options, input controls include *Gain* knobs for each microphone input.

This is a variable gain setting, enabling you to adjust input gain to suit the level of a variety of audio sources.

15.4.1 EQUALIZER

The seven-band equalizer allows you to 'shape' sound to taste, accommodate sources with different acoustic characteristics (such as mismatched mics), minimize feedback and roll off unwanted parts of the audio spectrum.

Enable or disable the *Equalizer* using the switch beside the label above its control group. The 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 hanging 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 input or output involved.

15.4.2 COMPRESSOR LIMITER

The *Compressor/Limiter* is capable of preventing clipping (see Section 15.3.1) 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.

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.

Compressor-Limiter – what's the difference?

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'.

Very high ratio settings are the reason for 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.

SECTION 15.5 PRESET BIN

Audio presets work just like their counterparts in the *Media Players*. Presets are a convenient way to quickly store and recall audio steps and settings for different venues, productions, and users.

Hint: When you roll the mouse to either edge of the screen, the very same Audio Preset bin appears either at left or at right.

Chapter 16 NETWORK SOURCES

TriCaster™ supports two simultaneous network sources, letting you switch displays from networked computers as part of your production. Also, when connected to a networked workstation or laptop computer running LiveText™, NewTek's powerful realtime titling software, you can assign your CG duties to a second operator – freeing you to focus exclusively on live switching.

External computer displays served across a network can be selected as video sources in the TriCaster™ live production environment.

Potential sources include displays from network connected (Windows® or OS X® based) computer systems (via iVGA™), text and graphics overlays from LiveText™, as well as NewTek 3Play™, TriCaster, or Apple Airplay® sources. The currently selected *Network* sources are directly available for selection on the *Switcher*, and can of course be captured or streamed as well as included in your presentation.

Note: Gigabit networking is highly recommended, and should be considered mandatory for HD sessions in particular.

SECTION 16.1 IVGA

For an iVGA source to be recognized by TriCaster, you must first install a small iVGA client program on the remote computer on your network. iVGA client programs are supplied for Microsoft Windows® and Apple OS X®. You will find iVGA installation files inside the C:\TriCaster\Extras\iVGA folder on your TriCaster system drive.

16.1.1 IVGA FOR OS X

The iVGA installation for OS X is supplied as a zipped *disk image* (.dmg) file. To install it, first copy this file to your Macintosh® Desktop (either using a network connection between your Macintosh® and TriCaster systems, or perhaps by using a USB thumb drive).

FIGURE 255 – MOUNTING THE IVGA DISK IMAGE

FIGURE 256

- Double-click the Zip file to decompress it, and then double-click the .dmg file to mount it.
- The *NewTek iVGA* icon shown above will be placed on your *Desktop*. Open it (by double-clicking, and you will see two files in a Finder window – the readme file, and the *iVGA* client program.
- Drag the *iVGA* icon from the finder to your *Applications* folder.
- Run it by double-clicking the icon, and in a moment or two the iVGA swirl will be placed in your Dock, and an onscreen dialog reporting 'iVGA Ready and listening!'

When you roll your mouse over the *Net 1* or *Net 2* monitors in TriCaster's *All Monitors* tab, a triangular button appears next to the *Configure* button (gear).

The new source (your 'Mac' desktop) will be listed in the drop-down selection menu that opens when you click the triangle.

Hint: A single iVGA source cannot be simultaneously connected to both Net 1 and 2.

When iVGA is running, the icon in the (OS X) Dock has a menu you can access by right-clicking it:

FIGURE 257

- Engaging *Privacy Mode* prevents the client display from appearing accidentally on the TriCaster display when you don't want it to.
- *Keynote Mode* allows the iVGA client to update the screen even if Keynote® is running. (This also can be used with some games, though the framerate will likely be only one frame per second.)
- Hide the mouse cursor in output with the Hide Mouse option.
- Show either desktop monitor when you have more than one attached using the *Monitor 1* or *Monitor 2* options in the menu.
- The *Options* list contains settings for *Open at Login*, *Remove from Dock*, and *Show in Finder*.

16.1.2 IVGA PRO (WINDOWS)

The iVGA PRO™ installation for Microsoft Windows® systems is supplied as an executable (program) file. To use it, copy this file to the client system from its location in the iVGA folder (found inside on C:\TriCaster\Extras).

Run iVGA on the client computer by double-clicking its icon (iVGA PRO will run from anywhere you put it on the client system – even a thumb drive).

Note: iVGA PRO is for use with XD series TriCasters. For use with SD-only model TriCasters (or 32bit iVGA client computers) use the original version of iVGA.

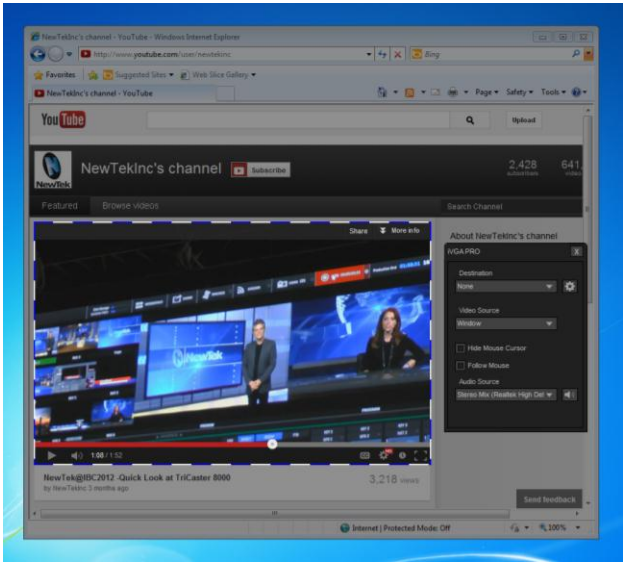


FIGURE 258

The first time you launch iVGA PRO you'll be asked to accept an *End User License Agreement*.

Afterward, several things will occur:

- A small icon is added to the Windows® task bar notification area.
- The iVGA PRO control panel opens on your computer desktop.

The control panel, Taskbar iVGA PRO icon (and its context menu) along with a marquee, discussed momentarily, provide all the settings and controls you need to configure and manage the application and its output.

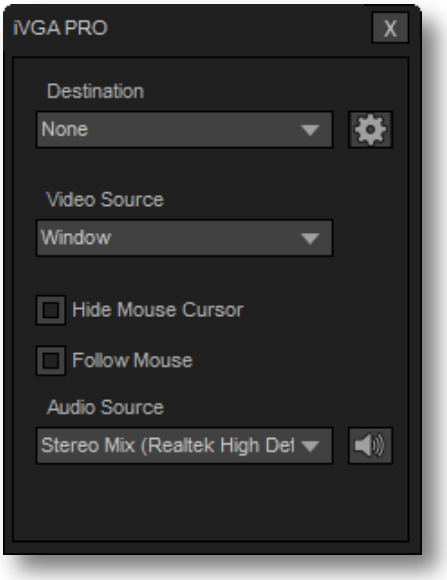


FIGURE 259

16.1.3 THE CONTROL PANEL

Let's begin our review of the tools provided by looking more closely at the control panel.

DESTINATION

The default *Destination* setting is *None*, indicating that iVGA PRO's audio and video output is not connected to a TriCaster on your local network.

When one or more TriCaster systems are detected, the drop-down menu will display their machine names (Figure 260). A given TriCaster may display more than one possible entry in the list depending on how many are currently free for iVGA selection.

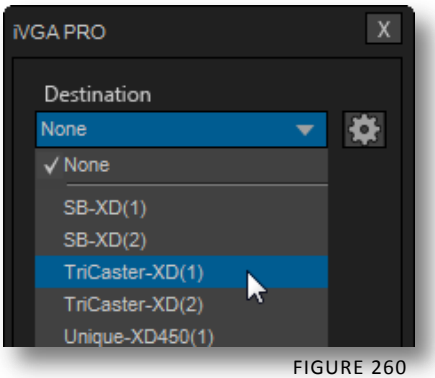


FIGURE 260

Alternatively, TriCaster operators on the same network can directly select your iVGA client as a network source for their *Net 1* or *Net 2* inputs (see Section 11.2.1).

When a TriCaster you have not previously connected to selects your iVGA output, iVGA pops up a 'connection request' dialog. You can then authorize or decline the connection request (click the gear icon next to *Destination* and checkmark *Accept All Connections* in the menu if you prefer that this dialog not be shown).

RECORDING

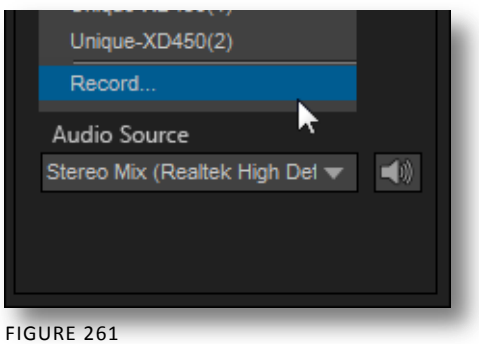


FIGURE 261

The last entry in the *Destination* menu is always *Record*. Selecting Record redirects iVGA PRO output into a movie file instead of transmitting it across the network.

When you select *Record* a file window opens to let you set the path and file name for the clip that will be captured.

Note: You can choose between alternate file formats for recording by modifying the 'Save as type' setting (in the file path dialog).

Also, the *Send* button at the bottom of the control panel is re-labeled *Record*. As you would expect, clicking the button initiates recording of the current iVGA source. Press it again to end capture.

Hint: Changing the Video Source while recording will automatically stop and restart recording. The current file name is numerically incremented as required.

QUALITY (CONFIGURE)

Click the *Configure* (gear) button beside *Destination* to reveal a menu providing quality options.

The setting here affects iVGA's video compression parameters. You can use these options to improve performance when your local network connection lacks the bandwidth required to deliver the highest quality iVGA output to TriCaster.

Note: Gigabit network connection provides the best transfer rates and the best quality video output. Slower connections may cause dropped frames, and should be considered unsuitable, especially for HD sessions. In extreme cases, where network capability is low or unreliable because of other traffic, iVGA may still be useful for static displays.

VIDEO SOURCE

The video source menu governs the imagery iVGA transmits or captures. The menu lists a number of important options (Figure 262).

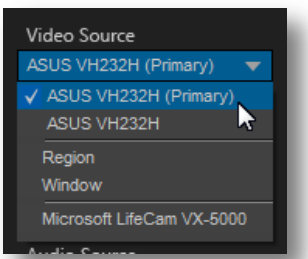


FIGURE 262

- At the top, you will see all monitors connected to the system iVGA PRO is running on named. Selecting a monitor by name assigns its entire display as the current iVGA source.

- Just beneath the list of monitors is the *Region* option. This refers to the portion of the screen that is inside a rectangular marquee that is shown when *Region* source mode is newly selected.

- Drag the cross-hair icon in the center of the marquee to relocate it on the screen or to a different monitor.

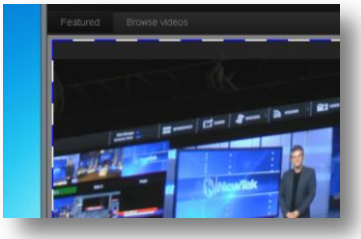


FIGURE 263

- Drag the mouse on any border of the marquee to scale it up or down. By default, scaling is constrained to retain a 16:9 marquee aspect. Hold down Ctrl when dragging to release the aspect lock. To restore the marquee's standard widescreen aspect, simply drag the border again without the Ctrl key depressed.

- The next *Video Source* option shown in the menu is *Window*. This is a particularly useful option, as it allows you to 'snap' iVGA to a specific application window (or child window).

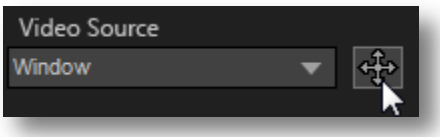


FIGURE 264

  For example, you might designate just the video player pane on a browser page as the source; or perhaps you might want to snap to the video display pane in an application such as Skype™.

  When you select the *Window* option in the *Video Source* menu, a new icon is shown at right (Figure 264). Click the mouse on this icon, and then drag it to the application window you want to assign as the source. (The marquee updates as you drag the mouse around the screen from one application window to another. Note that it automatically disappears from view when the control panel is closed.)

  Hint: Many application windows actually comprise a number of child windows grouped together. When you drag the marquee around in Window mode its borders snap to the current child window, showing what is currently selected.

- Finally, if you have any webcams or similar video input devices connected to the system, you'll see these listed below the *Window* option in the *Video Source* menu.

AUDIO SOURCE

This menu allows you to directly select sound from available audio inputs and system audio devices (the latter may provide useful level and mixing options). iVGA PRO transmits the selected sound to the *Network* inputs of TriCaster's that support this feature. A nearby mute icon allows you to toggle sound output on/off.

Hint: Select None to mute audio output. (Privacy mode also temporarily engages Mute.)

OPTIONS

- *Hide Mouse Cursor* –the mouse pointer will not appear on iVGA's video output when this option is enabled.
- *Follow Mouse* – the marquee tracks mouse movement when this option is enabled.

SEND/RECORD/STOP

A multi-function button at the bottom of the iVGA PRO control panel toggles output (or recording) on and off. The button label updates to display the action that will occur if you click it according to the current operation and state of the application. It may variously show *Send*, *Record* or *Stop*, as appropriate.

16.1.4 TASKBAR ICON MENU

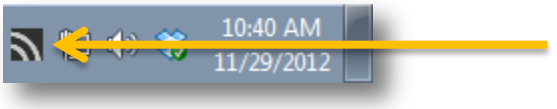


FIGURE 265

A 'radio beacon' icon (shown at left in Figure 265) is shown in the system taskbar when iVGA PRO is running. The icon shows a 'radiating' animation when connected to a TriCaster.

