NewTek TriCaster™

TCXD300

HD PORTABLE LIVE PRODUCTION

USER GUIDE

![NewTek logo](www.newtek.com)

TRICASTER™ TCXD300

TC

TABLE OF CONTENTS

PART I (GETTING STARTED)

Introducing TriCaster™ TCXD300 – connections and registration, a top-level overview of primary features, and a hands-on tour to get you started.

1   ABOUT THIS MANUAL

Hate reading manuals? If so, you are part of the majority (estimates are that between 60 and 97% of the human race concur). Most prefer to jump right in, maybe asking a friend for occasional help (and who can blame them)?

This manual attempts to tell you what you need to know in a friendly, concise way, while also providing a deeper reference section you can turn to when you really need specifics.

If you do hate reading, please take a moment to peruse at least *this* section, which explains the manual's organization. You may find you can escape with a minimum of reading. (Or, if you are a devout reader, you can be the hero the others turn to for expert advice!)

- **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 45 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 B lists all shortcut keys. Part III is also home to a comprehensive keyword index.

2 INTRODUCTION

Thank you for purchasing this NewTek™ product. TriCaster™ TCXD300 is the newest addition to a family of video systems and software with a proud heritage. A genuine video pioneer, NewTek is justifiably proud of its innovation, ongoing commitment to excellence and superb product support.

This chapter provides a quick tour of the major components of your TriCaster system.

2.1 OVERVIEW

Traditionally, producing live high definition television has been very costly, requiring very expensive equipment and a large crew. TriCaster TCXD300 (like its standard definition siblings) changes all that. In one lightweight, portable system (small enough to fit in a backpack) you have a complete toolset to create, broadcast, web stream and project your HD production. TriCaster TCXD300 even includes NewTek's revolutionary LiveSet™ system to provide you with network quality virtual sets, for 'bigger than life' production capabilities.

TriCaster thus sets a new benchmark for "portable live production". It is the most complete, reliable and efficient system available for live production and web streaming. Its small footprint makes it possible to broadcast from almost anywhere, 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 (in both Standard and High Definition) from diverse sources and materials – use multiple cameras, recorded digital video, PowerPoint™ presentations on networked laptops, live web pages, digital photos and graphics, and much more. Your presentations can be simultaneously displayed by video projectors, television monitors and streamed in high quality on the Internet.

2.2 STARTUP SCREEN

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

Figure 1

The 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.

Having created a session (or opened an existing one), you proceed to the similar Sessions screen. Here you can launch the **Live Desktop** (for live production), or perhaps choose to **Edit**, prepare **Graphics** (title pages)**,** or **Manage** content from the rotating function selector allow.

2.3   LIVE DESKTOP

TriCaster's live production features are all available from its unique **Live Desktop**, which in large measure mimics familiar production equipment. That said, the Live Desktop provides a great deal more functionality than that of similar single-purpose devices.

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

MONITORING

LIVE CONTROL

TABBED MODULES

Figure 2

The uppermost area is devoted to **monitoring**. The **Switcher** is centrally located, and is also home to the **Transition** and **Overlay** controls. The bottom-most section of the **Live Desktop** holds side-by-side tabbed panels featuring media players (**DDR, Stills** and **Titles**), **Virtual Input** setup, and the **Audio Mixer**.

2.4   FEATURES

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

2.4.1   A/V INPUT AND OUTPUT

- Live switch between three SDI and/or analog HD or SD cameras.
- Professional BNC video connectors provide increased durability and reliability for camera connections.
- Input and output 4:3 or 16:9 widescreen formats.
- Freely mix SD and HD sources in both HD and SD sessions.

- Output SD and HD simultaneously.
- Integrated DDR and Stills modules allow you to insert pre-recorded video, sounds or 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 client.
- Mix internal and external audio sources.
- Supply external audio via analog, AES/EBU (AES3) or SDI Embedded audio.
- Balanced XLR and ¼ phone jack audio connectors.
- Send output to a video to a projection system (or secondary monitor), up to WUXGA (1920x1200) resolution.

2.4.2 MONITORING

Figure 3

TriCaster's **Live Desktop** includes a large **Program** output monitor with associated controls. Also, freely toggle between viewing:

- **All Monitors -** ISO monitors for all sources (Figure 3)
- **Switcher Monitors** - Preview and Effects row selections ( )
- **Preview Scopes** - Waveform and Vectorscope monitors, along with the Preview row selection
- Plentiful second monitor output options including:
    - All ISOs *plus* Preview, Program and clock
    - Waveform + Vectorscope + Preview
    - More …

2.4.3   MULTIPLE PROC AMPS

- Separate control over the **Brightness**, **Contrast**, **Hue** and **Saturation** for each video input.
- Separate Proc Amp control over **Program** output and **VGA** (projector) output.

2.4.4   THE SWITCHER

The three row **Switcher** allows you to freely *hot-punch* between external (**Camera** and **Network**), internal (**DDR**, **Stills** and **Titles**) and **Virtual Inputs**, or **Take/Transition** between **Preview** and **Program** row selections. The **Effects** row allows you to choose a third source for use in **Overlay** channels or **Virtual Inputs**.

2.4.5   TRANSITIONS
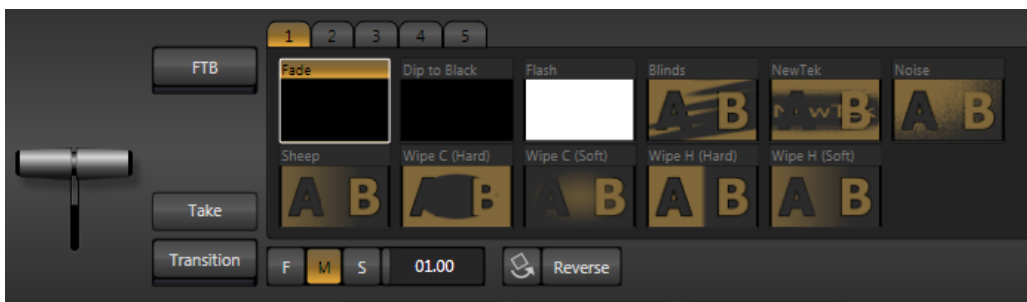
- One-click **FTB (Fade to Black)**, **Take** or **Transition.**
- Traditional **T-bar** transition controller.
- **Reverse** switch.
- **Ping Pong** – automatically cycle the direction of transitions.
- Transition **Speed** presets and variable timing.

2.4.6 OVERLAY
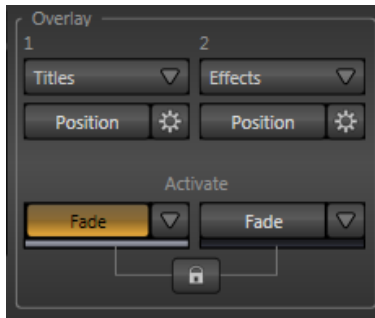
Figure 6

TriCaster's **Overlay** section provides dual-channel downstream keying, allowing you to assign any switcher source to either channel. Overlay channels can be displayed (and removed) in tandem or independently.

You might use the **Stills**, **Titles** and **DDR** modules to overlay graphics and text, including scrolls, crawls and motion lower-thirds -- but there's nothing preventing you from assigning a **Camera** input or **Network** source as an overlay using the **Overlay** section's *source selector* buttons.

Independent **Position** and **Scale** controls *for each overlay channel* permit you (for example) to configure two live sources as 'Picture in Picture' elements using the **Overlay** channels, freely switching them on and off (with or without individual custom effects), all *without* using the main **Switcher** rows and **Transitions** section (which thus remain free for other duties).

2.4.7 RECORD AND STREAM

- Record your live-switched production at full resolution to a multi-platform compatible format, or archive your Internet stream.
- Simultaneous output for broadcast, projector and live web stream to in-house and remote audiences.
- Use either Windows Media™ or Flash Media™ streaming.
- Store over 18 hours of HD video.

2.4.8 AUDIO MIXER
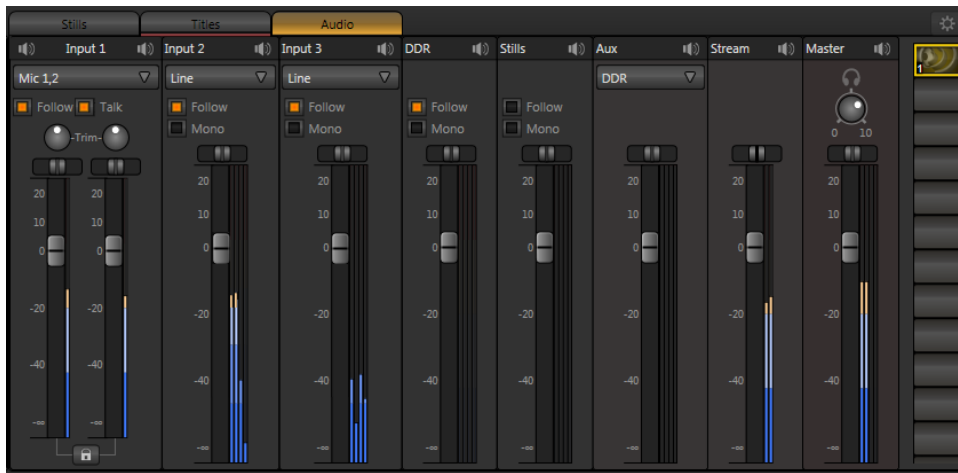
TriCaster provides extensive multi-channel audio control and management. Adjust individual audio sources (internal and external) and introduce them into your program manually or automatically. Control output levels for program, headphones, auxiliary output and stream separately. **Presets** allow single-click access to prepared mixer setups.

2.4.9 INTEGRATED MEDIA PLAYERS

TriCaster's media players and title system serve up graphics and titles during your live productions quickly and easily.

- Add a/v clips, sound files or still image files to the **DDR** (**Stills** supports image files, sounds and title pages).
- Trim and re-order playlist entries.
- Store playlists as presets for easy recall.
- Flexible playback controls include variable **Speed** and **Loop** options.
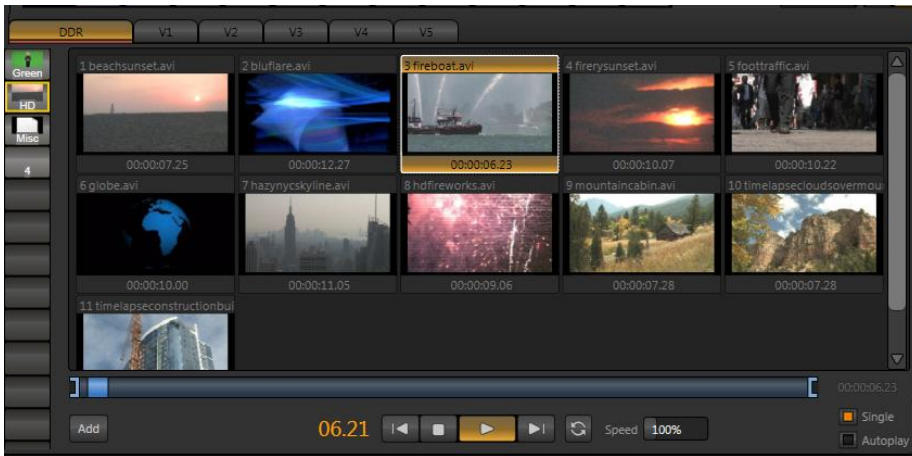
Figure 8

- Start and stop playback manually or automatically.
- Use two media players (**DDR**, **Stills** or **Titles**) to create automated 'slide-shows', complete with transitions.
- Assign titles, graphics or a/v clips to multiple **Overlay** channels.

2.4.10 KEYING, VIRTUAL SETS AND VIRTUAL INPUTS

- Use **LiveMatte**™ realtime keying technology for green/blue screen effects.
- Apply independent LiveMatte settings to all video sources.
- Achieve the look of a sophisticated studio setting in a very small space with NewTek's **LiveSet**™ virtual set technology.

- **Zoom** in/out on **LiveSets** during your live productions right from the **Live Desktop**.
- **Virtual Inputs** (Figure 9) permit M/E (Mix/Effect) style compositions of two primary switcher sources, with convenient scale and position controls.
- **Virtual Inputs** also sport an integrated overlay channel, selected from any switcher source, with its own scale and position controls.
- Module **presets** allow single-click access to prepared playlists for **DDR**, **Stills** and **Titles**, as well as pre-configured **Virtual Input** setups.

2.4.11 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.

2.4.12 EDIT

The full version of NewTek's popular and versatile non-linear video editing program SpeedEDIT™ is included as well. SpeedEDIT provides powerful 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.

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

3   SETTING UP

This chapter explains how to properly connect power, external control devices, monitors and audio visual sources to your NewTek TriCaster system.

It also reviews registration for warranty purposes and technical support. After completing this short section, you'll be all set to continue into the Quick Start chapter that follows it.

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

1. TriCaster TCXD300
2. Keyboard and Mouse
3. A/C power cord
4. DVI->VGA adapter, DVI->HDMI cable and BNC->RCA adapters
5. TriCaster / 3PLAY First Look DVD
6. Getting Started DVD
7. XD300 Quick Start Guide
8. Registration reminder card

3.1   COMMAND AND CONTROL

1. Connect an external computer **monitor** to a port appropriate for your monitor connection (DVI or VGA) on TriCaster's backplate – use an adapter if necessary.

Note: TriCaster's user interface requires a minimum screen resolution of 1280 x 1024 for 4:3, or 1440 x 900 for 16:9.

2. Connect the **mouse** and **keyboard** to USB ports on TriCaster.
3. Connect the **A/C power cord** from the three-prong connection 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).

> *Hint: Though not required for TriCaster to function, it is always wise to use an uninterruptable power supply (UPS) for any 'mission critical' system. Likewise, consider A/C "power conditioning", especially in situations where local power is unreliable or 'noisy'.*
>
> *Power conditioning can reduce wear on power supplies and other electronics, and also provide a measure of protection from surges, spikes, lightning and high voltage.*

3.2   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.
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 3.13 for more on network connections.)

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

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

3.3 TRICASTER 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. It provides the unique **Product ID** you need to register your system. A 90 day period is allowed for your TriCaster to be registered and 'unlocked' (by entering the **registration code** in the space provided.)
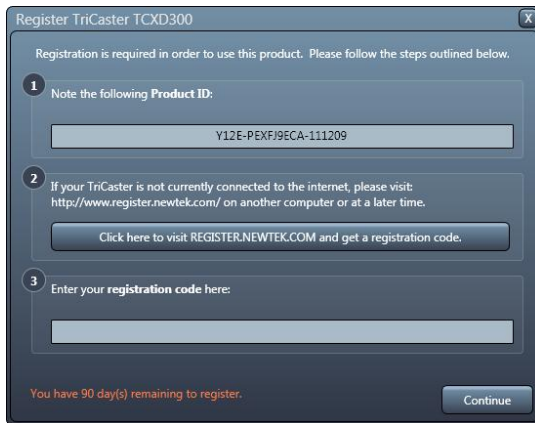
Figure 10

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.

3.3.1 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) in the **Customer Care** section of NewTek's website where you will find further directions.

Hint: More information on connecting TriCaster to a network can be found in Section 3.13

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 3** of the dialog. (You'll want to record the *login name* and *password* you choose when creating your website profile, and check your personal area of the site from time to time

afterward. Among other things, you'll be able to download any software updates that are made available.)

3.3.2   REGISTERING BY TELEPHONE

NewTek's Customer Care 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 Service follow:

- **Telephone:** (US) 1-800-862-7837
- (Outside US) +1-210-370-8000
- **Fax:** 210-370-8001

Note: For Technical Support contact information, please see Section A.6.2*.*

3.4   INPUT CONNECTIONS

3.4.1   CONNECT A/V SOURCES

Three external audio and video sources can be added to the input connectors on TriCaster's front panel.

Figure 11

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

    a. **SDI** − Attach the SDI source connectors to BNC connectors marked **SDI** in the **Video In** group.

    > *Hint: If your equipment supports SDI, this is your best quality I/O option.*

    b. **Component –** Attach the appropriate BNC connectors from your sources to the *second, third and fourth* BNC connectors (labeled **Y**, **Pb** and **Pr**) in each row 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 *third* of four BNC connectors (labeled **Pb**). Attach the source's **C** (chroma) connector to the *fourth* connector (labeled **Pr**).

    d. **Composite -** Attach the composite source's connector (may require an RCA to BNC adapter) to the *second* connector (labeled **Y**).

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

2. To input analog audio* along with the video, connect the external audio sources to the XLR or 1/4 inch (6.3mm) phone jacks provided beside each video input section.

> ** Note: SDI video sources with embedded audio do not need a separate audio connection. Use the BNC connectors in the Digital Audio sections if required to connect AES/EBU audio sources.*

3.5 GENLOCK CONNECTION

3.5.1 GENLOCK CONNECTION

The **Genlock** input on TriCaster's front panel (Figure 12) 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.

Figure 12

Genlocking is commonplace in higher end environments, and genlock connections are usually found on professional gear.   If your equipment allows you to do so, you *should* genlock all cameras supplying TriCaster, *and* TriCaster itself. To genlock TriCaster, supply the reference signal from the 'house sync generator' to TriCaster's **Genlock** connector.

(If you haven't already done so, genlock all cameras connected to TriCaster inputs to the same reference signal – see your camera manual for details.)

IMPORTANT Note: Digital audio is less forgiving in certain respects than analog. To avoid occasional audio glitches when mixing digital audio (whether for recording or live production) you must ensure that the timing for all digital audio sources is synchronized.

This means that for digital audio, you must do one of the following: 1) genlock all digital audio sources and TriCaster to a house reference signal, or 2) genlock the cameras directly to the XD output.

3.6   OUTPUT CONNECTIONS

Next we'll discuss the vital external audio and video connectors, and relevant settings.

We'll start with output connections, not only so you can view your results, but because some aspects are best considered before even beginning a TriCaster session.

Figure 13

3.6.1   A/V OUTPUT

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

Figure 14

- Simultaneously send program output to both **Standard** and **High Definition** devices.
- Simultaneously send program output to both **Analog** and **Digital** devices.
- Send program output to a secondary monitor or projector.
- **Stream** program output to the **Internet** via a suitable network connection.

3.6.2 HD AND SD

As mentioned above, TriCaster supports *simultaneous* output of both SD (Standard Definition) and HD (High Definition) video. Flexible video output is conveniently presented on TriCaster's faceplate. The **Video Output** section provides three rows of BNC connectors which offer the following connection possibilities for live production:

- **Row 1 and 2** output format is determined by the session (see Section 5.1)
    - When the session is SD (4:3 or 16:9), output is SD (4:3 or 16:9).
    - When the session is HD, output is HD.

- **Row 3** always outputs video in SD format. If the session is 16:9, output from Row 3 is also 16:9, and output will likewise match SD 4:3 sessions.

3.6.3 CONNECTING DEVICES

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 type) or S-video (4 pin mini-DIN) to BNC adapters, and also that both of these connection options support output at SD resolution only.

    a. **SDI** – Attach SDI connectors to the BNC connectors marked **SDI**.

    > *Hint: If your equipment supports SDI connections, this is your best quality option.*

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

    c. **Y/C** – If your S-Video equipment and cabling has the usual 4-pin mini-DIN connectors, you will need an 'S-Video to dual BNC' adapter. Attach the **Y** (luma) connector of your device to the *third* BNC connector (labeled **Pb**). Attach the **C** (chroma) connector to the *fourth* connector (labeled **Pr**).

    d. **Composite -** Attach the device's connector to the *second* connector (labeled **Y**).

2. Connect TriCaster's audio outputs:

   a. **Analog audio** – connect external audio devices to the ¼" phone jacks in the ANALOG AUDIO OUT section.

   b. **Digital audio** - a separate audio connection is not necessary for SDI output with embedded audio. Use the BNC connectors in the DIGITAL AUDIO OUT section to connect downstream AES/EBU (AES3) audio devices.

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

3.6.4 VGA OUTPUT

A secondary monitor (or projection device) can be connected to TriCaster and used for a variety of purpose ranging from program output for IMAG (Image Magnification) installations or local monitoring for the convenience of the operator.
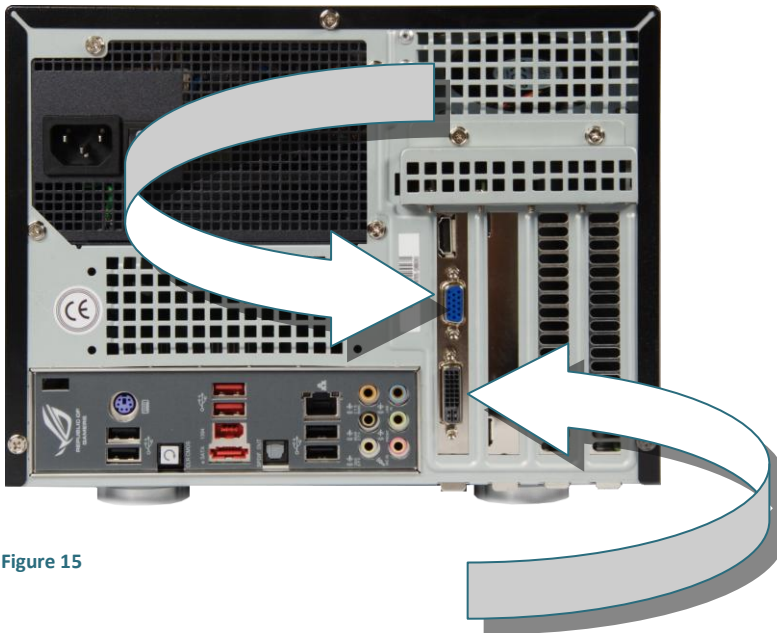
Figure 15

Simply connect the secondary device to the unused video output connector (DVI or VGA) on TriCaster's backplane before powering up. The new device should be recognized and enabled by the system automatically, and you can configure it using settings in TriCaster's Live Desktop (after creating a session).

Note: Physical ports may vary from Figure 15. Depending on the type of connection your external device supports, you may need an adapter to connect it. Also, it is important to configure VGA Output to the native resolution of the external display (monitor or projector) for best results.

3.7   TALLY LIGHTS

TriCaster's **Tally Light** support includes **Program** and **Preview** row selections (and *both*). The current **Program** row selection is indicated by a red LED. The **Preview** row selection is indicated by a green LED. When an input is selected for both **Program** and **Preview**, the tally light will be amber. For **Virtual Inputs**, the LED will light up when the source assigned to **Input A** is selected (on Program or Preview).

3.7.1   EXTERNAL CONNECTIONS
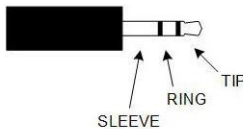
Figure 16

TriCaster provides 1.8" (3.5mm) female jacks next to each of the LEDs on its faceplate. These are located just left of the SDI connectors (under the column heading, **Tally**).

The jacks accept a standard 1.8" (3.5mm) male TRS plug. The 'TRS' designation refers to "tip", "ring" and "sleeve", describing the 3 contacts on the 3 plug (Figure 16).

- The tip and ring contacts supply a 'logic low' signal when the corresponding tally light is not lit, and 'logic high' when it is.

- An external LED may be directly driven by connecting it across either the tip and sleeve, or the ring and sleeve. The LED anode should be connected to the tip or ring, and its cathode to the sleeve.

- The tip-sleeve contact state is controlled by the **Program** row selection, corresponding to the red Tally Light on TriCaster's faceplate.

- The ring-sleeve contact state is controlled by the **Preview** row selection, corresponding to a green Tally Light on TriCaster's faceplate.

- When an input is selected on *both* **Program** and **Preview**, the faceplate Tally Light will glow amber.

Note: To prevent damage to TriCaster's components when making external connections to the tally light jacks, care should be taken that connection to the sleeve is always at ground potential.

3.8   STARTING A SESSION

If TriCaster is not already running, power it up now to reveal the **Startup Screen**. If TriCaster was 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; click the Back arrow at upper-left in the **Session Page** to return to the **Home Page**.

The **Startup Screen** consists of two similar interface pages – **Home** and **Session**. Among other things, the **Home** page is where you choose basic TriCaster session settings.

THE HOME PAGE

When no previously created sessions exist, the function selector ring dominating the **Home** page defaults to the **New** icon, inviting you to create a new session. A default name for the new sessions is listed at the top of the right-hand pane. Initially, the suggested name will be the current date. Click in this area to modify the name using the keyboard if you like.

Figure 17

Continue with session creation by designating the **Video Standard** used in your locale (International models only). For the moment, let's choose HD1080i for **Resolution** (even if the cameras you plan to connect are SD 4:3), then click the **Start Session** link below.

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. For SD mode, select between 4:3 and 16:9 image aspect. TriCaster International models permit you to select from three video standards according to your locale – NSTC, NTSC-J (Japan) or PAL.

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** icon on the rotating function selector, and then click the link **Start Live Production**.

Figure 18

This will launch the **Live Desktop**, which is likely the place where you will spend most of your time working with TriCaster.

THE LIVE DESKTOP
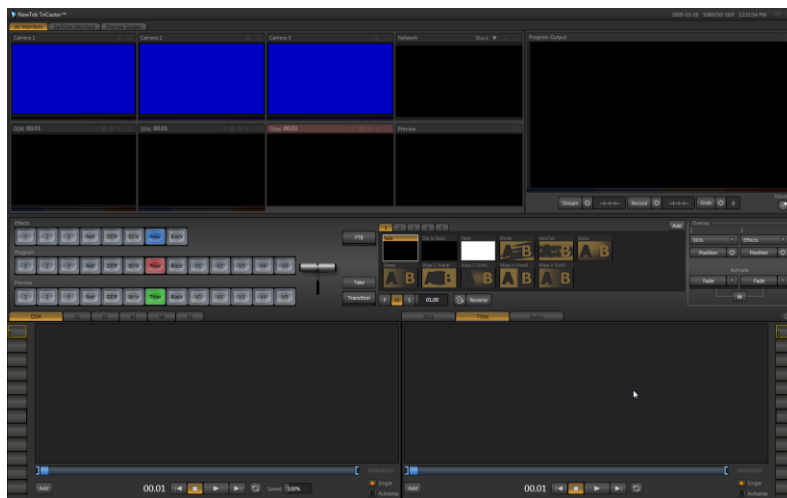
Figure 19

Initially, as you have yet to configure input devices or add content, the **Live Desktop** will look a bit barren (Figure 19).

Take a quick look around, but then let's continue to configure your devices. We had a brief glimpse of the Live Desktop back in section 2.3, but we'll examine it more closely in Chapter 4, Live Production – coming up soon.

3.9   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.

Figure 20

In other cases, however, you will likely connect external monitors to the **VIDEO OUT** connectors on TriCaster's faceplate (see Section 3.6). High definition monitors will be connected to either **SDI** or **Component** connections on the faceplate.

3.9.1   SD ANALOG CONFIGURATION

For standard definition monitoring, however, several types of analog connections are currently in popular use. These include **Composite**, **Y/C** (also known as S-Video) and – at the upper end of the analog quality range – **Component**. To connect an *analog* standard definition monitor for use in live production*, you must specify the connection type in the **Output Configuration** panel.
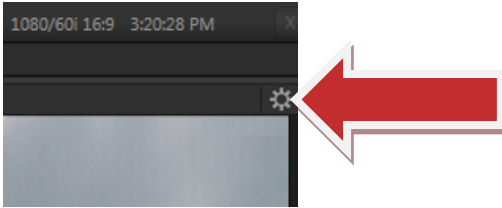
Figure 21

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

2. Click the **Configure button** (gear) that appears above its top-right corner (Figure 21) to open the **Output Configuration** panel.

The first tab in this panel is labeled **Program**. Optional settings for **SD Analog Connections** are located in the lower part of this pane (Figure 22).
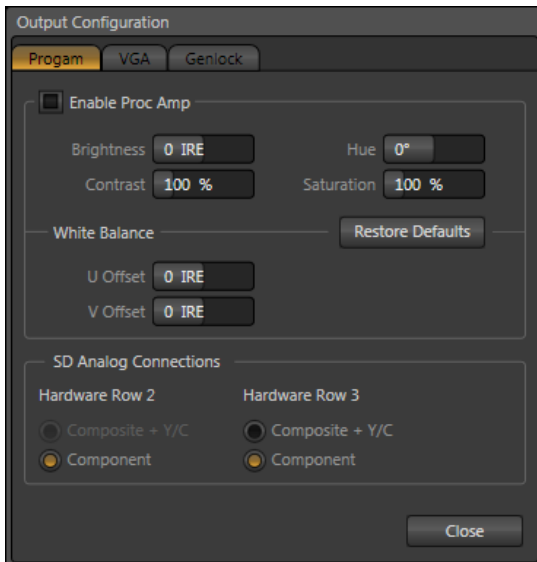
Figure 22

Two options are available below for each **Hardware Row**:

- **Composite + Y/C**
- **Component**

If you select the first option for either row, composite video output is provided on the second BNC connector in **VIDEO OUTPUT** (labeled **Y**), and Y/C is placed on the third and fourth connectors (labeled **Pb** and **Pr**, respectively).

Note: during HD sessions, Row 2 output is always HD. As HD analog monitors always use Component connections, the controls for Row 2 are locked during HD sessions.

