Viz Vectar Plus
Live Production Guide

Version 1.0

NDI®

Disclaimer

Vizrt provides this publication "as is" without warranty of any kind, either expressed or implied.
This publication may contain technical inaccuracies or typographical errors. While every precaution has been taken in the preparation of this document to ensure that it contains accurate and up-to-date information, the publisher and author assume no responsibility for errors or omissions. Nor is any liability assumed for damages resulting from the use of the information contained in this document. Vizrt's policy is one of continual development, so the content of this document is periodically subject to be modified without notice. These changes will be incorporated in new editions of the publication. Vizrt may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time. Vizrt may have patents or pending patent applications covering subject matters in this document. The furnishing of this document does not give you any license to these patents.

Technical Support

For technical support and the latest news of upgrades, documentation, and related products, visit the Vizrt web site at www.vizrt.com.

Created on
2021/04/08

CONTENTS

PART I (GETTING STARTED)

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

1 About This Manual

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

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

- *PART I – GETTING STARTED*

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

- *PART II – REFERENCE*

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

- *PART III – APPENDICES*

  Certain topics which benefit from in-depth coverage are located in this section, along with cross-references to relevant information elsewhere in the manual and concluding with a keyword index.

2 Introduction

The next stage of software driven live production has arrived. Viz Vectar Plus - Live Production is the first and only major live production solution to be offered either as a software download to install locally on a standard computer system that meets the necessary performance requirements on-premise, or as a virtualized package that runs in private or public Cloud environments that support GPU processing. This chapter provides a brief tour of system features.

2.1 Overview

We are determined to deliver the most complete, reliable, and efficient integrated systems available for live production and web streaming, with capabilities suited to almost any broadcast need. This software allows you to produce and distribute live video programs from diverse sources in ultra-high definition formats, up to 2160/59.94p.

Viz Vectar Plus - Live Production is the first and only major live production solution to be offered either as a software download to install locally on-a standard computer system that meets the necessary performance requirements on-premise, or as a virtualized package that runs in private or public Cloud environments that support GPU processing.

2.1.1 Launch Screen
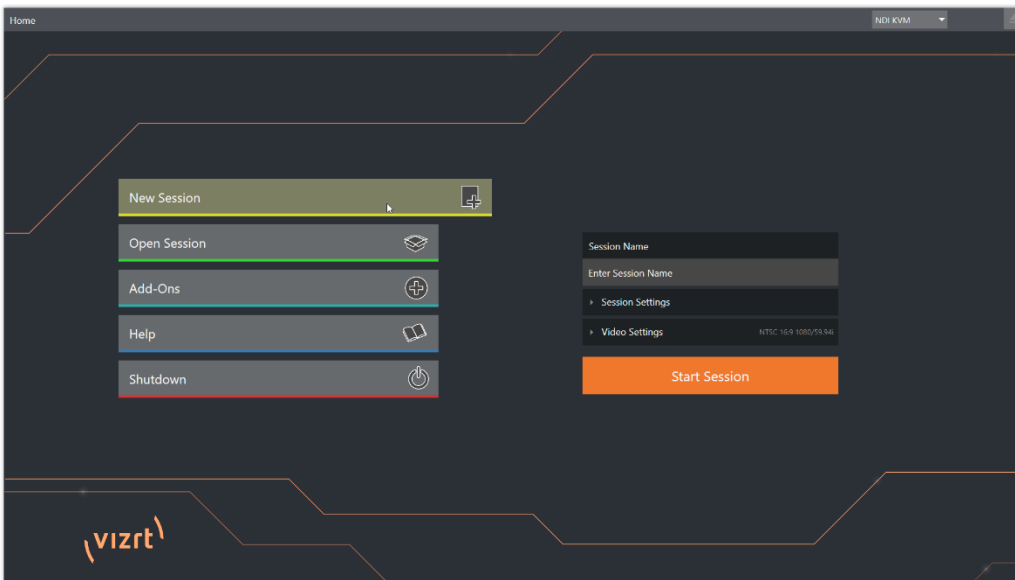
The *Launch Screen* appears shortly after you power up your live production system. The *Home page* of the *Launch Screen* allows you to create (and re-open) *sessions*. Sessions are an important concept to understand – essentially a custom preset prepared for an individual production or other purpose.

When you open a session, Viz Vectar Plus - Live Production next displays the *Session Page*, which features some file management features, and also allows you to launch the *Live Desktop* to begin production.

2.1.2   Live Desktop

Your system's live production features are all available from the *Live Desktop*, which in many ways mimics familiar video production equipment (however, the *Live Desktop* provides far more functionality in its integrated environment than similar single-purpose devices).
The various features, controls and modules comprising the *Live Desktop* are arranged in horizontal bands..
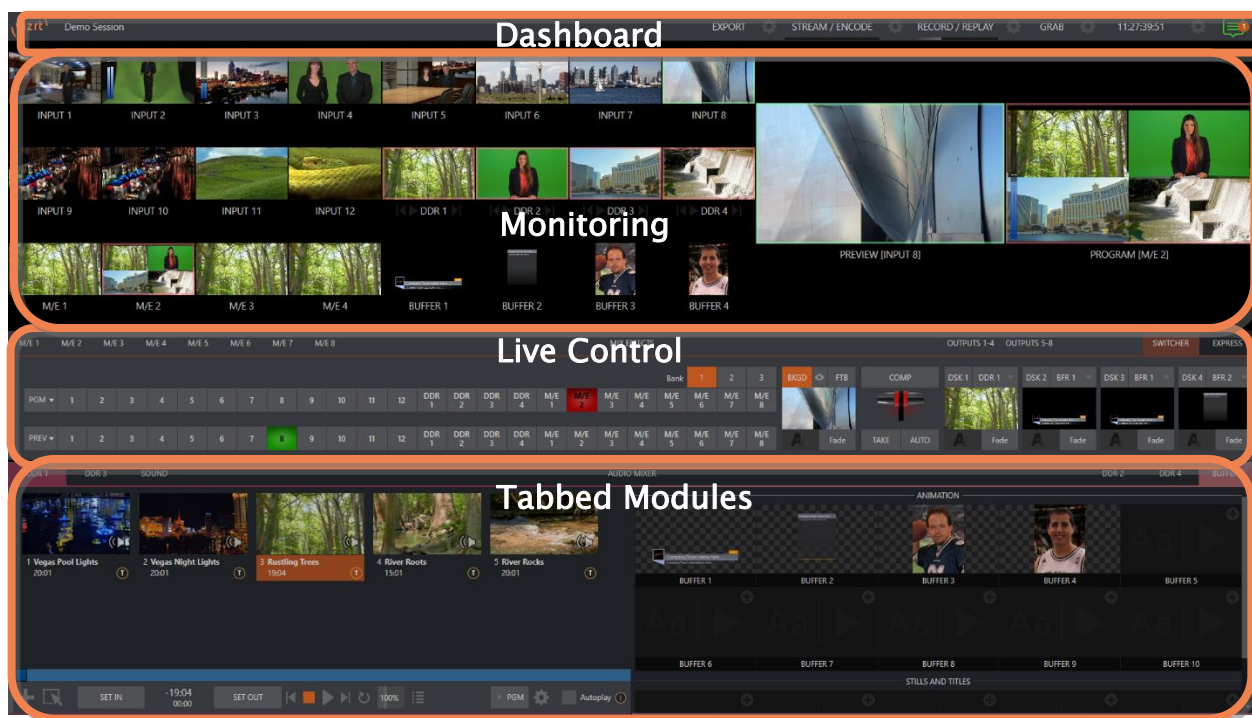
FIGURE 2

- The area just below the Dashboard is normally devoted to a multi-pane monitoring display, providing source and output views. This multiview can be re-sized and even completely hidden. Its display attributes can be customized to complement external Multiview(s), or for numerous other purposes.
- The central Live Control section is home to the Switcher, Transition, DSK (overlay channels) and M/E controls (M/E panes can be minimized, and are hidden from view in Figure 2).
- By default, the bottom third of the Live Desktop is home to tabbed control modules, including Media Players, Buffers, and the Audio Mixer.

2.2   Features

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

2.2.1   A/V Input and Output

With built-in media players, recording, streaming, audio, and graphics control, Viz Vectar Plus - Live Production effortlessly masters the art of reaching more audiences with aspect ratio, resolution, and frame rate independence, providing simultaneous delivery for distribution to multiple destinations supporting various screen types. Viz Vectar Plus - Live Production employs a software

model, integrating standard computing and network infrastructures with NDI® IP integration and optional SMPTE 2110 connectivity.

Other features include:

- Support for up to 44 external inputs in resolutions up to UHD 60p with alpha channel, and support for over 40+ output signals over IP, all independently configurable through software.
- With Virtual PTZ, you can create and access multiple shots from any individual video signal—complete with live virtual zoom and real-time pan and scan effects.
- Powerful, multi-bus mix effects with eight M/E busses, plus preview bus, all supporting zero-latency video re-entry
- Freely mix multiple video formats, and output UHD and HD sessions simultaneously.
- Supply Microsoft Windows® or Apple Macintosh® computer displays as Switcher inputs over the network using NDI® Scan Converter clients.
- Load layered animations and PSD files directly into system buffers.
- Cascade effects in endless creative ways using multiple re-entrant M/Es.
- Readily access all the sources, destinations, and media assets from any location on the network
- Create complex M/E effects and compositions using multiple sources with live (virtual) camera moves.
- Use switcher row color groups to link video sources for multiple M/E s, etc.
- Manage the input and output of video in non-standard aspect ratios like 9:16 and square video, non-standard video frame rates, rotate and flip to produce content for any platform and destination.
- Send Main or AUX bus audio mixes to a variety of IP audio outputs.
- Viz Vectar Plus - Live Production provides the flexibility to mix and match caller software applications, streaming formats, websites, video formats and a wide range of media files

2.2.2   Viz Engine Integration

- Viz Engine 4.2 is a powerful compositing and real-time 3D rendering platform that forms the foundation for a range of graphics and video production.
- Viz Engine 4.2 comes with Viz Artist, a powerful graphics design tool that supports a range of production use cases including live motion graphics, virtual sets, augmented reality, and complex 3D animations.
- Viz Engine platform connectivity enables integration of customized control software, 600+ user-specific plug-ins, Unreal Engine 4 rendering, importing of models from Autodesk's Maya and 3ds Max, Maxon's Cinema4D, and Adobe After Effects, and support for multiple tracking systems.

2.2.3   Conference Call Connectivity

- Live Call Connect is a flexible and powerful integrated support for a wealth of popular remote calling and conferencing applications, plus supported web browsers.
- Install popular applications like Microsoft® Teams, Zoom, Google Chrome and many others, and assign their individual audio and video outputs directly to Viz Vectar Plus - Live Production's Switcher and Audio Mixer inputs.
- Productions are enhanced with real-time interactions that feature multiple high quality video and audio inputs, so that show producers are able to connect between studios and remote guests or callers from anywhere in the world, without compromise or worrying about connectivity.

- Use Viz Vectar Plus – Live Production's native Innovative Skype TX support with Microsoft's powerful Skype TX™ platform to connect Skype™ calls directly to the Switcher, with automatic handling of return audio and video (including mix minus).
- Viz Vectar Plus - Live Production offeres a unique TalkBack feature to provide private direction to callers.

> *Note on Deployment platforms:*
>
> *Viz Vectar Plus - Live Production is designed to take advantage of the hardware accelerated capabilities of the latest versions of Windows. Because of this, the Live Call Connect feature requires Windows Build 19041 or later. There are some cloud platforms like AWS on which this might not currently be available in the current default configurations although this is of course very likely to change over time. The customer can in most cases work around this; bringing their own Windows 10 version and deploy that manually in the cloud platform. This may have implications on cost, technical complexity and licensing agreements with Microsoft. To do this manul process is not something Vizrt can support installing, however, we do support our software.*

2.2.4   Timecode

- NDI Quicktime® recording format includes embedded time-code.
- Recorded clips are easily aligned for synchronized post-show editing using timecode.
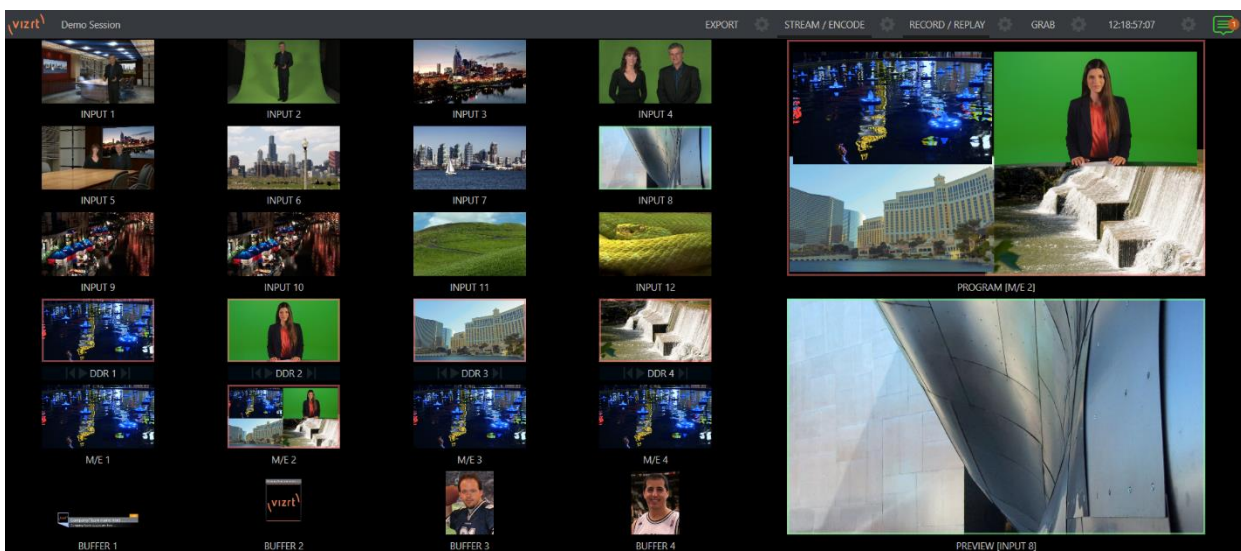
FIGURE 3

2.2.5   Monitoring

- The Live Desktop includes a large monitoring pane with multiple, easily customized Workspaces.
- This multiview allows you to keep an eye on all live and internal video sources, including Media Players and network sources.
- External multiview Workspaces offer many alternatives, including numerous multi-bridge layouts, overlays and Event Clocks.
- Monitor sources on both Live Desktop and up to four external multiview's are user-configurable, and include Media Player clip timecode counters, and custom logo display.
- Waveform and Vectorscope monitors help you calibrate your signal to ensure your output meets broadcast standards and looks great.