Click the icon to show the iVGA PRO *Control Panel* (and marquee, when enabled).

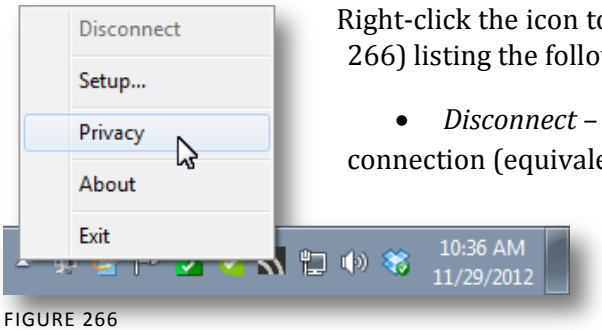


FIGURE 266

Right-click the icon to display its context menu (Figure 266) listing the following items:

- *Disconnect* – releases the currently selected connection (equivalent to selecting *None* in the control panel *Destination* menu).

- *Setup* – shows the iVGA PRO control panel.

- *Privacy* – while engaged, *iVGA PRO's* video output is replaced by a static privacy image (see hint below) and audio output is muted.

  Privacy mode allows the user to check e-mail, or perhaps view or arrange something, without risk of the audience observing. The taskbar icon shows a red indicator when *Privacy* mode is engaged.

  Hint: If an image named "privacy.bmp (or privacy.jpg) exists in the folder that iVGA is launched from, it will be sent. Otherwise the default privacy screen is used.

- *About* – displays information about the application.

- Exit (exits the iVGA application)

16.1.5 HOTKEYS

In *Region* mode, it's possible to zoom the marquee to several preset sizes (150%, 200%, 400%) using the hotkeys Right Ctrl + number pad 1, 2 or 3 (these hotkeys enable Region mode).

Right Ctrl + (number pad) 0 selects the full screen for output. Pressing Right Ctrl + (number pad) 5 toggles the *Marquee* display on/off (even if the control panel is closed), while Right Ctrl + (number pad) 9 enables or disables the *Follow Mouse* option.

SECTION 16.2 AIRPLAY

AirPlay® is Apple's protocol for getting audio and video from 'here' to 'there' – specifically, from an AirPlay source (which may be an Apple® computer, or a mobile device such as iPad®, iPod®, or iPhone®) to a second device.

The local network is the means of transmission between units, and a wireless connection from the player to the network is perfectly acceptable. Typically, the target device for AirPlay might be a television display or set of speakers, but in this case, your TriCaster is the beneficiary. It basically works as follows:

- You select the AirPlay entry in the *Source* menu for *Net 1* or *Net 2*, just as you would select an iVGA or LiveText source. (Unlike iVGA, embedded audio, with level control, is supported.)
- TriCaster identifies itself as a network client for AirPlay apps/applications.
- You can then designate TriCaster as the output device for content played on the device.
- AirPlay streams audio, video, or both from the device to the local network, and on to TriCaster.
- The AirPlay output is available just like any other TriCaster *Switcher* source.

Consider just a *few* of the countless possibilities: Use your iPad® as a touch-driven external (wireless) DDR, or capture video or snapshots on your iPhone®, and instantly stream this content to the TriCaster.

Note: Please see Appendix A, Section A.1.13 for more on Airplay connections.

SECTION 16.3 LIVETEXT

As we noted in the Walkthrough chapter (Section 5.6.2) a companion workstation on your TriCaster network with LiveText standalone installed serves as a dedicated CG and title solution for your live presentations.

FIGURE 267 – LIVE OUTPUT

When running and connected, LiveText will be listed in TriCaster's *Net 1 and Net 2* drop-down menus, similar to an iVGA source. For more information on installing and using LiveText, please refer to its manual.

SECTION 16.4 3PLAY™

3Play's *Output A* and *Output B* are available as *Switcher* sources to TriCaster. They appear in the source selector menu for TriCaster's *network* inputs as "3Play(A)" and "3Play(B)," where "3Play" is the name for the system. Conveniently, the output includes embedded audio, freeing up multiple TriCaster a/v inputs for other purposes.

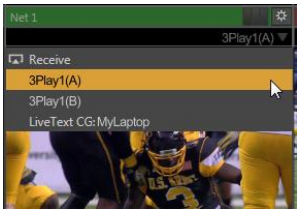


FIGURE 268

Macro capabilities smooth out your workflow, reducing complex operations to a single button press, and make it easy to produce sophisticated programs.

Combined with TriCaster's Hotspot automation, macros provide many opportunities for both workflow streamlining and creative applications. (As well, macros can reduce or eliminate embarrassing operator errors.)

One of the hardest things about live switching is keeping up with the action. We're only human, limited as to how fast our fingers can move, recall and perform important sequential steps, and so on.

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*.

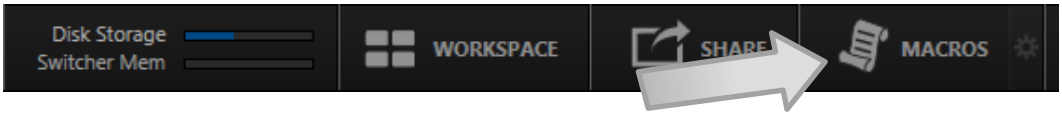


FIGURE 269

Macros can do almost anything – preload and play content, modify audio settings, automate complex switcher sequences or perform synchronous operations. The value of macros justifies the prominent placement of the *Macros* control in the center of the TriCaster's *Dashboard*.

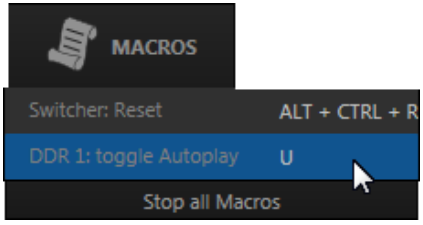


FIGURE 270

Click the *Macros control* to show a drop down *Favorites* menu (Figure 270), or roll the mouse point over it to reveal a configuration button (gear). Clicking the latter button opens the *Macro Configuration Editor*, which is where you can create and manage macros.

Hint: The Switcher: Reset entry is permanently included in the Favorites menu. This macro sets all effects (including DSK and Key transitions) to the default Fade, and assigns M/Es to Mix mode. It does not alter the current source selections.

SECTION 17.1 SYSTEM MACROS

The largest part of the (resizable) *Macro Configuration Editor* consists of the *Macro List*. By default it will initially display a single line entry labeled *System Macros*.

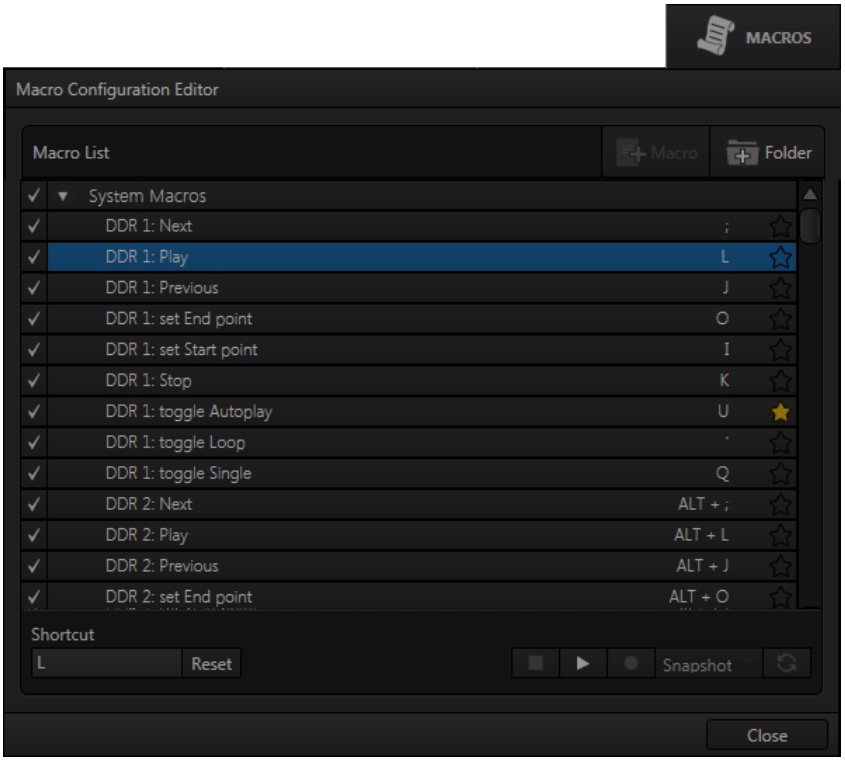


FIGURE 271

System Macros are actually the very same commands called by the user interface and control surface to operate your TriCaster. Expand this entry by clicking the triangle at left to see a long list of these important macros.

Hint: Notice that keystroke shortcuts for macro entries are shown at right, which is a convenient reference if nothing else.

It's worth noting a few unique aspects of *System Macros*. First, *System Macros* are specially safeguarded within the system. *Rename, Delete*, *Copy* and *Paste* features are disabled, nor can you change the (alphabetical) order of entries in the list.

Also, be aware that un-checking the *enable* switch at left for the entire *System Macros* folder (or individual entries within it) will naturally result in the failure of all related keystroke shortcuts. This does not affect *Control Surface* operations, mind you.

Hint: If keyboard shortcuts are unresponsive even though System Macros are enabled, check the state of the similar Enable Keystroke Shortcuts setting in the TriCaster Options menu (see Section 8.1.1).

SECTION 17.2 RECORDING MACROS

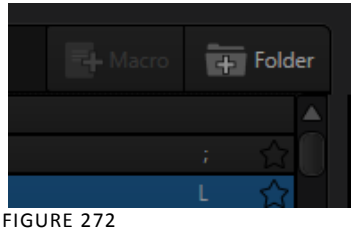


FIGURE 272

Creating a new macro is simple. Two 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 272). Clicking this button creates a new macro entry in the folder.

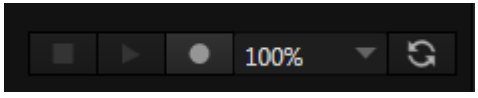


FIGURE 273

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 a progress bar in the background of the macro's entry in the lister tracks playback. 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 provided next at right.

SNAPSHOT MODE

One option in this menu bears explanation – *Snapshot* is rather special. When you choose *Snapshot* as the macro's 'speed', you essentially force it jump to its end result. Any operation that is ultimately irrelevant in achieving that end result is simply omitted. *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).

SECTION 17.3 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).

17.3.1 KEYBOARD SHORTCUTS

Keystroke shortcuts are readily added and modified. You can readily see the shortcut assigned to a macro at right in its entry in the lister. You'll also see a 'star' gadget at right (Figure 274). Click this to add (or remove) the macro to the *Favorites* menu (Figure 270), shown when you click directly on the *Macro* control in the *Dashboard*.

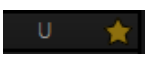


FIGURE 274

To set a new shortcut or modify an existing one, click in the *Shortcut* field at lower left in the *Macro Configuration Editor* panel (it will brighten and display a "Listening …" tag), and then press the desired keystroke combination.

FIGURE 275

Hint: For clarity, lower-case characters are shown as capitals. True upper-case letters are displayed in the form [Shift + (character)].

Shortcuts are 'per user', allowing you to employ your personal favorites without conflicting with the shortcut preferences of other users. Speaking of conflicts, note that assigning a single shortcut combination to multiple macros *is* supported. Conflicted keystrokes are shown in red. You can resolve conflicts in several ways. Of course you can assign a different keystroke to conflicted macros. Or you can disable them if you like, using the checkmark switch at left for the entries involved.

Hint: Folder level enable/disable switches offer an altrnative method for managing program-specific shortcuts. The keystroke assignments for entire folders full of macros designed for various programs or purposes may conflict with shortcuts in another folder., but keystrokes for any inactive folders are ignored.

Otherwise, pressing the conflicted shortcut key will perform *all* macros sharing that keystroke assignment – which may be just what you had in mind.

17.3.2 THE CONTEXT MENU

Entries in the lister have a context menu, shown when you right-click an item (Figure 276).

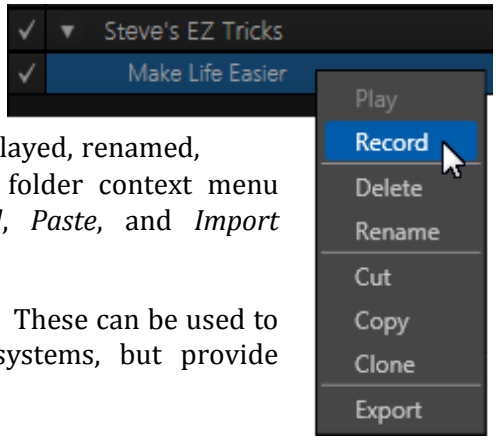


FIGURE 276

Macros can be recorded, as we've seen, of played, renamed, deleted, copied, cloned, or exported. The folder context menu supports, in addition, *Play All*, *Stop All*, *Paste*, and *Import* operations.

Import and Export are noteworthy features. These can be used to share macros with multiple users and systems, but provide another important opportunity.

A good deal of time can be spent preparing complex macros designed to support your production. It would be a shame for these to be lost unintentionally through some mishap, as by some tidy soul deleting a folder on your day off (or perhaps by performing a *System Restore*).

For this reason, we encourage you to use the *Export* feature to prepare a backup archive of your painstakingly designed macros. (This is quite easy to do, since *Export* of entire folders is supported, as is multi-selection.)