3.9.2 CONFIGURE VGA OUTPUT
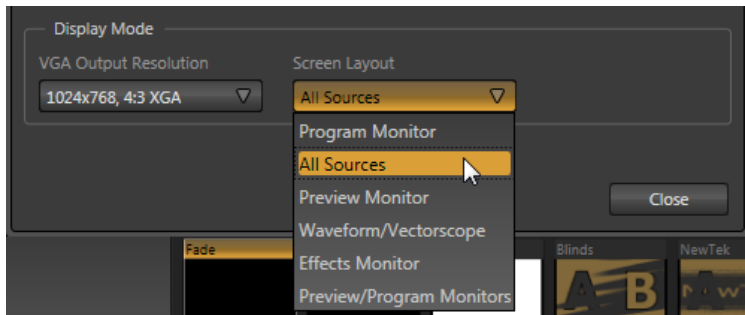
Figure 23

The **Display Mode** section of the next (VGA) tab in **Output Configuration** determines what is displayed on TriCaster's secondary video output, and the resolution of that display. You could use this output to supply a video projection system or a subsidiary monitor.

The **Screen Layout** drop-down menu provides numerous optional displays, including **Program**, **Preview** or **Effects** monitors, an **All Sources** (ISO monitors for all Switcher sources, plus a clock) option, and more.

Set the **VGA Output Resolution** to the native resolution of your external device, and try the various display options to find the one that best suits you current need.

3.10 CONFIGURE VIDEO INPUT

Let's continue by configuring the video sources you connected earlier (Section 3.4):

1. Click the **All Monitors** tab at upper-left on the **Live Desktop**.

2. Move your mouse back and forth over the preview monitors labeled **Inputs 1-3**.

3. Notice that a **Configure button** (*gear* icon) appears above the top-right corner of the preview monitors as you do so.
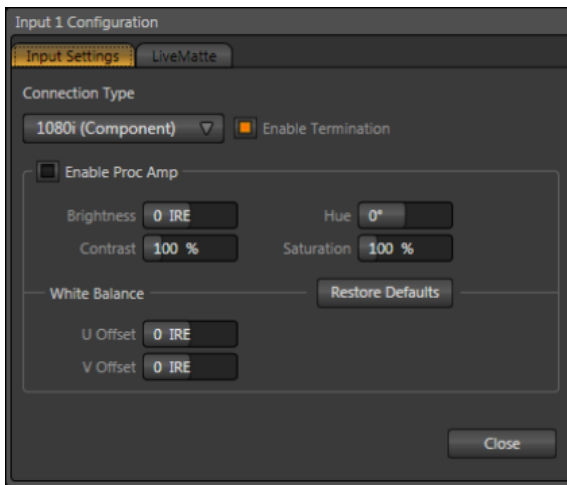
4. Click the **Configuration button** to open a tabbed settings panel for **Camera 1** (Figure 24).

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 plan to connect to this input.

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 external video sources in the same manner.

We'll look at the other options and settings in the **Configuration** panel later (see Section 8.2), but at this point you should be able to view the video inputs you have configured on their respective preview monitors.

3.11 CONFIGURE AUDIO

Click the **Audio** tab in the lower third of the **Live Desktop** to reveal audio set up and control features.

Figure 25

The tab houses individual control panels providing control for:

- **Inputs 1-3** - the three rows of external audio inputs on TriCaster's faceplate.
- **DDR, Stills** – internal audio sources (the **DDR** and **Stills** modules can both play sound files).
- **Aux** –auxiliary output to the **AUX** section of TriCaster's faceplate.
- **Stream** – network streaming audio.
- **Master** – primary program output through the **PGM** output connectors.
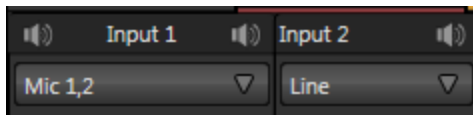
There is a source **Type** selector drop-down at the top of the control panels for **Inputs 1-3**. Clicking it opens the list of connection types.

The **Type** options for **Input 1** are slightly different, including two **Mic** options (with and without *phantom power*). This is because the faceplate provides two combination XLR/Phone connectors in the analog portion of the row labeled Input 1, while Inputs 2 and 3 each contain four phone jacks instead.

After connecting audio sources to the input connectors (see also Section 3.4.1), the first thing to do is set the correct **Type** using the drop-down menu. Select **Mic** for professional grade microphones or other low impedance connections, **Mic + Phantom** for condenser microphones requiring supplementary power, **Line** for higher impedance device connections (such as a CD player, computer audio output or VCR), and **AES/EBU*** or **SDI Embedded*** as required to connect a digital audio source.

 * (see important note about synchronizing digital audio sources in Section 3.5.1)

Note: Analog 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 48 kHz.

The **Gain** sliders next to the **VU meters** for Inputs 1-3 default to their lowest setting on first launch. After adding audio sources, slowly bring these sliders up to pass their signals through the system. The 0dB position represents *unity gain* – that is, the (post-Trim) signal is passed through as-is, without increase or decrease.
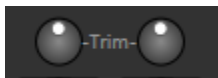
Hint: As for most numeric controls in TriCaster, Shift + double-click control knobs to reset them to their default (0dB for Gain sliders).

Some variation exists as respects the signal levels of low impedance sources. For **Mic** (and **Mic + Phantom**) connection types, the **Trim** controls (Figure 27) provide a preliminary adjustment to allow you to match the input level. Use **Trim** to bring the levels for microphone and similar sources into a useful range on the VU meter.

Note: The top of the VU scale represents 0dB FS (decibels, Full Scale). Input signal levels above this point cannot be correctly transmitted or recorded by TriCaster. For this reason, the level display on the VU meter is drawn in red well below this limit.

To be safe, avoid recording signals that exceed-14dB FS. As in any digital system, signal levels that would exceed the maximum are 'clipped' (uniformly assigned the maximum level value), inevitably entailing losses and possibly audible glitching. Use Trim and Gain judiciously to ensure strong signal levels without over-modulation.

3.12 CONFIGURE GENLOCK

1. If necessary, open a TriCaster session from the **Startup Screen**, and access the **Output Configuration** panel by clicking the **Configure button** (the small 'gear' icon) that appears at upper-right when you move the mouse over the main **Program Output** monitor on the **Live Desktop**).

2. Click the **Genlock** tab in the **Output Configuration** panel.
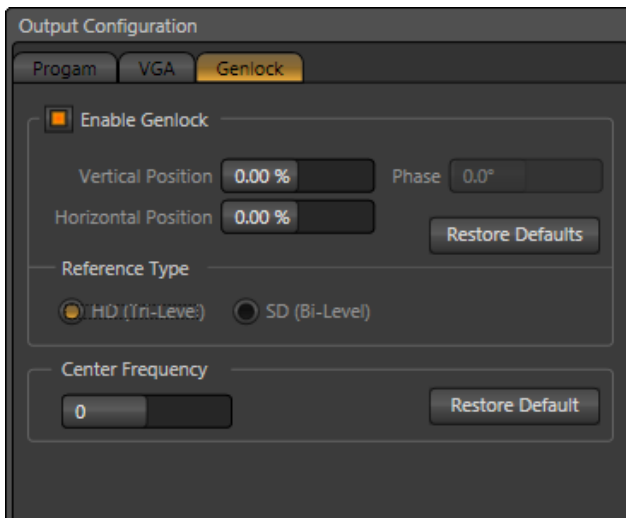
3. The default **Reference Type** in the Genlock settings is **SD (Bi-level)**, as this is by far the most common reference signal type. However, if you supply an HD reference signal to the Genlock input, change the setting to **HD (Tri-level)**.

4. 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.

Again, 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 applied. Time Base Correction may drop or insert frames as necessary to maintain sync, hence it is a less desirable approach.

Note: For a deeper explanation of genlocking, please see Section 8.1.5.

3.13 NETWORKING

TriCaster is capable of displaying screens from networked computers running NewTek's iVGA™ client software, or output from other supported applications (such as NewTek's own LiveText™).

Connecting TriCaster to a *local area network* (LAN) may require additional steps beyond those mentioned back when we discussed Microsoft Windows ™ activation (Section 3.2). Here is the basic procedure involved in joining a *workgroup*:

1. Connect an *Ethernet* cable from the port on TriCaster's back plate to your external network.

2. (If necessary) – close the **Live Desktop**, go to the **Home Page** and click **Shutdown**, then select **Exit to Windows** at right to access the operating system's own desktop.

3. Right-click on the **My Computer** icon, and select **Properties.**

4. Scroll down in the right hand pane of the **System** panel that opens to find the **Computer name, domain and workgroups** settings area.

5. Click the **Change Settings** link at right.

6. Click the **Computer Name** tab of the **System Properties** panel that opens.

7. Click the **Change** button, and enter the name of your local *workgroup*, as provided by your system administrator.

8. Close the **OK** button.

9. Close the **System** control panel.

10. At this point**,** the network connection should be functional. If further help connecting is required, please consult your system administrator.

The next section (Chapter 4, Live Production Walkthrough) will guide you through your first experience using TriCaster.

4 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 the fundamentals:

- Startup and Import
- Monitoring and related features.
- Network sources.
- Switching between video sources and using transitions.
- Mixing audio (and the Audio Follow feature).
- Recording a/v clips and Program Output.
- Playing stored clips using the DDR ('Digital Disk Recorder') .
- Adding (and editing) title pages and graphics.
- Using LiveMatte to create a simple chromakey effect.
- PiP (Picture in Picture) effects – superimposing one video source on top of another.
- Creating a LiveSet (virtual set) shot.
- Using Virtual Inputs.
- Streaming your program to the Internet (and recording the stream).

4.1 CREATING A SESSION

We ran through the basics of starting new *sessions* and configuring devices back in sections 3.8 though 3.12. If you need to review this information, go ahead and do so now. We'll look at these items 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 **Sessions page** of the Startup Screen will appear when you click **Start Session.**

3. Click the **Manage** icon on the function selector ring (Figure 29).
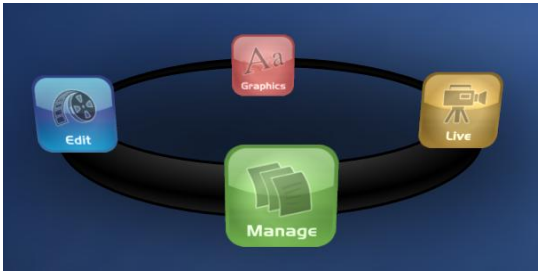
Figure 29

4.2   IMPORTING CONTENT

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

5. Navigate to *C:\TriCaster\Documentation\Walkthrough Content*.

6. Click in the file pane in the system **File Explorer** that opens, and press **Ctrl + a** to select everything – then click **Open.**

7. You'll see several new file windows pop up, each showing the content you imported in its new location. Notice that different media types are automatically sorted into their respective destination folders (we'll use these files later).

8. Close the file windows, click the **Live** icon on the selector ring, and then click **Start Live Production** at right.

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). See Section 6.4.1 for more information.

At this time, though, we want to begin our tour of the **Live Desktop** with consideration of the monitoring features and options it provides.

4.3   MONITORING

4.3.1   PROGRAM OUTPUT

Inevitably, you'll be paying a lot of attention to the main **Program Output** monitor (Figure 30), found at the right side of the **Live Desktop** in the upper (monitoring) section. This display shows you what you are sending to downstream devices – and your viewing audience.

Situated beneath the monitor itself are **Stream, Record and Grab** buttons, their respective **Configuration** buttons and time/counter fields (we'll look at those features later).

Figure 30

*Hint: Move your mouse over **Program Output**, then click the **Configure button** (gear) that appears above it to open a tabbed panel containing **Proc Amp** and **Genlock** settings.*

4.3.2   ALL MONITORS

Click the **All Monitors** tab at upper left to view dedicated (ISO) monitors for all three main video inputs, along with an array of other previews.

These include monitors showing the current playlist items in the **DDR**, **Still** and **Titles** modules, and the **Network** source – such as an **iVGA** input or **LiveText™** title from another computer on the network.
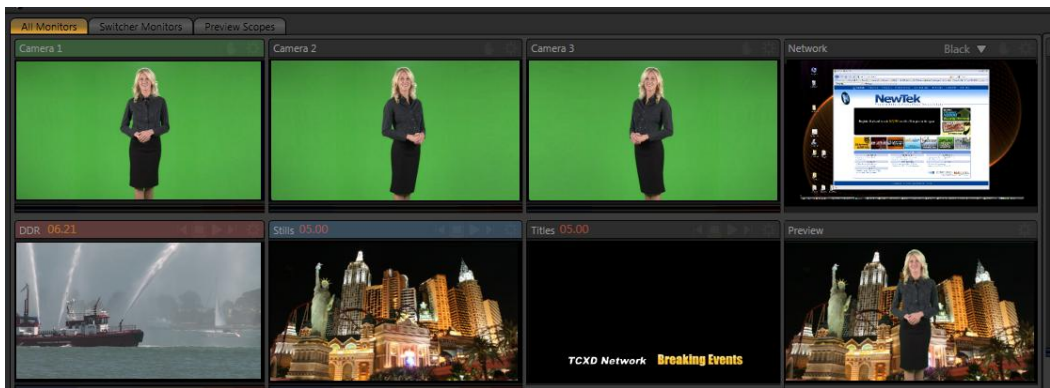
Figure 31

The source currently selected on the **Program** row is highlighted in red. The current **Preview** row selection has a green highlight, while the **Effects** row border selection is tinted blue.

Note that the ISO monitors are *interactive*:

9.   Click a monitor once to select the corresponding source on the Switcher's **Preview** row.
10. Click the Preview monitor again to perform a **Take** (swap) between the **Program** and **Preview** row sources on output.
11. Double-click any monitor to send that source immediately to **Program** output.

And, as discussed in Section 3.10, the Camera 1-3, Effects and Preview monitors display a **Configuration button** allowing input type selection and more, including **Proc Amp** (see Section 8.2.2) and **LiveMatte** controls (see Section 4.10).

Further, ISO monitors provide popup contextual controls including things like **Play** or **Stop** (**Freeze**), and **Network** source selection (see Section 7.2.1).

4.3.3   SWITCHER MONITORS
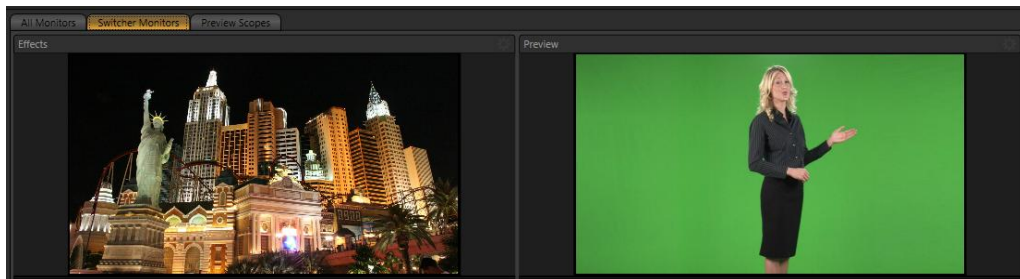
In this configuration, the left section of the Live Desktop's monitoring section displays two larger preview panes. These show just the video sources currently selected on the **Effects** and **Preview** row in the **Switcher**.

You can use these larger monitors to sample the video feed from any source by selecting them one at a time on **Preview** or **Effects**, but they are handy in other ways too. Among other things,

they provide a convenient view for adjusting **LiveMatte** or **LiveSet** effects. Hover the mouse over the **Preview** or **Effects** monitor, then click the **Configure button** (gear) above to display the settings for the current video source (i.e., the one selected on the corresponding Switcher row.)

Hint: Unlike the ISO monitors, these monitors do not feature interactive switching functions, nor of course are colored borders required to indicate their Switcher selection status.

4.4   AUDIO MIXER

Having previously connected and configured your audio inputs, let's explore a few of the other features in the Audio tab. You will need to have speakers connected to (at least) the first two connectors (channel 1 and 2) in the **PGM** row of TriCaster's **Analog Audio Out** section (even better, if you have them handy, connect a pair of stereo headphones and put them on).

4.4.1   MUTE, MONO AND BALANCE

1. Click the **DDR** tab

2. Click the **Add** button in the **DDR** pane

3. Click the **Practice Session** entry under the heading **Audio** (in the **Location** list at left).
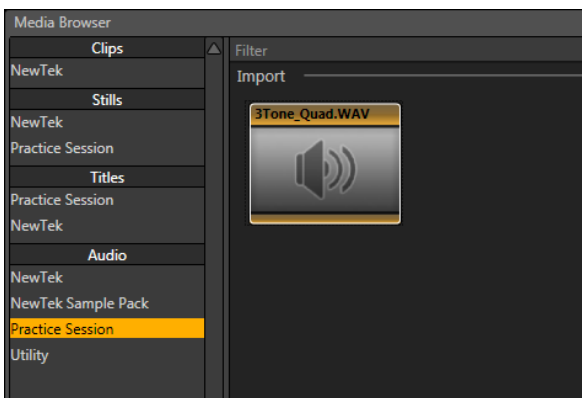
Figure 34

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 sound file to the DDR playlist.

6. Turn on both **Single** and **Loop** for the **DDR**, then turn **Follow** *off* for the DDR

7. Click the **Audio** tab, and **Mute** Inputs 1-3 (click the *speaker icons* at upper-right in each input control panel, so they show a red stroke through them).
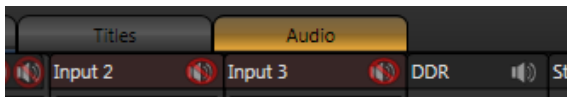
8. Make sure **DDR** audio is *not* muted (Figure 35).

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

10. Click the DDR's **Play** button.

   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 **CH1**) and a higher pitched tone from the right speaker (connected to Output **CH2**).

   > *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.*

   You can also observe that the **VU meter** shows matching levels for all four input channels (Figure 36).

11. Next, drag the **Balance** slider all the way to the left. As you do so, observe that the level on channels 2 and 4 are gradually reduced. At the extreme left position, these two channels are completely silent. Only the mid-range tone (on channel 1) is heard, and only from the left speaker at that – see Figure 37.
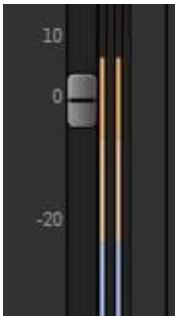
12. Moving the slider to the right (of center) has the opposite effect, reducing channels 1 and 3 – doing so without any effect on the other 2 channels. At the extreme right position, only the mid-range tone from the DDR file is audible (and only from the right speaker).

The lesson here is that – unlike **Mono**, considered shortly, or **Pan** – **Balance** does not 'move' audio from one channel to another. You cannot use it to 'blend' channel 1 with channel 2, for

example. Balance regulates the levels for one pair of channels (1 and 3, or 2 4) at a time, and does not affect the other pair in 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** in the **DDR**

> *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.*

4.4.2   PAN

The **Pan** control looks much like the **Balance** slider, but has special abilities. Pan is uniquely available for **Input 1**, and even then only appears when one of the two **Mic** input **Types** is chosen.
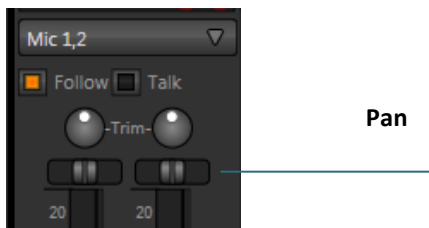
Figure 38

A **Pan** slider is provided for *each* of the two channels in the **Input 1** section (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 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.

4.4.3   TALK

    17. Start the **DDR** playing the audio tone file again.
    18. Enable the **Talk** switch in **Input 1**, but watch the DDR **VU meter** as you do so.

Talk is an abbreviation of "Talk Over". 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 principal purpose.

4.4.4   FOLLOW
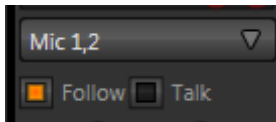
    19. Connect cameras to both **Video In** rows 1 and 2.
    20. Connect two (audibly different) active audio sources to **Audio In** rows 1 and 2.
    21. Enable the **Follow** switch in the **Audio Mixer** for both **Input 1** and **Input 2**.
    22. Select the button for video **Input 1** on the Switcher's **Program** row.
    23. Select the button for video **Input 2** on the Switcher's **Preview** row.
    24. Click the **Audio Mixer** tab.
    25. Click the Switcher's **Take** button

Notice that when the video source assigned to Input 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 that video source, the VU meter still shows audio levels, but the graph is drawn in black and white (providing confirmation that audio is present even before you switch).

Hint: Follow even works when the associated video source is displayed on Output as an Overlay or Virtual Input source.

4.5   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 as **Switcher** sources from computers on the same network via the supplied **iVGA™** client application (not required for LiveText).

4.5.1   IVGA CLIENTS

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

    For **OS X** client systems, copy the file *iVGA.dmg.zip* from the same folder to the 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 Section 9.1 for more detail).

2. Connect **TriCaster** to the client computer via the local network. (For computer-to-computer connections, use the supplied crossover cable to connect directly to TriCaster).

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 the iVGA client list.

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

Figure 40

When TriCaster recognizes qualified network sources, it adds them to a drop-down menu for quick selection (Figure 40).

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

5. Click the triangular menu button above the monitor to quickly select a networked source (or change the current selection) from the menu located.

> *Hint: iVGA places a red-green-blue 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 is animated when the iVGA source is selected as the active Network source in TriCaster.*

4.5.2 LIVETEXT™

NewTek's (optional) standalone LiveText™ application offers features that are very similar to TriCaster's integrated **LiveText** (see Chapter 17), but installs separately on a compatible Microsoft 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** source selection drop-down menu (just as an **iVGA** source would be).

When you select **LiveText** (and click the **Live** button in LiveText), the current title page is available via the **Network** button on TriCaster's **Switcher** or in its **Overlay** panel. For more information on installing and using this great tool, please refer to the Chapter 17.

Figure 41

4.6 SWITCHING

Back in Section 3.4, you connected cameras to TriCaster's (front panel) inputs and configured them. If you haven't already done so, let's explore basic **Switcher** operations.

4.6.1 SWITCHER ROWS

The **Switcher** features 3 rows of labeled buttons. The three rows are labeled (from top to bottom) **Effects**, **Program** and **Preview**. Each button represents one of the many and varied video sources available – the first three represent **Inputs 1-3**, while the others are for special sources (discussed soon).

Figure 42

Clicking a button in any row selects the active source for that row. The **Program** row selection dictates what video stream is sent to **Program Output**. The **Preview** row selection determines which source is cued up for the next **Take** (cut) or **Transition** operation. (The **Effects** row serves other purposes which we'll come to a bit later).

Hint: By default, selecting a tabbed module (DDR, Stills, etc.) on the Preview row automatically shows the corresponding control panel in the tabbed panes below. Click the configuration (gear) button the the right of the tabs (beneath Overlay) to enable or disable this behavior.

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

    i. Move your mouse over an **Input** preview monitor (**All Monitors** view).
    ii. Open the **Configuration** panel by clicking the **Configure button** (gear) that appears above the monitor.
    iii. Choose the appropriate **Connection Type** setting for your camera.
    iv. Close the **Configuration** panel.
    v. Repeat the steps above for all connected cameras.

2. Click the **Switcher** button labeled '1' on the **Program** row (Figure 2) to place **Camera 1** on **Program Output**. The button turns red, and the video stream from **Input 1** appears on the **Program Output** monitor. (Program Output is available to connected video display devices and/or the Internet, and optionally, for recording to disk, too).

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

4. Note that the borders of the corresponding ISO monitors (**All Monitor** view) are now tinted red and green, respectively.

4.6.2   TRANSITIONS

Now we're ready now to try out the features in the **Transition** section, to the right of the **Switcher** rows (Figure 43).
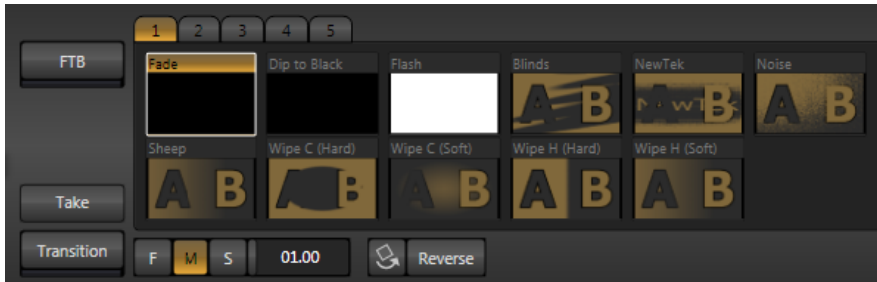
1. Click the **Transition** button
    i. **Camera 1** is gradually removed from **Program Out**
    ii. **Camera 2** (previously the **Preview** row selection) takes its place on **Program Output**
    iii. The **Camera 2** button is now lit up on the **Program** row
    iv. The **Camera 1** button is lit up on the **Preview** row
    v. The red and green borders around the ISO monitors have been swapped

2. Click **Take** to force the swap between **Program** and **Preview** row selections to occur instantly

3. Click a *different* transition icon in the selector pane (beside **FTB**), and click the **Transition** button again. (TriCaster supplies a wealth of transitions to suit every need)

4. Click the **[S]** button to select a slower speed preset, and click **Transition** again to test the new rate of change

Hint: you can manually control the progress of a transition by grabbing the T-bar with the left mouse button and dragging it downward.

4.7   RECORD AND GRAB

Located immediately beneath the **Program Output** monitor are **Stream**, **Record** and **Grab** buttons, along with their respective **Configure** buttons. We'll discuss streaming further on, but let's consider **Record** and **Grab** here.

4.7.1   RECORD

1. Click the **Configuration button** (gear) next to **Record**.

2. The **Record Configuration** panel opens.

3. Click in the **Base Name** field, and enter a unique name for the captured file(s). Note that recorded clips are always stored in TriCaster's default **Clips** folder.

4. Optionally, enable the **Add to DDR Playlist** switch to automatically add newly recorded clips to the current DDR playlist.

> *Hint: TriCaster stores recordings at C:\TriCaster\Media\Clips\sessionname\Capture (replace "sessionname" with your actual session name).*
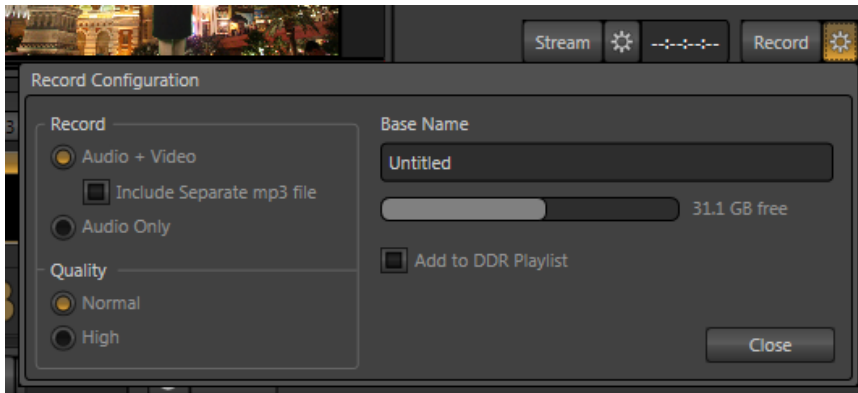
Figure 45

5. Click **Audio + Video**, and then click **Close**.

Hint: If you choose 'Audio + Video', selecting 'Include Separate mp3 file' is useful if your editing software doesn't support the embedded audio in TriCaster's MPEG2 files.

6.   Make sure you have an active source playing on **Program Output**.

7.   Press the **Record** button – it will illuminate, and the neighboring timecode field will begin keeping track of the duration of your recording.

8.   After a little while, press **Record** again to stop recording.

You can record anything that is displayed on **Program Output** in this manner. This lets you record your entire live production if you like, but it also provides a way for you to capture clips for playback (from TriCaster's DDR) *during* live events.

4.7.2   GRAB
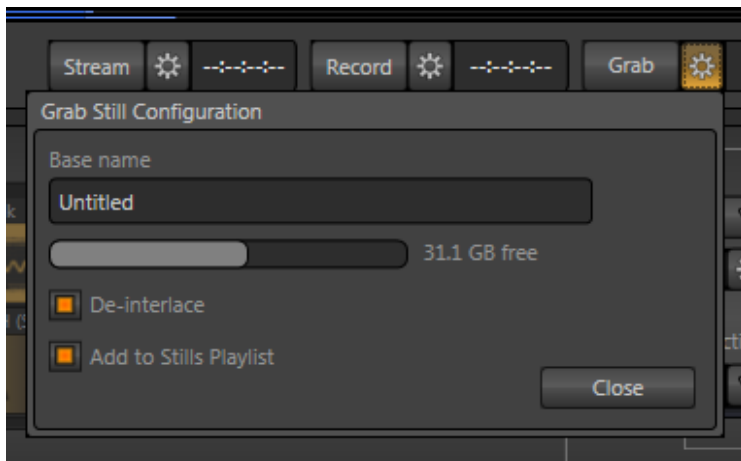
The **Grab** feature is quite similar to Record, just described - except of course that it grabs a fresh still image from **Program Output** each time you click the Grab button.

4.8   MEDIA PLAYERS

4.8.1   DDR

TriCaster's **DDR** (Digital Disk Recorder) is a powerful media player, and can greatly enhance your live productions.

Show the **DDR** by clicking its tab in left-hand tabbed pane beneath the Switcher. (The DDR also has two right-hand pane siblings, the **Stills** and **Title** players, which we'll discuss in the next section.)