©Copyright Vizrt 2021

2.2.6   Video Processing

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

2.2.7   The Switcher

The powerful *Switcher* module, which provides native support for the popular NDI® protocol, puts your sources at your fingertips in a familiar *Program/Preview* row control layout.
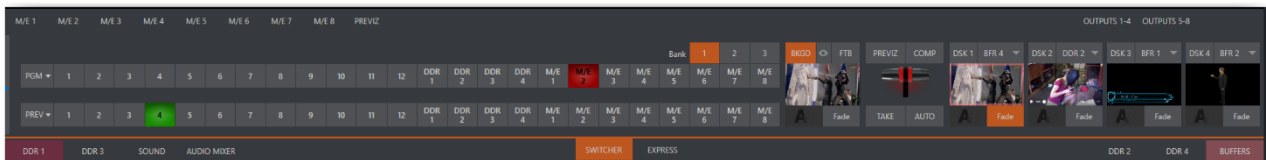
For less complex productions, the *Switcher's* convenient *Express mode* simplifies the process (Figure 5). This one-button operating mode will be especially welcome in environments where volunteers or less experienced operators are involved.
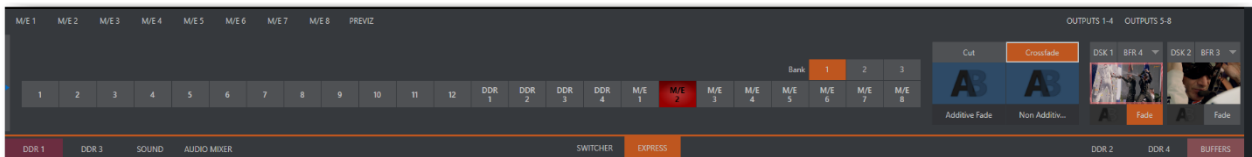
Additionally, optional support for switching with a touchscreen has been provided. See something interesting on a viewport in the monitoring section? Just tap the corresponding viewport to instantly send that source to *Program* output, using the current *background transition*.

Video Layers and Transitions

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

- Freely hot-punch or transition between external sources, internal Media Players, and M/E effects.
- Latch selected Switcher and M/E source rows in color groups to synchronize switching operations.
- Multiple DSK (Downstream Key) Switcher channels and independent KEY channels for each M/E, permit endless creative possibilities.
- Bring DSK's on and off screen with PGM/PST background sources using combined layering and transition effects.

- Use any of the hundreds of transitions supplied to reveal either Background or DSK/Key channels with animated wipes, trajectories and dissolves, including colorful Animation Store transitions with sound effects.
- Reveal combinations of video layers with one operation of the T-bar or click on Take/Auto buttons.
- Or use per-layer controls to independently display any layer with or without transitions.
- Employ *Speed*, *Reverse* and *Ping Pong* options to modify individual transition effects for any layer.

DSK Channels
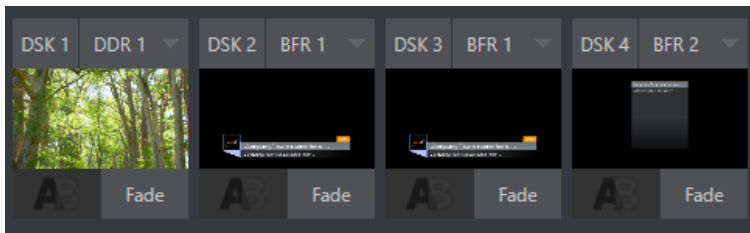
- Display DSK channels independently and swap them during a switch with custom transitions.
- *DSK* layers support downstream overlays (*M/E Keys* are *upstream* overlays, i.e., ahead of the main *Switcher*).
- Assign *Media Players, Buffers,* camera or network sources to an overlay channel.
- Independent Crop, Position, 3D Rotation, and Scale controls for each DSK channel permit you to configure mulitple sources as picture-in-picture elements and reveal them with custom effects.

2.2.8   M/Es
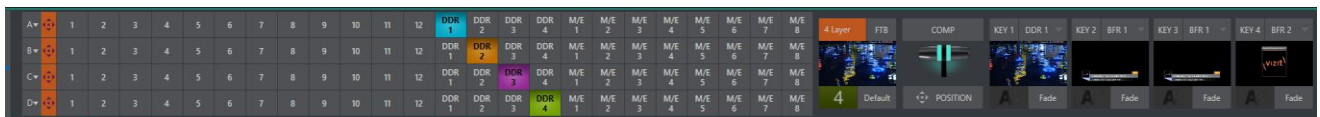
Color-coded *M/E* (Mix/Effect) banks provide stunning effects.
These include secondary video mixing capabilities, switching with traditional wipes, full alpha channel support and real-time keying technology for green/blue screen effects, and much more.
Each *M/E* bank supports:

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

2.2.9 Record and Stream

- Record live-switched production at full resolution to a high-quality QuickTime® format.
- Real-time, direct upload of clips, active recordings, and streams to social media, storage volumes, and Web-based destinations, with optional transcoding.
- Comprehensive, multi-channel recording configuration for capture, playback, and archive of production content across your ecosystem.
- Capture technology supports multiple simultaneous a/v recordings chosen from among local camera inputs and the four primary outputs.
- Easily grab still images from any Switcher source, or batch capture selected outputs.
- Streaming: RTMP, RTSP, HTTP, SRT, and more.
- Live stream live to multiple destinations for redistribution and archive your stream locally.

2.2.10 Media Export

Real-time, direct upload of clips, active recordings, and streams to social media, storage volumes, and Web-based destinations, with optional transcoding
Clips and stills from live sessions can be added to the *Export* queue without interrupting production, for distribution to multiple hosting services and social media sites (including Twitter®, Facebook®, YouTube®, and more) – even when live production recording is still underway. This is great for concerts, galas, sport events, game shows and more. The *Export* feature directly addresses FTP sites and network locations too. Transfer media to multiple locations at the same time to meet post-production needs or other collaborative and archival requirements.

2.2.11 Automation

Easily accessible through any Web browser or operating system, there are production-ready control panels for remote video mixing, media playback, audio mixing, and macro automation, plus a panel builder tool to design your own custom panels geared toward your unique productions and workflows.

2.2.12 Hotspots, Triggers and Trackers

Define multiple onscreen *Hotspots* for different (chromakeyed) sources, and *trigger* macros automatically whenever something opaque enters the hotspot. This live interactivity opens up countless creative applications.
Trackers provide motion data from selected color regions as they move about the frame in real-time. Lock video sources to *Tracker* output using *Position* tools in *M/Es* banks and *DSK*s and they will follow obediently.

2.2.13 Import

Import Media

With built-in media players, recording, streaming, audio, and graphics control, the integrated *Import Media* feature provides a convenient one-stop approach to gathering productions assets.

- Batch import media files for use in Media Players.
- Imported files can be pre-assigned automatically to specific players, making them easy to find and use during live productions.
- When necessary, imported files are transcoded.

2.2.14 Audio Mixer

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

- Adjust numerous internal and external audio sources, and introduce them into your program manually or automatically.
- Control output levels for program, phones, auxiliary outputs, recorders, and stream separately.
- Convenient Audio Mixer MEM system allows single-click access to prepared setups.
- Automation allows complex 'video follow audio' options and 'threshold macros'.
- Exclusive or latched Solo controls
- Independent 7-band EQ, Compressor/Limiter and Noise Gate for each source and output.
- Complete multi-bus 8x8 matrix routing options. Configurable VU meters: Show calibration on digital (dBFS) or (dBVU or dBu) scales.

Advanced Audio Connect

- VST plugin with NDI offers unlimited support for mix minus, intercom, and other advanced capabilities without any restrictions on scale, all with floating point audio, and without any channel restrictions
- Supports comprehensive integration of system audio with external mixers
- Provides independent routing of any audio input or audio output channel(s) for external routing
- Enables extraction of embedded audio from NDI® sources for external routing

2.2.15 Integrated Media Players

Media Players and the title system serve up graphics and audio files quickly and easily.
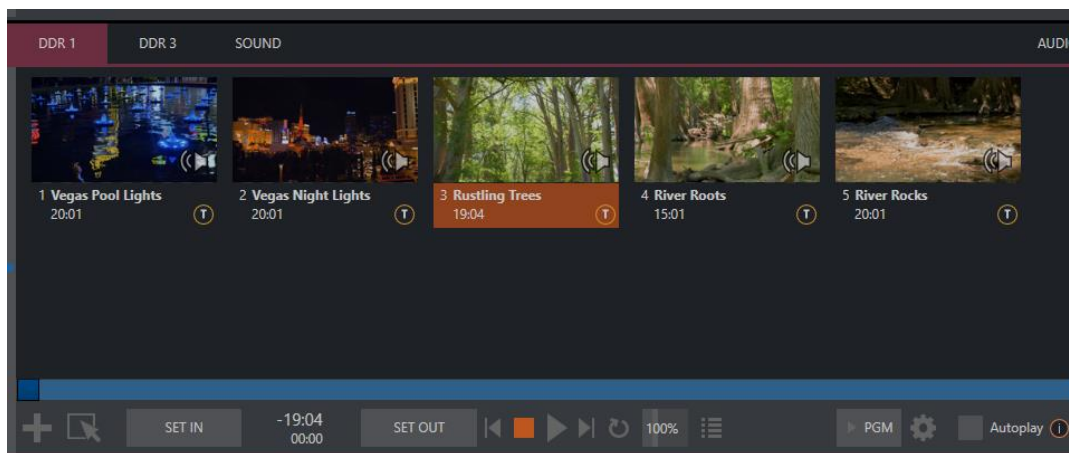
FIGURE 9

- Built-in media players, recording, streaming, audio, and graphics control, with aspect ratio, resolution, and frame rate independence.
- Superior stored media playback capabilities, with multiple real-time multimedia players supporting an array of file formats
- Re-order playlist entries.
- Add colorful transitions between playlist items.
- The Sound module has volume and other advanced audio controls in the Audio Mixer.

- Convenient 'per clip' audio level and playback *Speed* control.
- Auto play feature starts and stops playback automatically based on Switcher activity.
- Control Media Players with macros triggered by other events.
- Assign titles, graphics, or buffers to multiple DSK or M/E Key channels.
- Instantly transition media to the Main Switcher or an M/E and then restore the original source using the Show On feature.
- Store playlists and player configurations in MEM slots for easy recall.

2.2.16 Buffers

The *Buffers* module provides quick review and management of the internal media buffer system, providing combined playback and asset management tools, and is fully supported by the *Macro* system.
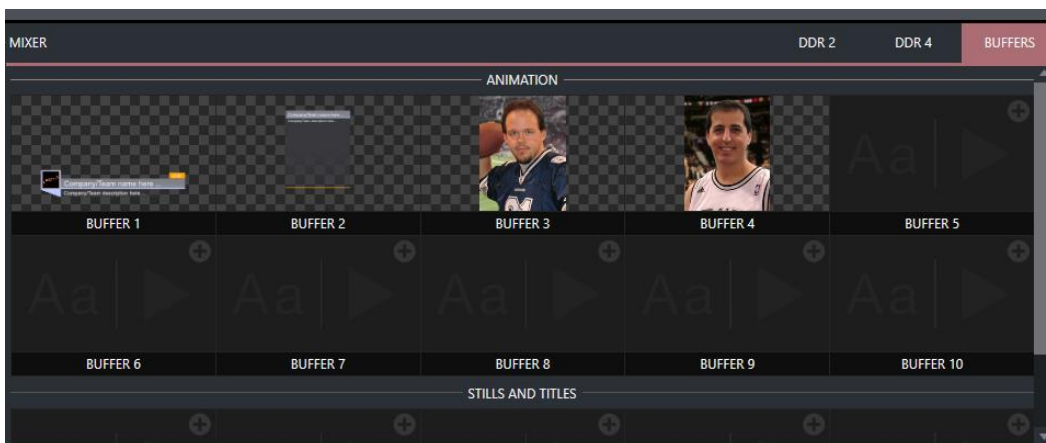
FIGURE 10

Buffers can be applied in any video channel, including all main *Switcher* and *M/E* rows, or as overlays in the countless *DSK/KEY* channels. *Buffer* 'slots' can contain animated effects, still graphics or editable title pages.
Buffer effects are resident in reserved *Switcher Memory,* making it possible to use them all at once without tying up *Media Players*.

2.2.17 Optional Control Surfaces

Several optional control surface options have been designed to complement your system, making your live production operations even more convenient. Once you get your hands on one, you'll never want to let go.
In summary, this live production system gives you more combined production power than any other single broadcast appliance. Let's jump in now. First, we'll get you connected, and then we'll explore some of the system's foremost features.