On-screen *HotSpots* (see Section 9.2.7) are another way to activate TriCaster's powerful macros. Live action on-stage can trigger multiple macros based on *HotSpots* activity detected. This is very powerful technology – the practical (and whimsical) applications are limited only by your imagination.

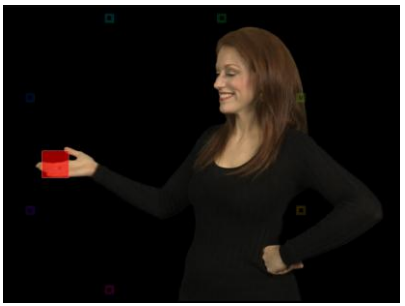


FIGURE 277

This feature makes TriCaster's virtual set system especially powerful. Talent can trigger one macro by moving their hand (for example) into a *Hotspot*, another by moving it out; and each source supports *8* hotspots.

- Use live action to make *Overlays* and *DSKs* appear auto-magically, or switch the video in a virtual monitor by tapping it with a fingertip.

- Switch from a seated desk shot to a standup virtual set simply set by walking into it; then auto-switch to the next shot when you walk back out of the frame.

FIGURE 278

- Load up new *DDR* presets, audio configuration and camera assignments when talent moves from the desk shot to standup in a virtual set.

- Reveal an over-the-shoulder Skype® shot and configure audio for a remote interview, then close it and restore the 'local' sound setup with a wave of the hand; or trigger a sound – a drum roll, gong, or the entire Muppets® anthology.

Hint: Use the Overlay option Flip View Horizontal to let talent see for exactly where their marks are on the screen – See Section 11.2.

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.

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.

FIGURE 279

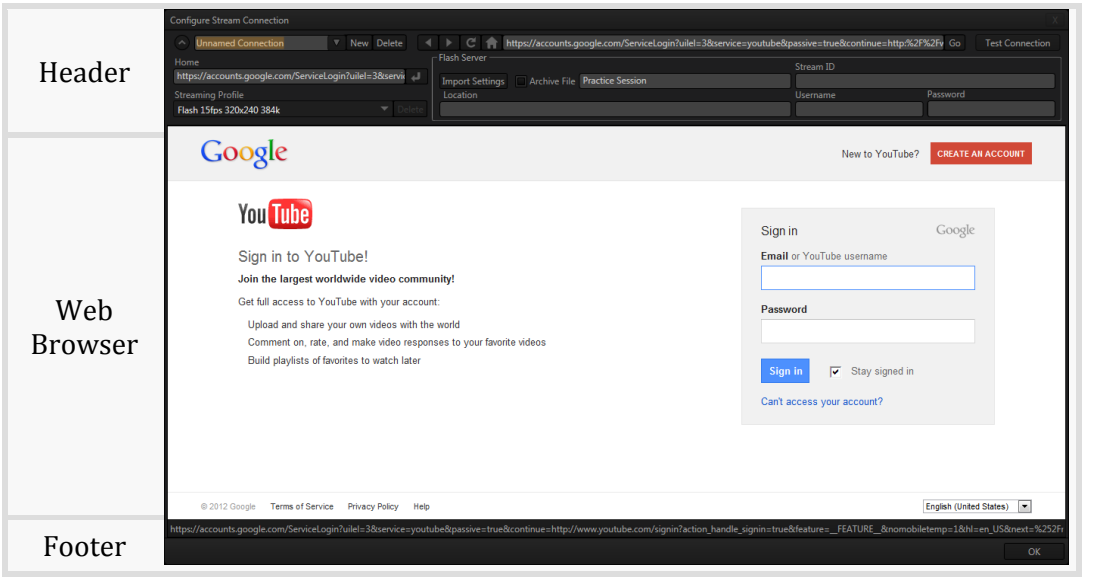
TriCaster's *Streaming Configuration* panel supports the creation and configuration of all of the information and settings you are likely to need in this context.

The information you enter for a given *Connection* is retained in a preset that is easily accessed afterward from a convenient drop-down me.

In addition, this panel has built-in web browser capabilities, permitting you to both view your stream from the remote site (just as your audience will see it) and access webpage based controls as required.

SECTION 18.1 OVERVIEW

To open the *Configure Stream Connection* panel, click the *Configure* button (gear) at right in the *Dashboard*'s large *Stream* button.



The panel is comprised of three bands:

- The uppermost band contains controls for creating and managing *Connection* profiles, along with familiar web browser navigation tools.
- The larger area beneath this displays the current webpage, if any.
- At the bottom of the panel is the footer, containing a status line and *OK*.

18.1.1 COMPACT VIEW

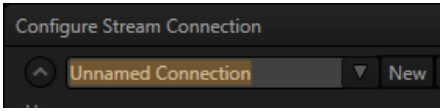


FIGURE 280

Just to mention it in passing, after configuring one or more *Connections*, you can collapse the header to a compact view using the up/down control to the left of the connection name field (Figure 280).

SECTION 18.2 WEB BROWSER

A simple set of *navigation controls* (Figure 281) is provided above the *Web Browser viewport*.

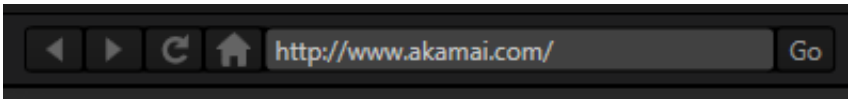


FIGURE 281

Easily recognizable *Backward*, *Forward* and *Refresh* buttons operate just like those on a typical web browser. The *URL field* allows you to type in a webpage address, and access it using the *Go* button at right.

The operation of the *Home* button varies a bit from familiar usage, and bears a little explanation:

It helps to understand the distinction when you recall that this is not a general purpose web-browser. The purpose here is to access the account page(s) you use for specific *Connections* (as opposed to a 'landing page' you might use for more mundane browsing). Thus, you very likely want the *Home Page* for one custom *Connection* to be different than the one you use for another *Connection* configured for a different end use.

The *URL* field above the viewport is always the current URL (Uniform Resource Locator, or simply, web page address). A second URL field, labeled *Home*, is located below the selected connection name at left. The address shown in this field is the assigned *Home Page* for the current *Connection*, usually different for each profile.

To copy the address for the currently displayed webpage into the *Home* field for the *Connection*, simply click the *Return* button at right of the *Home* field *(*Figure 282).

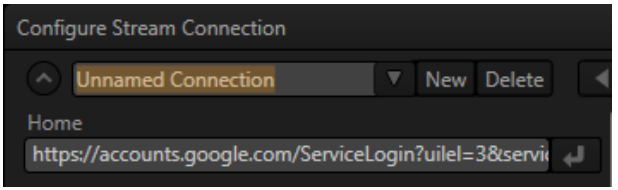


FIGURE 282

Afterward, clicking the *Home button* in the *navigation control group* at upper center will always return you to this location.

SECTION 18.3 CONNECTION OPTIONS

The process of configuring a *Connection* (preset) begins with clicking *New* to create it. This action will immediately open a dialog entitled *Choose Configuration Type*. The options available are as shown in Figure 283.

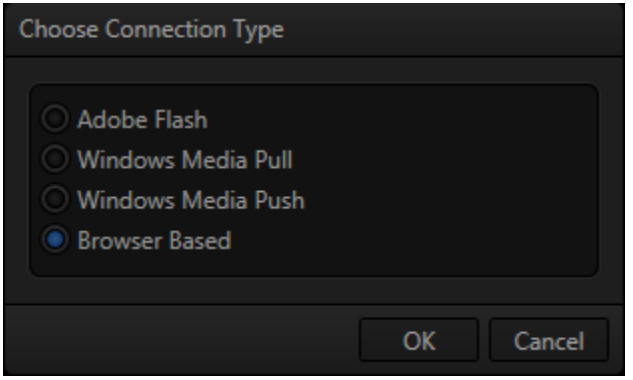


FIGURE 283

Hint: The Connection Type options may seem unfamiliar if you are new to streaming. You may find it helpful to read over Section 18.6, entitled Streaming Strategies.

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.

18.3.1 ADOBE FLASH®

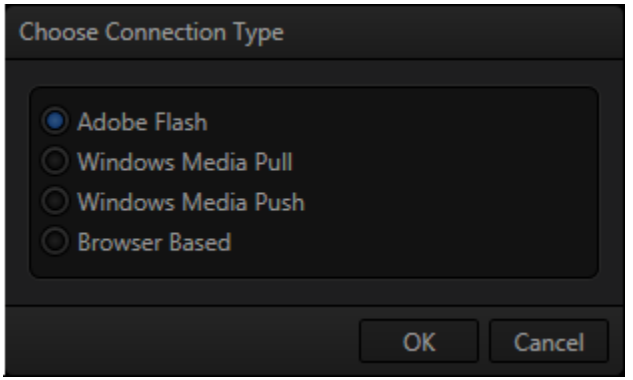


FIGURE 284

TriCaster can encode and stream using Adobe Flash®, and this is a very popular choice. In determining whether you should choose Flash or another encoding method for your own purposes, you might find it helpful to review the section titled Live Streaming in Section 18.6.1.

When you select *Adobe Flash* as the *Connection Type*, the controls presented in the header of the *Configure Stream Connection* panel update accordingly.

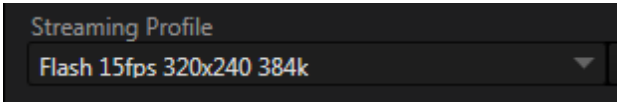


FIGURE 285

The first thing you might notice is the *Streaming Profile* menu at left beneath the *Home* field (Figure 285). This drop-down selector lets you choose from a prepared list of streaming profiles, labeled to show their respective frame rate (fps), resolution and bandwidth settings.

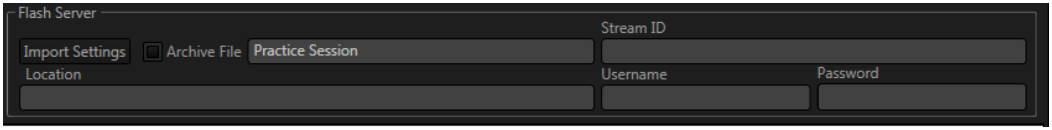


FIGURE 286

At right, you will see the *Server* control group (Figure 286), where you will enter the specific parameters required by your streaming service (or CDN – Content Delivery Network). Let's consider the information you need to complete this successfully.

The *Username* and *Password* are supplied to you by the streaming service, and are specific to your account. *Location* (also referred to as the Server Address) is the address TriCaster will send the stream to (this is supplied to you by the service provider). The *Stream ID* may or may not be provided, depending on the service provider; in some cases you can simply enter a custom ID number.

Many service providers will supply you with a streaming profile in the form of an XML file for use with *Flash Media Live Encoder*®. 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*.

Note: By design, the Import feature does not automatically change the Resolution profile you have selected at left. You should ensure that this setting is compatible with your service.

BROWSE (IMPORT A CUSTOM PROFILE)

A related function involves the ability to directly import a custom *Resolution* profile. You might create such a profile for a specific purpose, using either the Flash Media Live Encoder® or Windows Media Encoder® application installed on your TriCaster).

The *Browse* item at the bottom of the *Streaming Profile* menu allows you to select an appropriate file in a system file explorer, which is then copied to the correct location for it to be listed in the menu for your use in future.

Note: the nearby Delete button allows you to dispose of unused imports of this type. The default Resolution profiles cannot be deleted, however.

One other Flash-related detail deserves mention. The first time you configure a Flash stream, a webpage applet may pop-up up a configuration dialog asking you to permit Flash to access your TriCaster audio and video devices.

Click *Allow*, and checkmark *Remember*, too. Then, in turn, click the 'microphone' button and 'webcam' button, selecting TriCaster's audio and video devices from the drop down menus provided. (If you ever need to open this panel again, you can get to the settings by right-clicking on a flash applet in the browser, and select Settings.)

18.3.2 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.

That said, Pull is not a universal solution. Since your stream may be constrained by lower bandwidth than a commercial streaming service typically offers, Pull streaming may falter when more than a few users are viewing the stream.

For a Pull *Connection Type*, the *Location* field attempts to automatically display the Internet address you would provide viewers, or in some cases, your streaming service provider. This the IP (Internet Protocol) address of your computer on the network. This information will be provided as 'punctuated' numeric value.

IMPORTANT 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.)

The Location provided in this case is merely a local number assigned by the router, and is not accessible to the world at large. To find out how to provide external access to your stream in this configuration, please see Section 18.8, Diagnostics and Troubleshooting, for information on routers and "port forwarding".

You can provide any clients or streaming providers this address. Entering this address into the File menu of Windows Media Player® (using copy, and pasting it into the Open URL window) will direct the player to show the stream from your system on client computer system(s) connected to the Internet.

Hint: Most web browsers can be also configured to invoke a compatible player when required, as well, but using WMP directly in this fashion may save some steps.

Beyond this, simply select a suitable profile from the *Resolution* menu for your need. Once you are done setting up the connection, click *OK* to close the panel. Your live program stream will be sent continuously to the network while the *Stream* button is enabled.

18.3.3 WINDOWS MEDIA PUSH

A Push *Connection Type* is often the most convenient method, especially in cases where TriCaster is connected behind a firewall. Push streaming is also usually simpler when you need to stream from major venues (such as hotels or convention centers). The program stream passes quietly out through any firewalls or routers between the facility and your streaming server.

Also, once your streaming provider has provided you the connection specifics, you can resume the stream at any time without intervention from the server. When a *Push* profile is chosen, the *Server* control group updates to allow entry of the (pre-arranged) host web address (*Location*), *Username* and *Password*.

Note: The publishing point is placed at the end of the URL, following a forward slash (i.e., http://225.21.1.4:8080/NewTek).

Enabling the *Stream* button then "pushes" the stream from your location, logging into the pre-arranged web address using the username and password you provided. The streaming service then re-transmits your stream for all to see.