Figure 47

ADDING FILES
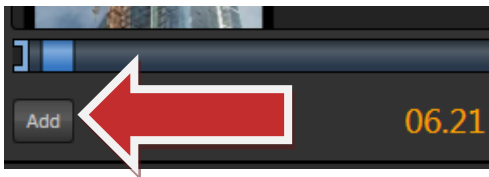
Figure 48

1.   Click the **Add** button in the **DDR** pane (Figure 48) to open a **Media Browser**.

2. Click the name for your current TriCaster session beneath the **Clips** header in the left-hand column of the **Media Browser**.

3. The file pane at right displays icons for recordings made in the session. It should list the file you recorded earlier (in Section 4.7.1) – click the icon to select it, then click **OK**.

4. You may wish to add several more files to experiment with (the **DDR** also supports most popular audio file formats).

TRANSPORT CONTROLS

5. Select **DDR** on the Switcher's **Program** row.

6. Click the newly added icon in the DDR's **playlist**, and press the **Play** button in the DDR footer (Figure 49)
    i. The video clip you recorded should play on the DDR ISO monitor (**All Monitors** view).
    ii. Click **DDR** on the Switcher's **Program** row, it will appear on **Program Output**.

7. Click the **Stop** button.

8. Click *inside* the **Speed** slider (engaging direct edit mode), and change the speed to **50%**.

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

10. Adjust **Speed** again – notice that you can even modify the slow motion playback rate during play.

11. Click **Stop**.

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 50).
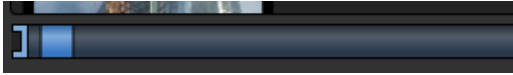
Figure 50

Drag the Scrub Bar's square blue 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 **[** gadgets at either end. (The mouse pointer changes to a double-headed arrow when you move it over a trim control.)

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

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

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

SINGLE AND AUTOPLAY
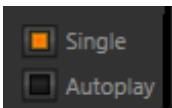
Figure 51

15. Click the **Single** switch (Figure 51).

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

17. Select **Camera 1** on the Switcher's **Preview** row.

18. Enable the DDR's **Autoplay** switch.

19. Play the first clip in the **DDR** again.

    This time, just as the clip approaches its end, the **Switcher** *automatically* performs a transition. (That is, the sources on **Program** and **Preview** are automatically swapped, leaving **Camera 1** on **Program Output**).

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

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

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

21. Click **Stop** (if necessary).

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

23. Highlight a fairly long clip (say, a minute or more) in the **DDR** on **Program**, and **Camera 1** on **Preview**.

24. Click **Play**.

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

26. Perform another **Take**
    i.   As expected, the **DDR** is restored to **Program Output**.
    ii.   **DDR** playback re-commences at the next frame of the current clip – the DDR did not automatically jump ahead to the next clip this time.

You may find **Single** mode your usual choice, 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 (while **Autoplay** on) works perfectly in this scenario. The TriCaster operator can click **Take** or **Transition** freely, confident that DDR playback will resume at precisely the right frame when he does so again.

PRESETS
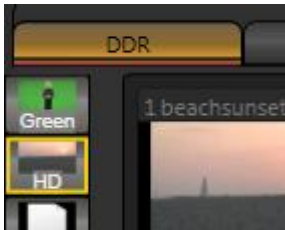
Figure 52

Let's consider one more powerful feature common to TriCaster's media players – the **Presets Bin**. This bin runs vertically down the outer edge of the DDR, Stills and Title modules, and provides instant access to custom playlists.

More than that, presets store other information about the current state of the module – playback position, selection status, and so on. In many ways, you can use presets as though they are tabs that reveal even more media players.

27. Click a different preset icon, and use the **Add** button to populate it.

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

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

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

The **DDR** has many more features which we'll cover later, in Part II of this manual.

4.8.2 STILLS

The **Stills** and **Titles** modules are actually very similar to the **DDR**, just discussed. Although each is primarily focused on a particular purpose, together they also provide many creative possibilities. The main difference between them is the type of media files they support:

- The **Stills** player supports popular still image file formats and audio files.
- The **Titles** module supports TriCaster **title pages** *and* popular still image file formats.

AN AUTOMATED SLIDESHOW

The controls of the **Stills** player are identical to the **DDR**. Rather than cover these again, let's have a little fun:

1. Click both the **DDR** and **Stills** tabs, so you can see both players.

2. Click any icon in the DDR **playlist**, and press **CTRL + a** on the keyboard, to select all of the playlist entries.

3. Press **Delete** on your keyboard, clearing out the entire **DDR** playlist (this is a non-destructive deletion, never fear).

4. **Add** some image files (a dozen or more) to the **Stills playlist** (you can use some of the images from the **NewTek Content** group under the **Stills** heading for this example).

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

6. Hold down the **Shift** key, and click the last icon in the playlist, *multi-selecting* all the files between the first one you clicked and the last one (the icons are given a lighter outline to show their selection status).

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

8. Right-click in the DDR playlist area, and select **Paste**.

Let's pause to review. To this point, we've prepared both the **DDR** and **Stills** modules with **playlists** consisting of a similar series of still images. (Note that still image files default to a five second duration when added to a playlist).

Fine, but 'what about the aforementioned fun', you ask? Let's continue:

9. Turn **Single** and **Autoplay** on for <u>both</u> **DDR** and **Stills**.

10. Select **DDR** on the Switcher's **Program** row.

11. Select **Stills** on the Switcher's **Preview** row.

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

13. Press the DDR's **Play** button, and watch the 'hands-free' slideshow.

Let's consider what is happening:

- When playback of the first **DDR** playlist entry reaches its end
    - The DDR's **Autoplay** setting invokes an automatic transition to **Stills**
    - And stops **DDR** playback
    - Then, unseen on **Program Output**, cues up its next playlist item.
- Simultaneously, the Still's **Autoplay** setting initiates playback of *its* first playlist entry.
- When playback of *that* item is reached
    - The Stills' **Autoplay** function performs another transition, returning the **DDR** to **Program** row
    - And stops **Stills** playback
    - Then, unseen on **Program Output**, Stills cues up its next playlist entry.
- Next, the DDR's **Autoplay** setting automatically starts playing *its* next playlist item.
- The cycle repeats until all items play though or is interrupted by user actions (if **Loop** was enabled in both players, the slideshow could theoretically continue to the end of time).

4.8.3 TITLES

At first glance the **Titles** player seems very similar to the **Stills** and **DDR** modules – it has the same trimming and transport controls, **Autoplay** and **Single** switches, **Preset bin** and so on.

Of course, as its name implies, the **Titles** player is intended for preparing and displaying title pages. Let's see how it works:

1. Click **Add**, and select a few of the prepared title pages from the **NewTek** location listed under the **Titles** heading in the Location List (left column) of the **Media Browser**.

2. Click an icon to highlight it.

3. Display the title page on **Program Output** by selecting **Titles** on the Switcher's **Program** row.

4. Move the mouse over a *different* title page icon, and click the **Configure** button (gear) that appears in its lower-right corner.
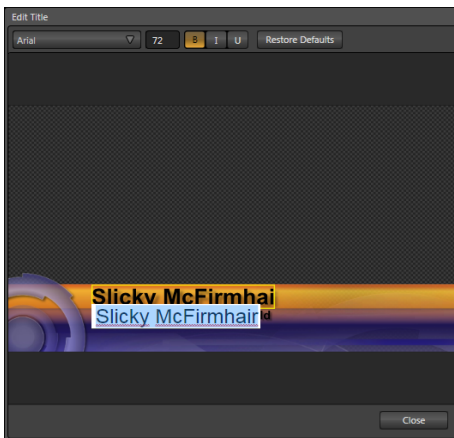
5. The **Title Page Editor** shown in Figure 53 will appear.

6. 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.

7. 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.

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

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

Edit Title

Arial | 72 | B | I | U | Restore Defaults

10. Try changing the **Font**, **Size** and other *attributes* for a line of text, using the tools in the Title Page Editor's titlebar (Figure 54).

11. Click the **Close** button.

4.9 OVERLAY

Having learned the basics of the **DDR**, **Titles** and **Stills** players, let's learn how to superimpose their content over **Program Output**. TriCaster provides a number of approaches to this, but often you might use one or both of the **Overlay** channels on the **Switcher** for this purpose.

In Figure 55 we see both **Overlay** channels applied to form a two-tier 'lower-third' title composition. The background for the composition is a modified version of one of the supplied *title pages* (displayed in the **Titles** player). A looping globe animation (playing from the **DDR**) is overlaid on top of the title.

Hint: This two layer title is displayed in front of live talent in a greenscreen set, which – with LiveMatte enabled – finally appears above a 'location shot' (in this case, a still image).

Let's recreate this overlay (using any live camera input you have handy as a backdrop (alternatively, you can use a **Network** source or even **Black** for now).

1. Click the appropriate button for the background video on the Switcher's **Program** Row (this selection will substitute for the airport shot seen in Figure 55).

2. Click the **DDR** and **Titles** *tabs.*

3. Click **Add** in the **DDR** tab to open the **Media Browser** we used earlier.

4. Click the **NewTek** location in the column at left. Select the icon named *Earth Spin.avi* (under "Animations") in the pane at right, and click **OK** to add it to the **DDR** playlist (this is the animation clip we will display in front of our title text).

5. Enable **Single, Loop** and **Autoplay** in the **DDR** pane.

6. Click the **Add** button in the **Titles** tab, to open another **Media Browser**.

7. Click the **Practice Session** location under the **Titles** heading in the Locations list at left, and add the *title page* named "*Breaking News.cgxml*" to the **playlist**.

8. Click the **Overlay 1** source selector button (the 'downward-pointing triangle').

9. Use the **source selector** that pops up to select **Titles**.

10. Repeat the two steps above for **Overlay 2** selecting **DDR** as the source.
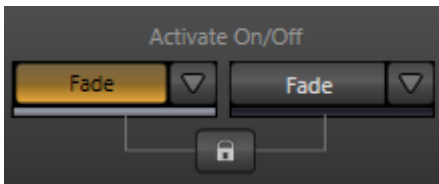
11. Click the **Activate** button under **Overlay 2** (Figure 57).

12. The current playlist item (Earth Spin.avi) from the DDR will appear on Program **Output**, superimposed above your **Program** row source.

This globe is too big for our current purpose, so let's continue:

Figure 58

13. Click the **Configure button** (gear) next to Overlay 2's **Position** button.

14. Enable the **Aspect Lock** button (padlock) in the **Position** panel. This permits you to scale the overlay evenly on both axes.

15. Drag the mouse over the magnifying glass button to squash the overlay to a suitable size for use with the title.

16. Now adjust the position sliders to place the overlay at a location similar to that shown in Figure 55.

17. Close the **Overlay 2 Position** panel.

18. Try switching the illuminated **Position** switch off an on – see how it toggles the adjustments you made above?

Figure 59

19. De-activate both **Overlay** channels.

20. Click the **Lock** (padlock) button in the **Activate** section, illuminating it and locking the two overlay channels together.

Figure 60

21. Click the (Overlay) **effect** button for either channel, and they are *simultaneously* displayed.

Hint: By clicking the Effect buttons for the Overlay channels, you can assign different effects for each. Notice too that – for many effects – the direction reverses automatically when removing the overlay from view.

We're nearly done here – but let's reflect on a few interesting details about how **Autoplay** works in the **Overlay** context. Note that:

- The globe animation begins playing as soon as you **Activate** its overlay channel. This is the result of enabling **Autoplay** for the **DDR.**

- Likewise, the animation stops playing when you *de-activate* the overlay channel (and, unseen, the **DDR** advances to the next item in the playlist).

4.10 LIVEMATTE

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

Figure 61

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

1. If necessary, remove the **Overlay** channels from **Program Out**.

2. Click the **DDR** tab, and select **DDR** as the **Program** row source on the **Switcher**.

3. **Add** the video clip named *Kiki Center.mpg* from the **Greenscreen** group inside the **Clips>NewTek** location.

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

5. Select **Stills** on the **Effects** row in the **Switcher** (this defines what will appear behind our greenscreen shot in the result).

6. If you are not already viewing **All Monitors**, click that tab at the top of TriCaster's **Live Desktop**.

7. Move your mouse pointer over the **DDR Monitor**.
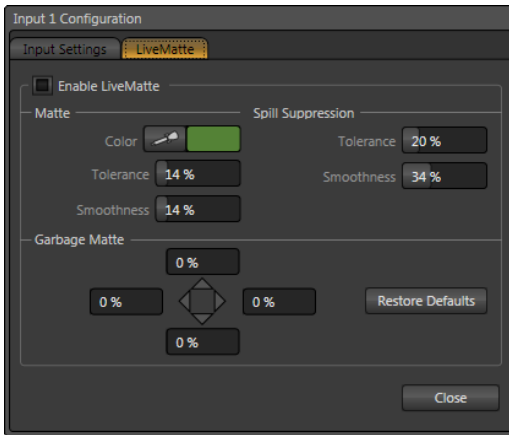
Figure 62

8. Click the **Configure button** (gear) that pops up just above the **DDR m**onitor (when you roll the mouse over the DDR monitor).

9. Click the **LiveMatte** tab in the **Configuration** panel that opens (Figure 62).

10. Click on the **Pick Color** button in the **Background** section of the panel, and *keep the mouse button depressed*.

11. Drag the *eyedropper* pointer over the green background in the DDR's ISO monitor, and then release it. This establishes the primary key **Color**.

12. The default settings for **Tolerance** and **Smoothness** below are likely close enough for this little demonstration, so you can close the **DDR Configuration** panel now.

We'll look at the details of **LiveMatte** in more depth in Part II (the Reference section), but already your result should look very similar to Figure 61. TriCaster doesn't stop here, though. Let's proceed into an introduction to **Virtual Inputs**.

4.11 VIRTUAL INPUTS

Virtual Input buttons sit innocuously on TriCaster's **Switcher** rows just like other video inputs, but in fact they possess very powerful features. **Virtual Inputs** can be somewhat likened to the M/E (Mix/Effect) rows of a traditional video switcher. They permit a composition to be prepared from multiple sources (including an upstream keyer channel).

4.11.1 COMPOSING INPUTS A AND B

Let's begin our examination by re-constituting our simple keyer setup above, but this time doing so using a **Virtual Input**.

1. Change the Switcher's **Program** row selection to **V1**.

2. Click the tab labeled **V1** below the **Switcher** (to reveal the panel for **Virtual Input 1**).

3. Notice that the **Sources** portion of the **Virtual Input** panel is home to two **source selector** buttons rows labeled **Input A** and Input **B**.

4. At the end of the previous section, we left the **DDR** with **LiveMatte** enabled. Click **DDR** in the **Input A** row, designating it as the foreground stream for this **Virtual Input**.

Figure 63

5. Click **Stills** in the **Input B** row (Figure 63), designating that source as the background.

At this point, the display on **Program Output** should be identical to the simple 'weather map' setup we created in the previous section (Figure 61); remember that LiveMatte is *already enabled* for the greenscreen shot from our previous exercise.

We can use a few of the unique features of **Virtual Inputs** to dress it up a bit though. For example, we might want to transpose the entire greenscreen shot to one side, placing the onscreen talent off-center in the result.
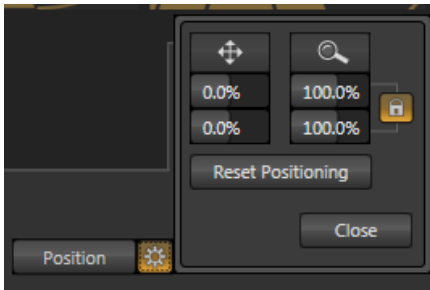
Figure 64

6. Click the **Configure button** just to the right of the **Input A** source-selector row to open the **Input A Position** panel (Figure 64).

There are two pairs of numeric sliders in this panel, one with a **Position** (four-pointed arrow) button above, and the other surmounted by a **Scale** (magnifying glass) button. Experiment with these controls a bit to see how they work.

You can drag the mouse over either of the top buttons in each group to freely adjust **Position** or **Scale** on both axes, or use the numeric sliders below to adjust just one property. As the **V1** button is selected on the Switcher's **Program** row, your **Program Output** displays the result of any changes you make in realtime.

Hint: When the Lock (padlock) button next to the Scale controls is lit, vertical and horizontal adjustments are locked together - adjusting one affects both. When unlocked, the vertical and horizontal scaling factors are independent.

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

7. Click **Reset Positioning** to restore default **Position** and **Scale**.

8. Drag the horizontal (upper) **Position** mini-slider to the right, to about 90-95%.

Figure 65

Without having moved the physical camera, we have changed the apparent position of our talent relative to the virtual backdrop (compare Figure 65 with Figure 61).

4.11.2 ADDING AN UPSTREAM OVERLAY
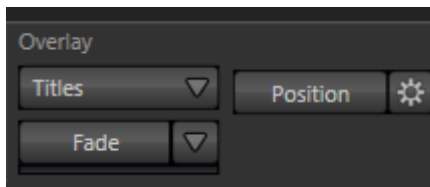
Figure 66

Just above the **Position** button for **Input A** there is a control group labeled **Overlay**.

The **Overlay** feature in **Virtual Input** tabs is, of course, *upstream* of the **Switcher**. It works very much like the two *downstream* Overlay channels we discussed back in Section 4.9, but content in this channel will appear *beneath* anything you display in those two Overlay channels on **Program Output**.

Figure 67

9. Access the **Titles** player, and click the "*Breaking News.CGXML*" icon you added to the playlist from the **Practice Sessions** folder, back in Section 4.9.

10. Edit the top line in the title to say "5 Day Forecast", as shown in Figure 67.

11. Select **Titles** as the **Overlay** source in the **V1** tab, and **Activate** the Virtual Input's overlay channel using the button beneath.

As you can see, we have fully replicated our earlier composition (which relied on the Effects channel), but with added benefits:

- The currently selected title page already will be displayed when you select V1 on the **Switcher.**

- Virtual Inputs all you to offset (and even scale) the primary video source – of course this works every bit as well will live camera streams.

As well, since the entire composition is now represented by a single button on the Switcher, it is very easy to **Take** or **Transition** directly to it with a single click – and it is just as easy to Transition from one **Virtual Input** to another.

Of course, this is just one way to use the basic **Virtual Input** features. The creative possibilities are endless. For example, Figure 68 shows **Input A** (with **LiveMatte** enabled) keyed over **Input B**, with the Virtual Input's integrated **Overlay** channel use to add a PiP (Picture in Picture) effect.

Figure 68

Please note that this setup leaves *both* primary Overlay channels available for other purposes – such as add two more live PiPs, graphics or a title composition).

4.11.3 LIVESET™

We've saved the best for last in connection with **Virtual Inputs**, 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 simple one, named "**A over B**" (Figure 69), which is the default.
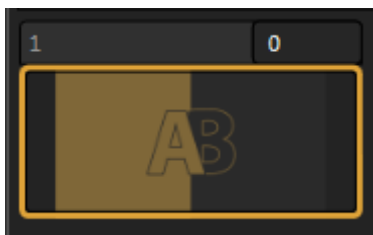
Figure 69

As its name implies, **A over B** simply produces a composite of the video source you select as **Input A** displayed on top of **Input B**. In cases where **LiveMatte** is active for Input A, or if Input A has an alpha channel (as might be the case, for example, for a 32bit image file), Input B will show through transparent areas in the composite result. We saw how that worked in back around Figure 67.

The name of the current **LiveSet** is shown above the **Zoom Preset** thumbnail icons at the top of the Virtual Input tab – in this case, we see "NewTek > Default > A over B", identifying the specific LiveSet, a member of the "Default" group in the "NewTek" folder.

Let's try something more sophisticated now:

12. Click the **Add** button at the right end of the current LiveSet name display to open a **Media Browser**.

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

14. In the file pane at right, click the thumbnail icon named *Center Monitor* in the **Demo Studio** group, and then click **OK** at the bottom of the Media Browser.
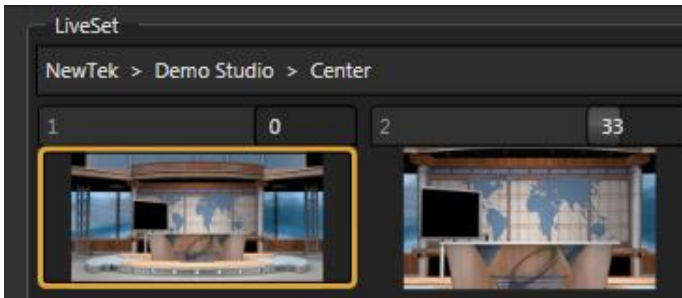
Figure 70

The **Zoom Presets** in the Virtual Input tab and the name above will update, showing that the current LiveSet is now **NewTek > Demo Studio > Center** (Figure 70).

Assuming that you still have **LiveMatte** enabled for the **DDR**, V1's **Input A** selector set to **DDR** and **Input B** set to **Stills,** a little adjustment in the Positioner (at the end of the Input A selector) is all that it should take to produce a result similar to Figure 71. Input A is the primary input for the LiveSet, while Input B serves as a secondary source – in this case assigned to the in-set 'monitor' screen.
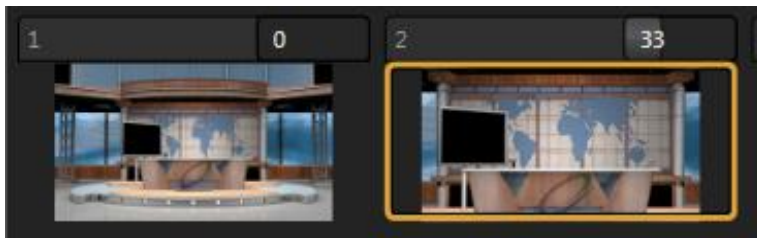
15. Now, click the second **Zoom Preset** icon (Figure 72).

Observe that the view on **Program Output** has now zoomed in by 33% - the value shown in the adjustable zoom slider above **Zoom Preset 2**.

16. Enable the **Animate Zoom** switch, and click **Preset 4**.

The zoom gradually changes from the starting position to the level assigned to Preset 4 - 100% (Figure 73). The timing for the change is controlled by the F|M|S buttons (Fast, Medium, Slow) below, and the nearby time slider. Notice that this LiveSet (which has the word "monitor" in its name) targets the monitor as you move closer - not the actual center of the set.

Using the other Virtual Inputs along with convenient presets, you can easily mimic a very large studio complex from a much smaller location.

4.12 STREAMING

Sending your output to the world can be nearly as easy as connecting TriCaster to the Internet (or intranet), and pressing the **Stream** button right below the **Program Output** monitor.
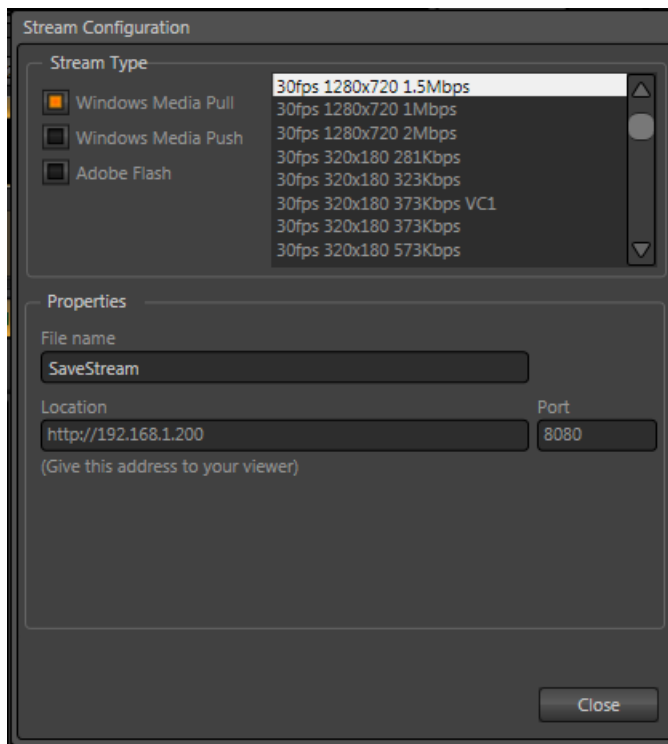
Figure 74

4.12.1 STREAMING CONFIGURATION

Click the **Configure button** situated next to the **Stream** (on/off) button to view and modify settings related to streaming your production across a network connection (Figure 74).

The **Stream Type** options allow you to select between **Windows Media Pull**, **Windows Media Push**, and **Adobe Flash** streaming protocols. To the right of these switches is a **Streaming Profile** selector, which permits you to select from a long list of pre-configured size and bandwidth *presets* for your Internet broadcast. You can choose a profile to suit your current need, considering both the capability of your outbound Internet connection and the typical bandwidth of your viewing audience as well.

4.12.2 SIMPLE PULL STREAMING

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

1. Select **Windows Media Pull** as the **Stream Type.**
2. Pick a **Profile**, and click the **Stream** button.
3. Oh wait, there *is* no step three.

Believe it or not, that's it. In a moment, TriCaster's streaming feature provides you with the IP (Internet Protocol) address of your computer as viewed from the network. This information will be provided to you as a 'punctuated' numeric value in the **Location** display field.

You can provide clients or streaming providers this 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.

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 10 for a more elaborate explanation.

4.12.3 PUSH AND FLASH STREAMING

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 'free', advertising -sponsored) Content Delivery Network.

(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 10.

4.12.4 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.

5   THE STARTUP SCREEN

TriCaster's Startup Screen is the gateway to a suite of applications as well as *session* and system maintenance and management features.

Icons in the left-hand pane of the Startup Screen provide access to numerous functions. We'll discuss each of these in the pages that follow, beginning with a review of the concept of sessions.

The Startup Screen appears whenever you launch TriCaster. From here, you create and launch sessions, then choose what sort of activity you wish to pursue by selecting an icon from the rotating selector on the Session Page.

Figure 75

Your intention may be to begin a new live production, or to produce another episode of a live series. Perhaps you wish to do some video editing using SpeedEDIT, to prepare some titles for an upcoming event, or to perform system maintenance.

We'll look into each of these in turn, but first let's consider a fundamental TriCaster TCXD300 concept – the *session*. What is a session, and why are sessions both important and valuable to you?

5.1 INTRODUCTION TO SESSIONS

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

- What broadcast standard is used in your locale – is it PAL, common in Europe among other places, or perhaps NTSC, standard throughout North American regions?
- If your task includes cameras or other live sources, are they HD or SD (or both)?
- How are cameras connected (are you perhaps using component or SDI connections, or a mixture of several 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 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 of a projection system.
- What are your output device connection preferences? (Will you send output from the connectors of Output Row 3 to a local reference monitor using an S-Video or composite cable, etc.)?
- You might create a playlist of custom title pages in the Titles player, along with preset and playlists for clips and other graphics in the **DDR** and **Stills** players.

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

- You could grab a series of still images from **Program Output**.
- And/or 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. Assuming you do not deliberately delete the session, all of your media and all of your settings are ready for immediate recall.

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 more or less 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 load any session freely. This greatly simplifies business models that involve regular trips to several locations, a number of unique episodic programs, or different users with their own specific needs.

5.2   THE HOME PAGE

Figure 76

Having discussed sessions, let's go on to consider how you create sessions, and choose which one to work on. This and 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 function selector ring shown in Figure 76. When you click an icon on the ring (such as **New** or **Open**) it moves forward 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 function selector ring.

When you choose an icon from the selector ring, the right-hand pane updates to provide more options related to your choice.
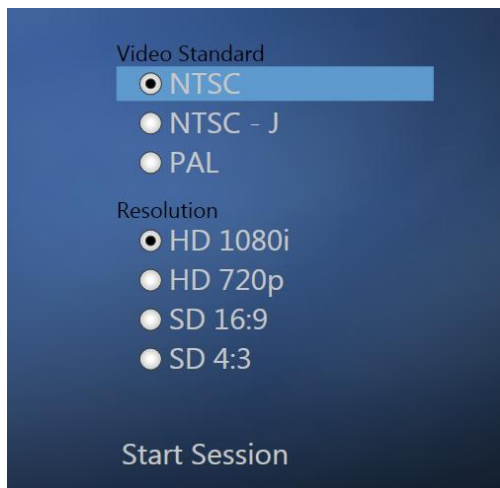
Figure 77

For example, the first thing you will likely do on launching TriCaster for the first time is create a new session. In anticipation of that, the **New** icon is in pre-selected whenever no sessions already exist on TriCaster. This results in the options shown in Figure 77 being displayed at right.

5.2.1   NEW (SESSION)

As just mentioned, clicking the **New** icon on the function selector ring populates the pane at right with related options. Principally, for each session you must designate (by selecting switches) your local video standard (International model only – select NTSC, PAL or NTSC-J) and session format – HD 1080i, 720p, SD 4:3 or SD 16:9.

SESSION NAME

You will see a suggested name for a new session listed above the options pane at right. You can click this name field to modify the default name provided using your keyboard.

FORMAT AND OUTPUT CONSIDERATIONS

Remember that for Live Production, TriCaster can supply SD output (for SD sessions), or both SD and HD (in the case of HD sessions). The format of video output on rows 1 and 2 varies according

to the session type. For any HD session, output on these rows is also HD, but for SD sessions it will be SD. For 16:9 sessions, SD outputs are 16:9 too; but for 4:3 sessions they will be 4:3.

The session setting has some other significant ramifications, too. For example, if your session format is SD 4:3, this is the format that will be captured by the Live Desktop's **Record** function, even when the video cameras supplying your inputs are HD.

Hint: See Section 8.1 for more information on Video Output configurations.