3   Setting Up

While traditional hardware-based systems have provided solutions for decades, this approach is not flexible enough to contend with the realities of IT and IP environments. With a legacy of software-based production systems, Vizrt is uniquely situated to take software to the next level for live production that actually works in a connected, collaborative, and distributed manner.

3.1   Windows Login

Although the system can be operated without a password requirement, it is recommended to use one to secure your system from unwanted use or intrusion.

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

3.2   Input Connections

3.2.1   Connecting a Control Surface

Please refer to 21.1 for a discussion of connecting and configuring control surfaces.

3.2.2   Connecting Routers

Viz Vectar Plus - Live Production represents a new way to address changing requirements by removing the traditional boundaries of media formats, I/O, channels, and delivery as an all-encompassing digital media environment to create content for Internet, mobile, and television distribution.

With the appropriate software installed, your system can control and access output from router models supporting NDI matrix router, DeltaCast, Bluefish444, Matrix, Black Magic Design®, Grass Valley® Native Protocol and many more.

A basic setup with any of the above supported cards would be as follows:

- Connect the ethernet controlled router to the same network as the system, then connect one (or more) of the router's video outputs to external SDI inputs with matching numbers, using suitable video cables. (For example, by default router output number 3 would be connected to Input 3 for control communication between the devices to be properly linked.)
- Click the Shutdown icon on the Home page (Launch Screen) and click the Administrator Mode at right.
- In the Administrator Mode panel, click Exit to Windows.
- Navigate to the appropriate folder below by model:
- C:\ProgramData\vizrt\Vectar\Configuration
- And open the file named router_setup.xml by double-clicking it (it will launch in Notepad).

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

A typical entry might be as follows:
<grassvalley ip="10.28.1.128" port="12345" name="AJA KUMO"/>

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

Some routers allow each router input to be provided with a unique name. In such a case, Viz Vectar Plus - Live Production may be able to access that name and use it for *Switcher* buttons as appropriate.
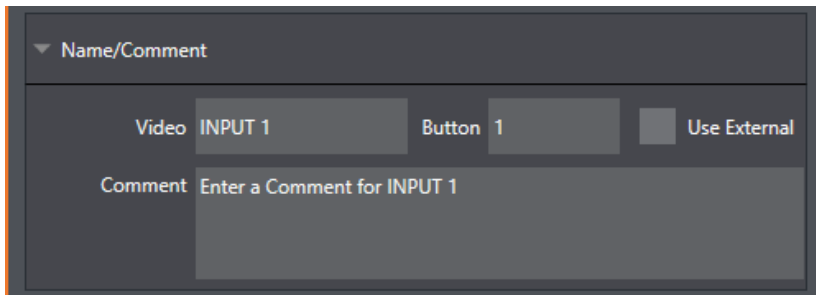
To enable this behavior, checkmark the *Use External* (name) switch in the *Input Configuration* panel (Figure 11) – see Section 8.1.1 for more detail.

Black Magic Design® Auto-Detection

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

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

3.3   Output Connections

Viz Vectar Plus - Live Production is a software-only, IP-based live production solution, delivering a choice of configurations for on-premises or virtualized cloud environments.

We'll start with video output, not only so you can view your results but because certain items are best considered before beginning a live production session.

3.3.1   A/V Output

Viz Vectar Plus - Live Production can switch, mix, and actualize any type of live production while removing traditional boundaries of media formats, I/O, channels and delivery on any infrastructure that meets performance requirements.
Here are some of the possibilities:

- Pull in streams across the internet from various sources using standard protocols such as SRT and mix them into your productions.
- Viz Vectar Plus - Live Production can output a huge number of different sources – including eight unique mixed compositions, support for over 40+ output signals over IP, multiple internal recorders, and three additional local multiview monitors.
- Send program output, secondary mixes, or custom 'monitor bridge' layouts to as many as three supplemental monitors.
- Stream two independent video outputs independently configurable, with simultaneous stream recording, to multiple Content Delivery Networks.

Each of the primary outputs, referred to as *MIX 1 – 8,* can be configured independently. Video format settings for these outputs are provided in the Live Desktop's *Output Configuration* panel.

- Output video from anywhere to anywhere with Viz Vectar Plus - Live Production IP-based software solution.
- Re-entry function allows for multiple versions of the same program to be output with different aspect ratios, resolutions, and graphics simultaneously.
- Native support for network audio input and output via NDI®.

3.3.2   Supplemental Video Outputs

Viz Vectar Plus - Live Production comes with fully integrated quad-head multiviewer functionality, with dedicated monitor ports, configurable workspaces, and customizable windows.

Hint: You can choose which monitor is the "main display" by choosing Administrator Mode, then clicking Display under the Settings heading.
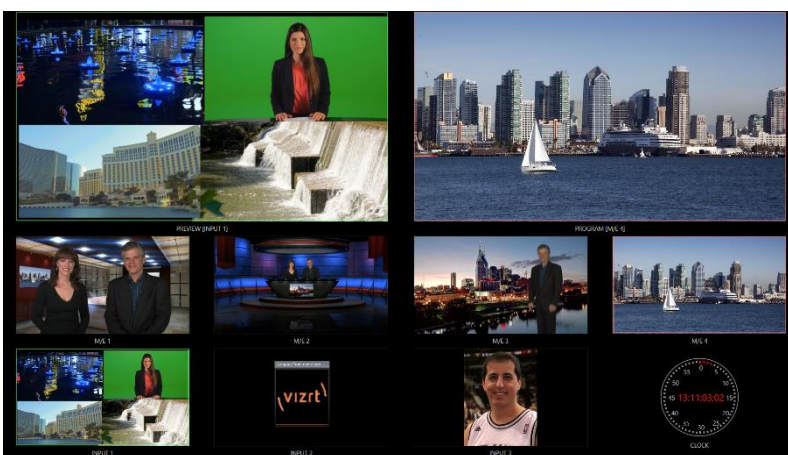
FIGURE 12

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

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

3.4   Starting a New Session

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

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

The Home Page

When no previously created sessions exist, the icon tab dominating the *Home Page* defaults to *New*, inviting you to create a new session.
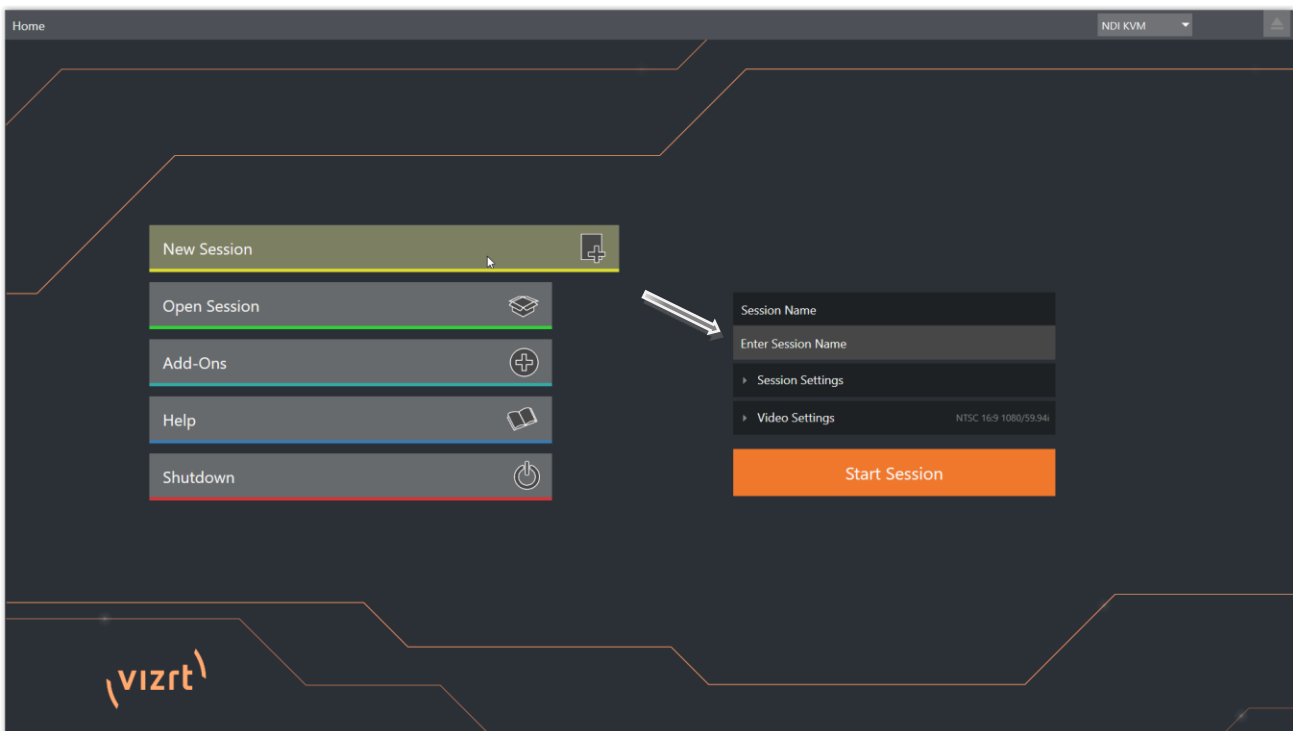
A link containing the text "*Enter Session Name"* is shown at the top of the right-hand pane when the *New Session* link is selected at left. Click in this text box to modify the default name using the keyboard if you like (otherwise, the default name is the current date).

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

Continue with session creation by designating the *Video Standard* used in your locale. For the moment, let's click the HD button in the *Preset* list, which establishes either *1080/59.94p* or *1080/50p* as the session format (based on your choice of PAL or NTSC video standard), then click

the *Start Session* link below. By default, new sessions are created on the D: (Media) drive (see Section 5.2.1 for a discussion of session *Volume* options).

The Session Page

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

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

The Live Desktop

Initially, as you have yet to configure input devices or add content, the *Live Desktop* will look a bit barren (Figure 15). Take a quick look around, then let's continue to configure devices. (We had a brief glimpse at the *Live Desktop* back in 2.1.2, but we'll examine it further in 6, Live Desktop.)

3.5 Configure A/V Output

3.5.1 Primary Outputs

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

Often, though, you will want to connect external monitors or other downstream devices to your system (see 3.3.1). In either case, you will be faced with decisions about the output formats, and audio and video sources provided to downstream systems.

The primary 'mixed' a/v outputs are presented to downstream devices by various means as depicted in the following table.

	Video Output			Audio Output	
Name	**Source**	**Format**	**NDI**	**Source**	**Supplemental *(NDI/other)**
Mix 1	Selectable	Selectable	✓	Selectable	✓
Mix 2	Selectable	Selectable	✓	Selectable	✓
Mix 3-8	Selectable	Selectable	✓	Selectable	✓

* Up to eight audio channels can be mapped to supplementary outputs with the installation of supported third-party audio drivers (such as Audinate's Dante™).

> *Hint: There can be many additional outputs apart from these primary ones and the Stream outputs configured in the same pane. We'll discuss supplemental outputs in Section 3.5.2.*

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

1. Move your mouse pointer to the large Program Output monitor on the Live Desktop.
2. Click the Configure button (gear) that appears at lower right over the viewport to open the Output Configuration panel ().

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

This panel hosts several tabbed panes, with the first one labeled *Output*. This is where the signals sent to each of the video output busses designated *MIX 1-8* as well as *Stream* outputs are configured. There are various decisions to make for each output:

- What video source will you assign to the output?
- What audio source will accompany it on digital connections that carry both signals?
- Which video format will be transmitted?
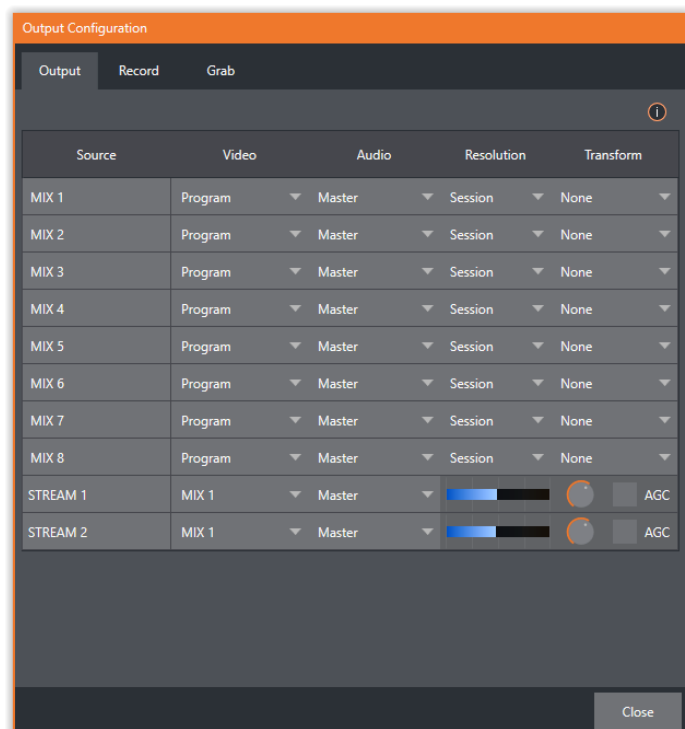
FIGURE 16

And so on …

Output Channel Options

Let's review video source selection first. A drop-down menu in the *Video* column permits you to assign sources to the primary video outputs. The primary output connectors are identified by number in the external SDI OUT group on the system; these sources also appear on your network as NDI sources.
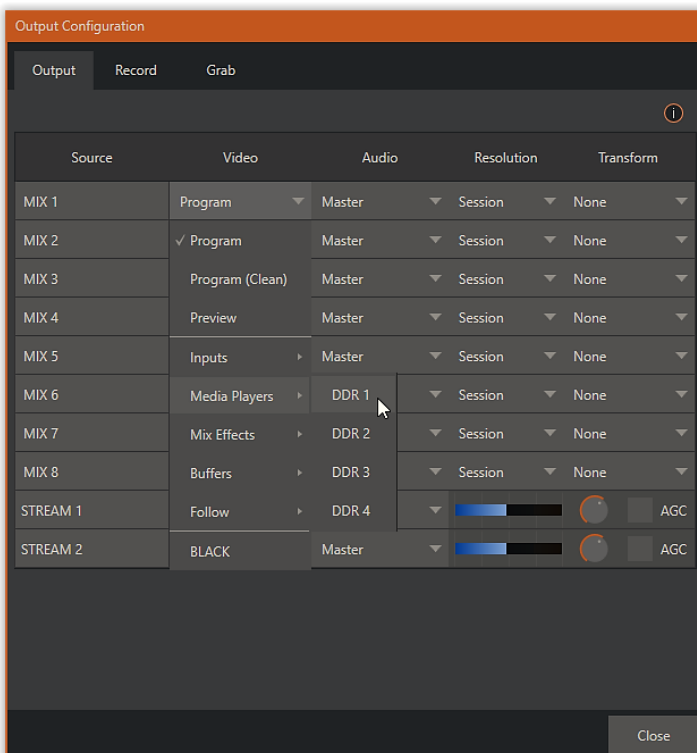
FIGURE 17

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

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

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

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

3.5.2   Supplemental Outputs

The 'mixed' outputs mentioned above are just the tip of the iceberg. Direct support for internet streaming, multiviews, and recorders drastically reduce the need for 'outputs' as they are traditionally defined in this space.
Beyond this, NDI (Network Device Interface) options provide the system with more powerful and plentiful output capabilities than any other video mixer on the market. Deploy, control and output video from anywhere to anywhere with IP based software solution.