Note: You will find information on the use of custom streaming profiles including MBR (multi-bitrate) options at Section A.7.3 in Appendix A.

18.3.4 BROWSER BASED

The basic *Browser Based* connection option can arguably be thought of as the lowest common denominator, and also the least demanding approach in terms of learning curve for you, the operator. The only local setting required beyond the initial *Connection Type* selection is the URL of the *Home* field (see Section 18.2) for 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, the companies involved 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 *Test* button provided in the *Configure Stream Connection* panel. After leaving this panel, the *Stream* button underneath the *Program Out* monitor on the *Live Desktop* toggles streaming (note that if you start streaming with the *Test* button, then close the *Configure Stream Connection* panel, streaming continues uninterrupted.)

If you do not wish to archive your test stream, disable the *Archive File* switch beforehand – but remember to re-enable it later if desired.

Hint: Some services may show you what they are receiving from TriCaster when you press Test or 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 *Browser Based* 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 running on the 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 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 18.4 AUDIO LEVEL

Recall, that *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 18.5 CAPTURING THE STREAM

TriCaster can archive your live stream file as it is created. Enable the *Archive File* switch in the *Server* control group, 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: this option is not shown for Browser-based connections since archival service is commonly offered by the CDN in that case.)

SECTION 18.6 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.

18.6.1 ON DEMAND OR LIVE STREAMING?

Not all 'streaming' is 'live streaming.' The difference is similar to i) watching a television program you previously recorded at a time convenient for you, or ii) watching a live event.

On demand streams are stored on a server (often supplied by an external service provider), ready to be transmitted whenever a viewer wishes. Live streams are available at the time they are broadcast, such as during a live concert or event.

ON DEMAND HOSTING

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 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 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).

- Flash has a very wide installed user base, and seems poised to increase in proliferation in the foreseeable future.

- Flash works well across multiple platforms (PCs, Macs, Linux, etc.). Windows Media® is well represented, but perhaps not quite to the same degree.

- Some sources report that the Flash movies will have a larger file size and use greater bandwidth than Windows Media for a given stream quality. (This is hard to assess, and changes constantly as developers update their products).

- Encoding software for both types is updated with fair regularity, and when you choose the 'latest, greatest' encoding, your viewers may not all have the current player, requiring them to download and install updates.

You'll often hear the term 'bitrate' in connection with streaming video. 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 *Stream Profile* in TriCaster's *Stream Configuration* panel. 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 connection 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 18.8.1 for some useful resources.)

18.6.2 STREAMING PROTOCOLS

Additionally, there are two primary 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:
  - 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:
  - 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.
  - If TriCaster is behind a router, your router must be configured to 'port forward'.
  - 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:
  - Pull doesn't waste bandwidth; no signal is being sent out to the server unless somebody wants to view it.
  - If you lose your connection to the (provider side) server, the server will re-connect to your encoder automatically when Internet connection resumes.
  - 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:
  - 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:
    - 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:
    - 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.
    - Some external streaming providers prefer to Pull streams, as re-connection can 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.

18.6.3 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.

18.6.4 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!)

SECTION 18.7 PRODUCTION AND CAPTURE CONSIDERATIONS

If you're not intent on live streaming, but wish to capture a live switching session, you would likely record at full resolution using the *Record* button (rather than *Stream*). The high quality captured files can then be used later in TriCaster's DDR, edited in SpeedEDIT™, or even be transferred to another computer (even on a different platform) for external processing or editing.

Hint: use 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 18.8 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.

18.8.1 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 the tools and integrated web browser in the Streaming Configuration panel, but you may want to confirm using an external system, too. Open Windows Media Player®, and select *File> Open URL* from its file menu (in some versions, you need to right-click WMP's title bar to present the menu).

3. Enter the *IP address* and *port number* for your stream here.

4. You should be able to connect and view your program stream.

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…

FLASH MEDIA LIVE ENCODER NOTES

Unfortunately, there are cases in which Flash Media Live Encoder® fails to report significant error conditions. For example, no error message is displayed if the network cable is disconnected while streaming, or if the connection to the remote server is lost.

Note: If the connection to a server is lost after initial success, the encoder attempts to resume streaming automatically if the connection becomes available again during the session.

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.

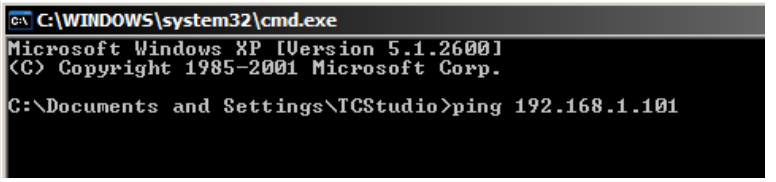


FIGURE 287

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 288. A success ping will display a report like Figure 289.

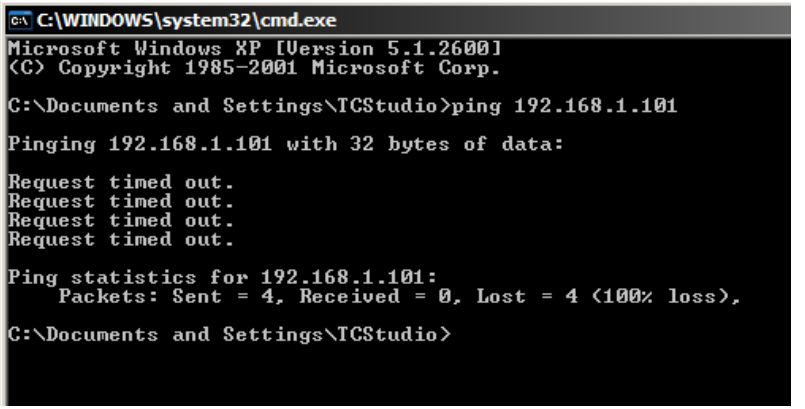


FIGURE 288

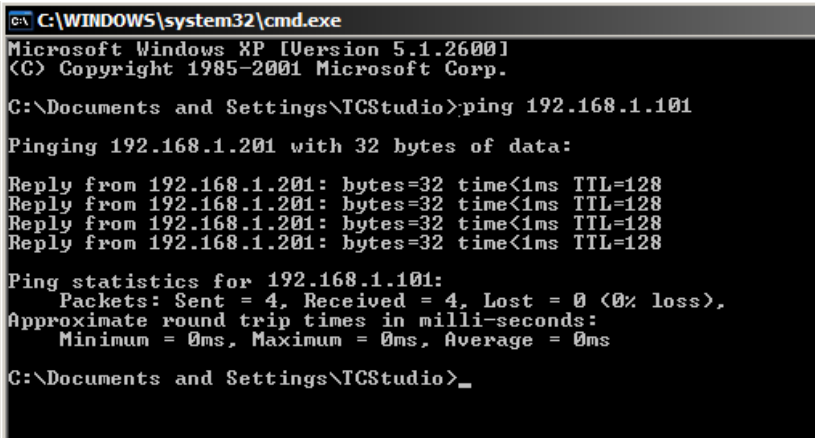


FIGURE 289

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).

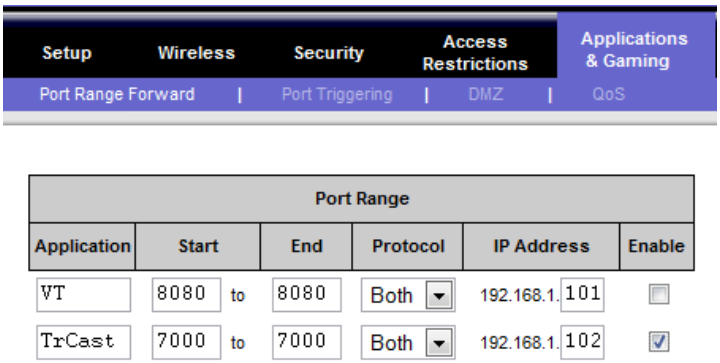


FIGURE 290

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 full (punctuated numeric) local IP address shown in the *Location* field of your TriCaster after you enable the stream.

7. Checkmark *Enable.*

Some routers may have other security settings that need to be modified for your Pull stream to be visible from the outside. For example, the Linksys® router shown above has a setting in the Security page named Block Anonymous Internet Requests. While this may be a great idea normally, it's not going to help much when outside computers request that your system permit them to Pull the video stream, is it?

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

18.8.2 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 19 SHARE

TriCaster 8000's *Share* 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 continue. 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 19.1 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®, or Twitter® provides opportunities for brand extension and monetization. In addition, TriCaster 8000's *Share* feature supports distribution to corporate web sites, intranets and the like.

Essentially, you will pre-enter credentials for your social media accounts and other upload targets before production. Sharing tools in the Live Desktop make it quick and easy to distribute selected content to multiple sites even while production and recording is still underway – just perfect for concerts, galas and sport events.

SECTION 19.2 ACCOUNT CONFIGURATION

FIGURE 291

You will see *Share Account* icons in the titlebar of both the *Home* and *Session* pages of TriCaster's *Startup* screen (Figure 291).

Click a specific icon or the neighboring *configure button* (gear) to open the *Account Configuration* panel (Figure 292). This is where you enter your credentials and details for social media sites or storage targets (local volumes or ftp sites).

Hint: A green checkmark overlay on the Account icon indicates it has been successfully configurated for sharing.

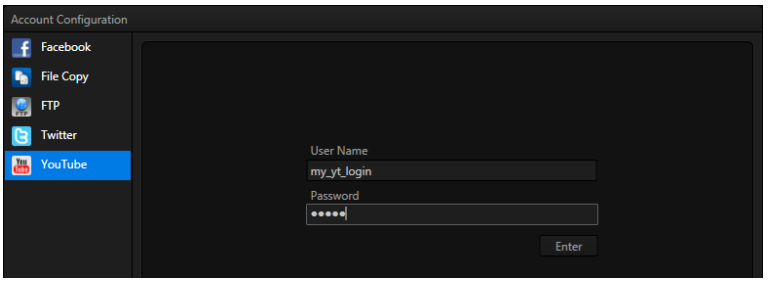


FIGURE 292

Click an entry in the *Account List* at left to display corresponding entry fields for your credentials in the pane at right. Typically you will need a *user name* and password for your social media accounts, as well as FTP servers (connections are tested when you press *Enter*, and will report an error if a problem exists).

19.2.1 SOCIAL MEDIA SITES

At the time of writing, TriCaster's *Share* feature can publish media to Facebook®, Twitter® and YouTube®. Other connections may be supported as it becomes possible to do so.

Note: See also Section A.4.3, How Do I Share Files On YouTube®?

19.2.2 FILE COPY AND FTP

The *File Copy* and *FTP* options are very useful output alternatives, effectively providing a live export method that does not force you to wait until production ends to use them. These features can be invaluable for collaboration, whether local or remote.

19.2.3 COMPRESSION

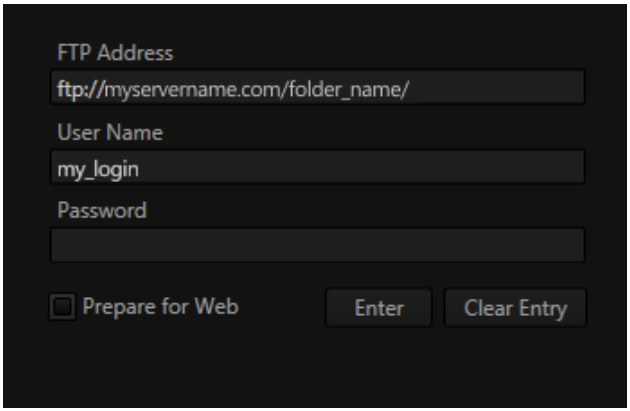


FIGURE 293

A feature common to both *File Copy* and *FTP* publishing is the option to compress video before sharing.

Selecting the item *Prepare for Web* encodes shared files to a compact H.264 (MP4) format for Internet distribution. (You may wish to disable this option when you wish to use the files for post-production.)

19.2.4 WATERMARKING

To avoid misuse of private or copyrighted media, you may want to add a watermark before publishing it to public sites. The *Watermark* feature allows you to select a suitable image to overlay on your output.

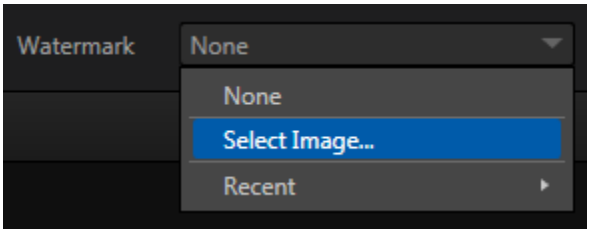


FIGURE 294

The image you select will be overlaid on shared 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 image aspect of exported files.

SECTION 19.3 THE SHARE QUEUE

Having discussed configuration of targets for sharing, let's move on to look at live operations.

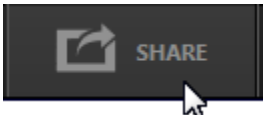


FIGURE 295

Clicking the large *Share* button in the *Dashboard* (Figure 295) opens the *Share Media* panel (Figure 296) where you will create and manage the *Share queue* – that is, the list of clips and still images you wish to publish.

The *Share Media* panel is easy to comprehend. Click the *Add* button to open a *Media Browser* from which you can select (and multi-select) suitable content for sharing; you can choose items from your current session or another location.