Having made your selections, click the **Start Session** button at lower right to launch TriCaster's **Live Desktop**.

5.2.2   OPEN (SESSION)

If there are existing sessions on TriCaster, the function selector ring on the **Home Page** will default to the **Open** icon (Figure 78).
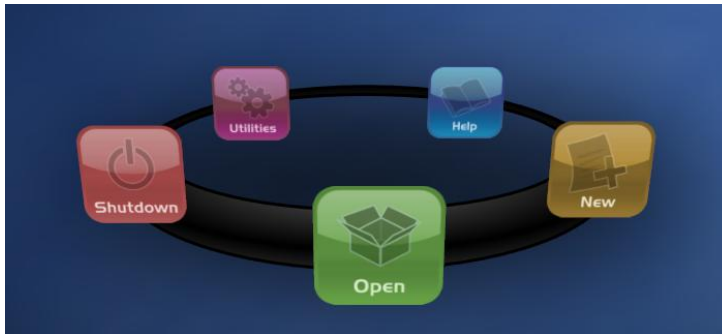
Figure 78

Selecting **Open** causes the **Sessions List** to appear at right. This pane lists all sessions currently stored on TriCaster, showing the **Session Name** and **Format** for each one.

Let's look at a few features of the **Sessions List** briefly before we open a session.

Figure 79

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 title and edit project files* created within the session (unless you have deliberately saved the projects and all constituent 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 FROM BACKUP

In another section of the **Startup Screen** (Session Page>Manage) there is a feature that allows you to backup the current session to another storage volume. That's the reason you will see a **Restore Session Backup** link at the bottom of the **Session List**.

To restore a session you have previously archived, click **Restore Session Backup** (Figure 80), and use the file explorer provided to select a *.SessionBackup* file.

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

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 function selector 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**.

5.2.3   SHUTDOWN

This selection provides **Restart TriCaster**, **Shutdown TriCaster**, and **Exit to Windows** links – click them to perform the named action in the usual manner. (In the case of the last-named function, you can return to the TriCaster environment from the Windows™ interface by double-clicking the desktop icon named **TriCaster TCXD300**.)

5.2.4 UTILITIES

Selecting **Utilities** on the **Home Page** function selector ring presents a list of functions at right that have to do with the TriCaster system.

REGISTER TRICASTER

TriCaster can operate for 90 days before registration is mandatory, but we encourage you to register early. Among other reasons, doing so will serve to identify the unit to NewTek as yours in case of theft, and will also allow you to check for software updates that may have been recently released.

(The steps in the Registration process were outlined back in Section 3.3, so we won't repeat them here.)

UPDATE TRICASTER

Periodically, NewTek may 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 access the update webpage, where you can check for new software patches or other downloads provided by NewTek. Use the login details you provided when registering your TriCaster to enter your

personal product page, click the "my downloads" link at the top of the page, and install any new updates. This way you can be sure the very latest version of the software for your TriCaster is installed.

1. Click **Update TriCaster**
2. Login to the NewTek update webpage, locate the latest update and click on it.
3. At the dialog popup, choose **Run**.
4. Comply with any onscreen prompts that follow.

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

DEFRAGMENT HARD DRIVE

Over the course of lengthy use, the section of TriCaster's internal storage devoted to audio and video storage can become fragmented. Eventually, this can degrade playback performance. Defragmenting corrects 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 large while others are small, just as TriCaster session content files may be larger or smaller.
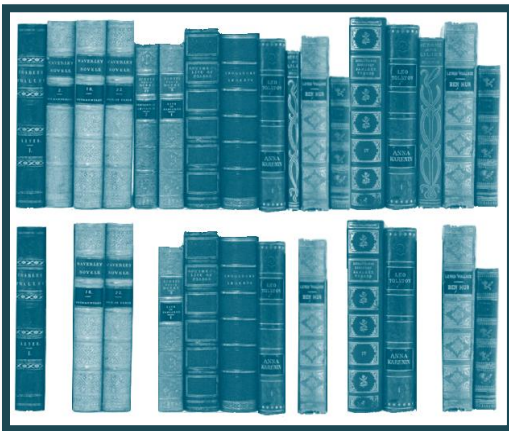
To make room for new additions, you decide to remove books you have finished with from the shelf. You remove a book here, another there, opening up gaps between the remaining books.

This makes some shelf space available, but does so in the form of gaps separated by the remaining books. Sadly, when you obtain another large book, it may be too big to fit in any one of the gaps.

Figure 82

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

This process can take considerable time, so it's not something you want to begin just before an important event.

5.2.5 HELP
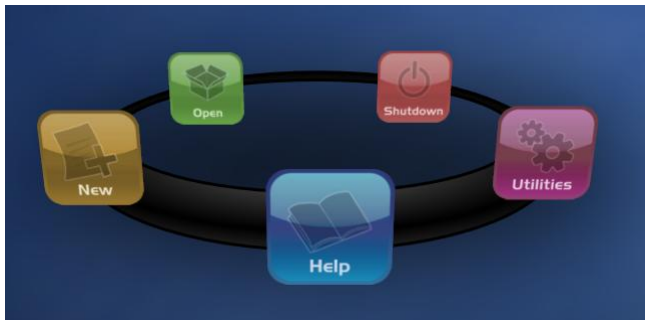
Figure 83

- Click the **About** link to lists software version information, credits and acknowledgments.
- Click the **Live** link to open the TriCaster manual.
- Click the **Edit** link to open the SpeedEDIT manual.
- Click the **Graphics** link to open the LiveText manual.

5.3 THE SESSION PAGE

Figure 84

Opening a session from the **Home page** (whether using **Open** or **New**) takes you to the **Session Page**, providing a new set of icons on the function selector ring.

Home / WXZB Morning News

Figure 85

The name of the current session is shown in the top-left corner of the screen (Figure 85). 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.

The function selector ring in the **Sessions page** offers four selections. These are discussed next.

LIVE DESTKOP

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 it to launch the Live Desktop.

GRAPHICS
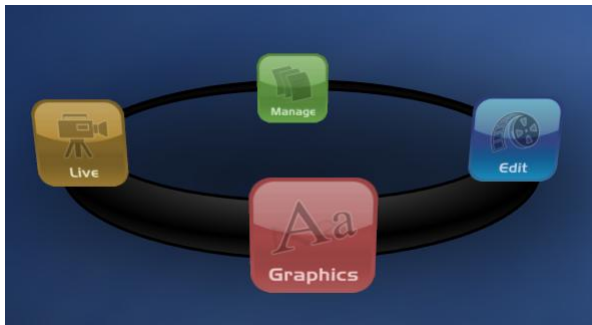
Figure 87

TriCaster TCXD300 includes an integrated version of **LiveText**, NewTek's standalone titling and CG application. Selecting the **Graphics** icon displays a number of related items on the right-hand side of the **Sessions page**.
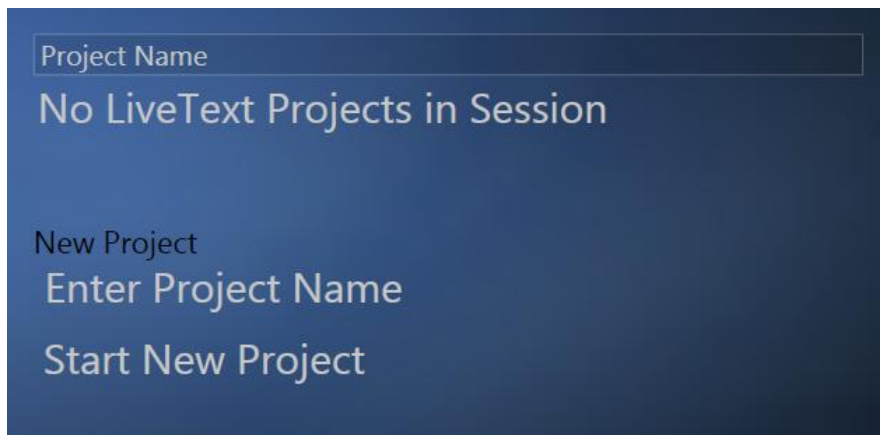
When you first enter a new session, no LiveText projects are listed in the area under **Project Name**. When you have created one or more projects, the name(s) will appear here and, as you would expect, you can re-open the project by clicking its name.

Note: TriCaster stores new LiveText projects inside a folder named for the current session, as follows: D:\LIVETEXT PROJECTS\sessionname\projectname.cg. LiveText's internal File menu Save and SaveAs functions default to the same location.

However, it is possible to use File>SaveAs 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 screen. To re-open them, you'll need to navigate to the project file using File>Open in LiveText. 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 (just above the **Start New Project** link) and modify it, then click Start New Project. When you are finished working in LiveText, clicking the [x] button in its upper-right corner (or selecting **Exit** in the **File** menu) returns you to the **Session Page**.

EDIT
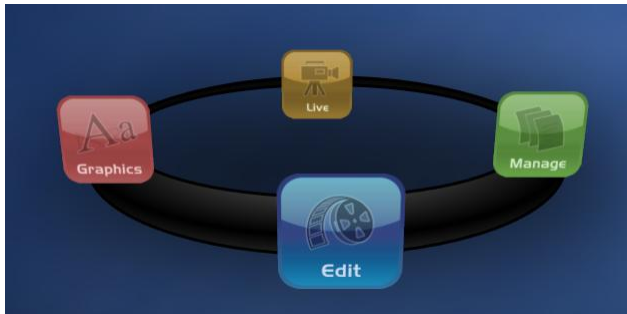
Figure 89

TriCaster includes an integrated version of **SpeedEDIT**, NewTek's popular standalone non-linear video editor. Selecting the **Edit** icon displays a number of related items on the right-hand side of the **Sessions screen**.

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

Note: TriCaster stores new SpeedEDIT projects inside a folder named for the current session, as follows: D:\SPEEDEDIT PROJECTS\sessionname\projectname.vtp. LiveText's internal File menu Save and SaveAs functions default to the same location.

However, it is <u>possible</u> to use File>SaveAs 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 screen. To re-open them, you'll need to navigate to the project file using File>Open in SpeedEDIT. 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 SpeedEDIT project, click in the default project name (just above the Start New Project link) and modify it, then click **Start New Project**. When you are finished working in SpeedEDIT, clicking the [x] button in its upper-right corner (or selecting **Close** in the **File** menu) will bring you back to the **Session Page**.

MANAGE
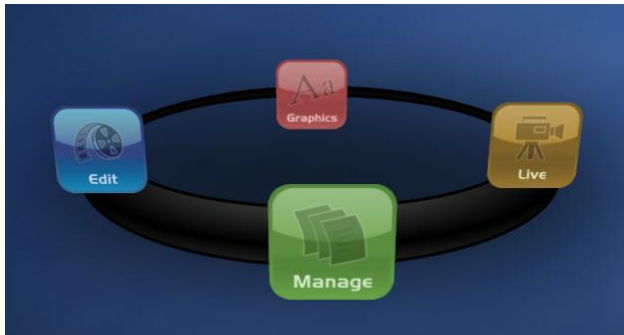
Various TriCaster components provide filebins to permit you to manually administer files related to their projects, playlists, and so on. The **Manage** icon on the function selector ring in the **Sessions page** provides an alternative approach to file management.

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
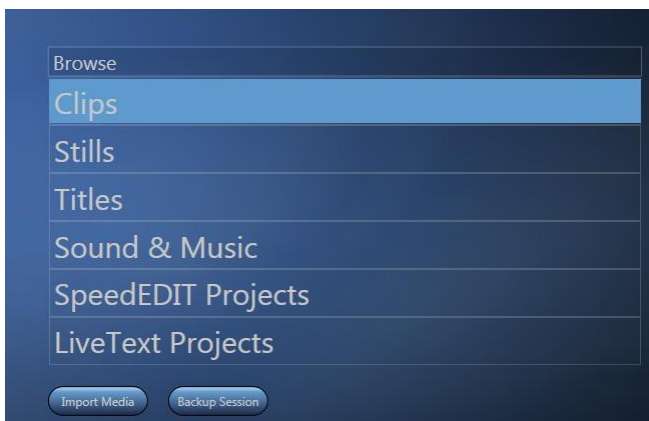
Under the label **Browse**, you will see direct links to the **Clips**, **Stills**, and other content associated with the current session. Clicking one of these links (or selecting it with the up/down arrow keys and pressing Enter) opens a system file explorer. You can use the familiar features and shortcut keystrokes in these windows (Cut, Copy, Paste, Rename, Delete and so-on) to manage the session content.

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

Figure 92

Two other important features are found in **Manage – Import Media** and **Backup Session**.

IMPORT MEDIA

Click the **Import Media** link to open a system file explorer, then select (or multi-select) suitable media files for import. Selected files will be copied (unchanged) into the current session on clicking **Open**. Imported files are automatically copied individually to the appropriate folder according to their file format (**Stills**, **Clips**, **Titles**, and so on).

BACKUP SESSION

Clicking the **Backup Session** button opens a system file explorer to the default location for backup files (D:\Session Backups). Backup operations can take some time, depending on the amount of content in the session. It would be wise not to begin a 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 backup a different session, return to the **Home Page** and **Open** a different session.

The backup operation next determines whether <u>all</u> media used in the session is *local* (i.e., located in folders named for that session), or one or more files 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

6 LIVE DESKTOP: OVERVIEW

TriCaster's Live Desktop is the control center for your live production. It provides control over switching, transitions and overlays, title, audio mixing, playback of digitized content, and so on.

As well, streaming and recording features are located here, along with keying and virtual set tools. This chapter provides a top-level view, leading into the detailed information in subsequent chapters.

Launch TriCaster's Live Desktop by creating (or opening) a session in the Startup Screen's **Home page**, then selecting the **LD** (Live Desktop) icon and clicking **Start Live Production**.

6.1   DISPLAY REQUIREMENTS

The **Live Desktop** requires a minimum 1280 x 900 screen resolution.

Figure 93

Though not a requirement, you may prefer to use a widescreen display for the user interface if you primarily work with HD (or SD 16:9) sources. Likewise, a 4:3 aspect monitor suits SD 4:3 sessions more closely. This has no bearing on recording or video output, of course. It is simply

because an aspect mismatch causes either letterboxing or pillar-boxing of the onscreen monitors (to display video without stretching).

6.2   OVERVIEW

TriCaster's **Live Desktop** provides visual feedback for operations, including monitoring, live switching, and so on. It is divided into three horizontal bands. From top to bottom, these are:

1 - Monitoring

- All Monitors view - all live inputs, including internal sources (such as the DDR)
- Switcher Monitors - your current Switcher row selections
- Preview Scopes - the Switcher's Preview row selection along with Waveform and Vectorscope
- Program Output

2 - Live Control

- Switcher Rows - Effects. Program and Preview
- Transition controls
- Overlay - downstream key selection and control
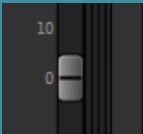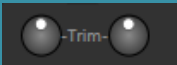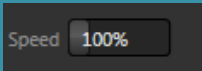
3 - Tabbed Modules

- DDR
- Virtual Sources
- Stills
- Titles
- Audio

6.3   A FEW HINTS

You will find various types of user controls in TriCaster's **Live Desktop**. Some examples are shown in the table below. Several convenience features are associated with these controls.

As you would expect, all slider controls (whether their motion is vertical or horizontal) can be set to a new value by holding down the left mouse button and dragging in the direction of the controls orientation.

Control Type	Type	Examples	Usage
	Slider (vertical or horizontal, single-value)	Gain, Balance	Drag in line with the control's orientation to raise or lower the current value.
	Radial slider (two-value)	Position, Size	Drag up-down to adjust one value, left-right to adjust the other value, or diagonally to adjust two values simultaneously.
	Rotary Knob (single-value)	Audio Input 1 Trim	Drag left-right to adjust the current value.
	Numeric Slider (single-value)	Speed, LiveSet Zoom	Drag in line with the control's orientation to raise or lower the current value. Click (or right-click) to type in a new value.

If you hold down the keyboard **Shift** key and double-click most controls, the associated value is reset to its factory default.

Hint: To make very fine adjustments to slider values, hold down the Ctrl key on your keyboard while dragging with the mouse (this increases accuracy by a factor of 10.)

6.4   TITLEBAR TIPS

An information display in the **Live Desktop** titlebar provides useful data. Displayed info includes:

- **Session Name**

- **Session format**

- **Time of Day** (from the system clock)

- **[x]** (Exit button)

6.4.1   STATUS BAR

An information display is conveniently located below the titlebar, just above the main **Program** monitor. From time to time this bar displays information pertaining to operations or system status, including any cautionary indications.
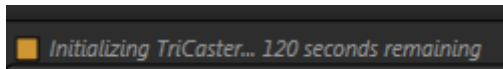
Figure 94

For example, a brief initialization is required following a system start (or restart) for DDR video playback to stabilize. During this brief 'warm-up' period, an *initialization countdown* is displayed (Figure 94) in the **Status Bar**.
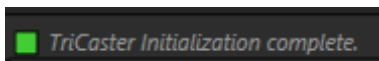
Figure 95

 At the end of the countdown, the status line is updated (Figure 95). The display automatically clears a few moments later, so as not to pose an unnecessary distraction.

7 DESKTOP MONITORS

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 when monitoring a process. As a noun, we understand it to mean devices that permit one to do just that.

TriCaster's desktop monitors are just what you need to keep an eye on and control your live productions, warn you of conditions that might affect the quality of your output, and also allow you to make any necessary adjustments.

Note: For convenience, several valuable controls and features are located in the monitoring section. Among others, these include the Proc Amp, Genlock, and LiveMatte controls. To give these features their due, they are treated individually in Chapter 8, which is entitled "I/O Configuration". Likewise, Network sources are discussed in Chapter 9.

7.1 PROGRAM OUTPUT

Figure 96

The **Program Output** monitor could hardly be more important. It shows exactly what TriCaster is displaying to your viewing audience at any moment. This includes the combined output of the **Switcher** selections as well as any **Overlay** channels you have active.

When you move your mouse pointer over **Program Output**, a **Configure button** (gear) appears above its upper-right corner. Clicking Configure opens a tabbed panel containing **Proc Amp** controls (for Program and VGA outputs) and **Genlock** settings – see Chapter 8 for details.

7.1.1   CONFIGURATION INDICATORS

A small indicator (flag) may appear above the **Program Output** monitor. Its presence denotes that **Proc Amp** settings are enabled for **Program** or **VGA** output (or both).
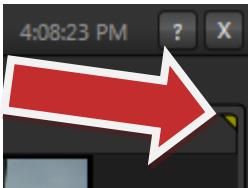
Figure 97

7.2   ALL MONITORS TAB
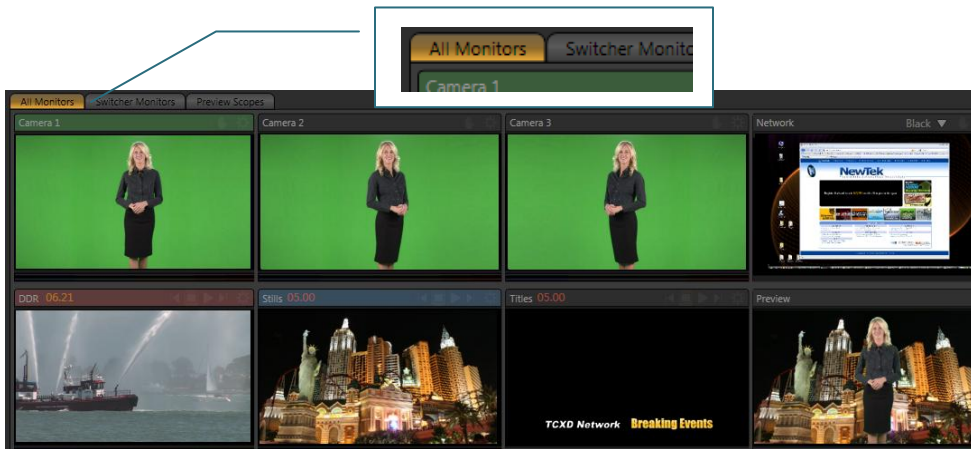
Figure 98

Click the **All Monitors** tab at upper-left to reveal a group of preview windows. These previews, often referred to as **ISO** (Isolation) monitors, display all primary video sources currently available for selection in the **Switcher** rows below.

Monitors for three live **Camera** inputs are provided, along with previews of the **DDR, Stills** and **Titles** module content. Two additional ISO monitors show your current **Network** (external) source selection (if any) or **Black**, and the Switcher's **Preview** row selection.

7.2.1 CONTEXTUAL TOOLS

Additional controls pop-up when you move your mouse pointer over the ISO monitors. The controls provided vary according to the source type represented by the monitor:

Camera 1-3 monitors show **Freeze**, **Play** and **Configure** buttons on roll-over. The function of the first two is obvious; the third button opens the **Configuration** panel for the related source (see Chapter 8, Section 8.2).

Note: Audio not affected by the status if the Freeze feature.

Additional controls appear if you roll over the ISO monitor for **DRR**, **Stills** or **Titles** (Figure 99). **Stop** and **Play** buttons are supplemented by **Previous** and **Next** (playlist item) buttons. These buttons all perform identically to the corresponding controls in **tabbed modules** below the **Switcher** (see Chapter 13).

Hint: Click the timecode display to enable direct keyboard entry of a timecode value (the player will jump to that point in the current playlist entry).

As well, a timecode field is conveniently situation next to the ISO monitor label for **DDR**, **Stills** and **Titles** (Figure 100). Like its sibling in the tabbed modules, right-clicking here opens a menu allowing you to **Reverse Direction** for the time counter and show or disable **Warning Colors**.

The **Network** ISO monitor's contextual controls are a bit different. In addition to the **Configure button**, a downward-pointing triangle is displayed on mouse-over. Click it to expose a menu listing any valid network sources TriCaster has recognized, along with a default **Black** option.

This menu might list displays from other computers transmitted across the network via **iVGA™**, or perhaps the output from a companion NewTek **LiveText™** workstation. (LiveText and iVGA are

considered in more depth in Chapter 9.) Slide the mouse down the menu to the entry you wish to select and click the source you wish to assign as the current **Network** source.

7.2.2   INTERACTIVE CONTROL

The ISO monitors (with the exception of **Preview**) are actually interactive live production controls. You can click them to perform many **Switcher** operations. Here's a list of things to try:

- Click on an unselected monitor to place it on the **Preview** row.

- Click the same monitor again to perform a **Take** (swapping it with the current **Program** row selection, and sending it to **Program Output**).

- Double-click any monitor to immediately send that source to **Program Out** (moving the previous **Program** row selection to **Preview**).

- Shift + click the monitor selected on the **Preview** row to **Transition** it to **Program Output**.

- Shift + double-click any unselected monitor to **Transition** it to **Program Output** (sending the original **Program** selection to **Preview**).

(Observe that the **Autoplay** switches respond normally when you switch interactively in this manner.)

7.3   SWITCHER MONITORS TAB
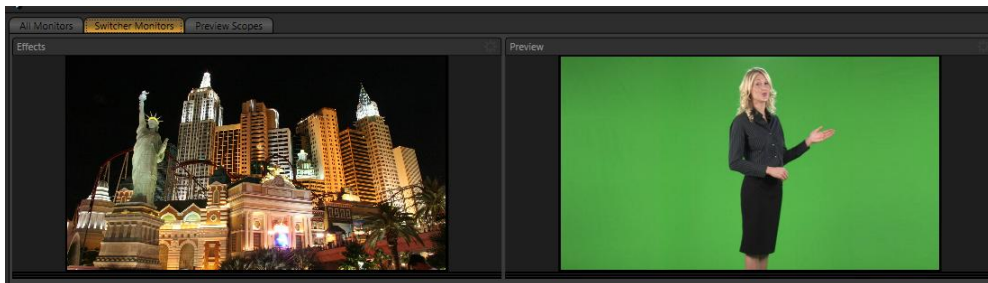
Figure 102

The second tab in the upper-left corner of the Live Desktop is labeled **Switcher Monitors**. This view is dominated by two large preview panes. These show the video sources currently selected on the **Effects** and **Preview** rows in the **Switcher**.

Hint: Unlike the ISO monitors, these monitors do not feature interactive switching functions, nor of course are colored borders required to indicate their Switcher row status.

The **Preview** and **Effects** monitors are handy in other ways too. For one thing, the larger size can be useful to provide a better preview for setting up **LiveMatte** or **LiveSet** effects.

7.3.1 CONTEXTUAL TOOLS

Just as we noted earlier (Section 7.2.1) when discussing the **All Monitors** view, rolling the mouse pointer over the preview panes in the **All Monitors** tab presents a context sensitive row of buttons to appear above.

These include a **Configure** button, and other control features relevant to the source currently assigned to this monitor on the Switcher rows below. (The function of these buttons is identical to the corresponding controls in the **All Monitors** tab.)

7.4 PREVIEW SCOPES TAB
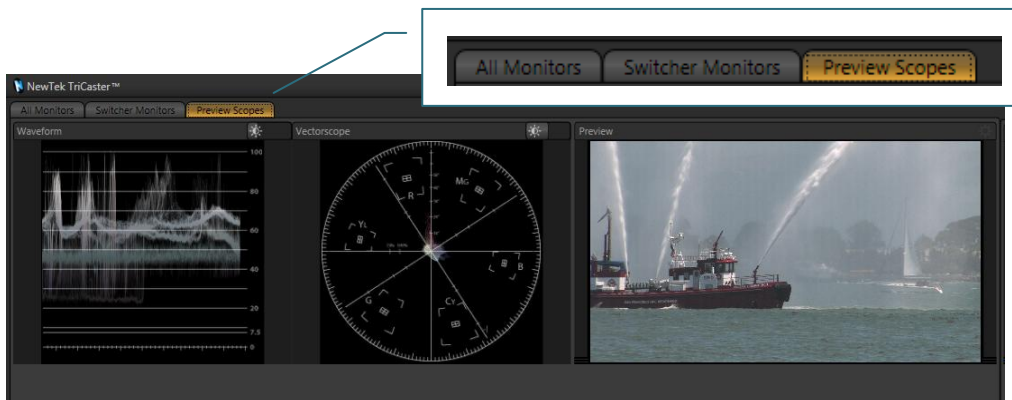
Figure 103

A third monitoring tab option is **Preview Scopes**. This alternative presents a **Preview** monitor (showing the current Preview row selection) along with **Waveform** and **Vectorscope** displays. These displays permit the user to judge the effect of **Proc Amp** and **LiveMatte** adjustments while making them. (See Appendix C, Video Calibration for help on using TriCaster's scopes.)

A control above each scope allows you to adjust the **Brightness** for that display – drag the slider left/right, or click the control to enter a value directly using the keyboard. Shift + double-click to reset the slider to its default.

Hint: Drag the horizontal divider between the monitoring section and switcher to re-size the monitors.

8   I/O CONFIGURATION

TriCaster provides extensive control over your video signal at both input and output stages.

Each video source has its own realtime Proc Amp and keyer (via LiveMatte). As well, TriCaster supports independent Proc Amp settings for each of output types - Program, Stream and VGA.

It is very useful to be able to adjust each source and also the output stream independently. Source configuration options ensure that you can match camera inputs to each other, and that their signals fall within legal ranges (it's best to use camera white balance controls whenever possible, mind you).

Output proc amp settings allow you to make adjustments for a specific purpose. For example, independent **Proc Amp controls** make it simple to tweak the **VGA** output to conform to local conditions such as projector color temperature variations, projection surface color and local lighting conditions – without affecting other video output streams.

Let's begin with a consideration of **Output Configuration** tools.

8.1   OUTPUT CONFIGURATION
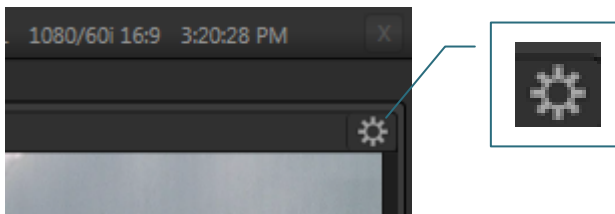
Figure 104

Roll the mouse pointer over **Program Output** to reveal a **Configure button** (Figure 104) above the top-right corner of the display. Click it to open the **Output Configuration** panel (Figure 105).
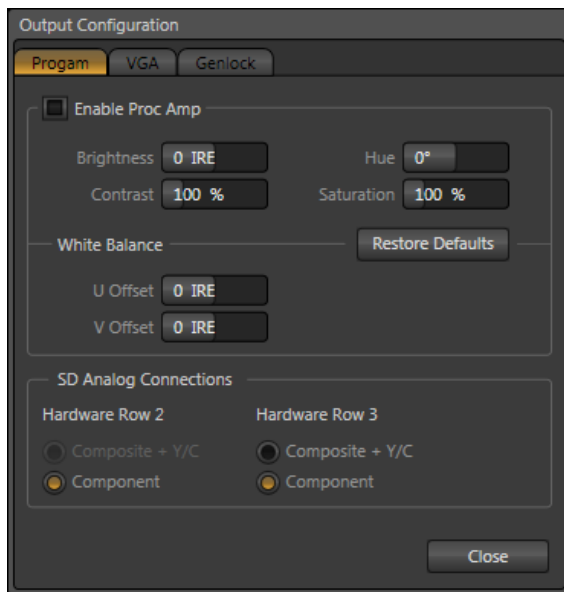
Figure 105

8.1.1 SEPARATE OUTPUT CONTROLS

Output Configuration contains tabbed panes providing:

- **Program**
  - **Proc Amp** ('processing amplifier') controls for TriCaster's primary output
  - **SD Analog Connection** configuration controls
- **VGA**
  - **Proc Amp** controls for **VGA** output
  - **VGA** output display options
- **Genlock**
  - **Genlock** calibration controls
  - **Center Frequency** setting

This panel closes when you click the **Close** button or click outside the panel.