Fulltime NDI Outputs

First, in addition to all primary outputs being provided as network sources (NDI), Viz Vectar Plus - Live Production provides many secondary NDI outputs. Among NDI sources available automatically, without any configuration steps required, over the network are the following:

- **Local sources** – all four external SDI inputs, if in use.
- **Media Players** – the displays from the four Media Players that provide visual output
- **Buffers** – still image output from all buffers (animated buffers are treated as still frames)
- **Mix 1-4** – the aforementioned mixed Switcher outputs

NDI Output Matrix Routers

Viz Vectar Plus – Live Production also provides an additional eight *routable* NDI outputs, labeled *OUT 1-8* on the *Live Desktop*.
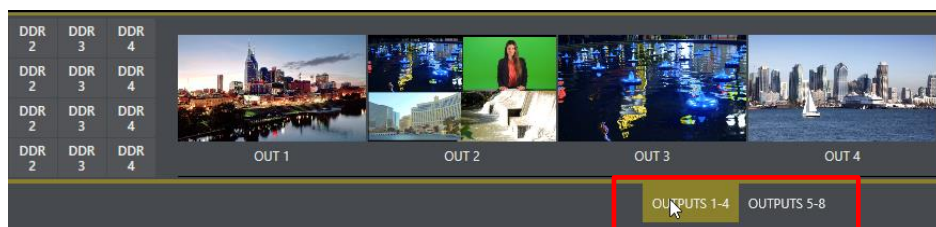
FIGURE 18

Figure 18 highlights two tabs labeled *OUTPUTS 1-4* and *5-8*, located at right just above the main *Switcher*. Clicking a tab reveals one of two specialized crosspoint panels, which appear in the same place that *M/E* modules are normally shown (Figure 19).
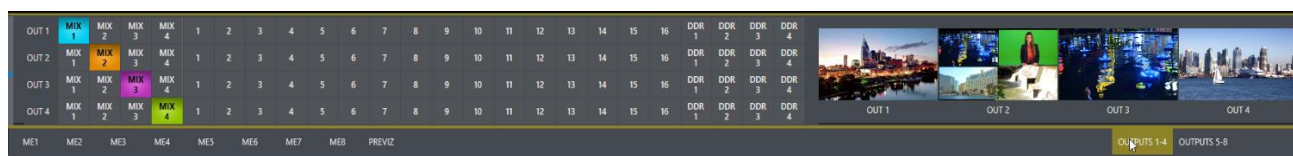
FIGURE 19

You would not be wrong to think of these panels and their associated NDI outputs as integrated *Output Matrix Routers*, in that their features are similar to those normally provided by an external SDI *matrix router*.

We'll discuss advanced aspects of these internal *Output Matrix Routers* later (15). At this point, when discussing configuring your system, let's simply note that you can assign many different sources to each of the 8 supplemental NDI outputs in these panes. Thus, *Output* source options occupy three banks like *Switcher* source rows.

3.6   Configure Video Inputs

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

The individual monitor viewports on the *Live Desktop* can be flexibly assigned to different *Switcher* sources and outputs. Complete monitor layouts can be stored and recalled using tools located in the *Workspace* menu, located in the *Dashboard* across the top of the screen. (We'll look at *Workspaces* in depth in the *Reference Section* of this manual). Now, though, let's see how to configure video sources.

1. Click Workspace in the Dashboard (at the top of the Live Desktop).
2. Monitoring layout presets are listed at the top of the menu as Interface A through D. Select the layout labeled A under Multiview 1 (if it isn't already check-marked).
3. By default, this default monitoring pane shows individual viewports for the various Switcher sources.

4. To continue to assign sources, you could select Configure from an input monitor's (right-click) context menu, but let's take a different approach.
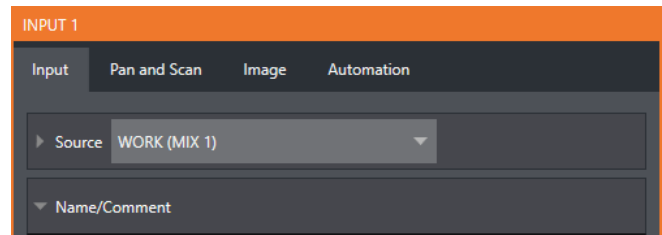
Move your mouse over the viewport for *INPUT 1* and notice that a *Configure button* (*gear* icon) appears at lower right. Click this to open a tabbed settings panel (Figure 21).

> *Hint: As a quicker way to access the Input configuration panel, simply double-click the viewport; or, for a touch-screen, tap the viewport with two fingers.*
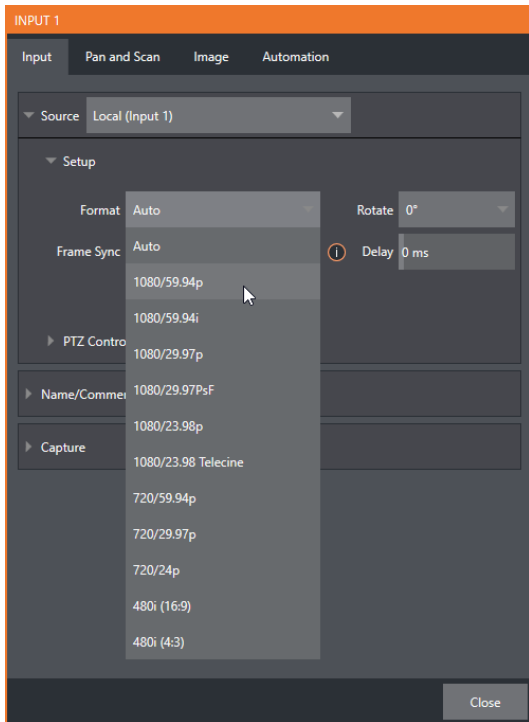
FIGURE 22

Click the Source drop-down menu to see a list of sources you can select. External SDI inputs and Black are listed first under the Local heading. Additional NDI sources discovered on your network are grouped below under source device headings.

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

5. The Format menu defaults to Auto-Detect. Generally, this option will suffice. Otherwise, for some external SDI sources you can manually select the correct Format (Figure 22).
6. Close the Configuration panel for now (click Close, or simply click outside the panel to close it).
7. Continue to configure additional video sources in the same manner.

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

3.6.1 Configure a Video Router Input

Right-click on the *Switcher* row button for the video input where the router is connected (see Section 3.2.2 for more detail) to select which router input will be transmitted to the *Switcher* input.

3.7 Configure Audio
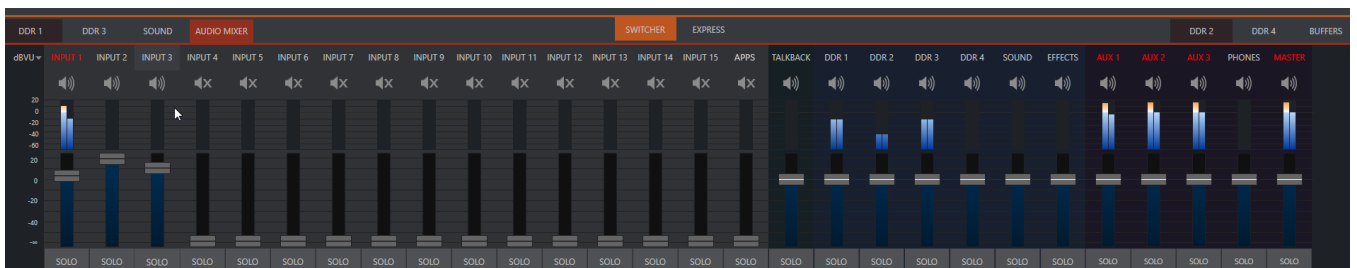
FIGURE 23

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

In addition to internal sources and outputs, the *Audio Mixer* supports sixteen external multi-channel audio connections, each of which can be assigned to a nearly endless list of audio source types. Each input and output has its own control column with *Volume* slider(s), VU meter(s), and other convenient features. An identifying label sits at the top of each control panel. Roll the mouse pointer over the label to reveal a *Configuration button* (gear) at right which, when clicked, opens the *Configuration* panel for the input (Figure 24).

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

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

Beyond this, you have the option of assigning the input to sound delivered over the network from any NDI or other supported network audio source (such as Audinate's Dante™ sources; requires a third-party driver) available on the system.

Returning to the *Input Configuration* panel, note that it holds both basic and advanced audio features. In the former category, a single multi-channel volume fader appears below the *VU meter* for each source and output. On first launch these are at minimum gain level; after adding sources, adjust the faders as required.

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

Audio Headroom

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

FIGURE 24

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

> *Hint: Confusion can sometimes arise because different calibration scales are common in various audio realms, and even for different device types and software.*
>
> *For example, mixers commonly show levels on VU scales indexed as just described. In contrast, digital devices and editing software usually display levels in dBFS (Decibels Full Scale) with 0dBFS – the absolute maximum signal level that can be recorded – at the top. VU meters have selectable indexing, allowing you to view a traditional dB VU scale or dBFS as you please (see Section 16.9.1).*

Whatever scale you choose, use *Volume* controls to avoid over-modulation. The*Compressor/Limiter* feature (also located in the *Audio Configuration* panel) is another powerful tool to help you prevent clipping – see 16.10.
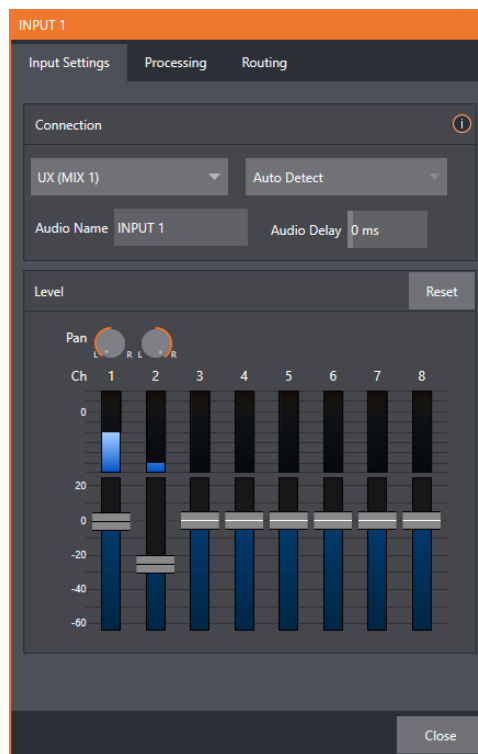
3.8   Networking

Viz Vectar Plus - Live Production has the flexibility to switch, mix, and actualize any type of live production. With built-in media players, recording, streaming, audio, and graphics control, providing simultaneous delivery for distribution to multiple destinations supporting various screen types. Instant access to seamless interchange with essentially unlimited IP sources from anywhere

across your network in real time. Viz Vectar Plus - Live Production is digital media production software that employs standard computing and network infrastructures with IP connectivity including SMPTE 2110 and NDI®.

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

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

4   Web Features

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

Having made the essential connections in the previous section, you'll want to start your first practical live production session, and skim through some important fundamentals. This would be a good time for us to introduce you to a special feature of your system: Viz Vectar Plus - Live Production has its very own webpage, delivered to your local network without requiring an external Internet connection.