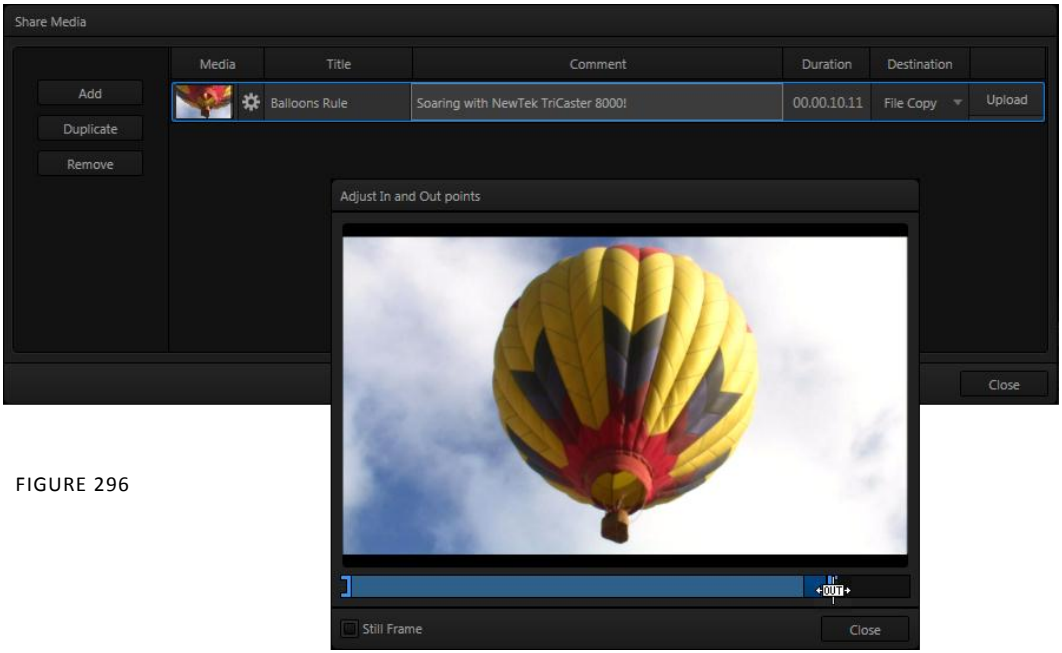


FIGURE 296

Hint: Remember that 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.

The selected entries are subsequently listed in the *queue pane* at right. Related information is displayed in columns here, including the file name (or alias, in the case of files added from a *Media Player* playlist), *Duration*, and *Destination*.

Several of the columns are special. Click the *gear* icon at left in any row to open a *trimmer* (Figure 296) that allows you to adjust the in and out points for clips you plan to share (not that some file formats may not support trimming).

Hint: Select the Still Frame switch in the trimmer to select a frame and convert it to a JPEG image file on upload.

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.

Editing the *Title* column entry in similar fashion affects social media uploads, but not FTP or File Copy operations.

The *Destination* column is home to a menu that allows you to choose between different upload targets for the file. Note that you can even select destinations that have not yet been configured, which allows you to queue up content, then later exit the *Live Desktop*, configure the credentials for the accounts (see Section 19.2) and upload the content afterward.

Click in the *Upload* column to actually publish the file (note that multi-selection is supported; all selected files are uploaded in this case). The neighboring *Status* column tracks upload progress.

19.3.1 MANAGING THE QUEUE

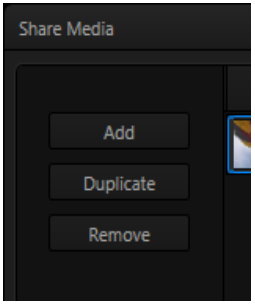


FIGURE 297

We touched on the *Add* button in *Share Media* earlier. Two other nearby features help you manage your queue entries:

Duplicate clones selected entries, allowing you to quickly and easily create versions of the entries that can then be assigned to different social media *Accounts* or target locations.

Remove, as you'd expect, deletes entries from the queue, doing so without any effect on the source files.

19.3.2 MORE 'ADD TO SHARE QUEUE' METHODS

Live production can demand your full attention. Spending much time in the *Share Media* panel can be tricky. For this reason, TriCaster provides several quick and convenient sharing alternatives.

SHARING RECORDINGS

Just as you can enable *Add to Playlist* to send newly captured files to a *Media Player*, *Record Configuration* also offers an *Add to Share Queue* feature (Figure 298).

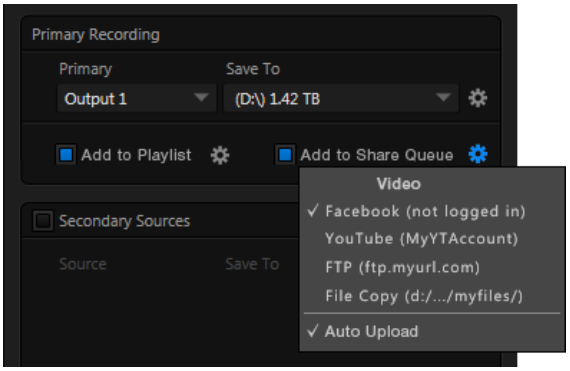


FIGURE 298

This provides a convenient way to update the *Share queue* each time you press *Stop* while capturing video.

Notice that there is an *Auto Upload* option at the bottom of this menu. When this is enabled, clip upload begins automatically, without even opening the main *Share Media* panel.

Hint: A TriCaster™ TimeWarp control surface makes a perfect addition to the system for sharing purposes. With Add to Share Queue and Auto Upload both enabled, a TimeWarp operator can easily mark and upload clips to social media sites on the fly, all without bothering the TriCaster operator in the slightest.

SHARING GRABS

The Grab feature has similar *Add to Share Queue* and *Auto Upload* features, but naturally these operate on still images rather than clips.

In connection with sharing stills, the *Capture stills from all inputs* and *Ignore inputs that are black* options can be particularly valuable. You can grab every live source and both outputs with just one click, then upload selected angles to multiple social media sites from any *Media Browser* or *Media Player* playlist pane.

Media Players have two *Share*-related thumbnail context menu items labeled *Add to Share Queue* and *Configure Share* (Figure 299).

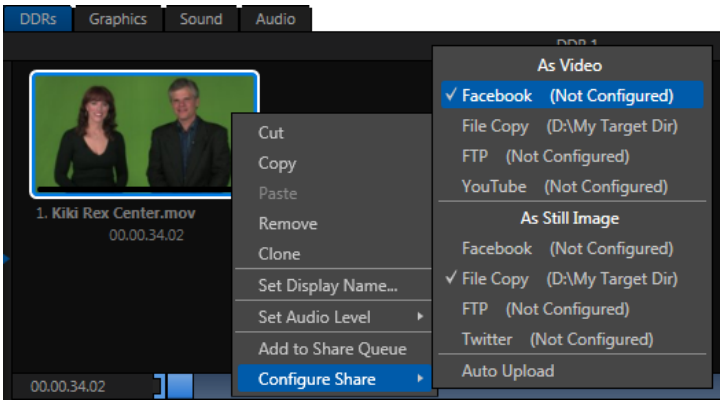


FIGURE 299

Add to Share Queue works just as described in the *Record* section just above.

The *Configure Share* menu expands to display *Destination* options for publishing selected items either *As Video*, *or As Still Image*, or both types at once. Likewise you'll see the familiar *Auto Upload* option at the bottom of the menu.

Hint: By default, when you add a video clip using the As Still Image option, the resulting queue entry defaults to the first frame of the clip – but you can select a different frame this using the Trimmer before uploading.

(Just to mention it again, note that it is possible to select currently un-configured *Destinations*. This allows you to add entries to the queue, with the intention of entering credentials for social media *Accounts* at a later time, and then continue with uploading.)

Chapter 20 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.

SECTION 20.1 RECORD

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). This is all very helpful for post-production purposes or even for immediate playback from a *DDR* during your production.

FIGURE 300

TriCaster's unique IsoCorder™ technology brings even more powerful capability to TriCaster's Record feature. With IsoCorder, it's possible to record all eight incoming sources simultaneously, or a perhaps mix of sources and output channels, including *Outputs 1* and *2*. Since these outputs are configurable, this allows capture of *Program*, *Program (Clean),* individual *Switcher* sources, or even an *Alpha Matte*.

Recording is enabled (or disabled) easily by clicking the large *Record* button in the *Dashboard* (Figure 300). The nearby counter tracks the number of clips recorded with the current base filename, and shows the duration of the current recording.

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 *Record* control to open the *Record Configuration* panel.

20.1.1 RECORD CONFIGURATION

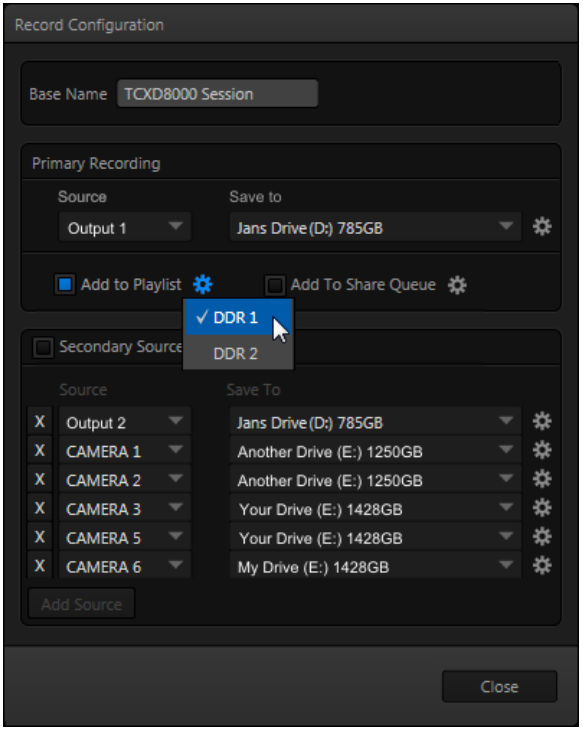


FIGURE 301

The *Record Configuration* panel (Figure 302) allows you to configure one *Primary* recording along with as many as seven additional (*Secondary*) sources to be captured at the same time. Let's review its features and settings, starting from the top.

GLOBAL RECORDING OPTIONS

BASENAME

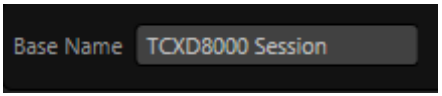


FIGURE 302

The first thing you may want to do is replace the default *Base Name* for captured files with a custom file name. TriCaster uses the base name and other information (such as the source) to apply a unique name to each captured file (the names are numerically incremented automatically as well).

PRIMARY RECORDING

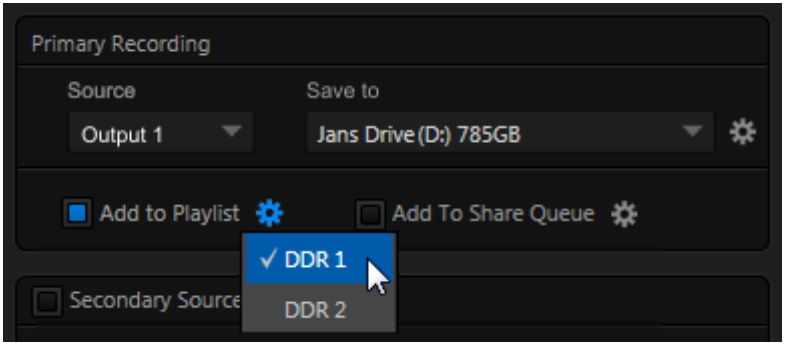


FIGURE 303

The main features of the *Primary* and *Secondary Recording* control groups are identical, but they are grouped separately to highlight two unique aspects of the *Primary Recording* – the *Add to Playlist* and *Add to Share Queue* controls.

ADD TO PLAYLIST

Select one or more *DDRs* using the menu that opens when you click the nearby gear to automatically include newly captured *Primary* clips in the playlist of the corresponding *Media Player*. These clips are then available for immediate playback.

Hint: You'll generally this feature enabled when using the optional NewTek TimeWarp™ control surface with your TriCaster for 'instant replay' purposes. See your local reseller or the NewTek website for more information on TimeWarp.

ADD TO SHARE QUEUE

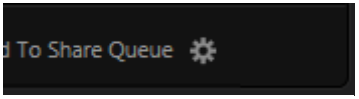


FIGURE 304

When enabled, the primary clip is added to the current upload queue in TriCaster's *Share Media* module.

Hint: Enabling Add to Share Queue does not automatically initiate file upload, except when Auto Upload is also enabled – see Chapter 19, Share.

SHARED OPTIONS

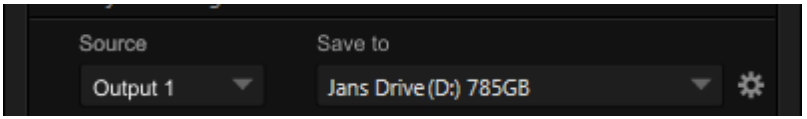


FIGURE 305

Apart from the *Add to Playlist* feature, Primary and Secondary recording controls are similar.

SOURCE

A drop-down menu labeled *Source* lets you choose which video channel and associated audio will be captured. TriCaster provides numerous source options. Selecting *Output 1* or *2* gives you access to a variety of useful video and audio source combinations and formats in *Output Configuration*. In addition, any single camera input can be designated as a source in *Record Configuration*.

Note that *Output 1* and *2* can likewise be configured to use any single camera as source. However – when you opt to record an *Output* (1 or 2) using the *Source* selection menu, it may well result in a very different recording than if you directly select the same input as *Source* in the *Record Configuration* panel.

Consider an example:

- Perhaps *Cam 1* is a 16:9 SD source
- *Cam 2* is a 720p camera
- *Cam 3* is 1080i

With *Output 2* set (in *Output Configuration*) to display *Cam 1, Cam2 or Cam 3* as 1080i, selecting *Output 2* as *Source* for recording in *Record Configuration* will always result in a 1080i format file.