8.1.2 PROC AMP

Proc Amp adjustments can be toggled on and off using the **Enable Proc Amp** switch at upper left in the **Main** and **VGA** panes, or reset by clicking the **Restore Defaults** button. Each **Proc Amp** pane has numeric slider controls for:

- **Brightness**: Adjustment range from -100 to +100 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 0-500% (default 100%).

- **Hue** – Adjustment range from -180° to +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 way to accurately monitor the video signal to avoid issues such as illegal color.
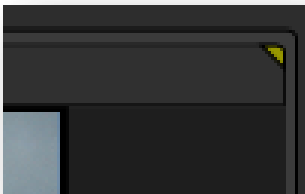
Figure 106

To serve as a visual reminder, a small yellow flag is provided above the **Program Output** monitor when any output stream has **Proc Amp** settings enabled (Figure 106).

> *Note: TriCaster's input and output Proc Amps are very useful. However, please keep this important thought in mind: Whenever possible, it is best to perform color adjustments at the source or target device. For example, it is better to correctly calibrate a camera's colors at the camera, before sending the signal to TriCaster. Doing so will yield higher color precision.*
>
> *Similarly, it's best to adjust output color using controls on down-stream devices – monitors or projectors whenever possible. TriCaster's VGA Proc Amp can never completely compensate for a badly calibrated monitor.*
>
> *TriCaster's Proc amps are available for occasions when no external options are available (many cameras do not have built in color controls; projectors generally do, but at times the physical placement of the device can make it inconvenient to access to them).*

WHITE BALANCE

A secondary group labeled **White Balance** adds **U Offset** and **V Offset** controls.

- The U portion of the video signal carries the blue and green color information. When you adjust the **U Offset**, you adjust only the blue/yellow portion of the video signal. Rotate U Offset clockwise to shift the signal toward blue and counter-clockwise to shift the signal toward yellow.

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

8.1.3 SD ANALOG CONNECTIONS
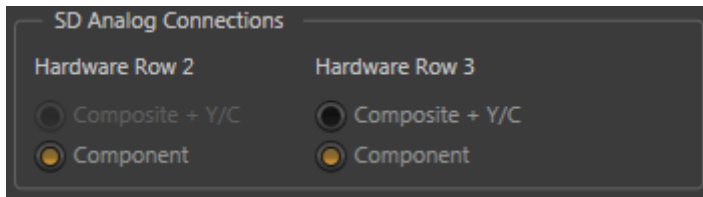
Figure 107

As discussed back in Section 3.6.2, TriCaster's three VIDEO OUT connector rows may output SD, HD, or both *simultaneously*.

- Row 1 and 2 video output *always* matches the session format.

- Row 3 *always* outputs SD video.

- For HD sessions, HD video output is in the same format (HD 720p, or HD 1080i). Consequently the four connectors in each row are configured as HD SDI and HD Component (Y, Pr and Pb).

- Similarly, for SD sessions Rows 1 and 2 output SD video. (If the session is 4:3, output is also 4:3. When the session is 16:9, video output is also 16:9.)

Some options are available for SD analog output. Analog output on Row 1 is always component, but you may select between **Composite + Y/C** or **Component** output for Rows 2 and 3. For HD sessions, Row 2 outputs HD, just like Row 1 – so in that case, the analog connection option is only available for output Row 3 (which is *always* SD). Choosing **Component** or **Composite + Y/C** results in the output connectors in the corresponding row being configured as follows:

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

8.1.4 VGA OUTPUT

Figure 108

TriCaster's VGA output fills several valuable purposes. You might use it to provide a video stream to a projection or other remote display system at high resolution.

The **VGA Output Resolution** menu provides a long list of popular and useful options to allow you to conform output to your downstream external device. Note that it is important to select the native resolution of the external display device (monitor or projector) for best results.

NOTE: Changing Output Resolution can cause frames to be dropped briefly. We do not recommend changing this setting during live production.

If you supply your external projection system using TriCaster's SDI or analog video outputs (or don't require projection) the VGA output can be given another assignment. Often, you might use it to support a secondary display monitor for the TriCaster operator. Or you may wish to use it support display of something other than the main Program output. This is where the **Screen Layout** menu comes in.

Figure 109

Screen Layout offers a diverse list including six optional displays as follows:

- **Program Monitor**: duplicates TriCaster's main Program output
- **All Sources**: this useful display is the default, and combines ISO monitors for all Switcher sources plus Program and Preview and a handy digital clock
- **Preview Monitor**: the current Preview row selection
- **Waveform/Vectorscope**: the current Preview row selection along with large Waveform and Vectorscope monitors
- **Effects Monitor**: the current Effects row selection
- **Preview/ Program Monitors**: the video sources currently

8.1.5 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. This synchronizes TriCaster output to other external equipment locked to the same reference. Genlocking is not an absolute *requirement*, but it is very *beneficial*, and you should definitely use it if you have the capability.

Figure 110

Hint: "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'.

TriCaster mixes and switches output from *three* video sources. Miniscule timing differences between these may force tiny delays during switching operations, which can also contribute to throughput latency. Thus, serving i) TriCaster's Genlock input <u>and</u> ii) other video devices in the chain all with the same reference signal 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.

IMPORTANT Note: Digital audio is less forgiving in certain respects than analog. To avoid occasional audio glitches when mixing digital audio (whether for recording or live production) you must ensure that the timing for all digital audio sources is synchronized.

This means you <u>must</u> do one of the following: i) genlock all digital audio sources and TriCaster to a house reference signal, or ii) genlock the cameras to TriCaster's output.

VERT POSITION, HORIZ 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). The **Phase** setting ensures proper color alignment, corresponding to making sure everyone is on the left or right foot at the same time.
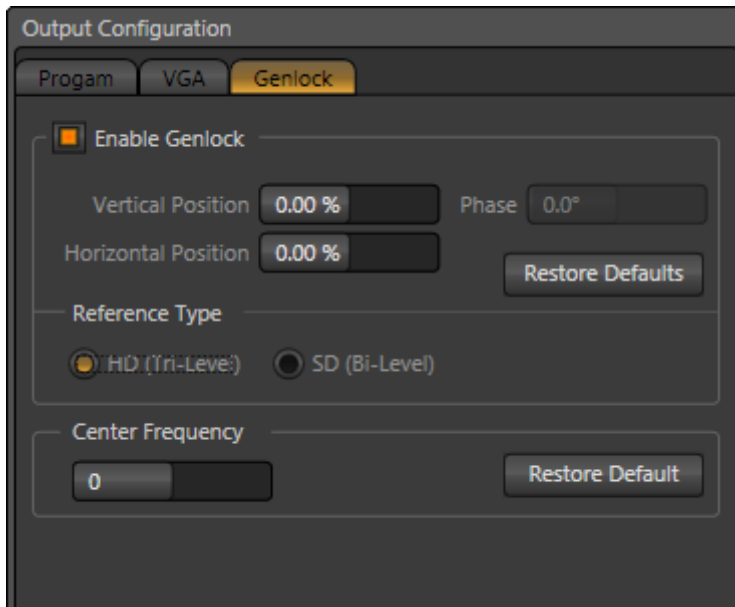
Figure 111

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

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

8.1.6   CENTER FREQUENCY

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

8.2   INPUT CONFIGURATION
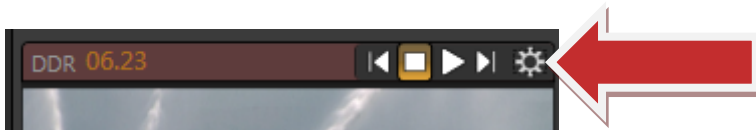
Figure 112

Just as for **Program Output**, the other preview monitors also have contextual tools that appear when you roll the mouse pointer over them. In every case, the right-most button is a **Configure button** (Figure 112). Clicking it opens the **Configuration** panel for a specific source (Figure 113).
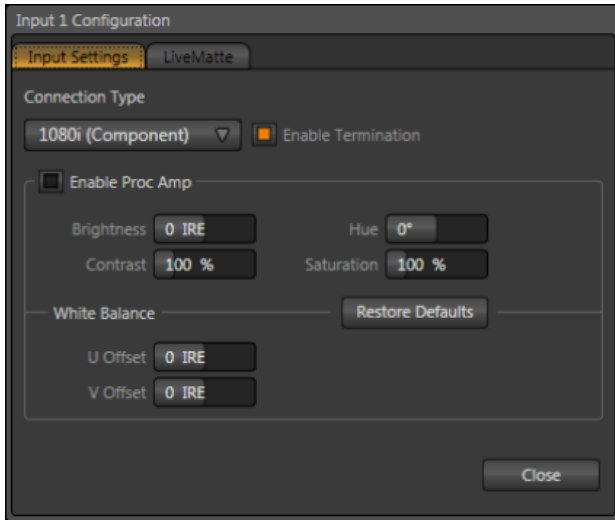
Figure 113

8.2.1 CONNECTION TYPE

The **Configuration** panel for the **Camera 1-3** inputs features a **Connection Type** menu at the top of its **Input Settings** tab. The options are:

1080i (Component)

• Analog source, high definition, interlaced
• 1920x1080 pixels, 16:9 picture aspect
• Connected to TriCaster by Y, Pr and Pb input connectors

1080i (SDI)

• Digital source, standard definition, interlaced
• 1920x1080 pixels, 16:9 picture aspect
• Connected to TriCaster by SDI input connectors
• Optionally carries embedded audio)

720p (Component)

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

720p (SDI)

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

Standard definition options, listed below, are provided in both 4:3 and 16:9 alternatives:

480i (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

480i (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)

480i (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

480i (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

Component 576i

- 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

SDI 576i

- 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)

Y/C 576i

- 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

Composite 576i

- 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

Connection Type menu offerings vary depending on the **Video Standard** for the session. TriCaster **International** 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.

TERMINATION

The **Termination** switch toggles a 75 ohm resistance which may be required for certain video sources. In a situation where you intend to loop a house sync signal *through* the TriCaster to other devices, Termination should be turned off.

8.2.2   PROC AMP
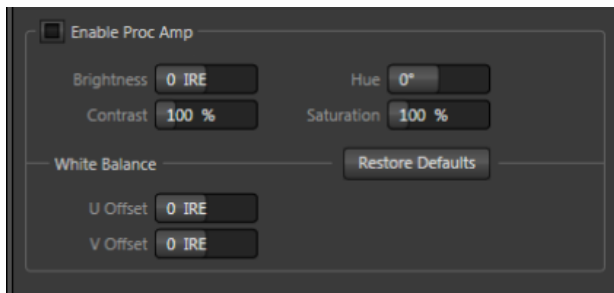
Figure 114

The lower portion of the **Input Settings** tab contains **Proc Amp** settings. These settings are identical to those discussed previously in Section 8.1.2. Of course, these settings are applied to the individual video *inputs*, thus before *output* Proc amp settings (which affect all sources equally).

When the **Proc Amp** is enabled for a specific source, a small yellow flag is displayed in the upper-right corner, just above the corresponding monitor in any of the three main monitor tabs.

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.

8.2.3   LIVEMATTE

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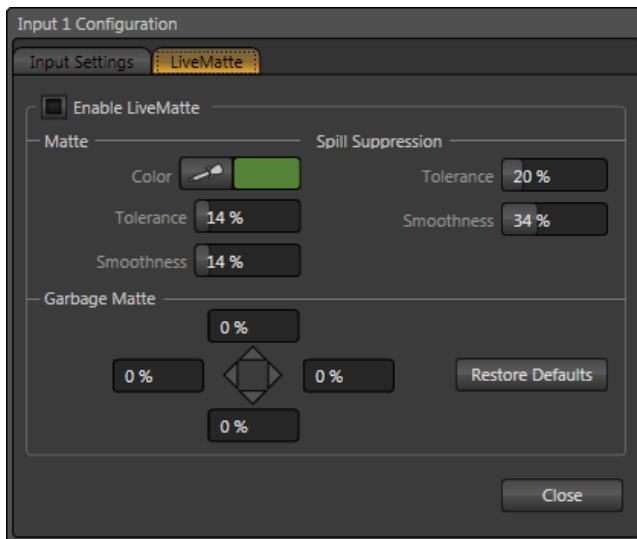
Keying is a popular and powerful method of combining two images — whether photos, video clips or live camera streams. The process involves eliminating a portion of the image (effectively cutting a digital 'keyhole' in it) to reveal a user-defined background scene. It also plays an important role in the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

LiveMatte's controls are deceptively simple, making a great deal of complex digital manipulations easy to use. Even so, much can be said about getting the best results. For that reason we've devoted a whole chapter in this manual to discussing it (please see Chapter 14).

When **LiveMatte** is enabled for a specific source, a small green flag is displayed in the upper-right corner above the corresponding monitor in any of the three main monitor tabs.

9 NETWORK SOURCES

The network source ability of your TriCaster is a very useful feature. You can use it to live switch displays from networked computers as part of your productions.

Or, connect to a networked workstation or laptop computer running LiveText™, NewTek's powerful realtime title and graphics software. This permits you to assign CG preparation and display to a second operator, freeing you to focus exclusively on live switching, and expanding your production capabilities.

External computer display inputs served across a network can be selected as video sources in TriCaster's live production environment.

Potential sources include displays from network connected (Windows™ or OS X™ based) computer systems (via **iVGA**™), and text and graphics overlays from **LiveText**™. The currently selected **Network** source is 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.

9.1 IVGA

For an **iVGA** source to be recognized by TriCaster, you must first install a small iVGA client program a computer on your network. iVGA client programs are supplied for Microsoft Windows™ (2000, XP and Vista, and Windows 7) or Apple OS X. You will find the iVGA installation files in the C:\TriCaster\ iVGA folder.

9.1.1 IVGA FOR OS X™

The iVGA installation for Apple OS X installations is supplied as a zipped disk image (.dmg) file. To install it, first establish a network connection between your Mac and TriCaster systems. Then copy this file to your Mac desktop.
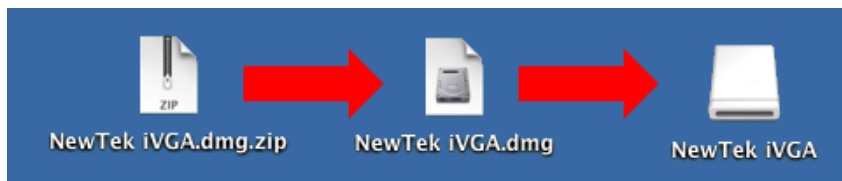
Double-click the Zip file to decompress it, and then double-click the .dmg file to mount it. The NewTek iVGA icon shown above will be placed on your Desktop. Open it (by double-clicking, and you will see two files in a Finder window – the readme file, and the iVGA client program.

Drag the iVGA icon form 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 **Network** ISO monitor 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.

When **iVGA** is running, the icon in the (OS X) **Dock** has a menu you can access by right-clicking on it:

1. Engaging **Privacy Mode** prevents the client display from appearing accidentally on TriCaster when you don't want it to.

2. You can set iVGA to show either of two monitors, when you have more than one attached.

3. **Open at Login** will automatically launch iVGA for you every time you login, if you wish.

9.1.2   IVGA FOR WINDOWS®

The iVGA installation for Microsoft Windows® systems is supplied as an executable (program) file.

To install it, first establish a network connection between the client system and TriCaster. Then copy this file to the client system.
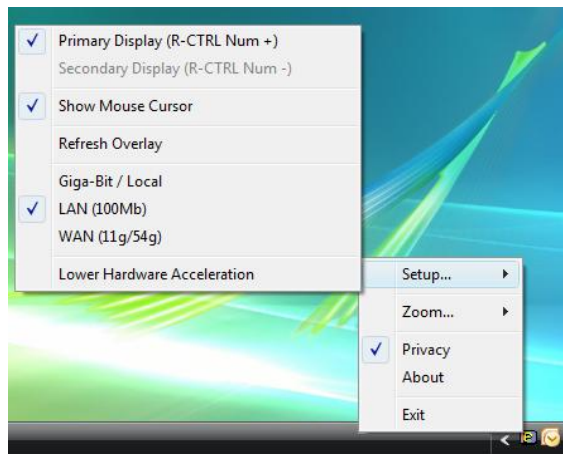

Figure 119 – iVGA context menu, Windows® version

Note: iVGA will run from anywhere you put it on the client hard drive, but you might wish to install it in the Program Files folder (Program Files (x86) for a 64bit version of Windows.

Run iVGA on the client computer by double-clicking its icon. A smaller icon will be added to the Windows *task tray*. To select this external computer as TriCaster's current **Network** source, click the triangle that appears next to the **Configure** button for the Network monitor when you roll the mouse pointer over it. The iVGA icon begins cycling – notifying you that this is a live input.

Right-clicking the little icon (on the iVGA client system) reveals a menu with various options (Figure 119):

Setup allows you to choose between monitors on a dual-screen system. You can also decide whether or not to **Show Mouse Cursor** in the display. **Refresh Overlay** is there in case you need

to quickly reset iVGA. Selecting this is equivalent to stopping and re-starting iVGA.

This is also where you set the rate of transfer your network can safely handle. Gigabit network connection provides the best transfer rates. Slower connections may drop frames, are should be considered unsuitable especially for HD sessions (in extreme cases, where network capability is low or unreliable because of other traffic, iVGA would still be useful for static displays).

> *Hint: **Lower Hardware Acceleration** may help in some cases where a client application uses display technology that would otherwise not work with iVGA. (Normally this can be left disabled.)*

1. **Zoom** allows you to magnify an area of the Windows display, which can help when fine detail is important for an application display on the screen. The portion of the screen sent to iVGA output is determined by the position of the cursor on screen.

   You can set zoom to 150, 200 or 400 percent, or disable it. When you do not want your zoomed view to move once set, you can lock zoom position with a hotkey — Right Ctrl + Numpad 9. The hotkey is a toggle – use it again to cause the display to track the cursor again (this is useful to re-position the display, too.)

2. **Privacy** mode allows the client some discretion if they need to check e-mail, or perhaps view or arrange something without risk of the audience observing. When selected, this will display a large "Privacy Mode" banner in TriCaster's preview monitors, so the operator is aware this source is temporarily off-line. The client icon also has a 'P' across the face, to remind the client that privacy mode is active.

3. Lastly, selecting **Exit** shuts down the iVGA client, and removes the icon from the task tray.

9.2   LIVETEXT

As we noted in the Walkthrough chapter (Section 4.5.2) a companion workstation on your TriCaster network with LiveText™ standalone installed serves as a dedicated CG and title solution for your live presentations.
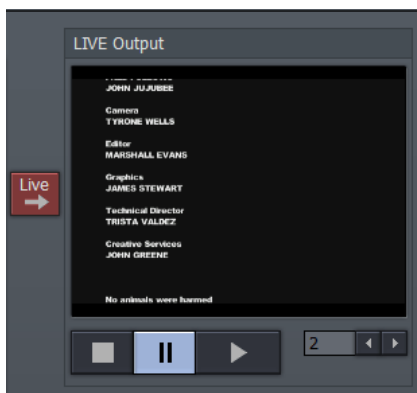
When running and connected, LiveText will be listed in TriCaster's **Network** drop-down menu, similar to an **iVGA** source.

For more information on installing and using LiveText, please refer to its manual.

Figure 120 – LiveText LIVE Output pane

Live webcasting has dramatically altered the broadcast landscape. Information can now be shared among audiences around the world with very small transmission costs – and the future is bright!

It seems certain that the live streaming market will continue to expand, providing many creative and profitable opportunities. When it comes to taking advantage of this new medium, TriCaster can place you in the forefront.

10.1 TRICASTER STREAMING

TriCaster offers both of the most popular streaming *encoders* – Adobe Flash® and Microsoft Windows Media™ – along with two streaming protocols named **Push** and **Pull** (see Section 10.2.2, Streaming Protocols for more information).
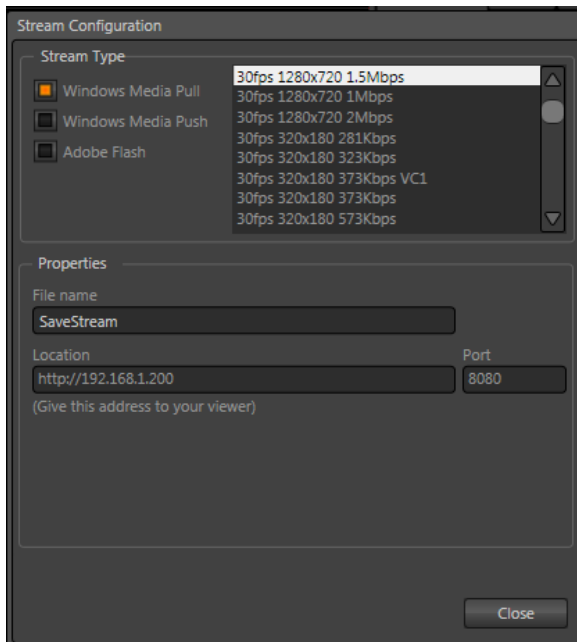
Figure 121

All the settings you need to configure your streaming output are located in the **Stream Configuration** panel (Figure 121). To open it, click the **Configure** button (gear) beside the **Stream** button – beneath the **Program Output** monitor.

10.1.1 PULL PROFILES

If you are streaming internally (to people in your building or inside your own corporate firewall), **Pull** streaming may well provide the easiest approach. (Be aware that 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. Also, Flash does not support Pull type connections.)

To see what Internet address to provide your customers or streaming provider, select a suitable Pull profile from the **Stream Type** menu. After pressing the **Stream** button (beneath **Program Output**) the stream will commence, and the button will light up to indicate this.

Note: The Windows Media Encoder supports Windows Media 11 and VC1 presets. VC1 is the video standard for HD DVD and Blu-Ray™ players, and is also used in some other environments such as gaming applications.
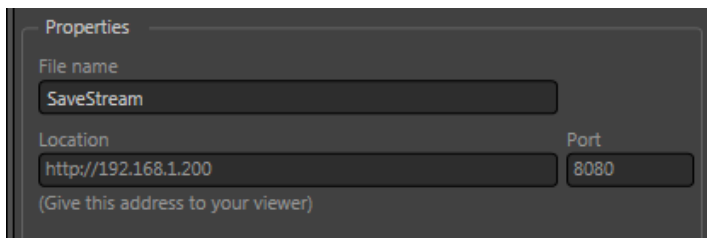
Figure 122

Once you begin (Pull) streaming, the **Stream Configuration** panel displays the IP (Internet Protocol) address of your computer on the network. This information will be provided as 'punctuated' numeric value in the **Location** display field.

Your live program stream will be sent continuously to the network while the **Stream** button is enabled.

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.

10.1.2 PUSH PROFILES

Push streaming is generally the most convenient method, especially in cases where TriCaster is connected behind a firewall. As discussed earlier, Push streaming is 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 **Stream Configuration** interface changes 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 after 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.

10.1.3 CAPTURING THE STREAM

TriCaster can archive your live stream file as it is created. The **File name** field in **Stream Configuration** allows you to assign a name to the resulting file. A new folder will be automatically created as needed (at D:\Media\Clips*sessionname*\SavedStreams) to receive the captured stream file.

10.2 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.

10.2.1 ON DEMAND, OR LIVE?

Not all 'streaming' is 'live streaming.' The difference is similar to i) watching a television program you previously recorded at a time convenient for you, or ii) watching a live event.

On demand streams are stored on a server (often supplied by an external service provider), ready to be transmitted whenever a viewer wishes. Live streams are available at the time they are broadcast, such as during a live concert or event.

ON DEMAND HOSTING

TriCaster permits you to record live productions to a local hard drive. The resulting files can be hosted on a network later, so viewers can connect whenever they like. If you have the resources

available, you can host the video yourself – but if many people will likely want to view your production, you will likely avail yourself of a service to stream it on your behalf.

Ideally, 'on demand' streaming video begins to play on request after a few moments (letting the stream get a bit ahead of the client playback device is called 'buffering', and helps ensure smooth playback). (This stands in contrast to other types of online video distribution which requires the viewer to completely download the video file before he can begin play. Given a sufficiently high speed connection between host and viewer, they may well be able to enjoy a seamless viewing experience without stuttering or other issues.

LIVE STREAMING

Live streaming is a growing international market, and one you may well wish to serve. This form of streaming is a somewhat more demanding implementation. Rather than record a file and deal with it later, live video is transmitted over the network (effectively in realtime, give or take a little 'time in the pipe' as it were.) Delivering a good quality stream requires that you consider both your network connection capabilities and that of your viewers. As well, to ensure reliable delivery, you will ideally have some idea of the size of your audience. Nevertheless, for all cases, TriCaster gives you the tools to do the job.

Naturally, streaming video is highly compressed to reduce bandwidth demands and make it available to a wider group. TriCaster supports two popular and prolific encoding systems, Microsoft's Windows Media™ and Adobe Flash Media ®.

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).

- Codecs for both types are 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.

BANDWIDTH CONSIDERATIONS

You'll often hear the term 'bitrate' in connection with streaming video. This expression refers 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:

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 10.4.1 for some useful resources.)

10.2.2 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 2003 Server 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.

10.2.3 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 a few hours notice, they can scale up your allotment on demand 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: If you need to find a good streaming service provider, ask TriCaster users for recommendations in NewTek's online discussion forums!

10.2.4 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!)

10.3 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, to 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.

10.4 CONFIGURATION 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.

10.4.1 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 <u>now</u> - 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 and his Law are alive and well. 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. Use another system to open Windows Media Player™, and use its menu (in some versions, you need to right-click WMP's title bar to present the menu) to select **File> Open URL**.

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, in a few cases Flash® Media Live Encoder fails to report significant error conditions. For example, if the network cable is disconnected while streaming, or if the connection to the remote server is lost, no error message is displayed.

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.

TESTING WITH PING

Before your stream can be seen - whether on a local intranet or the Internet - client computers (or your service provider) need to be able to establish a network connection with your 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®
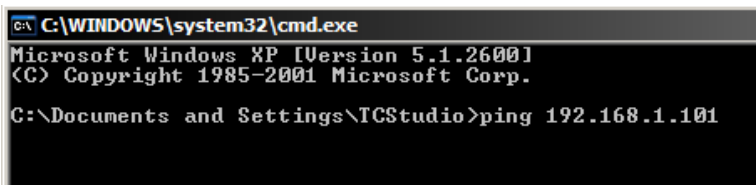
1. Click the Apple icon at upper left on the Desktop, and select About **This Mac.**

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**.


```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\TCStudio>ping 192.168.1.101
```

Figure 123

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 124. A success ping will display a report like Figure 125.

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.) You will also need to enable "port forwarding" on the router.

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.

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:

1. 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.

2. 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).

3. 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.

Figure 126

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).

3. Enter an **Application** name, if required (this is for your own recognition purposes, so use anything you like).

4. Enter the **Start** and End **port** values – you can use the same port number in both fields, but of course it must be the one you set in TriCaster's **Port** field.

5. IF possible, select Both for **Protocol** (or select UDP).

6. Enter the <u>full</u> (punctuated numeric) local IP address shown in the **Location** field of your TriCaster after you enable the stream.

7. Checkmark **Enable.**

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 Microsoft 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 simply 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

You will often want to capture video clips from external sources, as well as to record your own outgoing live production.

Similarly, it can be quite useful to be able to grab stills from Program Out, for use in the current production. This chapter will provide everything you need to know about this topic.

TriCaster offers the ability to capture the a/v stream from **Program Output** to hard disk. This can be useful as a method of archiving a live production for later use, or as a way to capture video clips for playback from the **DDR** *during* a live production.

Relevant settings and controls are grouped in the **Record Configuration** panel. To open this panel, click the **Configure** button (gear) next to **Record** beneath the **Program Output** monitor.

Hint: Record and Grab functions capture imagery from Program Output after the video signal has been processed by both Main and Input Proc Amps.

11.1.1 RECORD

Recording program output provides a way to capture an entire live production on the system, or to capture media files for use in the **DDR** or SpeedEDIT (**SpeedEDIT** provides its own supplemental capture capability for pre and post production applications).

Figure 127

Clicking the **Record** button activates recording (Figure 127), illuminating the button. The timecode display resets to zero when recording begins. Recording uses the current settings from the **Record Configuration** panel, discussed next.

RECORD CONFIGURATION

The **Record** group in the **Record Configuration** panel has several options in it. You can choose to record **Audio + Video** or **Audio Only**. There is an additional option in connection with the first case – **Include Separate MP3 file**. When this switch is enabled, a supplementary audio-only file is created, which can be useful if you plan to use third-party software that does not properly support the embedded audio in the MPEG2 clips that TriCaster records.
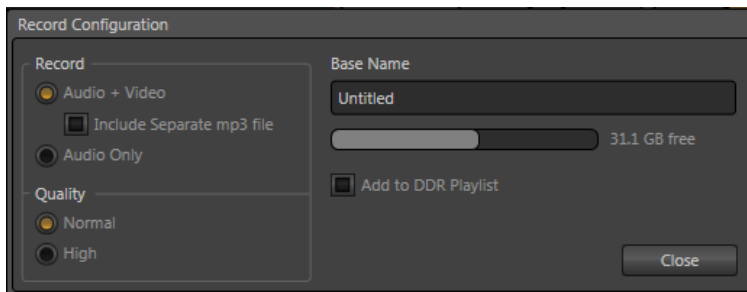
Enter something suitable in the **Base Name** field (this name will be incremented numerically as required). Close the **Record Configuration** panel by clicking **Close**, or clicking anywhere outside the panel. When ready, click the **Record** button to capture program output to your hard drive.