4.1   Password Protection

First though, let's note that (for security reasons) LivePanel features that can control your production over the network can be under password protection.
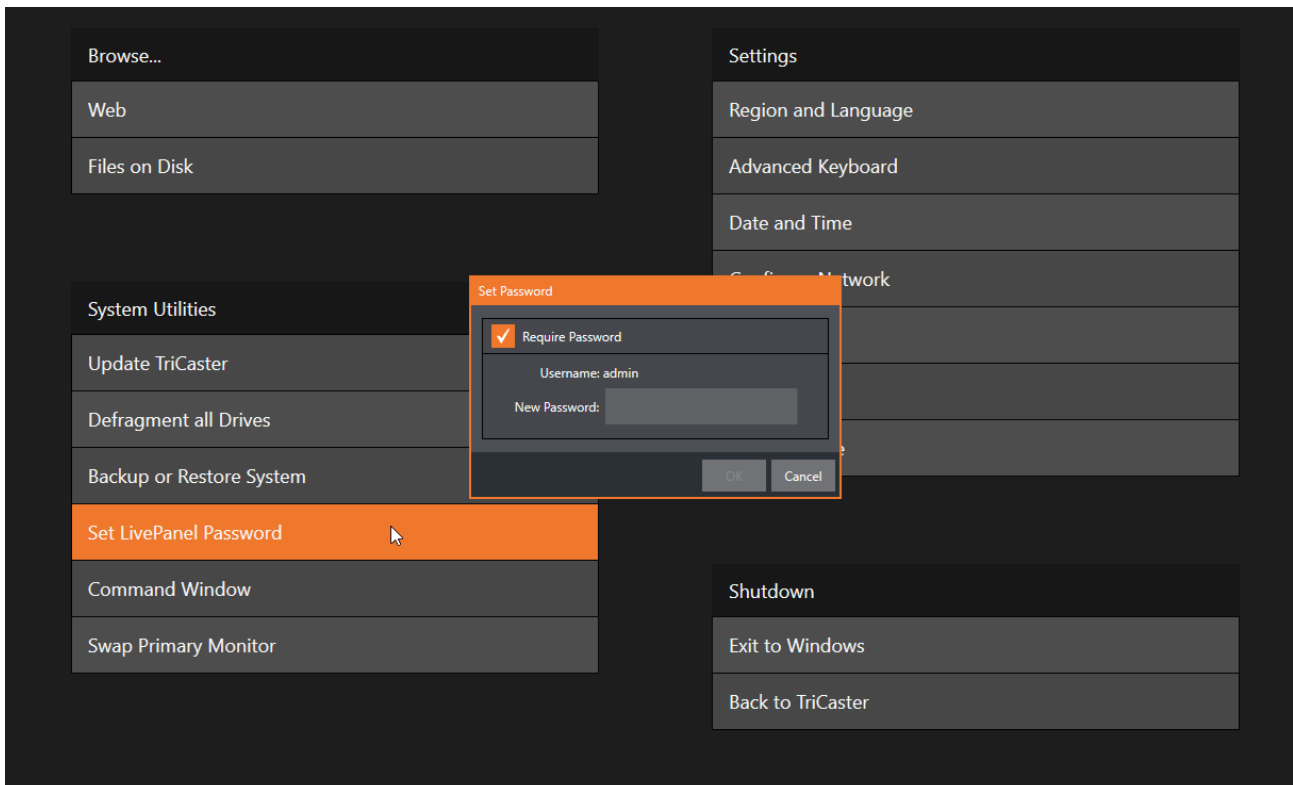
To enable or disable this security feature, or to modify the password, select *Administrator Mode* from the *Shutdown* menu on the *Home Page* main menu in the *Launch Screen*.

4.2   Resources

Viz Vectar Plus - Live Production local webpage system features a helpful *Resources* page, discussed shortly. In addition to the Resources page, you will find pages listing system keystroke shortcuts, as well as a reference to system

4.3   LivePanel™

Having launched a session (refer to *Starting a New Session* if you need a refresher), click the *Notification* button at extreme upper-right in the *Dashboard* at the top of the *Live Desktop*. Click this to open the *Notification Pane*, and then click the *Web Browser* button in the footer of that panel to view the webpage in a local browser.
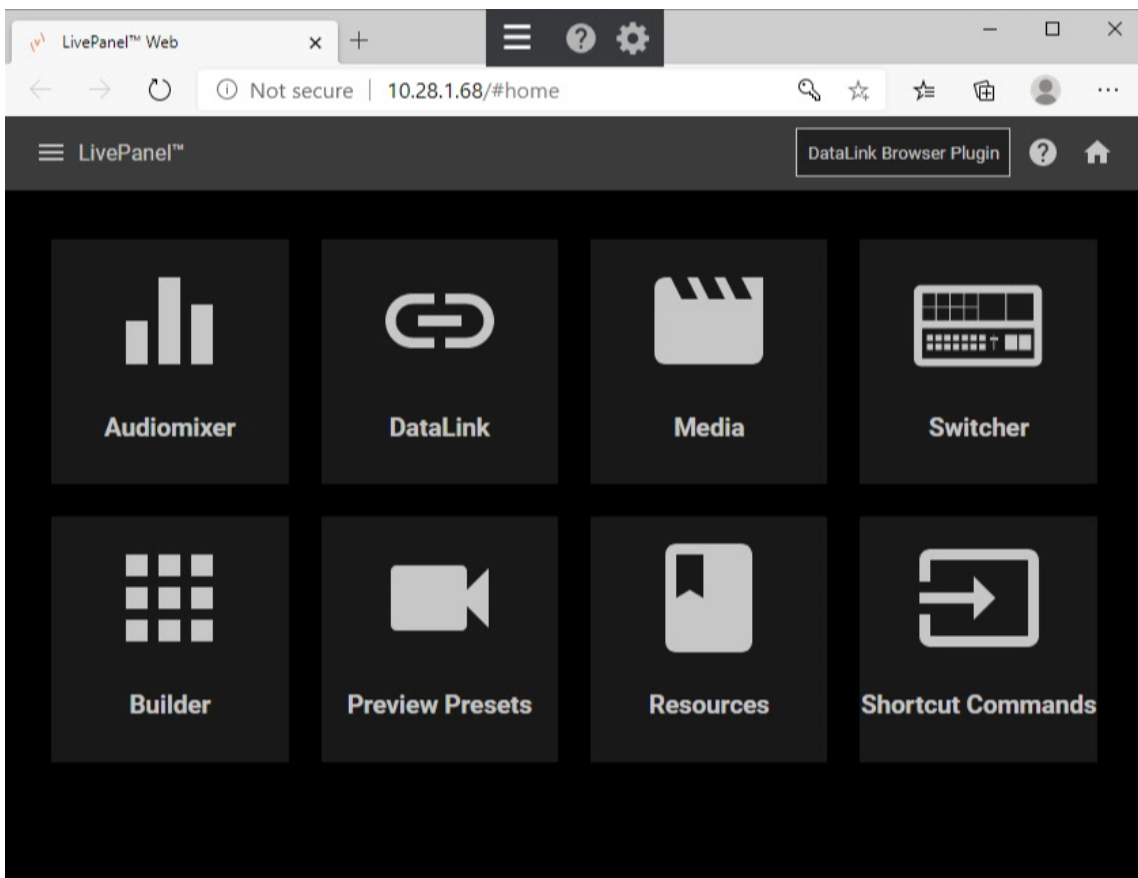
> IMPORTANT NOTE: This view is provided so you can preview the LivePanel features. It is not intended that you use the LivePanel web apps in a browser running on the local Vectar system.

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

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

The full gamut of LivePanel web apps are described in detail in Appendix A.2.4.

PART II (REFERENCE)

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

5 The Launch Screen

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

The Launch Screen's *Home Page* appears whenever you launch your Viz Vectar Plus - Live Production. From this screen you will create and launch *sessions*, then choose what sort of operations you wish to perform within it by selecting a link on the (similar) *Session Page*.
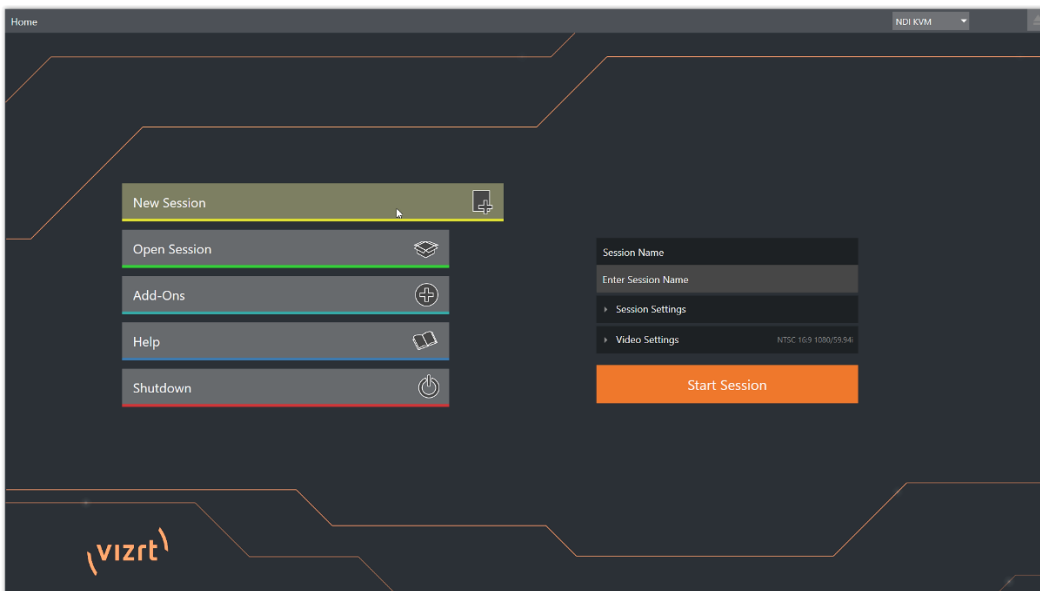
FIGURE 27

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

5.1 Introduction to Sessions

Any production involves a specific operating environment. The *session* is where Viz Vectar Plus - Live Production stores the details of that environment. Obviously, then, configuring session settings properly is important:

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

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

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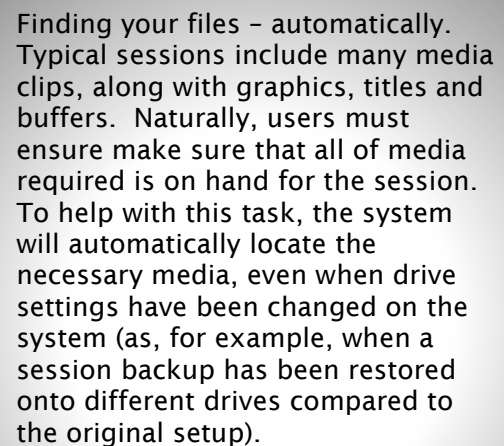
During the course of the actual live production you may perform further fine-tuning, and also add to the media content used in the presentation:

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

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

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

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

> Finding your files – automatically. Typical sessions include many media clips, along with graphics, titles and buffers. Naturally, users must ensure make sure that all of media required is on hand for the session. To help with this task, the system will automatically locate the necessary media, even when drive settings have been changed on the system (as, for example, when a session backup has been restored onto different drives compared to the original setup).

5.2   The Home Page

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

This primary screen is the first thing you encounter after launch. It is dominated by the main menu shown in Figure 28.

Choosing a link from the menu updates the right-hand pane of the *Home Page* to provide options and controls related to your choice.
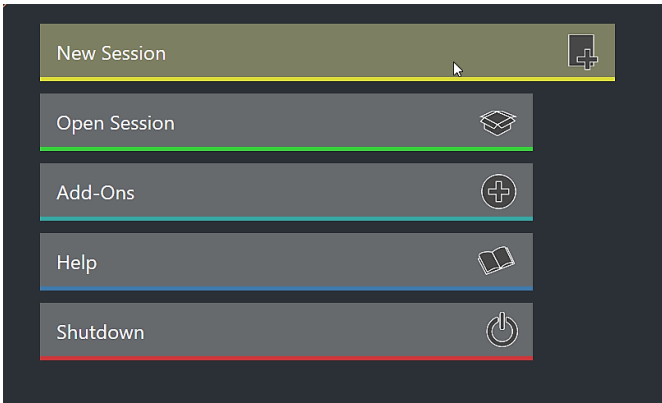
FIGURE 28

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

In anticipation of this, the *New* icon is pre-selected automatically whenever there are no existing sessions. This results in the relevant session options being displayed at right, as shown in Figure 29.

5.2.1 New (Session)

Clicking *New* on the link populates the pane at right with expandable *Session Name* and *Settings*, and *Video Settings* control groups.

Session Name

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

Session Settings

Volume

A menu labeled *Volume* appears in this group. Your selection designates a primary hard drive for the session and its associated content to be created and stored on by default.

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

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

FIGURE 29

Template

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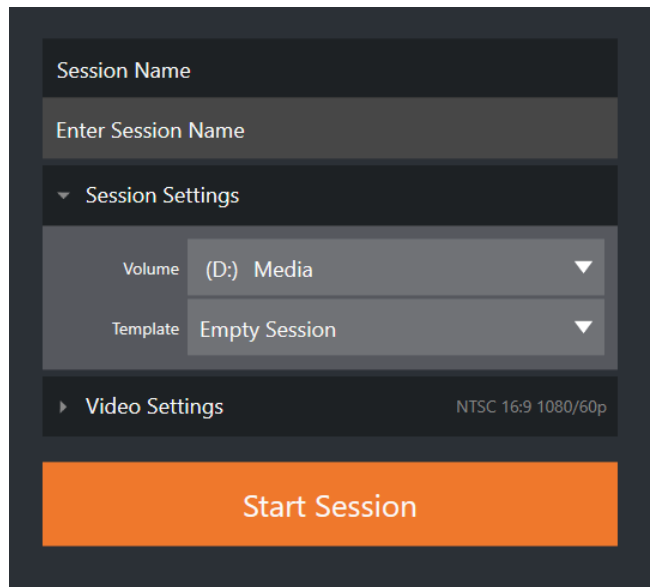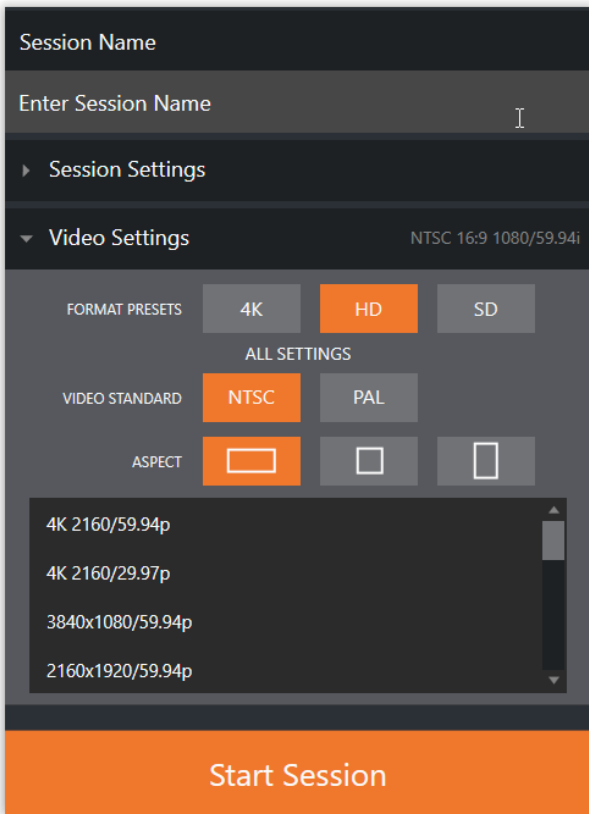
Video Settings

FIGURE 30

Designate your local video standard in the *Video Settings* group. Select NTSC or PAL video according to your locale. Then continue to choose between the following options:

▪ Choose traditional landscape, square or vertical Aspect for the session.