By contrast, directly selecting a *Camera (1-8)* in *Record Configuration* captures files in the actual source format of the specific input. (In our example, this would be SD 16:9, 720p, and 1080i respectively.)

Hint: this means you can record a given source more than once in Record Configuration, capturing it in multiple resolutions and formats simultaneously.

SAVE TO

The *Save To* drop-down menu allows you to select from available storage volumes as targets for the recording.

DEFAULT ENCODING

Notice that there is a *Configure* button (gear) at the right-hand end of the row for each recording. Clicking it reveals a menu listing optional encoding formats.

FIGURE 306

The default file format for capture is Quicktime®, a popular and widely supported file format. For this and other reasons, we strongly encourage that you use this default encoding option.

Hint: Download free NewTek codec packs for Windows® and Apple® MacIntosh computer platforms from your personal 'downloads' page in the "Registration" area of NewTek's website.

ALTERNATE FORMATS

For certain purposes, you may prefer to capture one or more files in alternative formats. Note that some TriCaster features will not provide full functionality for some of the alternate formats. Also, to constrain system resource demands to safe levels, selected formats are only available for Primary Recording). Let's consider TriCaster's two MPEG-2 formats first.

MPEG-2

TriCaster's 'double-rate' MPEG-2 format for capture is comprised entirely of 'I-frames', resulting in excellent image quality. Two variants are provided; the choice principally affects color sampling applied to captured clips.

- *MPEG-2 Compatibility* encoding invokes 4:2:0 color sampling (similar to that of the popular 'DV' and 'HDV' formats).

- *MPEG-2 High Profile* encoding raises color sampling to 4:2:2. These files retain more color information than standard DV/HDV files as well as many other file formats. The increased color fidelity is especially valuable for chromakeying purposes. (Please see the notes which follow regarding file compatibility.)

The 4:2:2 sampling and high fidelity of the *MPEG-2 High Profile* format make it especially suitable for chromakeying applications. Support for High Profile MPEG-2 files by various applications is not universal, however. It would be prudent to test file compatibility with your favorite third-party programs before making extensive use of this option.

Note: TriCaster's High Profile MPEG-2 files meet the "High Profile" MPEG-2 definition established by the Moving Pictures Expert Group (MPEG). Please see http://en.wikipedia.org/wiki/Mpeg2 for more detailed information on High Profile MPEG-2 encoding.

SPEEDHQ AVI

Selecting *AVI (.avi)* encoding tells TriCaster to capture the designated source using NewTek's native AVI format, called *SpeedHQ.* This is a high quality, 4:2:2 file format suitable for both SD and HD applications. (See the hint under *Encoding* above regarding NewTek codec packs to use this option with your favorite applications.)

H.264

Another important encoding type is *H.264*. TriCaster supports two different bitrates, designated *High Quality* and *Web Quality*. The former uses 20 Mbit/sec encoding, while the latter option uses a *2 Mbit/sec bitrate suitable for online use.

* Note that *Web Quality* recording is scaled to 720x480 when required to maintain good image quality.

Notes: H.264 encoding is processor intensive. To avoid dropped frames, we recommend this format be used to encode no more than one video stream.

SECONDARY RECORDINGS

NewTek's IsoCorder™ technology provides additional capture capabilities. Additional sources for capture can be individually added in the *Secondary Sources* pane of the *Record Configuration* panel. A *Switch* next to the *Secondary Sources* label toggles the operational state of all recordings configured below.

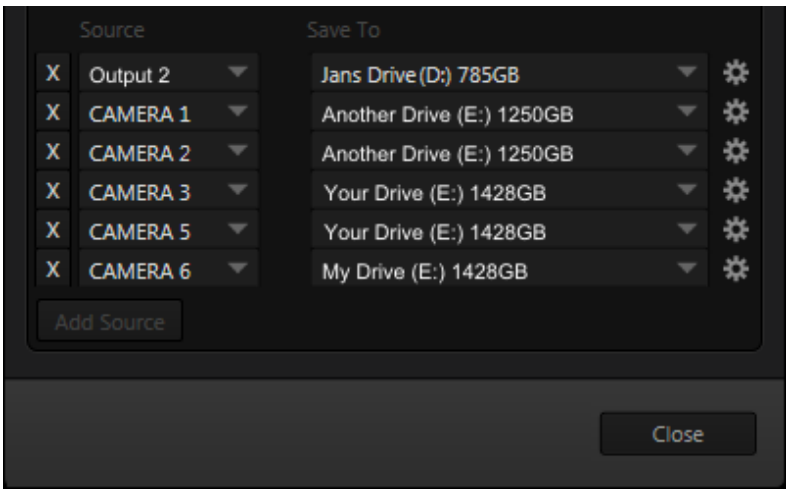


FIGURE 307

Click the *Add Source* button to place an additional entry into the list (up to eight sources in total, counting the *Primary*). To remove an entry, click the corresponding [X] button at left. *Secondary* recordings are configured in exactly the same manner as the *Primary* source discussed previously.

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.

SECTION 20.2 GRAB

At times, all you really want to capture is a still image from the current *Program Output* video stream. This is the purpose of TriCaster's *Grab* function.

Click the *Configure* button (gear) next to *Grab* beneath the *Program Output* monitor to open the *Grab Still Configuration* panel. The options presented are mostly similar to those of *Record Configuration*, though a bit simpler.

Again, enter a *Base Name.* The name you supply which will be numerically incremented as required. Enable *De-Interlace* if you wish to avoid a 'comb' effect caused by inter-frame motion in fielded sessions.

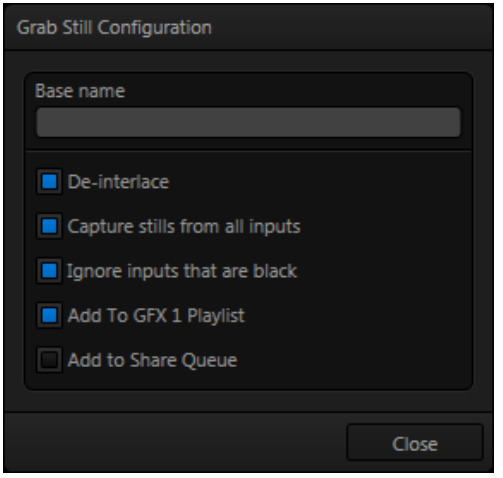


FIGURE 308

The option *Capture stills from all inputs* is especially powerful. It can store an image from every camera, plus those sources configured as *Outputs 1* and *2*.

The switch below prevents TriCaster from capturing unused sources that are simply black.

Enable the *Add to GFX1 Playlist* switch to automatically include newly captured clips at the end of the current playlist, ready for immediate playback during the live production.

Close the *Grab Still Configuration* panel by clicking *Close*, or clicking anywhere outside the panel. Then click the *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 (sub-folders are created for the supplementary files captured when *Capture still from all inputs* is in use).

Hint: During a session, the 'grab counter' situated beside the button keeps track of the number of images stored for the current base name entry.

Chapter 21 LIVETEXT™ AND SPEEDEDIT™

LiveText™ is a powerful title and CG application, allowing you to create title pages for use in the *Media Players* of your TriCaster™. SpeedEDIT™ provides a great editing tool for pre and post production purposes. It is innovative and powerful, ready to handle numerous editing and also file conversion chores.

LiveText and SpeedEDIT are both full-blown, powerful, professional programs also available as a standalone applications. Each of these programs has its own complete manual, which can be accessed from the Help icon in the TriCaster™ *Startup Screen* (the source .pdf files are located in the C:\TriCaster\Documentation folder, in case you wish to print them out). In this section, then, we will review matters specific to the different applications when running in as an integrated part of the TriCaster environment.

SECTION 21.1 LIVETEXT

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 6.3). This reveals options and links at right, discussed previously in the Startup Screen chapter just mentioned.

21.1.1 SESSIONS, PROJECTS AND DISPLAY

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.

21.1.2 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.

21.1.3 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 12.3).

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.

SECTION 21.2 SPEEDEDIT

SpeedEDIT is an optional download, and can be found in the TriCaster downloads section of your Registration page on NewTek's website.

SpeedEDIT is launched from the *Home Page* in TriCaster's *Startup Screen*. After creating a new session or opening an existing one, click *Add-Ons* on the icon ring (see Section 6.2.5). This reveals options and links at right, including SpeedEDIT after it has been installed.

21.2.1 SESSIONS, PROJECTS AND DISPLAY

Normally, TriCaster uses its current session settings for video output. New SpeedEDIT projects (created using SpeedEDIT's *File* menu (New), for example) may be a various resolutions, however. SpeedEDIT sends output to TriCaster's audio and video outputs continuously, without selecting any menu setting.

Unlike the arrangement for *Live Desktop* output, for SpeedEDIT purposes TriCaster's video outputs (rows 1-3) attempt to conform to the SpeedEDIT project format. So if the project is HD, TriCaster's SDI outputs will all send HD-SDI, and the analog outputs will all 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: When opening projects, TriCaster will attempt to provide hardware video output for SpeedEDIT, which may require it to reset the display hardware from HD to SD (or vice versa). It's possible that this could result in a monitor, its connection type, or both being inappropriate for TriCaster's output mode.

21.2.2 IEEE1394 I/O OUTPUT

The realtime IEE1394 (DV/HDV) preview found in SpeedEDIT standalone is not supported for TriCaster, which has other (superior) video display options.

21.2.3 SPEEDEDIT DESKTOP

TriCaster launches SpeedEDIT on a desktop of its own, spanning all connected monitors. You can exit SpeedEDIT by clicking the [x] button in the upper-right corner of the desktop, or by using the *File* men item *Close*.

If you have a secondary monitor connected to TriCaster, you can drag SpeedEDIT's *Video Output* window (opened from the *Window* menu) onto that screen.

Maximize it by double-clicking *inside the preview area* (double-clicking a second time restores the standard 'floating' window).

Similarly, you might find it convenient to maximize the SpeedEDIT window to fill the primary monitor display. To do this, double-click the window border. In this configuration, the Desktop exit button is not available, but you can exit the application using the File menu's *Close* item.

PART III (APPENDICES)

A time-saving question and answer section, followed by an extensive listing of Shortcut Keys, schematic diagram and keyword index …

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 4.5).
   (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 9.2.1).

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 9.2.1).

7. Choose *Act as Alpha Channel for Input (#)* as the *Connection Type* for the even-numbered source in the *Input Settings* tab. (See Section 9.2.2).

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.

MULTIVIEW MONITOR (OR PROJECTOR)

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 do not 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.

VIDEO MONITORS/DEVICES

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 4.8.1).

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 one of 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 4.11 for more information.)

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 INSERT/REMOVE A DRIVE FROM TRICASTER'S REMOVABLE DRIVE BAY

1. If TriCaster is running, and if applicable – Eject the hard drive you wish to remove (see Section A.1.9).

2. Open TriCaster's front panel.
3. Open the removable drive bay door.

FIGURE 309

4. Pull the hard drive currently in the drive bay (if applicable) to remove it.
5. Insert the new hard drive ('connector end' first)
6. Close the drive bay door.
7. 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.1.8 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.1.9 EJECT A HARD DRIVE?

8. Launch TriCaster, and click the *Open* icon on the *Home Page* of the *Startup Screen*.

9. Click the *Eject* gadget at upper right on the screen, and select the hard drive you wish to safely disconnect, or…

10. 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 8.1.1).

A.1.10 CONNECT TALLY LIGHTS?

External tally light devices and their connections vary widely. Please refer to Section 4.9 for details on TriCaster's tally light jack implementation.

A.1.11 CONNECT TO A NETWORK?

Please refer to Section 4.16 and Chapter 16 Network Sources.

A.1.12 LOCATE A SPECIFIC TRICASTER ON MY NETWORK?

Please refer to Section 4.2 for details on giving your TriCasters unique network names.

A.1.13 RESOLVE IVGA PRO QUIRKS

- Some antivirus software can interfere with certain iVGA PRO features. If you encounter a persistent quirk, you might try disabling your antivirus protection briefly to see if the problem disappears. If the problem goes away, consider using a different anti-malware product, or disabling realtime protection while using iVGA PRO.
- If iVGA PRO's connection to TriCaster seems intermittent, make sure only one network path exists between the two systems, to prevent the PC from switching back and forth between connections.
- Some systems deliberately restrict access to system sound (for DRM reasons), preventing the system 'Stereo Mix' from appearing as an audio source option for iVGA PRO. Several workarounds exist; as a starting point, try an Internet search for terms like "audio loopback software".

A.1.14 CONNECT TO AN AIRPLAY® SOURCE?

The local network (the same network you connect TriCaster to) is the means of transmission for AirPlay®, and a wireless connection from the player to the network is perfectly acceptable.

1. Select the AirPlay® entry in the *Source* menu for *Net 1* or *Net 2* (just as you would select an iVGA™ or LiveText™ source).
2. TriCaster identifies itself as a potential client device to the AirPlay® source.
3. One or more TriCaster devices will be listed as potential output devices for the AirPlay® device. Select one and you are done.

Note: A limitation of the current iTunes release prevents it from properly addressing the second AirPlay® connection it detects. Instead, it attempts to use the first connection. If the first connection is already committed to another source, this attempt will fail.

SUPPLEMENTARY QUESTIONS:

Q: *Why doesn't my AirPlay® device list TriCaster as a target?*

A1: The first time you connect to a network with the TriCaster, a network 'location' is selected. This is a standard Windows® process that automatically configures appropriate firewall and security settings for the type of network that you connect to.

There are three 3 location options: Home, Work, and Public. If TriCaster's active network has inadvertently been set to 'Public', AirPlay® will not connect. Be sure this is set to either *Home* or *Work*.