Files recorded by TriCaster are stored in a folder named for the session, inside the main **Clips** folder. A new sub-folder named "Capture" will be automatically created to receive the recorded files inside the session folder.

Hint: Enable the **Add to DDR Playlist** switch to automatically include newly captured clips at the end of the current DDR playlist, ready for immediate playback during the live production.

QUALITY

TriCaster records video using a 'double-rate' MPEG2 compression format comprised entirely of 'I-frames', resulting in excellent image quality.

Two options under the heading **Quality** principally affect color sampling applied to captured clips:

- **Normal** quality invokes 4:2:0 color sampling (similar to that of the popular 'DV' and 'HDV' formats).

- **High** quality 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.)

FILE COMPATIBILITY

The 4:2:2 sampling and high fidelity invoked by the **High Quality** setting make it especially well-suited to critical chromakey applications. Support for High Profile MPEG-2 files by various applications, while widespread, is not universal, however. It would be prudent to test file compatibility with your favourite third-party programs before making extensive use of the Studio Profile.

Note: TriCaster's High quality files fulfil the requirements for "High Profile" MPEG-2 encoding 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.

11.2 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.
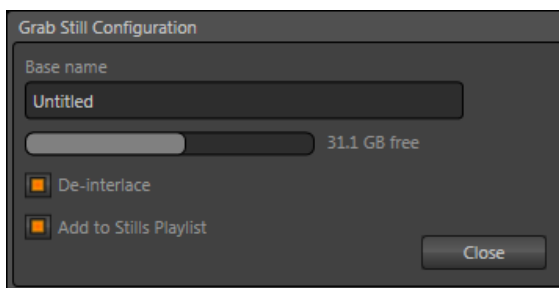

Figure 129

Click the **Configure** button (gear) next to **Grab** beneath the **Program Output** monitor to open the **Grab Still Configuration** panel.

The options presented are 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 the **Add to Stills Playlist** switch to automatically include newly captured clips at the end of the current **Stills** tab playlist, ready for immediate playback during the live production.

Close the **Grab Still Configuration** panel by clicking **Close**, or clicking anywhere outside the panel. Click the **Grab** button to capture the selected a/v source to your hard drive. Image files are stored in a folder named for the session, inside the main **Stills** folder.

Hint: During a session, the 'grab counter' next to the button keeps track of the number of images stored for the current base name entry.

12 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, two independent downstream overlay channels, and some very useful automation.

This chapter reviews these vital components of your live productions.

The central band of TriCaster's **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 **Transition** and **Overlay** areas (Figure 130).

Switcher Rows	Transitions	Overlay
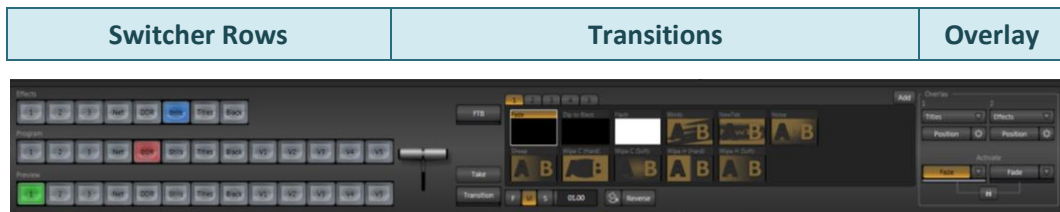
Figure 130

12.1 SWITCHER ROWS

The three Switcher rows are labeled **Effects**, **Program** and **Preview**, from top to bottom. Clicking a button in any row selects the active *video source for that row.

Figure 131

* An audio source may or may not be associated with a given video selection, and may or may not be affected by **Switcher** row activity – audio configuration is discussed in Chapter 16.

The **Effects** row selection provides an auxiliary video stream which can serves in a variety of ways. For example, it could supply the background scene for a **Program Row** video stream with **LiveMatte** enabled. It might be assigned to an **Overlay** channel (see Section 13.3), or as Input A, B or Overlay source for a **Virtual Input** (see Chapter 16).
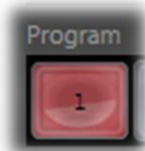
The **Program** row selection determines the primary video stream sent to **Program Output**. Other imagery *may* be mixed with this primary source at times – LiveMatte effects, overlays and the like, or an incoming video source during a transition. However, it would be reasonable to think of the Program row selection as supplying the foundation for Program Output.
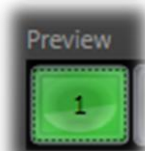
The **Preview** row selection determines which source is queued up for display by the next **Take** (cut) or **Transition** operation.

Figure 132

The **Program** and **Preview** rows are extended with buttons labeled **V1-5**. These buttons control display of the composite output of TriCaster's **Virtual Inputs** (Chapter 14).

12.2 TRANSITIONS

Immediately to the right of the Switcher rows is the **Transitions** section. With just one exception, this group of controls and settings provide many creative and flexible ways to swap the video streams selected on the **Program** row for that selected on the **Preview** Row.
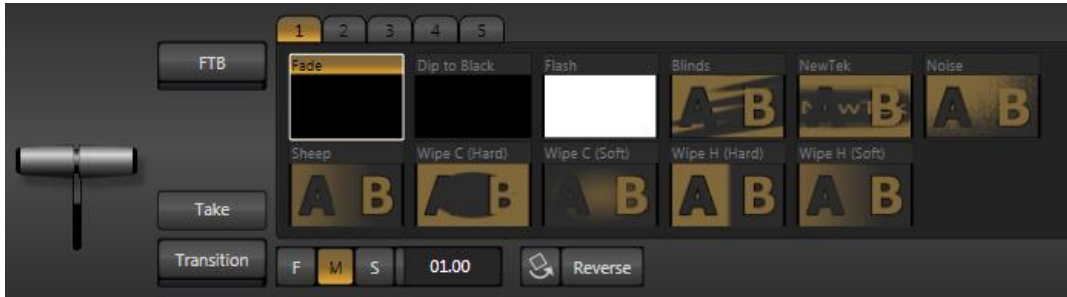
12.2.1 TAKE AND TRANSITION

The simplest way to accomplish this **Program** ↔ **Preview** stream *swap* is to click the **Take** button (keyboard shortcut **Enter**). This performs a straight cut to the Preview source.

Clicking **Transition** (or pressing the keyboard **Spacebar**) performs the same source swap, but does so using the digital video effect selected in the **Transition Bin** - whether a simple **Fade**

between sources, or something more elaborate. The time it takes for the transition is determined by the **[F]**, **[M]**, and **[S]** (Fast, Medium, and Slow) buttons. These correspond to two, one and one half seconds. Alternatively, you can drag left or right on the nearby numeric slider to set a different transition

Figure 134

time (click the time slider to enable direct keyboard entry of the duration for transitions).

Clicking **Reverse** causes transitions to be performed in the opposite direction. For example, a transition that normally reveals the incoming video stream from left-to-right will operate from

Figure 135

right-to-left instead. The small button immediately to the left of **Reverse** is **Ping Pong** (shown illuminated in Figure 135). When Ping Pong is enabled, the Reverse button is toggled on or off each time a transition is performed. Using
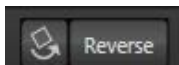
the previous example, if the last transition progressed from left-to-right, the next one will automatically be reversed and thus run right-to-left.

TAKE ALL/TRANSITION ALL

Two useful Switcher features do not actually appear visibly on the Live Desktop. **Take All** and **Transition All** work very similar to their 'shorter' namesakes, differing in only one respect – they remove or display (as the need might be) the content of Overlay channel 1 (or both channels when Overlay is locked).

These two features are performed using shortcut keystrokes – press "a" for Transition all, and "s" for Take All. The optional LC-11 control surface provides buttons for both functions, as well.

12.2.2 FTB

FTB stands for "Fade to Black". The function the button bearing that label performs will not likely surprise you very much. Even so, this buttons constitutes the exception mentioned earlier.

 While **Take** and **Transition** both perform a swap between the sources selected on **Program** and **Preview** rows, FTB does not. Rather, it does precisely what its name implies, fading **Program Output** out completely (to black).

12.2.3 T-BAR

The **T-Bar** mimics the similar control on a traditional video switcher, and allows you to *manually* perform a transition between sources assigned to the **Program** and **Preview** rows.

Figure 136

To use the T-bar, pull it downward by dragging it with the mouse pointer. When you drag it all the way to the bottom and release, the transition is completed. The T-Bar then pops back to the top position.

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

12.2.4 TRANSITION SELECTOR

Completing the Transition section is the **Transition Selector**, which allows you to pre-select the transition effect that will be performed next. The active transition is displayed with a white border.

The current transition bank is surmounted by five numbered tabs, which allow you to choose which bank of transitions to display.

Figure 137

Click the **Add** button at right to open a **Media Browser** to select from available transitions to populate the current bank (select entries under the **Transitions** heading in the left-hand column to view the installed transition sets.

A scrollbar (or the arrows at either end) beneath the **Transition Selector** allows you to view and select from the entries you add. Right-click a transition icon to open a menu that allows you to **Remove** the transition.

Hint: The frequently-selected Fade transition is always conveniently available at left.

12.3 OVERLAY
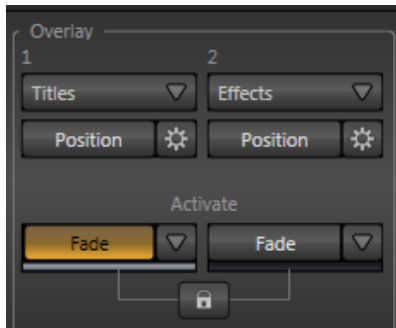
 The **Overlay** panel is the final component of the central **Switcher** section of the **Live Desktop** for us to discuss. You'll find it at the right-hand end of the **Switcher** panel (beneath the **Program Output** monitor). This placement is quite appropriate, as the two Overlay channels configured and controlled in this section represent a final opportunity for you to superimpose imagery on the video stream prior to output.

12.3.1 TWO CHANNELS

This group provides individual (or optionally, linked) control over two overlay (downstream keyer, a.k.a. "DSK") channels designated **Overlay 1** and **Overlay 2**. Imagery displayed in Overlay 2 appears 'in front of' Overlay 1 on **Program Output** – that is, closest to the viewer.

12.3.2 OVERLAY SOURCE
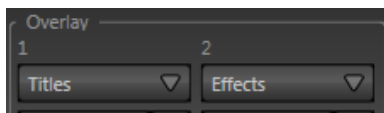
The **Source** button at the top of each Overlay section (Figure 139) identifies the current source for that overlay channel. The default source for **Overlay 1** is "Titles", while for **Overlay 2** it is "Effects". Clicking the Source button opens an input selector button row (Figure 140).
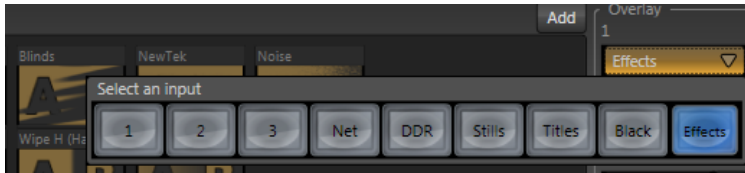
Figure 140

Clicking a button in the input selector updates the **Source** button label, and closes the selector (clicking anywhere outside the selector closes it without changing the current selection).

12.3.3 SOURCES AND TRANSPARENCY

Some **Overlay** sources may be partially transparent.   This might be because they are drawn from a media player (**DDR**, **Stills** or **Titles**) showing a file with an embedded *alpha channel*, or perhaps because **LiveMatte** is enabled for the source.   In either case, Overlay will respect the transparency.   The 'upstream' switcher output will appear through (or around) the Overlay channel source where appropriate.

Important Note: Use straight (a.k.a. "non-premultiplied") alpha channels in TriCaster's media players. Premultiplied files may not yield correct results when overlaid on other imagery.

Figure 141

TriCaster's Overlay channels offer a lot of creative possibilities.   You might use one channel to display a permanent station ID 'bug'.   Or, you might superimpose a company logo from **Stills** onto a title page in Overlay channel 2, add a 'spinning globe' animation playing in the **DDR** to a

lower-third, 'frame' a picture-in-picture (Figure 141), or set up many other elaborate effects in this manner.

12.3.4 POSITION (AND SIZE)
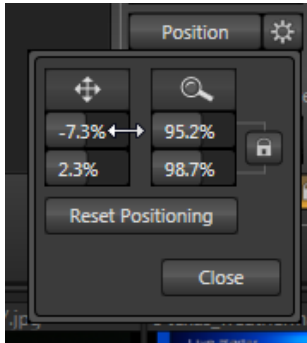
Each Overlay channel has its own **Position** button and settings. Click the neighboring **Configure button** (gear) to open the **Overlay Position** panel (Figure 142) for a specific channel.

At the top of this panel are two buttons – **Position** and **Size**, respectively. Click and drag on Position to relocate the source vertically or horizontally within the output frame. You can view the result of your modifications on **Program Output**, but if you do this during a live production you will likely set up the overlay on **Preview** instead, to hide your tinkering from the viewing audience. Notice that by dragging left or right on either of the two numeric gadgets below, you can adjust the position on a single axis. You can also constrain the action to one axis by holding down the Ctrl key before dragging.

Hint: 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).

In similar fashion, dragging the cursor on the **Size** button (magnifying glass) affects the *scale* of the overlay. When the nearby *lock* button is enabled, dragging in any direction affects size equally on both axes. Otherwise, dragging vertically changes the height of the overlay, and dragging horizontally affects its width.

Again, if you drag just one of the numeric gadgets below the **Size** button (with lock *disabled*), you modify just one dimension of the overlay stream – width or height.

Looking back at Figure 141, it can be seen that both the picture-in-picture source and the 'TV monitor' frame around it have been scaled down and repositioned. (Of course, TriCaster provides other and arguably *better* ways to accomplish a similar effect without requiring the use of the Overlay channels – see Chapter 15, Virtual Inputs.)
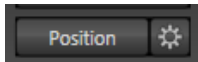
Figure 143

Position and **Size** can be reset by clicking **Reset Positioning**, and can be toggled on or off by clicking the **Position** button (Figure 143).

12.3.5 ACTIVATE
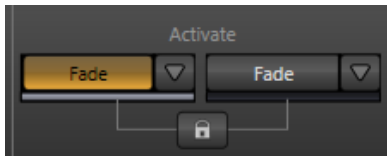
Figure 144

Overlay channels can be displayed or removed using effects. Buttons for each channel beneath the **Activate On/Off** label perform the assigned effect. Click the selector button (triangle) located beside the **Activate** button to open a menu displaying a list of available effects.

Hint: The duration for an effect is governed by the S|M|F buttons in the Transitions section of the Switcher.

Something interesting is that the direction of the effect automatically alternates. That is, if the first click displays the overlay using an effect, the next click removes it using the *reverse* effect, and so on (this behavior mimics the **Ping Pong** button in the *main* **Transitions** group).

A progress bar beneath the **Activate** button tracks display status, remaining fully 'on' when the channel is 100% displayed (Figure 144).

12.3.6 LINK OVERLAYS

By default, the display states of the two overlay channel are independent (permitting you to remove a title without removing its background at the same time, for example.) Enabling **Link Overlays** (the 'padlock' button shown illuminated in Figure 145) causes subsequent effect operations for Overlay 1 and 2 to work in tandem.

13 DDR, STILLS AND TITLES

TriCaster's media players permit you to integrate video, still images and title pages into your live presentation with utmost simplicity and professional style.

Preload content and display it sequentially as a playlist, or singly on demand. The media players can even play, stop and advance automatically in response to your Switcher operations.

13.1 SPECIALIZED MEDIA PLAYERS

TriCaster sports three media players, located in tabbed panes found in the bottom third of the Live Desktop. The players are labeled **DDR**, **Stills** and **Titles**.

Figure 146

In essence, the DDR, Stills and Titles players are specialized variants of a single module, intended for specific and complementary purposes. The media players differ primarily in the type of files they each support (and even that difference is not rigidly adhered to, as we will see.)

The **Titles** player is principally intended for display and management of title pages (both those based on the integrated titling system, and/or title pages prepared as image files exported from

third party applications). That said, if you found a reason to, you *could* use it as a 'secondary' media player for a playlist consisting of photographs (for example)

Similarly, the **Stills** player is meant for still images – photos, graphics, and the like; but you are not prevented from adding title pages to its playlist it if you like (you can even edit a title page in Stills, just as you can in **Titles**).

Of the three media players, however, *only* the **DDR** has the capability to play video clips (including motion titles such as scrolls). Like the other two, though, it can also host images, audio files, or title pages.

13.2 SHARED FEATURES

The Media Players are accessed by clicking tabs in the lower 1/3 of TriCaster's Live Desktop. Each appears as a 'half-screen width' panel.

13.2.1 PLAYLISTS

The dominant feature of all of TriCaster's media players is a *storyboard-style* playlist that is used to organize media files for display during live productions. This arrangement offers large thumbnail icons for each entry, which can quickly and easily be re-ordered using the familiar drag and drop workflow. A **scrollbar** at right accommodates long playlists.

Figure 147

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.

Clicking an item selects it. The play position is 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 tracks selection and trimming operations. The current item is displayed as the media player's output, and in consequence appears on the corresponding ISO 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. Note that even still images and static title pages added to the playlist are given a play duration. The default duration for these items is five seconds. 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 frame around successive playlist items illuminate as each is played in turn. The playlist pane scrolls to display the icon for the currently playing item. A progress bar is displayed beneath the currently playing thumbnail, and the **S**crub-Bar knob also tracks playback progress.

FILE OPERATIONS

- Click the **Add** button beneath the playlist pane to open a custom **Media Browser** (see Section 13.2.2).
- 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
  - Rename
  - Clone
  - Set Duration
  - Edit Title
- Standard **Cut, Copy, Paste** and **Delete** keystrokes are supported for playlist entries.
- Un-playable (missing, corrupt, or unsupported) file icons are 'ghosted'.

Interestingly, the playlist **Rename** 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 Alias in the header of the icon to see the actual filename.

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

SCRUB-BAR

Just beneath the Playlist pane is a full-width **Scrub-Bar** (Figure 148). The width of the Scrub-Bar represents the full run time of video clips and audio files. Drag the central knob left or right to change time position in the current item.
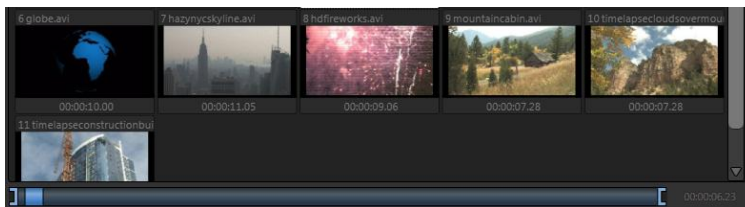
Figure 148

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). The duration (taking into account trimming operations) is displayed in a timecode field just to the right.

Hint: For longer durations, holding SHIFT while dragging In/Out handles increases precision.

During playback, the **Scrub-Bar** knob traverses the span between the **In** and **Out Points**.

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.

13.2.2 Media Browser
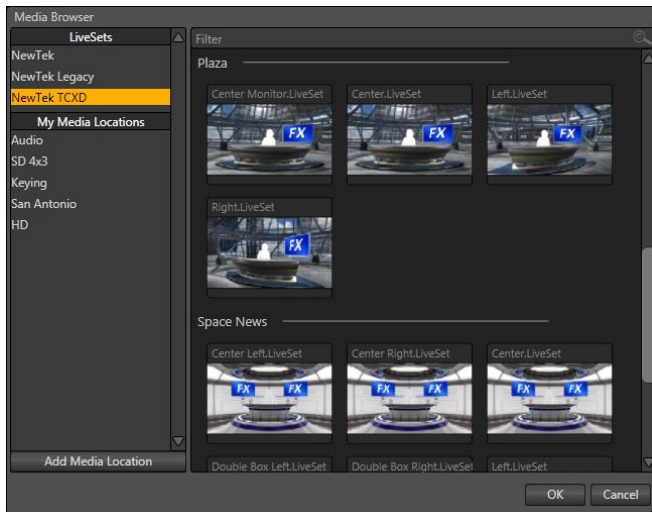
Figure 149

The custom Media Browser is available anywhere in the **Live Desktop** interface 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 comprised of left and right panes we'll refer to as the **Location List** and **File Pane** respectively.

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 is populated – this is the File Pane.

ADD MEDIA LOCATION
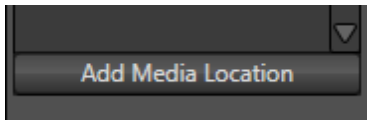
Clicking **Add Media Location** opens a standard system folder selector. The name of a folder you selected using this is added to the Media Browser's **Location List** under the main-heading **My Media Locations**. These locations can be accessed in others sessions opened by the same user.

File recursion for listings under **My Media Locations** is limited to one sub-folder below the folder (sub-heading) selected in the Location List. Recursion is deeper (infinite) for default locations.

Note: External devices used with Add Media Location must be fast enough to support realtime playback of the files on it. Really, it's better to use the Import feature instead of Add Media Location – but the latter can be handy for those times when you need to add smaller files wish after your production is already underway.

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.
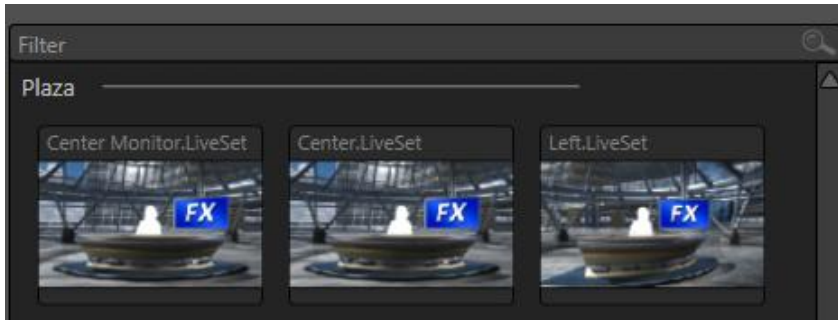
Figure 151

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).

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".

CONTEXT MENUS

Right-click a **Location** listed under **My Media Locations** to show a context menu with just one item in it. **Remove** de-lists the location (but does not delete the folder and its contents from the hard drive).

Note: this menu is exclusively for use in the "My Media Location" section, and is not available for other headings in the Location List.

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.

13.2.3 Controls

Transport controls and playback settings are located directly below the **Playlist** and **Scrub-Bar**.
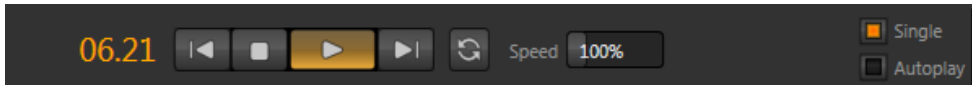
Figure 152

TIME DISPLAY
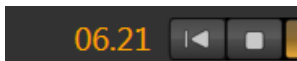
Figure 153

During playback, a timecode field in the transport controls area displays the **Current Time** for the currently displayed playlist item.

Left-click the field to type in a timecode, then press Enter to jump to that point in the file. If you right-click the timecode field, a menu allows you to choose to between showing *current time* and *remaining time* (**Reverse Direction**), as well as enabling or disabling **Warning Colors**.

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.   When only five seconds are left, the numbers are shown in red.

SINGLE
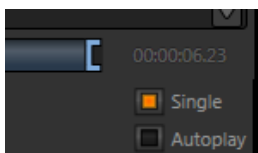
Figure 154

Media player playback normally conforms to typical playlist practice – each item in the playlist playing back in orderly succession. 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 repeats until manually interrupted).

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
- **Loop** – repeat playback continuously (respecting the **Single** switch state)
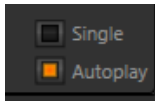
Figure 155

When enabled, the **Autoplay** switch has several important effects. Firstly, it initiates playback automatically when the associated media player is placed on **Program Out** by a (Switcher) **Take** or **Transition** operation for any media player either directly (as a Switcher row selection) or *indirectly -* as an input for a **Virtual Input** or **Overlay**.

Secondly, 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).

In similar fashion, for a media player with **Autoplay** enabled, performing an **Overlay Effect** automatically begins playback, and performs the reverse *overlay* effect when it ends.

Note: Unlike Switcher Transitions, the reverse overlay effect <u>does not</u> 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.

13.2.4 PRESET BIN

Another very useful feature shared by all three of TriCaster's media players is the **Preset Bin**, which provides quick and convenient access to multiple playlists.

As mentioned back in Section 4.8.1, presets also store the state of various media player controls.

If 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.

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').

13.3 SPEED
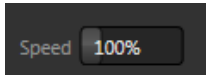
The **Speed** control is only found in the **DDR**. The DDR supports variable speed playback between 25% and 400% of the normal rate (100%). Speed can even be adjusted *during* playback. Note that certain highly compressed video file formats cannot successfully be played back at rates beyond 200%, even though Speed value is set to a higher value.

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.

13.4 EDITING TITLE PAGES

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**.
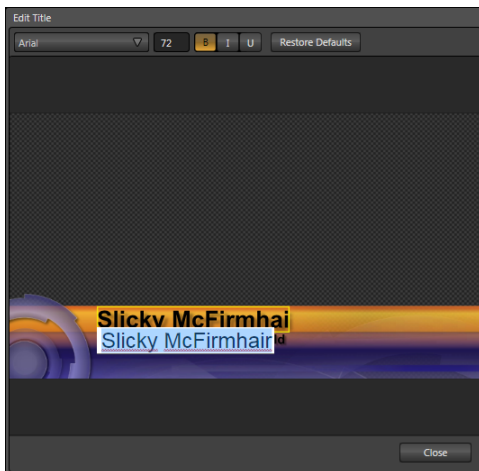
Title Page content can be edited during both play and display (changes are detected and shown immediately). Opening the pop-up **Title Page Editor** during playback *is* permitted. The panel can be re-sized by dragging its lower-right corner, and re-positioned by dragging its titlebar.

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.

If you begin editing the text by pressing a character on your keyboard, a text edit field opens (alternatively, double-click to open the text entry field). Press **Enter** or click outside the box to complete the operation.

Hint: A red line under a character or word indicates the spell-checker is questioning its spelling. Right-click the word to open a menu showing various suggested alternatives. Click one of these if you wish to update the original.

A number of keystroke shortcuts are available to help you edit text quickly. Typing keystrokes as listed below will produce the result shown:

- **Any character(s)** – text input box opens with the current string cleared and (only) the new character(s) entered.
- **Home** – text input box opens with cursor *before* the first character of the current string.
- **End** – text input box opens with cursor *after* the last character of the current string.
- **Delete** – text input box opens empty (the original string is cleared).
- **Spacebar** – text input box opens with original text string deleted and a space character inserted in its place.
- **Up** or **Left Arrow** key – text input box opens with the cursor *between* the last two characters of the current string.
- **Down** or **Right Arrow** key – text input box opens with cursor at the end of the string.
- **Backspace** – text input box opens with the last character of the string deleted and the cursor at the (new) end of the string.
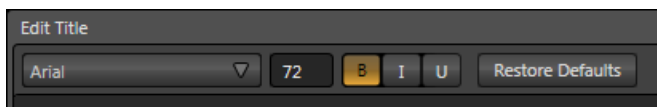
Figure 159

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** and **Underline** switches.
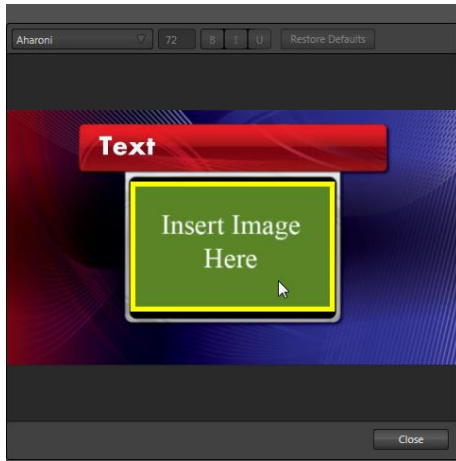
STAND-IN IMAGES

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**. 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').

14 LIVEMATTE

Although its user interface is deceptively simple, LiveMatte represents NewTek's newest and most powerful chromakeying technology, and is capable of very high quality results.

Whether you use it alone or in conjunction with TriCaster's Overlay or LiveSet features, you will find it can play an important 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 a different background. TriCaster also relies on this method to insert talent seamlessly into virtual sets via LiveSet.
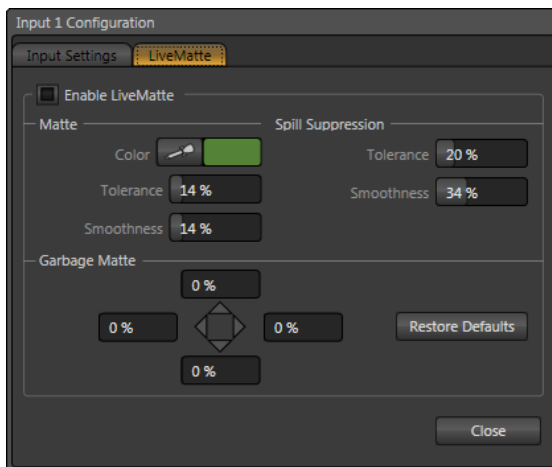
Figure 161

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

Hint: Clicking Configure for a monitor in the Switcher Monitors tab likewise opens the Input Configuration panel for the corresponding Switcher row source.