▪ Select a video format (such as 1080/59.94p) from the lister below.

▪ Having made your selections, you would normally click the Start Session button at lower right to launch the Live Desktop – but first, let's explore a few other features of the Home Page.
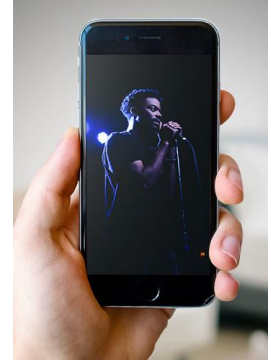
FIGURE 31

5.2.2 Titlebar Tools

Eject

FIGURE 32

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

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

NDI KVM

KVM is an abbreviation for "keyboard, video and mouse". You will notice an *NDI KVM* menu just left of the *Eject* button (Figure 32). This feature leverages the NDI® protocol to provide superb KVM functionality, giving you complete control your system from anywhere on the network where you can run the Windows version of NDI Studio Monitor.

To enable this feature, go to the Launch screen's Home page, and use the titlebar *NDI KVM* menu to select which operating mode you wish to apply, choosing between *Monitor Only* or *Full Control* (which passes mouse and keyboard operations to the remote system).

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

> *Hint: Note that Studio Monitor's KVM toggle button can be relocated to a more convenient spot by dragging it with the mouse.*

You can select to view or control the User Interface or another *Multiview*, or both with multiple instances of *Studio Monitor* (Figure 33) open on the receiving unit.
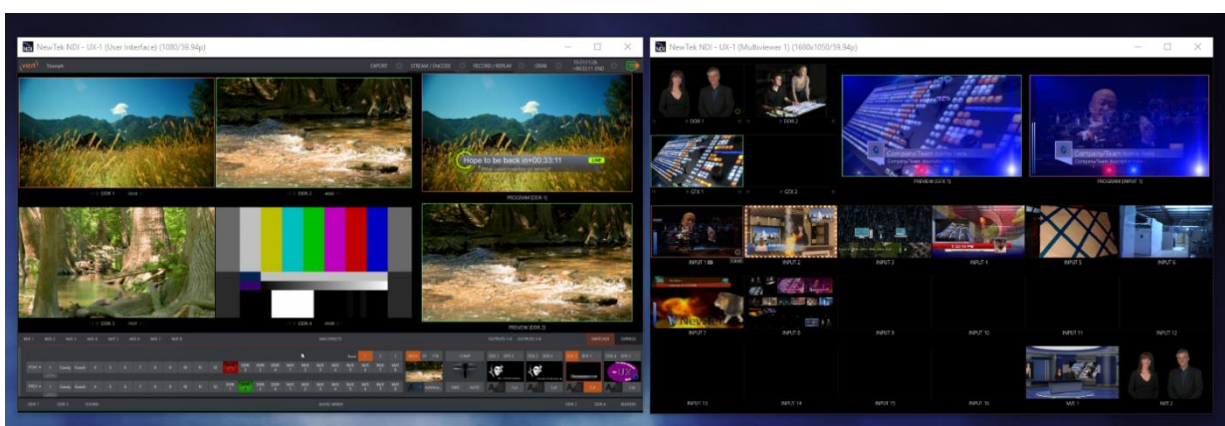
Note, too, that this feature gives you a great way to multiple your *Multiviews* around your studio or campus. You can even use these displays as video sources for another NDI-enabled system. System audio will also pass to the receiver, and you can even copy and paste text between the two systems.

With the User Interface running full-screen in *Studio Monitor* on a receiving system, it's sometimes difficult to remember that you're actually controlling a remote system. Even touch is supported, meaning you can display the interface on a remote Microsoft Surface™ system or other touchscreen for portable control over your entire live production system.

5.2.3 Open (Session)

If there are existing sessions on the system, the main menu at left on the *Home Page* will default to *Open* (Figure 35). Clicking *Open* causes the *Sessions List* to appear at right. This pane lists all sessions stored on currently mounted storage media.
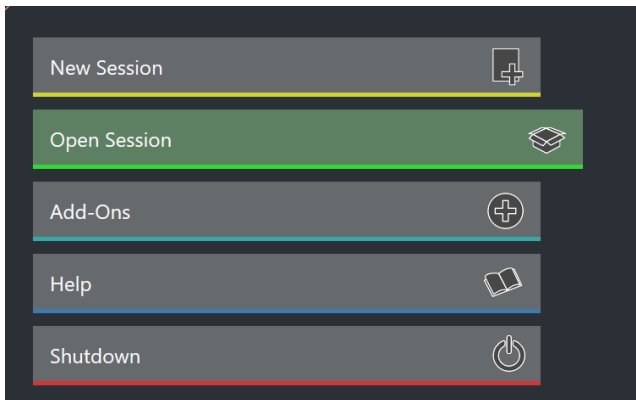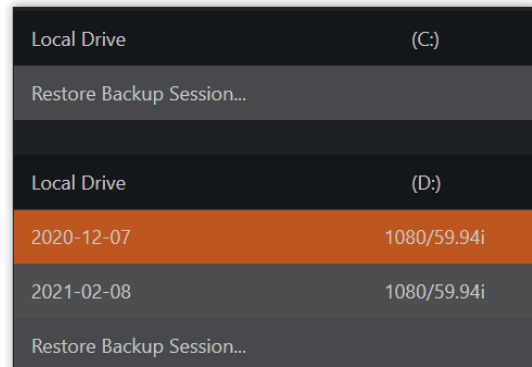
Available sessions are grouped under the names of the storage volume they are located on (Figure 34) The listing shows the *Session Name* and *Format* for each session, on each drive. Let's look at the *Sessions List* briefly before we open a session.

Auto-Launch Session

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

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

To do this, add a new value named *auto_launch_session* to:
        HKEY_LOCAL_MACHINE\SOFTWARE\VIZRT\XD\ADMIN SCREEN

If you set the value for this key to the name of an existing session that session will auto open on launch (instead of the 'last open' session). If the specified session does not exist, the auto-launch feature will not proceed, by setting *auto_launch_session* to "_Disabled" (or some other suitable string) rather than a real session name you can effectively disable auto-launch.

Context menu

Right-click a session name to open a context menu with two items listed in it: *Rename* and *Delete*. Be aware that the *Delete* function should be used thoughtfully, as it cannot be undone. All content stored in the named session's folders will be deleted, including imported clips, images and titles, any clips captured to the default session folders.

> *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.*

Opening a Session

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

5.2.4 Shutdown

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

Administrator Mode

Selecting *Administrator Mode* from the *Shutdown* menu on the *Home Page,* exits the live production environment, and takes you to a new screen (Figure 36) that offers various functions and settings having to do with system maintenance and management.
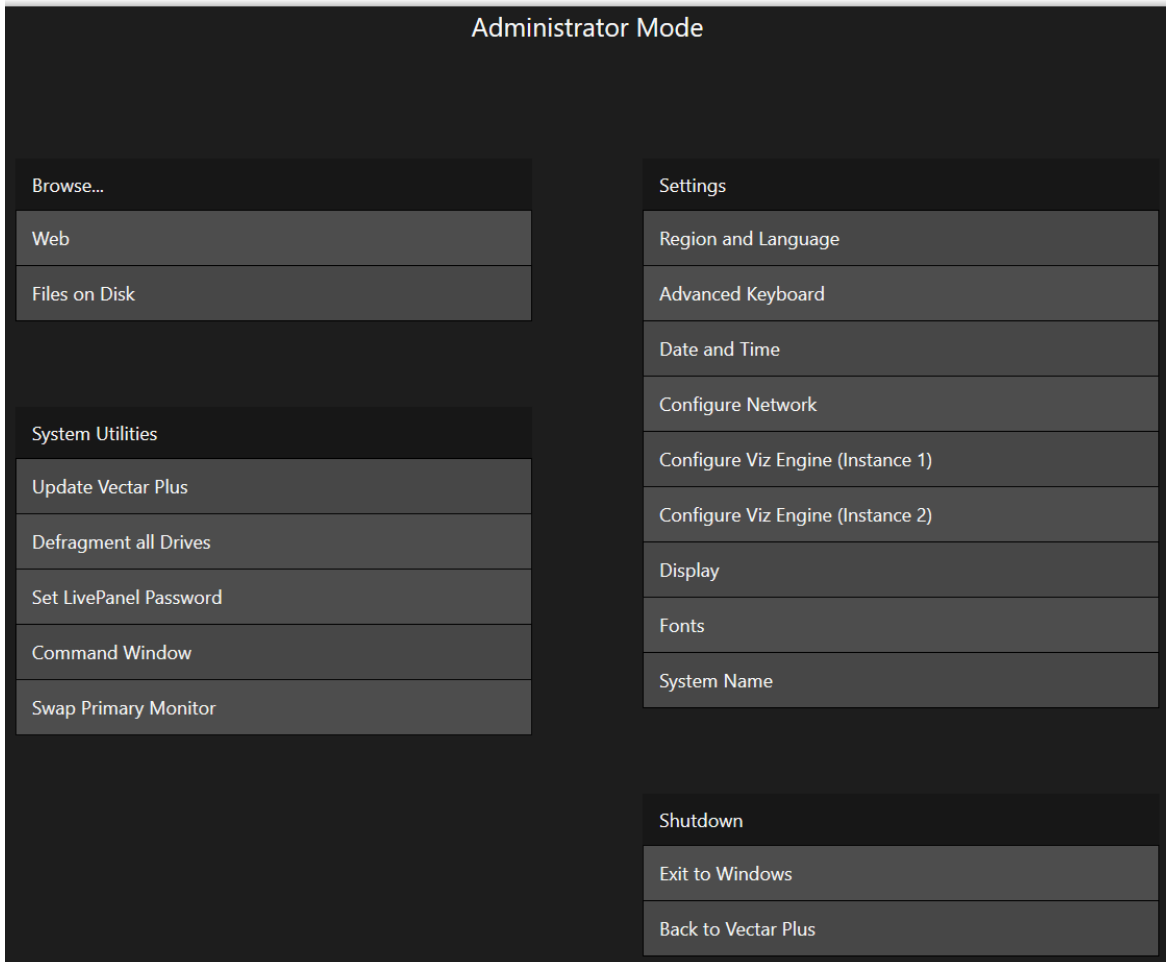
Administrator Mode options are grouped under several headings, as discussed next.

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

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

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

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

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

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

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

FIGURE 37

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

How much better it would be to slide the remaining books closer together, combining all the free space first. Unfortunately, computers are 'foolish librarians. They tend to want to fill in all the gaps in their storage areas, even if this requires literally shredding your 'book' (in reality, large video files from your sessions) into tiny fragments.
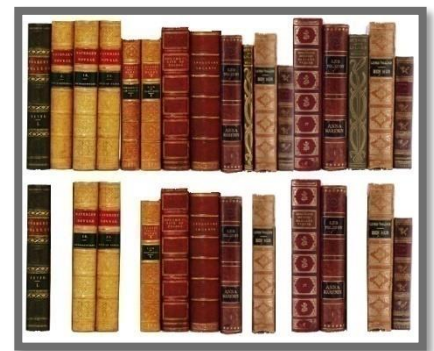
Defragmenting the storage volume has the same effect as sliding the books together, resulting in one or more larger gaps. The result is that the system doesn't have to frantically search in many different places to assemble the video streams from your recorded session.

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

- Set Live Panel Password – Configure the password for access to the web pages and network control features provided by the unit.
- Command Window – Open a system command line window, allowing you (among other things) to use advanced commands to manage your system and network settings.
- Swap Primary Monitor – The Live Destkop will appear on the monitor designated as primary.

Settings

- Regions and Language – Open the system language control panel.
- Advanced Keyboard – Open the system keyboard controls panel.
- Date and time – Open the system keyboard controls panel.
- Configure Network – Open the system network controls panel.
- Configure Viz Engine (Instance 1) – Launches the Viz Configuration UI
- Configure Viz Engine (Instance 2) – Launches the Viz Configuration UI
- Display – Open the system display controls panel (useful for configuring multiple monitors, among other things).
- Fonts –Open the system font management console, allowing you to add that new font your client wants you to use for their title pages.

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

Note: If using both Viz Engines, configure them separately before using.