A2: By default, the Windows® firewall is disabled on TriCaster. If your AirPlay device does not recognize TriCaster after enabling AirPlay® for *Net 1* or *Net 2*, it may be that someone has enabled it, and it is preventing connection. You can either disable it, or (if you really must have it) adjust its settings as follows:

1. Click C*onfigure Network* in the *Administration Mode screen.*
2. Open the Windows® Firewall interface using the link shown at lower-left in the *Network and Sharing* control panel.
3. In the left pane, click *Advanced Settings*. (If prompted for an administrator password or confirmation, type the password or provide confirmation).
4. In the *Windows Firewall with Advanced Security* dialog box, click *Inbound Rules* in the left pane, and then click *New Rule* in the right pane.
5. Follow the instructions in the *New Inbound Rule* wizard.
6. Ensure that the following ports are open:

Port	*Protocol*	*Name*
80	TCP	HTTP
443	TCP	HTTPS
554	TCP/UDP	RTSP
3689	TCP	DAAP
5353	UDP	mDNS (Bonjour)

A3: Make sure you are connected to the correct network, especially for Wi-Fi. iOS® connects to known networks by default. If multiple Wi-Fi connections are available, it may connect automatically to a previously known network. For a wireless AirPlay® source such as iPad®, follow these steps:

1. Tap *Settings* > *Wi-Fi*. If *Wi-Fi* is off, turn it on by tapping the on/off icon.
2. Available Wi-Fi networks appear under *Choose a Network*...
3. Locate and tap the Wi-Fi network that TriCaster is connected to.

A4: Wi-Fi uses radio frequency technology to connect hardware and software applications so that they can communicate. However, RF interference can be a major problem, especially in an environment such as a trade-show or conference that might entail numerous competing signals.

Other devices contributing to RF clutter include microwave ovens, cordless phones, Bluetooth devices, wireless video cameras, outdoor microwave links, wireless game controllers, fluorescent lights, and so on. These sources can cause significant interference and signal degradation. Where possible, try to eliminate or minimize the potential interference in your installation design.

A5: Consider the following suggestions when many conflicting wireless sources are in the immediate area:

- Set the wireless network SSID to any unique name. Choose a name that is unique to your network and is not shared by other nearby networks or other

networks you are likely to encounter to avoid connection failures, or unintentionally connecting to other networks sharing the same SSID.

- Make sure that the network is not set to 'hidden.' iOS® devices may interpret this as a closed network and fail to connect.
- If using security, make sure that it is set to WPA2 Personal (AES). Use of WEP is not recommended for compatibility, reliability, performance, and security reasons.
- If possible, configure 2.4 GHz Radio mode to 802.11b/g/n.
- If the router supports 5 GHz Radio mode, set it to 802.11a/n.
- Channel Settings should be set to 1, 6 or 11 (11 is the most common choice, since it is the starting channel, making 1 or 6 a good choice).
- Channel width should be set to 20 MHz or "Narrow Band" in 2.4 GHz mode.
- Channel width should be set to both 20 MHz and 40 MHz in 5 GHz mode.
- Ensure that only one DHCP server is active on the network.

Q: *Why do some clips not play properly across an AirPlay® connection?*

A: There are several possibilities: First, TriCaster cannot play media governed under Digital Rights Management (DRM) schemes. This is a common limitation of commercial content.

Otherwise, if an iOS® device loses its connection with the network for any reason it does not refresh the AirPlay® destination list for about one hour. It may seem as though the TriCaster is detected even though the connection has been lost.

One way to flush the AirPlay list is to enable and disable 'Airplane mode' in the device settings. Finally, make sure you are connected to the correct Wifi network (etc.)

A.1.15 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.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 6.1.

A.2.1 START AN SD SESSION?

1. Connect your SD sources to TriCaster's input connectors (see Section 4.5).

2. Connect your SD monitors to TriCaster's output connectors (see Section 4.8.1)

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 4.10 and Section 6.1.)

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.

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.

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. (See Backup Session under Section 6.3 for more detail.)

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 6.3).

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 – see Section A.2.4.

2. *Rename* the current session – see Section A.2.8.

3. *Restore* the backed up session – see Section A.2.5.

A.3 LIVE PRODUCTION

A.3.1 MAKE CUSTOM TRANSITIONS AND LIVESETS?

The *Animation Store Creator* application is included with TriCaster 8000. 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, TriCaster 8000's LiveSets support four primary video inputs, along with sources dedicated to Key channels. The 'Nightly Show A' LiveSet is special in that it *appears* to show many different video sources simultaneously (see Figure 310), even including a moving 'news ticker'.

FIGURE 310

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 311).

FIGURE 311

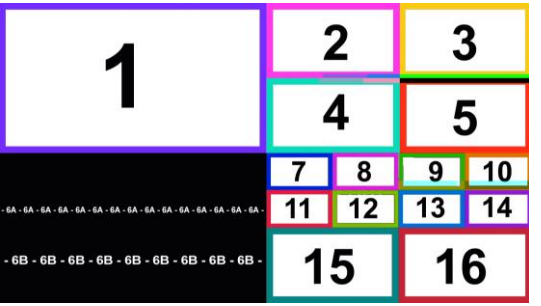


FIGURE 312

Hint: A template clip (Figure 312) 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, 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 312above). 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?

One of the sample LiveSets provided with TriCaster 8000 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.3.1 SET UP THE 'METROPOLIS A' LIVESET?

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.

FIGURE 313

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.

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.3.2 INITIATE STREAMING?

1. Connect TriCaster to the Internet (see Section 4.16).

2. *Open* (or create) a TriCaster session (see Section 4.10).

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. (See Section 18.3)

5. Close the panel, and – when ready – click the *Stream* button.
(See Section 5.13 and Chapter 17 Network Sources for full details.)

A.3.3 FIND MY CAPTURED STREAM 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 *Saved Streams* folder in the file explorer.

A.3.4 RECORD MY PROGRAM?

1. Open (or create) a TriCaster session (see Section 4.10).
2. Click the *Configure* (gear) button in the Dashboard's *Record* control.
3. Choose your recording options (see Section 5.8.1 and Chapter 20, Record and Grab) and enter a *Base Name* for the file(s).
4. Close the panel, and – when ready – click the *Record* button.

A.3.5 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.3.6 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 12.2.3 for more.

A.3.7 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.3.8 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.

FLASH (F4V)

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.3.9 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.3.10 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.3.11 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 Presets).

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.3.12 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 11.1).

NOTE: Changing Output Resolution can cause frames to be dropped briefly. Thus we do not 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*). To import media files:

1. Open (or create) a TriCaster session.
2. Click the *Manage* icon in the Startup Screen's *Session Page*.
3. Click the *Import Media* button (below the *Browse* list).
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 SHARE FILES ON YOUTUBE®?

Although you have opened an account with YouTube® and correctly configured the account (see Section 19.2) 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.

Afterward, TriCaster will be able to upload directly to your channel by means of its *Share Media* feature.

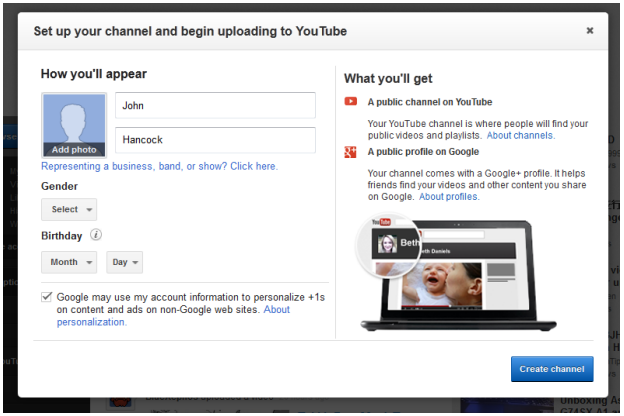


FIGURE 314

A.4.4 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.4.5 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 12.2.2)

A.4.6 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 12.2.2)

A.4.7 EXPORT FILES TO AN EXTERNAL DRIVE?

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 6.3.3.

A.4.8 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.4.9 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.4.10 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.4.8). 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.4.11 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 the heading System Utilities in Section 6.2.3).

   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, and follow directions provided (see the heading System Utilities in Section 6.2.3).

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 direct 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.3.8 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.

A.5.8 RESTORE TRICASTER SOFTWARE

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:
  - The existing (factory-prepared) Restore partition
  - 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 on the Registration *webpage* (in the Customer Care section of the NewTek website) 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 4.3 for more detail.)

A.6.2 CONTACT CUSTOMER SUPPORT?

Visit the NewTek Website, at www.newtek.com and select *Support* from the main *Customer Care* menu at the top of the page. This link leads to the latest support information for your NewTek products, including *FAQs* and documentation. It also lists 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.7.3 ADD A CUSTOM STREAMING PROFILE TO THE CONFIGURE STREAM CONNECTION PANEL?

The streaming profiles shown in the drop-down *Resolution* menu in the *Configure Stream Connection* panel are drawn from the folder *C:\TriCaster\Streaming Profiles*.

These files are organized according to whether they are WMV or Flash profiles, again into NTSC or PAL versions (Multi-standard models only), and then finally sub-divided into folders labeled *4x3*, *16x9* (the latter two being Standard Definition profiles), and *HD*.

(Note that profiles in the various sub-folders only appear in the *Stream Type* List for the *corresponding session type*.)

The easiest method of creating a custom profile is to modify an existing profile and then store it using a new name. The procedure differs depending on whether you are working with a Flash or Windows Media® profile.

***Note**: It is possible to create streaming profiles that place very high demands on system resources, or are impractical for streaming over most networks.*

The default profiles are suitable for most purposes, and should not interfere with other operations. Attention to these considerations when creating custom profiles is vital to ensure reliable performance, and we encourage you to perform real world testing beforehand.

IMPORTING A CUSTOM PROFILE USING 'BROWSE'

Flash Media Encoder profiles are XML files, while Windows Media Encoder® uses a .prx file extension for its profiles. If you already have a prepared custom profile and wish to import it, follow these steps:

1. Open the *Configure Stream Connection* panel, by clicking the *Configure* button (gear) next to the Stream button on the Live Desktop.

2. Click *New* (Connection)

3. Select the option appropriate to the profile you wish to import in the popup *Choose Connection Type* panel.

4. Click the *Resolution* drop down menu, and slide the pointer all the way down to the bottom to select *Browse*.

5. Navigate to the custom profile, select it and click *Open*.

CREATING A CUSTOM WINDOWS MEDIA® PROFILE

1. From TriCaster's *Startup Screen*, click the *Shutdown* icon, and select *Exit to Windows*.

2. Click the *Exit to Windows* button in the confirmation dialog that pops up.

3. Double-click the *My Computer* icon, and navigate to *C:\TriCaster\Streaming Profiles\WMVPRofiles.*

4. Identify a profile (.prx file) similar to the one you wish to create inside the appropriate sub-folder at that location.

5. Copy the file, and paste the copy in at the same location.

6. Double-click the new profile to open it in the Windows Media Profile Editor.

7. Make such changes to the settings as you see fit, then click the *Save and Close* button.

8. Rename the modified profile to differentiate it from the others in the same folder.

9. Close the folder, and re-launch TriCaster.

CREATING A CUSTOM FLASH STREAMING PROFILE

1. From TriCaster's *Startup Screen*, click the *Shutdown* icon, and select *Administration Mode*.

2. Press the Windows® key on your keyboard, and launch Adobe Flash Media Live Encoder® from the Windows® Start Menu.

3. Select *Open Profile* from the File menu in the encoder application.

4. Navigate to C:\TriCaster\Configuration\Streaming Profiles\FlashProfiles\.

5. Continue to identify a profile (.xml file) similar to the one you wish to create inside the appropriate sub-folder at that location, and click the *Open* button in the file explorer.

6. In *Adobe Flash Media Live Encoder®,* modify the settings for the profile to suit your need.

7. Select *Save Profile* from the *File* menu.

8. Navigate (again) to the appropriate sub-folder inside the main *C:\TriCaster*Configuration*Streaming Profiles\FlashProfile directory,* supply a suitable name for the new profile, and click the *Save* button.

9. Exit Adobe Flash Media Live Encoder, and re-launch TriCaster.

SUPPLEMENTARY QUESTION:

Q: *Does TriCaster support multi-bitrate streaming profiles?*

A: Yes it does, but there are a few things you should consider. Multi-bitrate encoding places higher demands on system resources than usual. It is entirely possible to create a custom multi-bitrate profile that is impractical, either because its bandwidth expectations are unrealistic, or because the encoding requires so many cpu cycles that it can intrude into other important live functionality.

For this reason, we encourage you to use the profiles supplied with your system whenever possible, and if you do opt to use a custom profile – especially a multi-bitrate one – do perform *meaningful* testing in advance, to ensure everything goes as planned.

Note: The Stream ID (text string) for multi-bitrate profiles must contain the character combination "%i", without the quotation marks. (The exact position of the character combination does not matter, and spaces are permitted – though the latter may pose issues for some CDNs.)

A multi-bitrate profile without "%i" in the Stream ID will produce a Flash Media Encoder® error on attempting to stream. Also, the filename for multi-bitrate streaming recordings TriCaster saves will automatically include the requisite "%i" (because the originating stream ID contains it).

SUPPLEMENTARY QUESTION:

Q: *Is it better to use a Baseline or Main profile for H.264 encoding?*

A: Flash Media Live Encoder lets you choose either Baseline or Main type profiles in the Advanced Encoder Settings that opens when you click the Configure (wrench)

button beside the Format menu (in the Video section of FMLE's Encoding Options tab).

At the time of writing, all NewTek H.264 profiles use the Baseline option as it seems to be the best supported by various online services, and produces excellent results.