14.1 CHROMAKEYING

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.

Note: Internally, LiveMatte actually goes well beyond simple chromakeying techniques to provide its great realtime results - but we'll stick with fundamentals for our discussion here.

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 graphics.

Figure 162

Of course, if you choose inappropriate settings, foreground areas may inadvertently be cut away as well. Ideal settings require judicious balance between 'too much' and 'too little'. Let's consider the tools provided to help you achieve a good result.
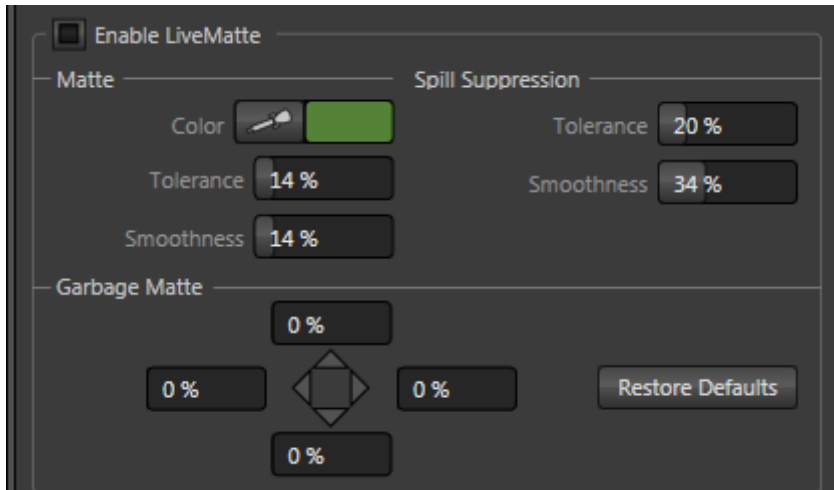
Figure 163

The term **Matte** refers to a black and white representation defining transparent (background) and opaque (foreground) parts of the image during compositing. Portions of the matte that are grey are treated as semi-transparent, which is very useful in smoothing edges between foreground source material and inserted background imagery.

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

14.2.1 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 163) 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.

14.2.2 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.

14.2.3 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'.

14.3 SPILL SUPPRESSION
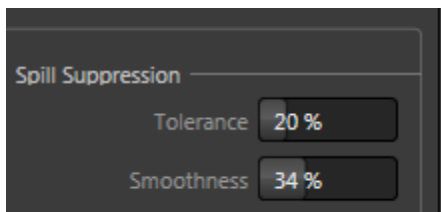
Figure 164

The term **Spill** refers to key color unintentionally reflected or 'spilled' onto the foreground subject. It's very common for a little green spill to occur on the shoulders of a person in a greenscreen shot, for example.

The **Spill** controls, when enabled, 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 it 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.

14.4 GARBAGE MATTE

The term **Garbage Matte** may sound like something found beneath a trashcan in the kitchen, but in this context it has a very different meaning. It is very common for a greenscreen shot to have unintentional inclusions that really need to be removed along with the background but which remain after the base chromakey process is applied.
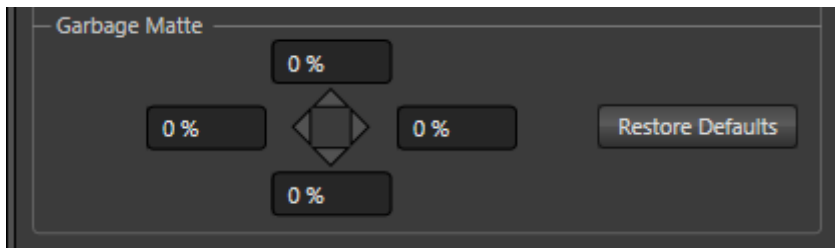
Figure 165

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.

The **Garbage Matte** label owes its name to techniques used to remove such unwanted 'garbage' from the scene.

Essentially, the four numeric controls in the **Garbage Matte** 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 (or right-click) a field to type a value using the keyboard. The region defined by these four controls will be completely cropped.

14.5 COMPOSITING

When you enable LiveMatte for an input, the ISO monitor for that input continues to show the original ('un-keyed') source. If you directly select that source on the Switcher's **Program** or **Preview** rows, you will see the result of compositing the input over the source selected on the **Effects** row.

Something similar will occur if you select the (LiveMatte-enabled) input as **Input A** in a Virtual Input tab, and then select that on **Program** or **Preview**. In this case, Input A is overlaid on the source you choose as **Input B**.

14.6 FINE TUNING

You'll find LiveMatte easy to configure with a little experimentation– but here are a few workflow tips.

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 let you assess the impact of 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 a 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 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 keying LiveMatte.

14.7 PRACTICAL STAGING FOR LIVEMATTE

We'd like to offer a few suggestions here to guide you in preparing, so you get the most out of LiveMatte.

14.7.1 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 green or blue 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 an 'edge' 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!)

14.7.2 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 <u>two</u> BNC connectors, Y/C keeps Y (luminance) and C (chrominance) signals separate.

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

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

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

Hint: cameras using IEEE 1394 connection (such as mini-DV or HDV format) are not supported as live switching sources, for several reasons. However they may often be connected by Y/C cable (mini-DV 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.

15   VIRTUAL INPUTS

Virtual Inputs are a wonderful TriCaster innovation, opening up whole new levels of convenience and production value.

You can pre-configure Virtual Inputs as multi-source compositions (with or without an overlay) and introduce them into your productions like any single Switcher source.

Virtual Inputs also provide TriCaster's connection to LiveSet, NewTek's astonishing realtime virtual set technology, investing it with great new capabilities.

We illustrated the value of Virtual Inputs back in Section 4.11 of the Live Production chapter. Now we'll look into this powerful tool in depth.

Five **Virtual Input** tabs designated V1-V5 sit in the lower-left pane of the **Live Desktop**. These correspond to similarly labeled **Switcher** buttons in the **Program** and **Preview** rows.

As you would expect, selecting one of the **Virtual Input** buttons on the **Program** row displays the output of the corresponding Virtual Input output to Program Output. Likewise, clicking V1-V5 on the **Preview** row cues up that Virtual Input's output for an upcoming **Take/Transition** operation (and also displays the corresponding control panel in the tabbed area below).

This arrangement makes it easy to **Take** or **Transition** directly to, from or between **Virtual Inputs** with a single click – even when the video sources embedded in the Virtual Input composition for both are *identical*.

15.1 PRIMARY VIDEO SOURCES

Figure 167

Virtual Inputs support two *primary* video sources. As we observed in the preceding chapter, normally (that is, apart from Virtual Inputs) when the Switcher's **Program** row source is partially transparent (as a result of your **LiveMatte** settings), the **Effects** row selection appears 'through' the transparent areas on **Program Output**.

The situation is similar for **Virtual Inputs**, which support two primary video sources. These are labeled **Input A** and **B**. Selection is made using switcher buttons in the Sources section of the tabbed panel. When a **Virtual Input** is displayed, Input A appears above (or, if you prefer, 'in front of') Input B by default.

This means that – assuming that the sources assigned to **Input A** and **Input B** are the i) same size and ii) no **Position** settings are active - when Input A is fully opaque it completely hides Input B.

However, as before, if **LiveMatte** settings for Input A result in transparency, Input B will appear through the transparent regions.

15.2 POSITION

Position controls for both **Input A** and **Input B** appear to the right of their respective selector button rows (Figure 168). Click the neighboring **Configure** button (gear) to open the **Position** panel (Figure 169) for a given channel.
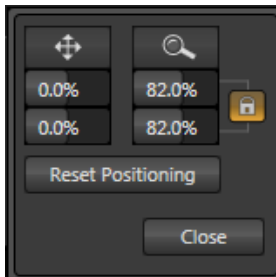
At the top of this panel are two buttons – **Position** and **Size**. Click and drag on Position to adjust the location of the source within the output frame. (It is useful to select the corresponding **Virtual Input** on the Switcher's **Preview** row while making adjustments). Notice that by dragging left or right on either of the two numeric gadgets below, you can adjust **Position** on a single axis.

Hint: If you click a numeric field a second time (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).

Dragging the mouse on the **Size** button (magnifying glass) affects the *scale* of the overlay. When the nearby *lock* button is enabled, dragging in any direction affects size equally on both axes.

Otherwise, dragging vertically changes the height of the overlay, and dragging horizontally affects its width.

Again, if you drag just one of the numeric gadgets below the **Size** button (with lock *disabled*), you modify just one dimension of the overlay stream – width or height. **Position** and **Size** can be reset by clicking **Reset Positioning**, and can be toggled on or off by clicking the **Position** button located to the left of the Configure button (gear).

You will likely have realized by now that simply using the **Virtual Input** controls considered so far, you could scale a live video source down, and position it above another source to create a picture-in-picture effect – or even two live insets (with a black background).

15.3 OVERLAY
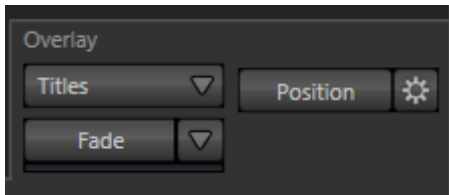
A control group labeled **Overlay** is situated just above the **Position** button for **Input A**. The **Virtual Input** overlay feature is very similar to the Overlay channels found on the Switcher. However, unlike them, since it is assigned to the Virtual Input it is applied *before* that composition is sent to the Switcher. Thus content in this overlay channel appears *beneath* anything displayed via the two (Switcher) Overlay channels on **Program Output**.

The **Effect** selection drop-down and activation buttons, as well as **Position** controls work just like their main Switcher cousins, as well.

15.4 LIVESET

This brings us to the **LiveSet** section of the **Virtual Input** tab. LiveSet allows you to achieve the look of a large, sophisticated studio setting (Figure 172) within a very small studio space (Figure 171) without the need for external equipment.

TriCaster TCXD300 brings important new capabilities to NewTek's revolutionary virtual set technology.

Figure 171

Figure 172

15.4.1 LIVESET SELECTION

An information line (Figure 175) at the top of the **Virtual Input** tab lists the current **LiveSet** (if any) for this Virtual Input. The default LiveSet simply composites **Input A** over **Input B** (if any part of the image assigned to Input A is transparent, Input B will show through). To select a different LiveSet, click the **Add** button at the right-hand end of this field line, opening a custom **Media Browser** (Figure 173).
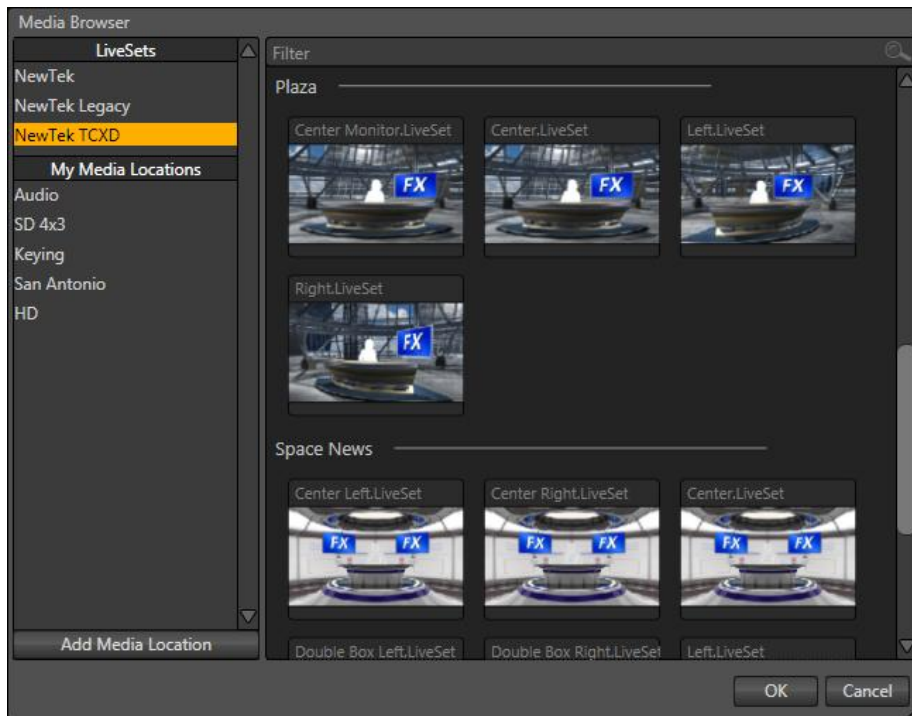
The **Location List** of the **Media Browser** lists any installed **LiveSet** groups under the heading "LiveSets". Select an entry beneath to show thumbnail icons in the Browser's **File Pane**.

15.4.2 VIDEO SOURCES

Virtual Inputs provide **LiveSet** with a new standard of flexibility, allowing you to easily and flexibly assign inputs from the **Virtual Input** tab(s), without Switcher involvement*.

> *Hint: One special case is when you select "Effects" as a LiveSet input. Conveniently, this allows you to use the Switcher to change the input without either interfering with other common Switcher operations <u>or</u> accessing the corresponding Virtual Input tab.*

Figure 174

Virtual sets in the **LiveSet** system display video from either one *or* two different TriCaster sources. It will not surprise you that these correspond to **Input A** and **B**, the primary video sources we discussed back in Section 15.1. (Again as you would expect, Input B is often assigned to secondary purposes, such as to supply the display for a 'monitor' in a virtual set.)

15.4.3 ZOOM PRESETS

Unlike earlier LiveSet implementations, **LiveSet** does not need multiple LiveSets to mimic different 'virtual camera distances' (for a single camera angle). Making a single selection populates four **Zoom Presets** just below (Figure 175).
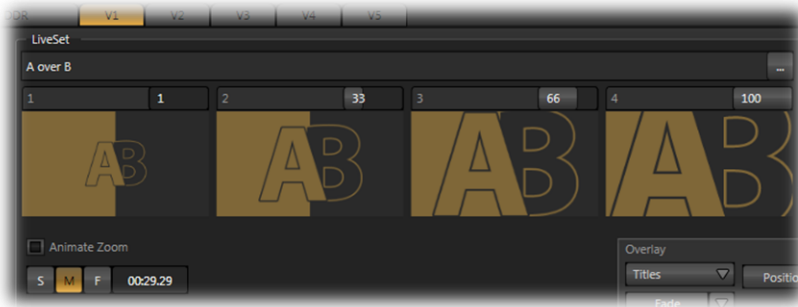
Figure 175

Initially, these four presets represent default stops between the maximum and minimum distance for the specific set - the 'closest' view is 100%. Click a preset thumbnail to jump to the camera view it represents. An active **Zoom Preset** is shown with a gold border (a white border tracks your cursor when selecting presets).

Notice that a numeric slider is provided above right for each preset. These work the same as other numeric sliders 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 then double-click to restore the default value for that preset.

Note: Some LiveSets (e.g., double-box sets) do not support zooming. In such cases, the Zoom Presets and the Zoom T-Bar are inactive.

15.4.4 ZOOM T-BAR
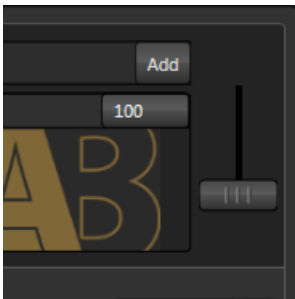
The **Zoom T-Bar** is located to the right of the **Zoom Presets**. Dragging it vertically adjusts the virtual 'camera distance' for the active **LiveSet**, between 0-100%.

When you click a **Zoom Preset**, the T-Bar updates to the new zoom level (which is displayed beneath). Conversely though, adjusting the **T-Bar** does *not* change the value for a **Preset**. (When the current T-Bar position does not correspond to any presets, none of them are shown with a white border.)

15.4.5 INPUT POSITION

We discussed the **Position** controls for video **Inputs A** and **B** back in Section 15.2. It's worth adding here that these controls, when active, do affect the scale and position for LiveSet video inputs (this is another unique advantage of this LiveSet implementation).

You will find that you can often use **Position** controls to ensure a 'good fit' and natural appearance of talent or other source appearing in your virtual sets (greatly reducing the need to fuss with physical camera positions to do so).

15.4.6 ANIMATE ZOOM
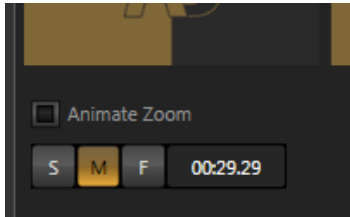
You can use the **Zoom T-Bar** to manually zoom in on a **LiveSet**, even when it is displayed on **Program Output**. The **Animate Zoom** switch makes it possible to easily perform this realtime zoom automatically with a single click.

With **Animate Zoom** *enabled*, simply clicking a preset automatically zooms from the current position to the virtual camera 'distance' represented by the preset. A built-in ease in/out is applied to ensure a smooth zoom.

The duration for the animated zoom is controlled by the tools beneath the **Animate Zoom** switch. These work just like the similar **S|M|F** buttons in the Switcher's **Transitions** section, and provide instant access to three preset durations. Alternatively, click and drag in the neighboring numeric field to set a custom duration – or click the field once more to enter a value directly using the keyboard. The maximum duration for an animated zoom is 120 seconds.

Hint: Livesets each 'zoom in' on a predetermined target. A given group of LiveSets may offer variations on the basic set that allow you to zoom in on an actor at center stage, or a 'virtual monitor' situated on a desk beside the talent, or something else entirely. You will find many creative uses for the different versions of the LiveSet.

16 AUDIO

Less than 100 years ago, movies were silent. We've come a very long way since "The Jazz Singer" (1927, Warner Bros.) High quality audio and audio management tools are almost certainly a requirement for your live productions.

When it comes to audio, TriCaster provides professional quality and convenience, which we'll explore in this chapter.

External audio connections were discussed back in Sections 3.6.1 and 3.4.1. You'll recall that there are three groups of audio inputs (numbered 1-3) on TriCaster's faceplate, along with separate connections for Program output (PGM), Auxiliary output (AUX), and headphones (PHONES). In addition, of course, live network streams contain audio output.

The **Audio tab** (Figure 178) is home to all of the controls required to manage both audio input and output.

Figure 178

Compact sub-panels are dedicated to each input (including internal sources) and output. Each sub-panel provides the configuration options and controls for one audio source or output.

16.1 EXTERNAL SOURCES

The first three sub-panels are labeled for **Input rows 1-3** on TriCaster's *faceplate*. You may choose to think of these audio sources as being associated with *video* inputs 1-3 in the nearby rows (see the sub-heading Follow, below) but you are completely free to use them in various other configurations.

Figure 179

16.1.1 INPUT 1

Uniquely, **Input 1** provides control for i) two combination XLR/Phone jack inputs (Mic/Line level switchable), ii) two 2-channel digital **AES/EBU** connections, or iii) multi-channel **SDI Embedded** digital audio.

A drop-down **Connection Type** menu at the top allows selection between the following input options:

1.	Analog

- **Mic** – low impedance microphones and other common professional audio sources
- **Mic + Phantom** (power) – microphones (typically condenser mics) requiring supplementary DC power
- **Line** – consumer audio sources such as CD players, VCRs, etc.

2.	Digital

- **AES/EBU** – a professional digital audio protocol connected using BNC connectors
- **SDI Embedded** – digital audio embedded with digital video transmitted via a Serial Digital Interface (SDI) connection

Because of its support for connecting microphones, **Input 1** has several other special features, discussed next.

TALK

The **Talk** switch (also known as "Talk Over") is shown when the **Connection Type** for **Input 1** is **Mic** (or **Mic + Phantom**).

It is often important to be able to reduce all other audio input levels so an announcement made using a microphone connected to **Input 1** can be clearly understood by the audience.

Enabling **Talk** (Figure 185) reduces the output level of all *other* audio sources by 20dB.

PAN

Figure 180

When the **Connection Type** is set to **Mic** (or **Mic + Phantom**), TriCaster presents small **Pan** sliders above each of the two **VU meters** in the **Audio 1** sub-panel. Pan adjusts *placement* of the corresponding input sound on output channels, and progressively modulates levels in the process so that the overall volume neither rises nor drops as a result of adjustments. Using Pan, one can send part of channel 1 to channel 2, and vice versa.

Let's consider an example:

- When **Pan** is set to the extreme left position for **Mic 1** – audio from that input is passed exclusively to output channel 1.

- Centering the **Pan** knob 'splits' the sound from Mic 1 so that it is heard equally on output channels 1 and 2. (The levels in this case are automatically reduced by 3 dB, so that the overall level sent from Mic1 to output remains constant).

- Sliding Pan for **Mic 1** all the way to the right would result in that source only being audible on output channel 2.

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 (Pan can do this).

TRIM

When the connection **Type** is **Mic 1,2** (or **Mic 1,2 + Phantom**), **Input 1** also features numeric **Trim** sliders 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.

LOCK

Clicking the **Lock** button links the level sliders above relative to each other. This enables them to be adjusted in unison.

16.1.2 INPUT 2 AND 3
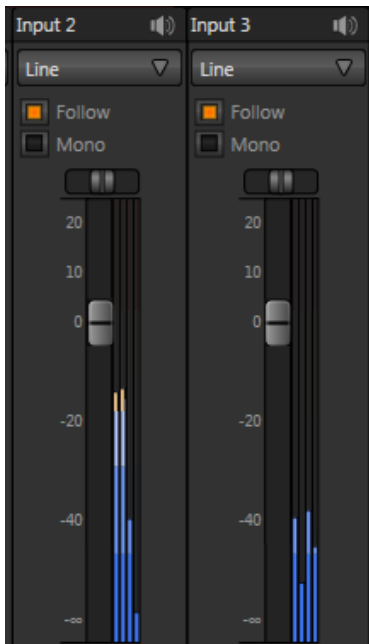
Figure 183

The control panels for Inputs 2 and 3 differ somewhat from Input 1. This is because the second and third rows of connectors in the **Analog Audio In** group on TriCaster's faceplate are different than the first row. Rather than two combination XLR/Phone connectors, rows 2 and 3 comprise ¼" four phone jacks.

For this reason the **Connection Type** drop-down for Input 2 and 3 contains fewer options as follows:

1. Line
2. AES/EBU
3. SDI Embedded

Most of the controls and options in the audio control panels common, but **Talk, Pan, Trim** and **Link** (all discussed earlier) are unique to **Input 1**.

16.1.3 COMMON FEATURES

Let's turn our attention to features that may be found in the control panels for any audio source.

MUTE

Figure 184

Click **Mute** (speaker icon button) to enable or disable output from the source.

FOLLOW
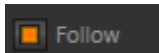
Figure 185

Enabling the **Follow** switch for an audio source directs TriCaster to track switcher operations for the related video source. This results in the audio from being *muted* until the associated video source is displayed on **Program Output** (whether as the Switcher's **Program** row selection, via **Overlay**, or as **Input A** for a **Virtual Input**).

When **Follow** causes an audio input to be added to TriCaster's output, the audio from this input is ramped up (or down, on removal) over 30 frames.

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
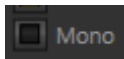
A **Mono** switch appears for many **Connection Types**. When it is enabled, Mono centers audio sources on both channels 1 and 2.

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.)

BALANCE

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 forming one pair, and 3 and 4 the other. Sliding Balance to the left decreases Gain for channels 2 <u>and</u> 4 (the notionally 'right' channels), and so on.

VU METERS AND GAIN

The largest portion part of the sub-panel is devoted to **VU** (Volume Unit) meters with **Gain** control knobs.

The VU meters displayed for **Input 1** vary depending on the **Connection Type**. This is because row 1 of the **Analog Audio In** section of TriCaster's faceplate provides two input connectors – unlike rows 2 and 3, which each provide four.
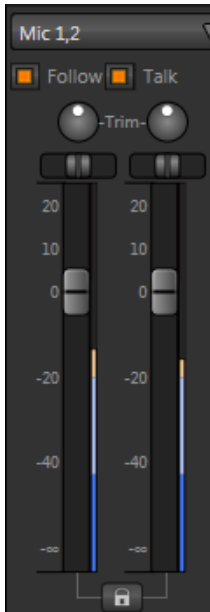
Figure 186
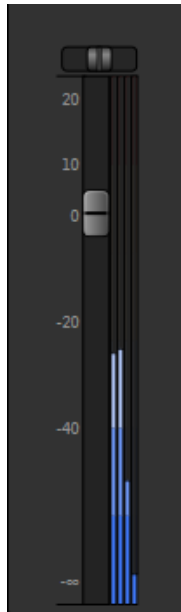
Figure 187

When an analog **Connection Type** is set to **Mic** or **Mic + Phantom** two **VU Meters** are displayed, with individual knobs to control the **Gain** for input channels 1 and 2 (see Figure 186).

When the **Connection Type** for **Input 1** is **Line**, the VU meter displays the levels for the two analog input channels, which are controlled by a single **Gain** knob. Also, the **Pan** slider is replaced with a **Balance** control.

Other connection **Type** selections and sources display a *single* VU meter with four level graphs, again controlled by a single **Gain** knob ((Figure 187). The four VU graphs show the audio levels for channels 1-4.

VU Meters and dB FS

TriCaster's **VU meters** are calibrated in **dB FS**, which stands for "dB Full Scale" (decibels relative to full scale). Digital audio systems have a maximum peak level, which is 0dB on the dB FS scale. This means that 0 dB FS is the maximum possible audio level, which can never be exceeded.

Attempts to compare dB FS calibration to a traditional analog dB scale are not entirely straightforward. The American SMPTE standard defines -20 dB FS as the **Alignment Level** (a common reference level considered a 'safe' benchmark) equivalent to a nominal level of +4dBU.

Note: 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 48 kHz. Clipping can occur when recording exceeds -14dB FS

As the suggested Alignment Level (a +4dBu reference level corresponding to 1.23v RMS) is -20dB Full Scale, you may take very limited advantage of the headroom above that to accommodate infrequent peaks – but do so very judiciously.

16.2 INTERNAL SOURCES

Besides external audio sources, sounds played from TriCaster's internal storage volumes (including removable media such as external hard drives or 'thumb' drives) via the content players (DDR, etc.) can be added to the output mix.

Separate sub-panels are provided to control audio added to TriCaster's Program output mix by the **DDR** and **Still** media players.

16.2.1 DDR AND STILLS

Both video and audio files in the media player playlists may contain numerous audio channels. At most, the **DDR** and **Stills** modules will output the first 4 of those available (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.

16.3 OUTPUT CONTROLS

Each of the audio *sources* discussed above provides its own contribution to TriCaster's audio output mix. Settings in the *output* control panels in the **Audio tab** take effect downstream from

the sources, further governing audio levels sent to three different outputs on TriCaster's faceplate.

16.3.1 MASTER (AND PHONES)

The main **Program** (labeled PGM on TriCaster's faceplate) outputs are controlled by the **Gain** knob and **Balance** control in the **Master** sub-panel, located at far-right in the **Audio tab**. Just above this is a simple level control for the **Phones** output.

Hint: Shift + double click Gain knobs to restore their default values (0dB).

Figure 188

16.3.2 AUX AND STREAM OUTPUT

The **Stream** sub-panel provides a method of independently adjusting (stereo) audio levels sent to the network when streaming is enabled.

Aux Output, as you might expect, controls the level of audio sent to the four **AUX** output connectors. An important addition to its options is the **Source** drop-down menu. This allows you

to select whether to supply sound to the AUX outputs exclusively from one of the following selections:

1. **Master** - The AUX outputs provide a supplementary program output channel with independent level control

2. **DDR** - The meters show the levels for audio (the first 4 channels) from DDR output, which are individually sent to AUX output connectors 1-4

3. **Stills** – The meters show the levels for audio (the first 4 channels) from DDR output, which are individually sent to AUX output connectors 1-4

4. **DDR and Stills** – The meters shows the levels for the first two channels from the DDR on the left pair, and the first two Stills channels on the right pair. At the AUX outputs, connectors 1 and two transmit the DDR channels as a stereo pair, while the Still channels are placed as a stereo pair on output 3 and 4.

16.4 PRESET BIN

Audio Mixer presets work just like their counterparts in the DDR and elsewhere. Presets are a convenient way to quickly store and recall audio steps and settings for different venues, productions, and users.

17 SPEEDEDIT AND LIVETEXT

LiveText™ is a powerful title and CG application, allowing you to create title pages for use in the Live Desktop's Media Players. Title pages can be still or motion pages, including scrolls and crawls.

SpeedEDIT™ provides a host of world-class editing tools for pre and post production purposes. You'll find it innovative and powerful, ready to handle numerous editing and also file conversion chores.

SpeedEDIT and LiveText are both full-blown, powerful, professional program 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 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.

17.1 SPEEDEDIT

SpeedEDIT *projects* are launched from the **Session Page** in TriCaster's **Startup Screen**. After creating a new session or opening an existing one, click the **Edit** icon on the rotating function selector ring (see Section 5.3). This reveals options and links at right, discussed previously in the Startup Screen chapter just mentioned.

17.1.1 SESSIONS, PROJECTS AND DISPLAY

Normally, SpeedEDIT uses the current session settings for output on TriCaster's video outputs. The session format is also used for new projects created using SpeedEDIT's **File** menu (New) or from TriCaster's **Session Page**.