Shutdown

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

- Back to Vectar– Exit Administration Mode, and return to the Launch Screen.

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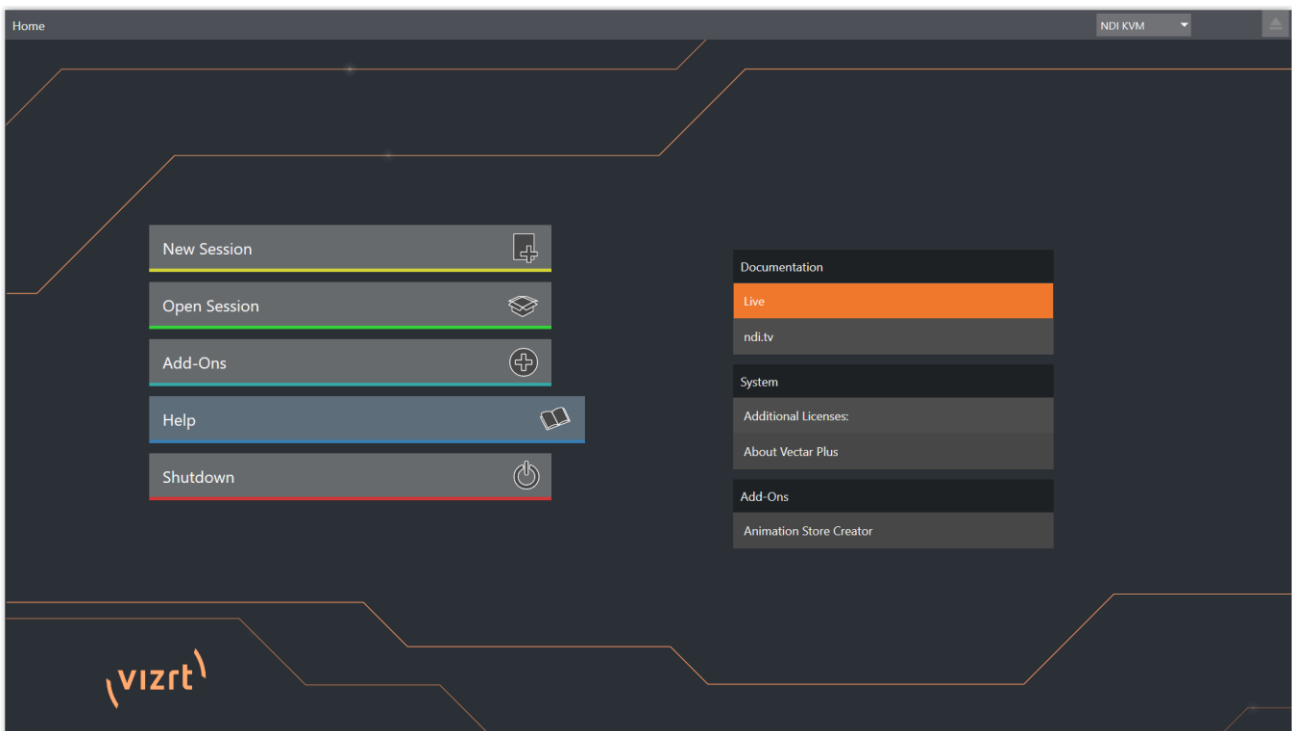
Select the *Help* icon to reveal links to open manuals and other information.

The primary User Guide is found here, as well as documentation for other software.

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

5.2.6   ADD-ONS

Vizrt offers additional software tools to expand the power of your Viz Vectar system. The icon labeled *Add-Ons* on the *Home Page* provides access to some of these tools.
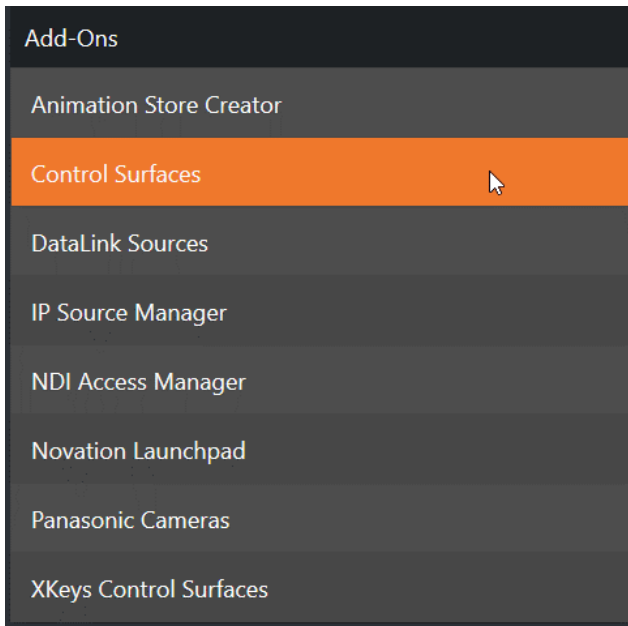
FIGURE 39

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

For example, you will see links to the included *Animation Store Creator* utility as well as the very useful *DataLink Configuration* applet, and much more.

5.3 The Session Page
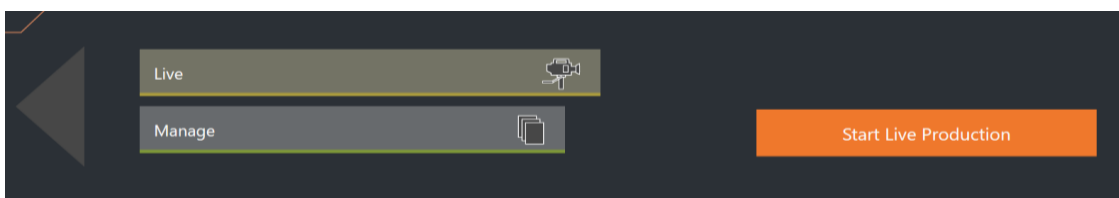
FIGURE 40

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

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

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

5.3.1 Live

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

5.3.2 Manage

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

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

Browse

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

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

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

Configure DataLink Keys

DataLink enables handling and updating of text and image data from both internal and external source for use in title pages in real-time, as well as other purposes. Briefly, DataLink tracks variables (called *DataLink keys*) and their values, and updates these values on-the-fly when used as entries in title pages.
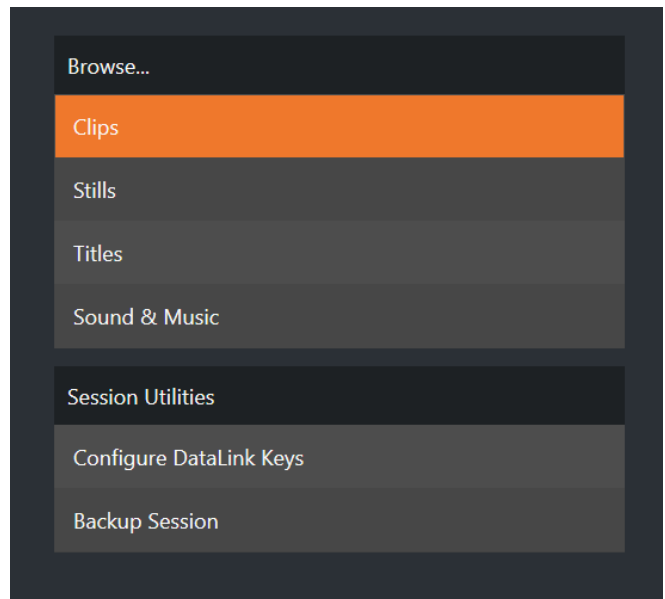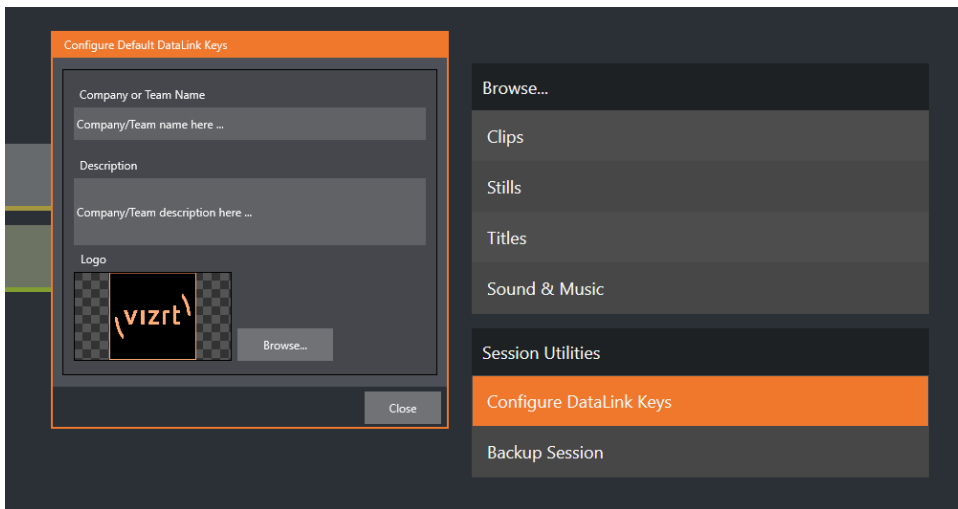
FIGURE 44

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

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

These *session keys* serve as the default first and second line text inserts used by the supplied template title pages. (By taking a moment to populate these keys with, for example, a company name, motto, and logo, you will find much of the included graphic content ready to use for a given production without ever having to type another line.)

6 Live Desktop

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

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

6.1 Display Requirements

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

FIGURE 45

6.2 Overview

The *Live Desktop* provides visual feedback for operations, including monitoring, live switching, and so on. While it is seldom necessary for it to appear as heavily populated as seen in Figure 45, we display it this way to illustrate that it can be logically divided into five horizontal bands, described from top to bottom in the following table.

1 - Dashboard

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

2 - Monitors

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

3 - M/Es

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

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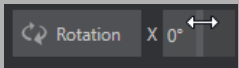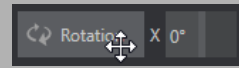
- *Switcher* rows – *Program* and *Preview* rows
- *Transition* controls – *T-bar* and *Delegate* buttons
- *DSK* video layer configuration and controls
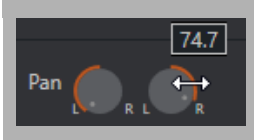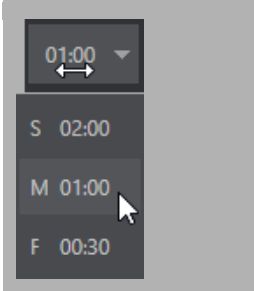
5 - Tabbed Control Modules

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

6.3   Control Types

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

Control Type	Type	Examples	Usage
	Numeric Slider	Gain, Pan	Drag in line with the control's orientation to raise or lower the current value.
	Rotary slider	Position, Size, Rotate	Drag up-down to adjust one value, left-right to adjust the other, diagonally to adjust both. Hold down Alt while dragging vertically to modify a third value when provided.

	Rotary Knob (single-value)	Audio Gain	Drag left-right to adjust the current value.
	Combo-Slider	Transition, Duration	Drag left/right to raise or lower the current value. Click the digits to type in a new value. Or click the triangle to open a drop-down menu.

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

6.4 Customizing the Live Desktop

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

6.4.1 Renaming Inputs

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

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

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

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

- 'Two finger tap' the viewport.

Expand the *Name/Comment* group in the *Input* tab of the *Input Configuration* pane, (see Figure 46) by clicking the twirl-down triangle at left. This group contains several editable text fields, including *Video* (the label shown under monitors), a shorter Switcher *Button* label, and the longer *Comment* field.
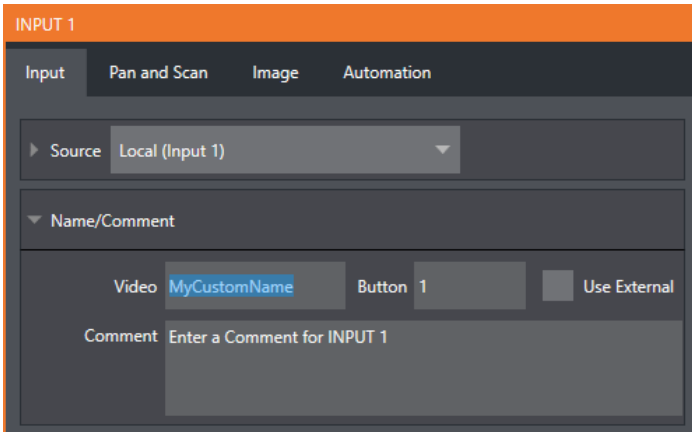
FIGURE 46