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 the a/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 9.1.3. For genlocked sources, consider disabling TriCaster's *Frame Sync* – see Section 9.2.3.

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 provides 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 315

SUPPLEMENTARY QUESTION:

Q: *Where can I obtain replacement or spare Power Supply modules?*

A: Contact NewTek Sales for purchase information for spare 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!"

Still waiting for the promised mention of 'relativity'? OK, here it is then: $E=MC^2$

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 – unless you happen to be very near the stage. For those in the front rows, a few extra frames of latency *may* be rather disconcerting. (It's true that IMAG was conceived primarily for the benefit of those further back, but if the latency is too obvious for those nearest the front it can be disconcerting distraction.)

For this reason, it's desirable to keep video latency to an agreeable minimum – but put away any notion of 'zero latency.' Not only would this require bending the laws of physics, it would be a bad idea.

Even before considering minimizing latency in the device chain, acknowledging that there is always going to be some latency calls for some creative thinking with regard to practical staging. For example, if you design your IMAG layout in such a fashion that those in the front row are unlikely to be able to see the screen(s) without lifting their eyes from the onstage talent, they are extremely unlikely to notice a small amount of latency.

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 4.6, Section 4.14 and 9.1.3). 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 9.2.3.

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

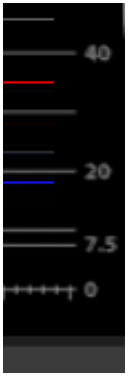


FIGURE 316

For video engineering purposes, the scale between black and white is defined in *IRE* units (IRE being an acronym for "Institute of Radio Engineers"). White is pegged at *100 IRE*. For PAL (and NTSC-J) countries, black is defined as *0 IRE*. For NTSC lands, black properly sits at *7.5 IRE*.

Using TriCaster's *Waveform* monitor (in the Live Desktop's *Preview Scopes* tab), you can actually see the IRE values for your video sources graphed on a vertical scale (select the source on the Switcher's *Preview* row).

Confirming that the black and white levels your camera is sending TriCaster are correct is as simple as sending first black, and then white, and reading the value from the scale.

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. For NTSC, it should be 7.5 IRE, for all others, 0 IRE.

To check white, use a standard white card or even a sheet of white paper. Ensure that it is evenly illuminated with *the same lighting your main subject will receive*, move or zoom to fill the viewfinder with it, and confirm that the Waveform monitor is showing 100 IRE.

If not, 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 317) can be likened to the familiar 'color wheel' (Figure 318) 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 317

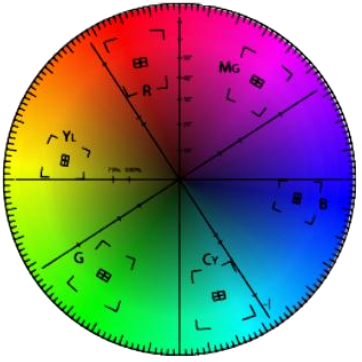


FIGURE 318

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 319 is an example of the color bars used in NTSC countries, while Figure 320 is a PAL example, common throughout European nations.

FIGURE 319 (NTSC)

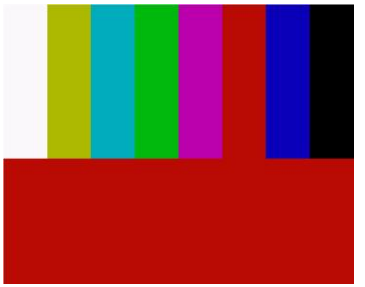


FIGURE 320 (PAL)

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.

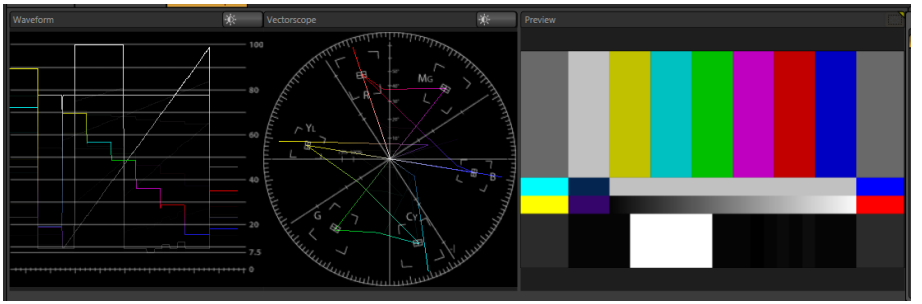


FIGURE 321

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 322).

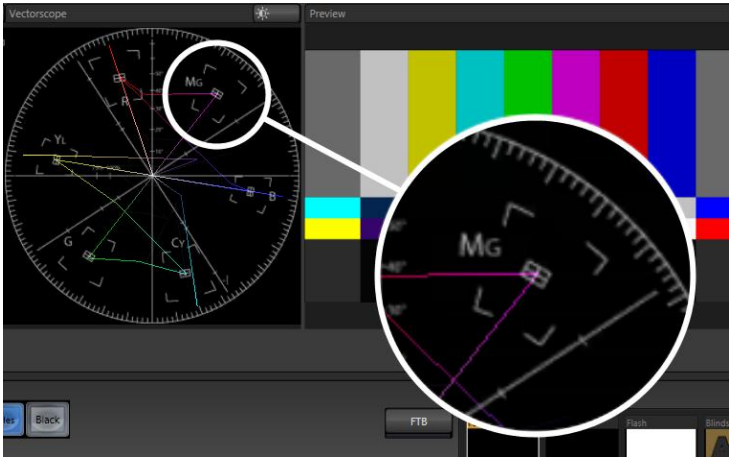


FIGURE 322

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/
http://www.lagom.nl/lcd-test/
http://www.jasc.com/support/kb/articles/monitor.asp
http://www.photofriday.com/calibrate.php
http://www.onecomputerguy.com/windows7/windows7_calibrate_color.htm

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 SETTING BLACK AND WHITE

As mentioned earlier, NTSC and PAL (and NTSC-J) regions use different black levels, so it's no surprise that they take different approaches to setting black and white levels, and that their respective color bar displays vary from one another. Likewise, we'll treat calibrating for NTSC and PAL separately.

NTSC

NTSC color bars have a special group of grayscale bars designated as the "PLUGE" (the acronym stands for Picture Line-Up Generation Equipment) in the lower-right area.

FIGURE 323

(The images in this section have been adjusted slightly to accentuate the subtle differences in the black bars making up this region.)

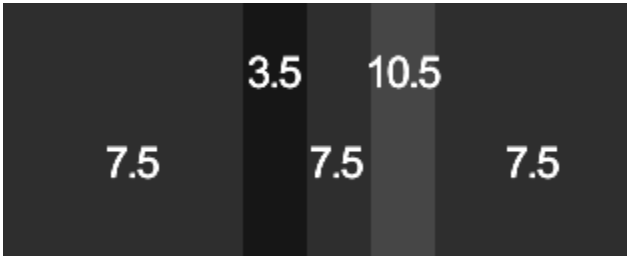


FIGURE 324

The large blocks at left and right in the PLUGE represent 'NTSC black' - 7.5 IRE. Between these larger blocks are three smaller bars – one at left that is slightly *darker* than NTSC black (3.5 IRE), one at right that is slightly *lighter* (10.5 IRE). These are separated by another equal-sized 7.5 IRE bar.

Our criteria for adjusting black level takes advantage of the fact that nothing in NTSC should ever be 'blacker' than 7.5 IRE. This means that when the monitor's black level is too bright, both the 7.5 IRE and 3.5 IRE bars will be distinct. Set properly, it will be impossible to distinguish them from one another. Conversely, if the monitor's black level was too dark, it would be impossible to distinguish between the (lighter-than NTSC black) 10.5 IRE bar and its darker neighbors.

Here are steps you can follow:

1. Having warmed the monitor up as described earlier, start by enabling the monochrome switch, if your monitor is so equipped (otherwise, turn the *Color* or *Saturation* knob all the way down).

2. Set the monitor's *Contrast* knob to its center detent.

3. Play with the *Brightness* knob until you can clearly discern the bars for all three black levels in the *PLUGE*.

4. Gently turn *Brightness* down until the 3.5 IRE and 7.5 IRE bars merge, becoming indistinguishable from one another.

5. You should be able to just notice the difference between the 7.5 IRE bars and the brighter 10.5 IRE bar.

6. Raise the *Contrast* level, brightening the 10.5 IRE bar quite a bit. You may notice that the large white bar second from the left at the bottom (Super White) becomes overblown, showing blooming into its neighboring color bars.

7. Dial *Contrast* back down until the Super White bar is just white, not blazingly so, and does not bleed into the other bars. The 10.5 IRE bar in the PLUGE should be just distinct from the 7.5 IRE bars again at this point.

PAL

1. Warm up the monitor as previously mentioned.

2. Set the monitor's *Color (or Saturation)*, *Contrast* and *Brightness* to their lowest settings.

3. Slowly raise *Brightness* until the black bar just begins to lighten.

4. Adjust the *Contrast* until the bars seem to be evenly graduated (ignore the white bar).

5. Tweak the *Contrast* watching the white bar carefully. When it stops getting brighter in response, pull it back slightly to the point where it just starts to have a dimming effect again.

C.3.4 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 325).

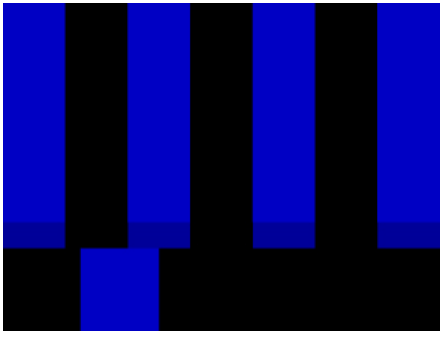


FIGURE 325

2. If the monitor lacks a "Blue-gun only" feature, you can obtain a colored filter such as a Kodak Wratten #47B gel, and hold that between your eyes and the monitor for a similar result.

3. Tweak the *Color* (or *Saturation*) knob until the small rectangular patches at very bottom of the tall upper bars on the extreme right and left of your screen merge with the tall bars above.

4. Tweak the monitor's *Hue* control until the small rectangles beneath the third and fifth tall upper bars likewise blend into bar above.

5. You may need to redo the last two steps several times, balancing the adjustments of these two controls until all four of the lighter bars evenly match the smaller rectangles just beneath them. (Note that a perfect match simply may not be possible on some monitors.)

6. Check your results with some familiar imagery, and make any further tweaks you feel are required.

PAL

1. If your monitor has a "Blue-gun only" setting, enable it. Raise the *Color* or *Saturation* setting until the three right hand bars all appear to be the same shade.

2. If the monitor lacks a "Blue-gun only" feature, you can obtain a colored filter such as a Kodak Wratten #47B gel, and hold that between your eyes and the monitor for a similar result.

3. Turn off the "Blue-gun only" feature (or dispense with the filter if you used one), and examine the red bar. It should appear not 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.

D KEYSTROKE SHORTCUTS

D.1 SWITCHER…

Program Row, Inputs 1 to 24	F1 – F12 plus [Shift + F1-12]
Preview Row, Inputs 1 to 24	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 AND GRAB

Record on/off	r/ Shift + r
Grab (still image)	p

D.4 TABS

Show DDR 1 tab	Ctrl + F1
Show GFX 1 tab	Ctrl + F2
Show Sounds tab	Ctrl + F3
Show Audio tab	Ctrl + F4
Show DDR 2 tab	Ctrl + F5
Show GFX 2 tab	Ctrl + F6
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 DDR 1

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

D.7 DDR 2

Stop	Alt + k
Play	Alt + l (lower case L)
Go to previous playlist item	Alt + j
Go to next playlist item	Alt +; (semi colon)
Autoplay On/Off	Alt + u
Loop On/Off	Alt + ‘ (apostrophe)
Single On/Off	Alt + q
Navigate through Playlist items	Up/Down/Left/Right Arrows
Set In Point for current Playlist Item (Clip or Audio file)	Alt + i
Set Out Point for current Playlist Item	Alt + o

D.8 GRAPHICS 1

Stop	Shift + k
Play	Shift + l (L)
Go to previous playlist item	Shift + j (J)
Go to next playlist item	Shift + ; (:, colon)
Autoplay On/Off	Shift + u (U)
Loop On/Off	Shift + ‘ (“, quotation)
Single On/Off	Shift + 1 (Q)

D.9 GRAPHICS 2

Stop	Ctrl + k
Play	Ctrl + l (lower case L)
Go to previous playlist item	Ctrl + j
Go to next playlist item	Ctrl +; (semi colon)
Autoplay On/Off	Ctrl + u
Loop On/Off	Ctrl + ‘ (apostrophe)
Single On/Off	Ctrl + q

D.10 SOUND

Stop	Ctrl + Shift + k
Play	Ctrl + Shift + l (lower case L)
Go to previous playlist item	Ctrl + Shift + j
Go to next playlist item	Ctrl + Shift + ; (semi colon)
Loop On/Off	Ctrl + Shift + ‘ (apostrophe)

Single On/Off	Ctrl + Shift + q
Set In Point for current Playlist Item	Ctrl + Shift + i
Set Out Point for current Playlist Item	Ctrl + Shift + o

D.11 GENERAL

D.11.1 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.11.2 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.11.3 MISC.

Cut	Ctrl + x
Copy	Ctrl + c
Paste	Ctrl + v
Delete	Delete Key
Show TriCaster version	Alt + b

E 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, 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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Acknowledgments: Tim Jenison, Jim Plant

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Design Consultants: Kris Gurrad, Dimitry Czar, John Powell

Additional thanks to:

- NewTek Marketing and Sales
- NewTek Customer Support
- NewTek Business Development

TriCaster