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) 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 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
3	SD	Composite	Y	C

Note: It is possible to use SpeedEDIT's File menu to open an existing project not using the current session settings. TriCaster will attempt to provide video output, 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.

17.1.2 FILEBIN QUICKTABS

SpeedEDIT's Filebins 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 SpeedEDIT does not support user-added Quicktabs.

17.1.3 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. However, the **File** menu point **Send to DV Tape** (and the similar icon context menu in the **Filebin**) is available.

Hint: SpeedEDIT's Output menu is not required in TriCaster for this reason.

17.1.4 SPEEDDIT 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, then 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.

17.2 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 the **Graphics** icon on the rotating function selector ring (see Section 5.3). This reveals options and links at right, discussed previously in the Startup Screen chapter just mentioned.

17.2.1 SESSIONS, PROJECTS AND DISPLAY

LiveText uses the current session settings for output to TCXD300 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
3	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.

17.2.2 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 these 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.

17.2.3 NAMING STAND-IN IMAGES

Among other things, the **Title Editor** in TriCaster's **Media Players** (DDR, Stills and Titles) allows you to substitute a different image for stand-in (or "placeholder") images in Title Pages (.cgxml) exported from LiveText. Details of how to replace stand-in images are found in the TriCaster manual.

When creating title pages for this purpose in LiveText, you may find it saves you time to add the string "_placeholder" somewhere in the filename of images you prepare for this purpose. For example, you might name an image "headshot_placeholder.png", or "_PLACEHOLDER_crest.jpg".

Images named in this manner will automatically appear as stand-in images (unlocked) in the Title Pages you export to TriCaster using the **Send to Live** options in LiveText's **File** menu**.**

PART III (APPENDICES)

A time-saving question and answer section, followed by an extensive listing of Shortcut Keys, schematic diagram and keyword index …

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).

The 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 faceplate according to your camera's video output connection type (see Section 3.4).

   > *Note: The BNC connections for connecting Y/C sources has changed on this TriCaster (compared to SD models). Please refer to Section 3.4 for details.*

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 Sessions page of the Startup Screen, and press **Enter** (or click the **Start Live Production** link).

4. Click the **All Monitors** tab at the top of the **Live Desktop**, roll the mouse pointer over the camera monitor you want to set up, and click the **Configure** (gear) button that appears above it.

5. Choose an appropriate **Connection Type** for your camera in the **Input Settings** tab. (See Section 3.4, Input Connections for more information).

A.1.2 CONNECT MONITORS?

COMPUTER MONITOR

With the power off, connect an external computer monitor to a DVI port on TriCaster's backplate, using an adapter if necessary.

SUPPLEMENTARY QUESTION:

Q: *My monitor seems to work when powering up, then displays a "No Source" (or similar) message instead of TriCaster's Startup Screen. What can I do?*

A: Some analog monitors may not correctly communicate with the system. If this occurs, try the following:

1) If you only have one monitor, try connecting to the other monitor port on your TriCaster. (e.g. 'projector out')

2) If possible, try connecting your monitor with a DVI cable instead of a D-Sub (VGA) cable.

SECONDARY COMPUTER MONITOR (OR PROJECTOR)

TriCaster supports the use of its secondary output connector by means of its VGA Out feature. This output can serve as a supplementary program output for projection, or for operational monitoring purposes (see Section 8.1.4).

1. Connect the external device to the secondary output on the rear of the TriCaster 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**.

3. Click the **Live** icon on the Sessions page of the Startup Screen, and press **Enter** (or click the **Start Live Production** link).

4. Roll the mouse pointer over the main Program output monitor, and click the **Configure** (gear) button that appears above it.

5. In the **Output Configuration** panel's **VGA** tab, set **VGA Output Resolution** to match the native resolution of the device.

6. Select an optional display mode from the **Screen Layout** menu.

> *NOTE: Changing Output Resolution can cause frames to be dropped briefly. We <u>do not</u> recommend changing this setting during live production.*

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 a other devices) and appropriately-labeled output connectors on TriCaster's faceplate (see Section 3.6.1).

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 Sessions 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 click the **Configure** button (gear) that appears above it to open **Output Configuration**.
   b. Click the **Program** tab, and select either **Composite + Y/C** or **Component** according to the connection type used by your device. (Please see Section 3.9 for more information.)

A.1.3   CONNECT THE LC-11 CONTROL SURFACE?

Connect the USB cable from the Control Surface to one of TriCaster's USB2.0 ports.

A.1.4   CONNECT AN EXTERNAL HARD DRIVE?

Connect a USB cable from the external hard drive to one of TriCaster's USB2.0 ports. Note that the external 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.1.5   CONNECT TALLY LIGHTS?

External tally light devices and their connections vary widely. Please refer to Section 3.7.1 for details on TriCaster's tally light jack implementation.

A.1.6   CONNECT TO A NETWORK?

Please refer to Section 3.13.

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 productions. See Section 5.1.

A.2.1   START AN SD SESSION?

1.   Connect your SD sources to TriCaster's input connectors (see Section 3.4)

2.   Connect your SD monitors to TriCaster's output connectors (see Section 3.6.1)

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.   TriCaster International only: choose your local **Video Standard** (NTSC, NTSC-J or PAL)

6.   Choose either **SD 4:3** or **SD 16:9** (widescreen) for **Resolution**

7.   Click the **Start Session** link (lower-right).

(See also Sections 3.8 and 5.1.)

A.2.2   START AN HD SESSION?

1.   Follow steps 1-5 in the preceding section.

2.   Select either **HD 720P** or **HD 1080i** for **Resolution**

3.   Click the **Start Session** link (lower-right).

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.

2.   Click the **Manage** icon in the Startup Screen's Sessions page.

3.   Click the **Backup Session** button (below the **Browse** list).

a. If the session has external files in its playlists, choose one of the options from the dialog that opens next.

4. 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 5.3 for more detail.)

A.2.5   RESTORE A SESSION?

1. Click the **Restore Session Backup** link on the Home page of the Startup Screen.
2. Navigate to and select the previously 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 and SpeedEDIT projects (external data that has not been imported will not be deleted). See Section 5.2.2 for more information.

A.2.7   MANAGE SELECTED CONTENT INSIDE A SESSION?

1. Click the name of the session containing the content you wish to delete in the **Home** page of the **Startup Screen**.

2. Click the **Manage** icon on the **Session** page.

3. Under **Browse** at right, click the link for the type of content you wish to manage (see the sub-heading **Manage** in Section 5.3).

A.2.8   RENAME A SESSION?

1. Right-click the name of the session you want to rename in the **Home** page of the **Startup Screen**.

2. 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 (to the d: drive if you have space) – 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?

At the time of writing, user-friendly tools for creating custom transitions and/or LiveSets for TriCaster have not yet been released.

A.3.2   RESTORE THE DEFAULT LIVESET?

1. Click the *ellipsis* button [...] to the right of the current LiveSet name to open the **LiveSet Browser**.

2. Click the **NewTek** heading beneath the **LiveSets** heading in the locations list at left.

3. Click the **A over B** in the **Default** group in the file pane at right. (See Section 15.4.1.)

A.3.3   INITIATE STREAMING?

1.   Connect TriCaster to the Internet (see Section 3.13).

2.   Open (or create) a TriCaster session (see Section 3.8).

3.   Click the **Configure** (gear) button next to **Stream** (under the **Program** monitor)

4.   Choose your streaming settings (see Section 4.12.1).

5.   Complete any blank fields in the lower part of this panel as required (passwords, username, etc.).

6.   Close the panel, and – when ready – click the **Stream** button.

(See Section 4.12 and Chapter 10 for full details.)

A.3.4   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 **SavedStreams** folder in the file explorer.

A.3.5   RECORD MY PROGRAM?

1.   Open (or create) a TriCaster session (see Section 3.8).

2.   Click the **Configure** (gear) button next to **Record** (under the **Program** monitor)

3.   Choose your recording options (see Section 4.7.1) and enter a Base Name for the file(s).

4. Close the panel, and – when ready – click the **Record** button. (See Chapter 11 for full details.)

A.3.6   FIND MY RECORDED PROGRAM FILE?

6. Got to Locate the **Home** page of the **Startup Screen** and click **Open**.

7. Click the name of the session you streamed at right.

8. Click the **Manage** icon on the **Session** page.

9. Under **Browse** at right, click the **Clips** link. A system file explorer will open.

10. Open the **Capture** folder in the file explorer.

A.3.7   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 13.3 for more.

A.3.8   GET STUBBORN CLIPS (MOV OR AVI) 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 (see Section 6.4.1).

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, we recommend converting it to a friendlier format.

Final Cut™ users might consider MPEG2, DVCPRO HD, or the DV Quicktime codec (for SD clips only, of course) as intermediate formats. In some cases you might be successful using SpeedEDIT to convert QuickTime files that fail in the DDR (its Quicktime support is more extensive).

AVI

AVI codecs are plentiful. Most are suitable for DDR playback, 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.

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 ISO 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 format (.cgxml) presently supports *almost* every attribute that LiveText offers – but there are a few exceptions.

For example, multiple font properties on one text line are not supported, which means in turn 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 VIRTUAL INPUTS?

Suppose you want to assign matching shots from one theme group of LiveSets to different Virtual Inputs (or Presets). You might, for example, want everything to be the same except that one shot is centered on a virtual monitor in the LiveSet, while another is centered on the set itself.

1. Prepare the first **Virtual Input** – click its tab, and use the controls to select a LiveSet, assign and position an **Overlay** source, even click a **Zoom Preset** to be the default.

2. Right-click on the **Preset** icon in the bin at left, and select **Export**.

3. Supply a filename for the **Preset**.

4. Click the second **Virtual Input** tab.

5. Right-click on a blank **Preset**, and select **Import** from the menu.

6. Select the file you exported above, and click **Open**.

7. The **second Virtual Input** 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 VGA OUTPUT?

TriCaster's VGA video output is very high quality, but it is possible for you to manually choose certain settings that will have a negative effect on it. Specifically, disabling Windows Aero® may cause video 'tearing'. Also, for best quality, be sure that the **VGA Output Resolution** you choose corresponds to that of the monitor connected (see Section 8.1.4).

NOTE: Changing Output Resolution can cause frames to be dropped briefly. We do not recommend changing this setting during live production.

A.3.13 VIEW TIMECODE ON VGA OUT WHEN SET TO 'ALL SOURCES'?

Space does not permit TriCaster to display timecode fields beneath ISO monitors on VGA output when **VGA Output Resolution** is set to 720x480.

A.4 FILES

A.4.1 MANAGE FILES?

Please refer to the item (How do I) Manage Selected Content inside a Session?

A.4.2 CHANGE THE RECORDING QUALITY?

TriCaster has two optional quality settings for recording live video, **Normal** and **High**. Both alternatives record 'I-frame only' MPEG2 files at a rate of approximately 100mbps for HD video (half that for SD).

The **Normal** setting produces a 'standard profile' MPEG2 with 4:2:0 encoding, and has best compatibility with third-party products. **High** quality files comply with the MPEG2 'high profile' standard, resulting in 4:2:2 encoding at the expense of slightly less cross-product compatibility.

To change the setting:

1. Open a TriCaster session.

2. Access **Record Configuration**, by clicking the 'gear' icon just right of the **Record** button (beneath the **Program** monitor).

3. Click the radio switch for the **Quality** setting you wish to use.

A.4.3 IMPORT MEDIA FILES?

Importing files implies copying them into the TriCaster session folders, making them *local* (rather than *external*). To import media files:

4. Open (or create) as TriCaster session.

5. Click the **Manage** icon in the Startup Screen's **Sessions** page.

6. Click the **Import Media** button (below the **Browse** list).

7. Use the system file explorer that opens to select the file(s) you wish to import into the current session, and click the **Open** button.

Selected files are automatically copied to the appropriate folder (Clips, Stills, etc.) according to their file type (see Import Media, in Section 5.3).

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 media content, making it wise to use Import instead whenever possible.

A.4.4 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**, **Stills** or **Titles**)

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 13.2.2)

A.4.5 REMOVE A LOCATION FROM THE FILE BROWSER?

1. Click the **Add** button for a Media Player (**DDR**, **Stills** or **Titles**)

2. Right-click the name of the location you wish to remove from the list, and select **Remove** in the menu that opens.

(See Context Menus in Section 13.2.2)

A.4.6 EXPORT FILES TO AN EXTERNAL DRIVE?

1. Click the name of the session containing the content you wish to export 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 export (see the sub-heading **Manage** in Section 5.3). A system file explorer will open to show the target content.

4. Hold down the **Ctrl** key, and right-click the name of the external drive you wish to export files to in the left column of the file explorer – select **Open** from the menu, then release the Ctrl key. A second file explorer will open.

5. Navigate to the file destination in the second file explorer.

6. In the first file explorer, select the files you want to copy to export, then drag them onto the second file explorer (if your source and destination are on the same volume, use **Copy** and **Paste** instead of simply dragging files.)

A.4.7 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.4.8 AVOID THE EXPORT 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.4.7). 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.4.9 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 the **Manage** icon on the rotating selector.

4. Click the **Clips** link at right.

5. Use the system **File Explorer** that opens to navigate up on level in the folder hierarchy, to D:\Media\Clips.

6. Right-click on the *NewTek* folder, and select **Delete** from the menu that appears.

7. Accept the deletion warning dialog.

A.5 SOFTWARE, MAINTENANCE AND UPDATES

A.5.1 IMPROVE PERFORMANCE?

1. Click the **Utilities** icon on the Home page of the **Startup Screen**.

2. Click the **Defragment Hard Drive** link at right (see Section 5.2.4). 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 **Utilities** icon on the Home page of the **Startup Screen**.

3. Click **Update TriCaster**, and follow directions provided (see Section 5.2.4).

A.5.4 UPDATE THE FLASH™ AND/OR WINDOWS MEDIA ENCODER?

TriCaster is not designed to be user-upgradeable. 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.

A.5.5   INSTALL VIRUS PROTECTION?

In general, once additional software or services are enabled on TriCaster, it is impossible to guarantee real-timer performance. We *strongly* recommend that you do not install virus and/or malware protection software on TriCaster.

These applications can dramatically impact system performance (this is true even for Windows Defender™, which is deliberately disabled for this reason). Instead, take sensible precautions not to introduce infected files into TriCaster, by virus- checking media you plan to connect externally beforehand.

If you really feel you *must* install virus protection, switch all "active" scanning operations off so that nothing can occur in the background while TCXD300 is running. Then, only when you need to do so, perform a manual scan. Never do this during a live performance.

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.)

A.5.7   RESTORE TRICASTER TO ORIGINAL 'AS-SHIPPED' CONDITION?

We firmly expect you will never need it, but isn't it good to know that a complete **System Restore** function is available in the event of an unforeseen problem?

1. To access **System Restore**, press F8 (you may need to do so a few times in quick succession, say once per second) immediately after powering up (well before the TriCaster Startup Screen appears).

2. You should arrive at a black screen listing boot options that include "Safe Mode" and "Return to OS choices menu." Choose the latter option, and then select **Restore** from the next screen.

This procedure will completely restore 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 if you truly find it necessary (a call to NewTek's excellent **Tech Support** first may often be fruitful – see Section A.6.2).

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:

   o Click the button in **Step 2** of the registration dialog.

   o Follow the directions on the Registration *webpage* (in the Customer Care section of the NewTek website) to obtain your **registration code**

4. If TriCaster does not have internet access, call (or email) Customer Service with the **Product ID**:

   (US) 1-800-862-7837
   (Outside US) +1-210-370-8000
   http://www.newtek.com/faq/index.php?contact=service

5. Enter the **Registration Code** provided into the Registration dialog at Step 3 (Please see Section 3.3 for more detail.)

A.6.2   CONTACT TECHNICAL SUPPORT?

Visit the NewTek Website, at www.newtek.com and select **Technical Support** from the main **Customer Care** menu at the top of the page. This page always contains the latest support information for your NewTek products, including **FAQs** for all products. It also lists the Technical Support Department's hours of operation and contact details.

A.6.3   FIND TRICASTER'S HARDWARE/FIRMWARE REVISION NUMBERS?

Click the **About** icon in the Startup Screen's **Home page**. Doing this opens an information panel that lists significant version numbers (at the bottom).

A.6.4   SAVE THE DEBUG LOG?

Click the **Utilities** icon in the Startup Screen's **Home page**, and select the link labelled **Save Debug Log**. This allows you to specify a location where a file containing the debugger output from the most recent TriCaster session will be saved. (This information may help diagnose any unexpected issues you encounter.)

A.7 MISCELLANEOUS

A.7.1   ACCESS WINDOWS™?

1. If necessary, close the **Live Desktop** by clicking the [x] button at the right-hand end of the titlebar.

2. Click the **Shutdown** icon on the **Home** page of the **Startup Screen**.

3. Click the **Exit to Windows** link at right.

A.7.2 RETURN TO TRICASTER FROM THE WIDOWS™ DESKTOP

1. Double-click the **TriCaster TCXD300** icon on the Windows™ desktop to return to the TriCaster **Startup Screen**.

A.7.3 ADD A NEW STREAMING PROFILE TO THE STREAM CONFIGURATION PANEL?

The streaming profiles listed in the **Stream Type** selector of TriCaster's **Stream Configuration** panel are all located inside the folder at *C:\TriCaster\Streaming Profiles*. They are segregated according to whether they are WMV or Flash profiles, again into NTSC or PAL versions (International models only), and 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 for in the Stream Type List for the *corresponding session type*.)

The easiest method of adding a profile is to modify an existing profile and 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.*

For Windows Media:

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.

For Flash:

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. Launch **Adobe Flash Media Live Encoder** from the **Windows Start** menu.

4. Select **Open Profile** from the File menu in the encoder application.

5. Navigate to *C:\TriCaster\Streaming Profiles\FlashProfiles\.*

6. 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.

7. In **Adobe Flash Media Live Encoder,** modify the settings for the profile to suit your need.

8. Select **Save Profile** from the File menu.

9. Navigate (again) to the appropriate sub-folder inside *C:\TriCaster\Streaming Profiles\FlashProfile,* supply a suitable name for the new profile, and click **Save**.

10. Exit **Adobe Flash Media Live Encoder,** and re-launch TriCaster.

A.8 MORE QUESTIONS AND ANSWERS

A.8.1   WHY DO SOME THUMBNAIL ICONS LOOK WRONG?

Some file formats (notably AVI) do not provide embedded aspect ratio information. As a result, certain files (such as 1440x1080 files intended to be displayed as 16:9) the 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 – taxing the CPU, GPU (and even the AGP or PCIe bus) of client systems, 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 two 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 cameras 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! Otherwise, the carefully timed delays the audio engineers induced would ensure a mismatch between video and late arriving audio. 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 – <u>unless</u> you happen to be very near the stage.   For those in the front rows, a few extra frames of latency *may* be rather disconcerting. (It's true that IMAG was conceived primarily for the benefit of those further back, but if the latency is too obvious for those nearest the front it can be disconcerting distraction.)

For this reason, it's desirable to keep video latency to an agreeable minimum – but put away any notion of 'zero latency.' Not only would this require bending the laws of physics, it would be a bad idea.

Even before considering minimizing latency in the device chain, acknowledging that there is always going to be some latency calls for some creative thinking with regard to practical staging. For example, if you design your IMAG layout in such a fashion that those in the front row are unlikely to be able to see the screen(s) without lifting their eyes from the onstage talent, they are extremely unlikely to notice a small amount of latency.

B.3.3   LATENCY AND YOUR TRICASTER

TriCaster is a wonderful tool in the IMAG arsenal, but inevitably it is only one (albeit critical) link in a chain of devices. It is common for each device to contribute a little to the combined total latency for the system.

TriCaster's portion of the total latency sum is well within standards for devices of this sort - between 2 and 3 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? To do so, 'Genlock' your cameras to the TriCaster output. You can do this with any camera that has genlock capabilities, using any model of the TriCaster.

Genlocking can be performed with suitable cameras as follows: connect TriCaster's composite output as the Genlock source, feeding it back to the cameras Genlock connection. Adjust the 'genlock phase' setting at the camera to get the lowest possible latency. This allows TriCaster to bypass its input time-base correctors, diminishing latency by about one frame (to its potential of just two frames.)

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:

1. If you use DVI or VGA 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.

2. 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.)

3. Certain projectors provide a special 'low latency mode' to disable features of the unit that carry a heavy toll in latency. Enabling this mode can make the positioning of 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.

4. 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.

An oft-heard expression is "Don't worry – we'll fix it in post".

Post-production techniques are invaluable, but they do not repeal 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 TriCaster's 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

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**.
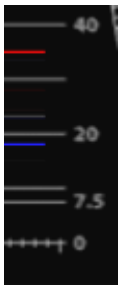
Using TriCaster's **Waveform** monitor (in the Live Desktop's **Preview Scopes** tab), you can actually see the IRE values for your video sources graphed on a vertical scale (select the source on the Switcher's **Preview** row).

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.

Figure 189

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 along, 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 190) can be likened to the familiar 'color wheel' (Figure 191) 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.
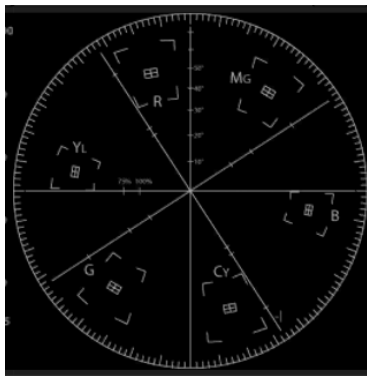
Figure 190
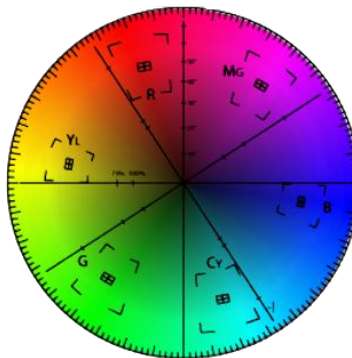
Figure 191

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 192 is an example of the color bars used in NTSC countries, while Figure 193 is a PAL example, common throughout European nations.

Figure 192 (NTSC)
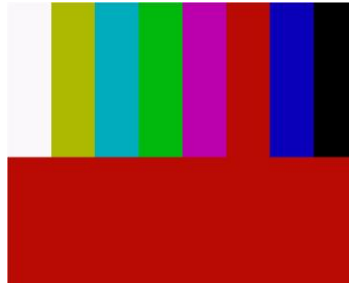
Figure 193 (PAL)

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.
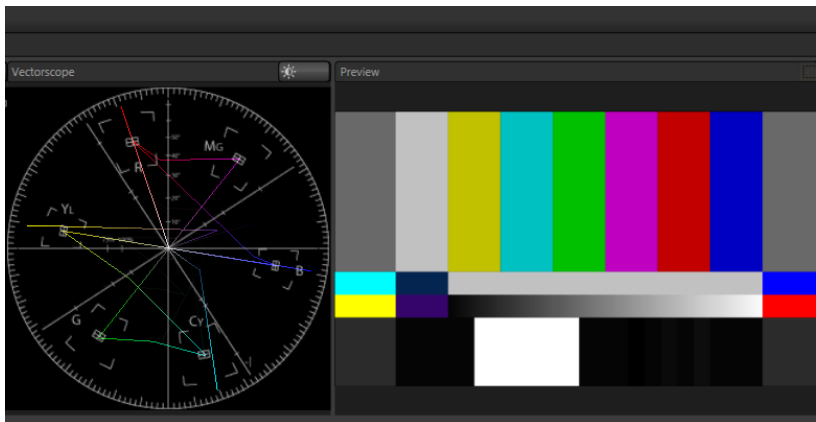
Figure 194

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 195).
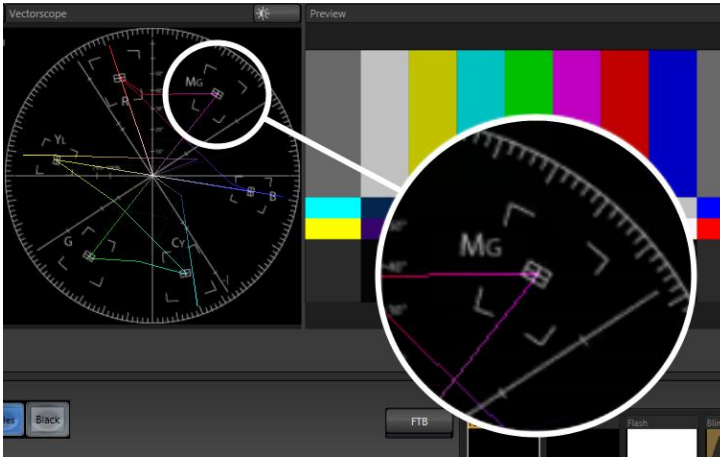
Figure 195

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 two 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 196

(The images in this section have been adjusted slightly to accentuate the subtle differences in the black bars making up this region.)
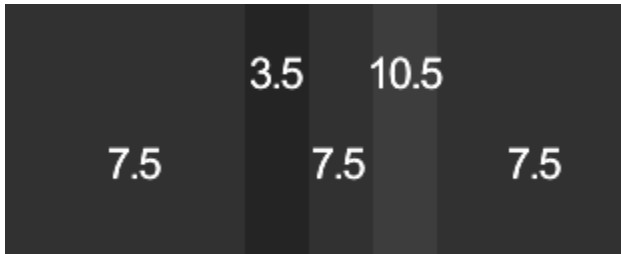
The large blocks at left and right in the PLUGE represent 'NTSC black' - 7.5 IRE. Between these larger blocks are three smaller bars – one at left that is slightly *darker* than NTSC black (3.5 IRE), one at right that is slightly *lighter* (10.5 IRE). These are separated by another equal-sized 7.5 IRE 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** know 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 198).
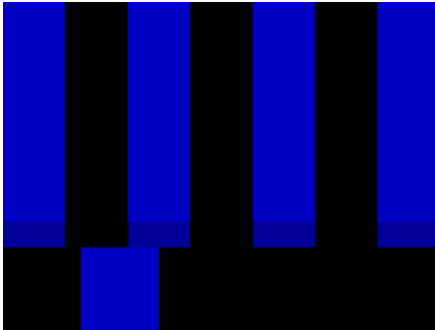
1. If the monitor lacks a "Blue-gun only" feature, you can obtain a colored filter such as a Kodak Wratten #47B gel, and hold that between your eyes and the monitor for a similar result.

2. 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.

3. Tweak the monitor's **Hue** control until the small rectangles beneath the third and fifth tall upper bars likewise blend into bar above.

4. 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.)

5. 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…

Live Row, Inputs 1 to 13	F1 – F12 plus [Shift + F12]
Preview Row, Inputs 1 to 13	1 – 0 (plus - and = and \)
Effects Row, Inputs 1 to 8	Alt + 1 – Alt + 8
Transition Overlay 1 On/Off	f
Transition Overlay 2 On/Off	Shift + f
Take Overlay 1 On/Off	d
Take Overlay 2 On/Off	Shift + d
Overlay Channel Lock On/Off	Shift+ \ (i.e., 'pipe', |)
Transition All (using Switcher Transitions and Overlay Effects)	a
Take All (Overlay ignores current Effects)	s
Fade to Black	Backspace, or Ctrl + b
Select Transition (prev/next)	, and .
Select Fade Transition	Ctrl + f
Restore Last Transition	Shift + Ctrl + f
Transition – Fast … Medium … Slow	z…x… c
Transition – Increase Speed	Shift + z
Transition – Decrease Speed	Shift + c
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 Alt)
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 tab	Ctrl + F1
Show V1-V5 tab	Ctrl + F2-F6
Show Stills tab	Ctrl + F7
Show Titles tab	Ctrl + F8
Show Audio Mixer	Ctrl + F9

D.5 DDR

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
Go to Start/End	Home / End Keys
Navigate through Playlist items	Up/Down/Left/Right Arrows
Go to first playlist item	Home
Go to last playlist item	End
Playlist - select to top	Shift + Home
Playlist - select to bottom	Shift + End
Playlist – add to selection (up)	Shift + Up arrow
Playlist – add to selection down	Shift + Down arrow

D.6 STILLS

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)
Go to Start/End	Home / End Keys
Navigate through Playlist items	Up/Down/Left/Right Arrows
Go to first playlist item	Home
Go to last playlist item	End
Playlist - select to top	Shift + Home
Playlist - select to bottom	Shift + End
Playlist – add to selection (up)	Shift + Up arrow
Playlist – add to selection down	Shift + Down arrow

D.7 TITLES

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
Go to Start/End	Home / End Keys
Navigate through Playlist items	Up/Down/Left/Right Arrows
Go to first playlist item	Home
Go to last playlist item	End
Playlist - select to top	Shift + Home
Playlist - select to bottom	Shift + End
Playlist – add to selection (up)	Shift + Up arrow
Playlist – add to selection down	Shift + Down arrow

D.8 GENERAL

D.8.1 MISC.

Cut	Ctrl + x
Copy	Ctrl + c
Paste	Ctrl + v
Delete	Delete Key

D.8.2 SELECTION…

Select All	Ctrl + a
First Item	Home
Last Item	End
Previous Item	(Left or Up) Arrow
Next Item	(Right or Down) Arrow
Previous Item and Keep Current Selection	Ctrl + (Left or Up) Arrow
Next Item and Keep Current Selection	Ctrl + (Right or Down) Arrow
Select All Previous Items	Shift + Home
Select All Following Items	Shift + End

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