6.4.2 Workspaces and Min/Maximize

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

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

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

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

Switching between presets, then, will allow you to view different sources. Even the overlays (such as *Safe Area* display) for each viewport are fully independent.
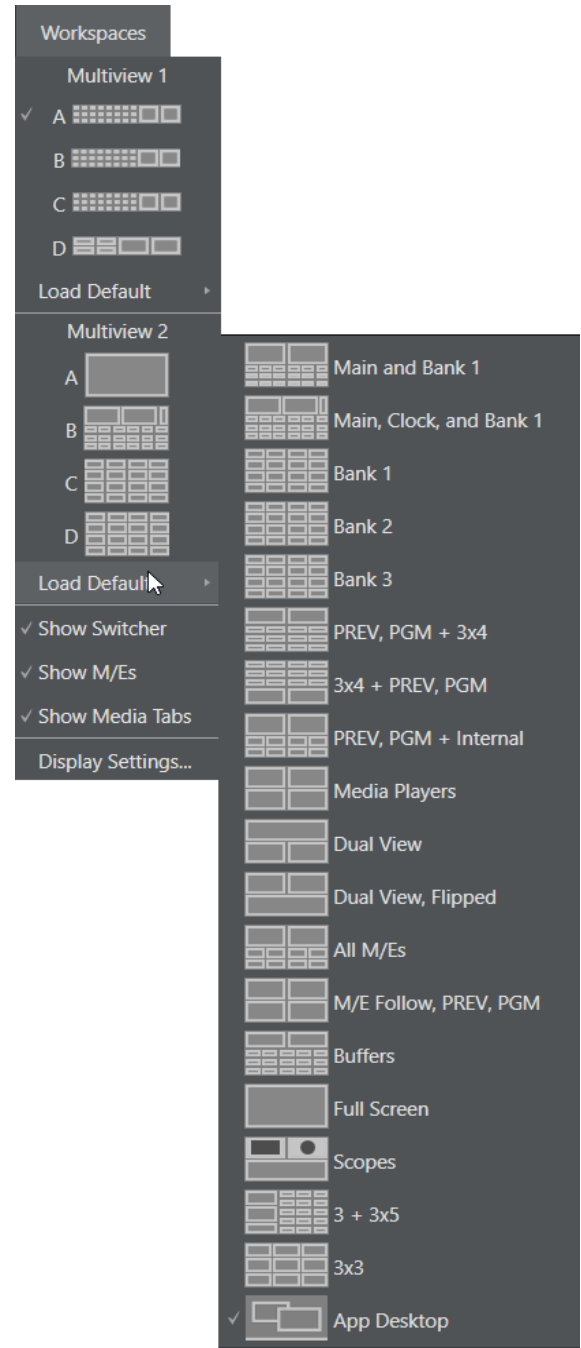
FIGURE 47

Screen Dividers
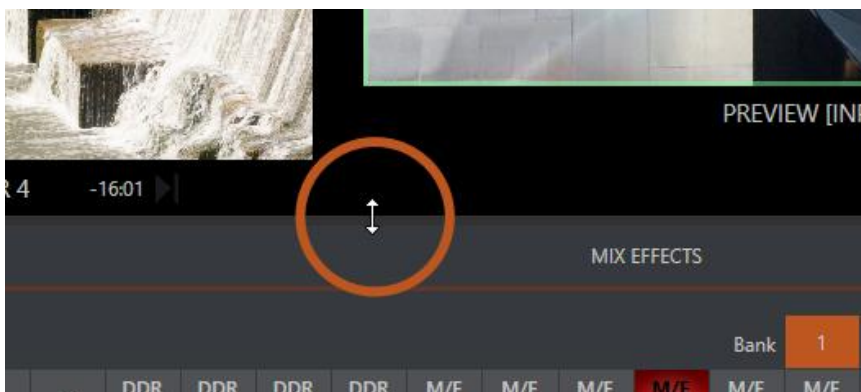
Notice too that, when the lower tabbed modules are visible, you can also drag the horizontal divider between the *Live Desktop* monitor pane and the *Switcher* up or down to modify its position.
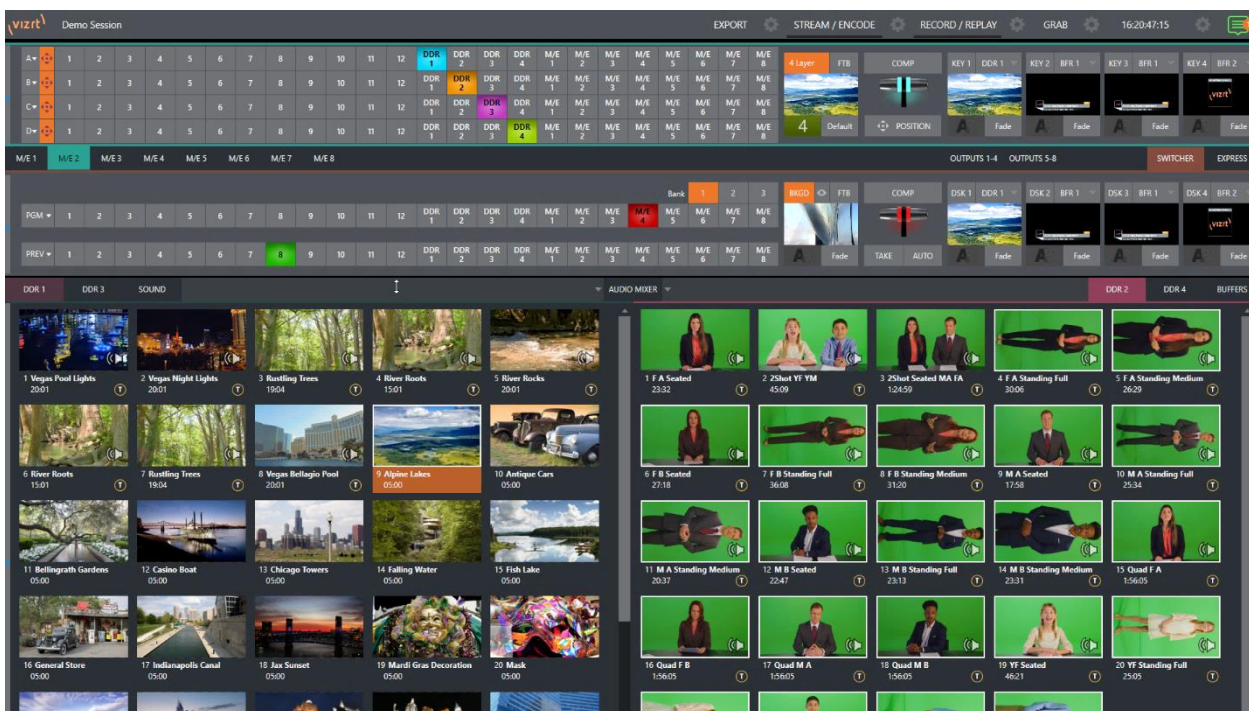
You can even move the horizontal divider all the way up to the bottom of the *Dashboard*, thus hiding the *Desktop* monitor pane entirely (Figure 49), providing much more room for other modules in the process.

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

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

6.4.3   The App Desktop

The *Application Desktop* option (available for all Workspaces other than the primary Live Desktop) is a special case, and clears the designated to provide screen real estate for supported *desktop applications*.

This special workspace lets you run selected applications inside Viz Vectar Plus - Live Production. A custom taskbar running across the bottom of this screen bears icons you can use to launch (or minimize) the various applications supported. The best part is that you can capture video from selected browsers, video conferencing applications, and their audio output and send it to Viz Vectar Plus – Live Production's Switcher and Audio Mixer.

Supported applications you install will appear along the taskbar, as shown here.

Supported Applications

Microsoft® Edge Chromium is installed on your Viz Vectar Plus - Live Production; however, if you prefer a different browser, Google Chrome or another Chromium™ based browser can be installed. A number of popular video conferencing applications are also supported, such as Microsoft® Teams, VooV™ Meeting, Slack, Discord, and Zoom.

6.4.4 Express Switcher Mode
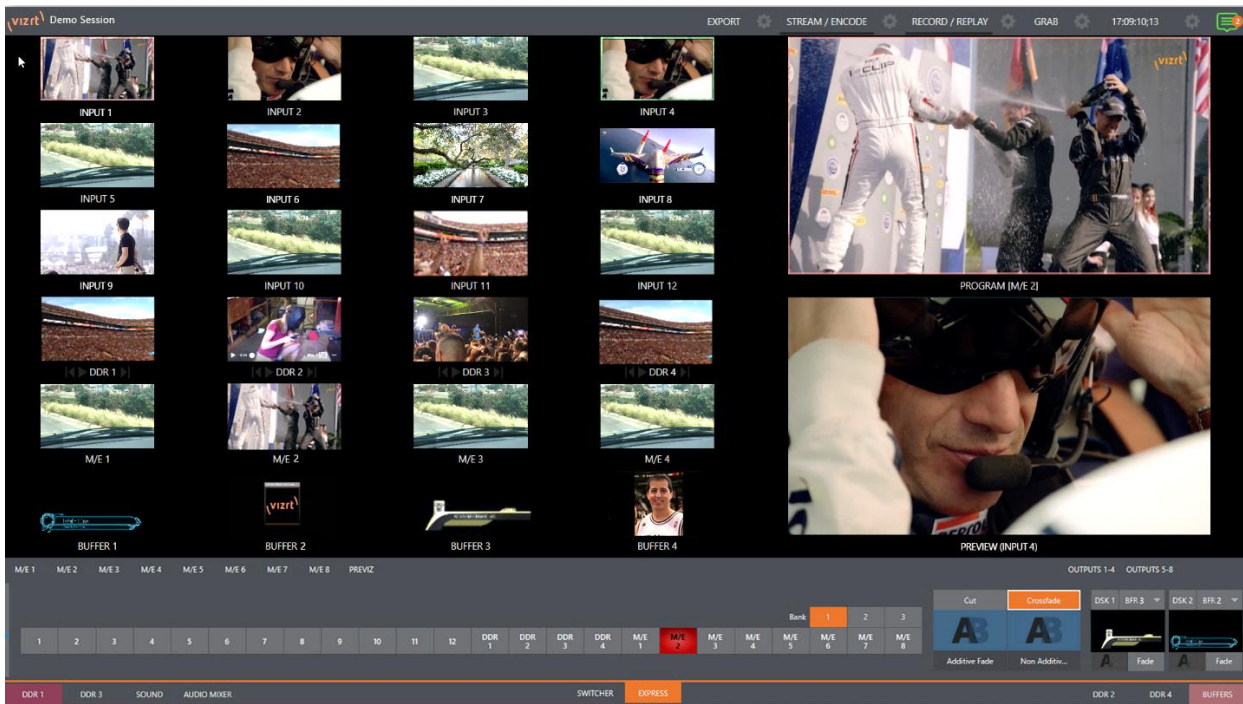
FIGURE 51

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

Too, *Express* mode (Figure 52) provides a simple 'single-click' workflow, ideal for less complex productions, when a control surface is in use, or in environments involving student or volunteer operators who may struggle with traditional switcher workflows.
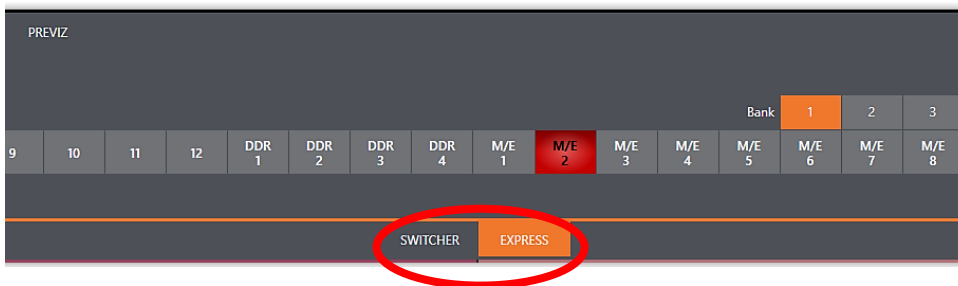
FIGURE 52

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

For more information on these two modes of operation, see 9.

7 The Dashboard

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

The *Dashboard* is home to several important displays, tools and controls. Prominently located at the very top of the *Live Desktop*, the *Dashboard* occupies the full width of the screen.
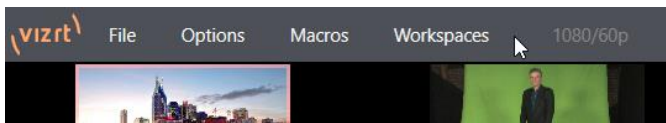
Initially, to avoid overwhelming users, the left end of the *Dashboard* simply shows the name of the current session. Moving the mouse pointer to the top of the screen reveals the set of menus shown in Figure 53.
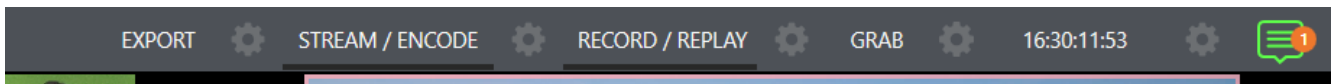
The right half of the *Dashboard* (Figure 54) contains additional features and tools that are more frequently accessed, for which reason they are displayed full-time. The various elements comprising the entire *Dashboard* are listed below (starting from the left):

1. File menu
2. Options menu
3. Macros menu – see 17
4. Workspaces menu – see 11
5. EXPORT button and Configuration (gear) – see 19
6. STREAM/ENCODE button and Configuration (gear) – see 18
7. RECORD/REPLAY buttons and Configuration (gear) – see 20
8. GRAB button and Configuration (gear) – see 20
9. Clock(s) and Configuration (gear) – see 7.2
10. Notification List – see 7.3

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

7.1.1 File Menu

This menu drops down to reveal the following items:

- Eject – opens a sub-menu that lets you safely disconnect selected storage volumes
- Import – easily add media files from external sources to the appropriate session folders, and automatically transcode them to friendly formats for optimal playback if necessary. (Import Bin features are similar to those of the Publish Bin.)
- Share Media Folders and Buffers (see 12.3)
- Exit – close your live production session, and return to the Session page of the Launch Screen (all session settings are stored on exiting)

7.1.2 Options Menu

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

Tabs Follow
- Enable *Follow Preview Row for All Inputs* to display the tabbed pane for a *Preview* row source automatically on selection changes (for *M/E* selections, the *M/E* pane must be maximized in order to see the *M/E* tab update).
- When *Tabs Follow Preview for M/Es* is checked, only the *M/E* pane selection updates (when you select an M/E as source on *Preview*).
- *Tabs Follow All Delegates* updates the *Desktop* in sync with control surface delegate changes.

> Hint: Control surface delegate operations can sometimes result in a tabbed module that you want to view being obscured when certain options are enabled. When this happens, press the control surface Delegate button again to re-display the tabbed pane you are interest in.
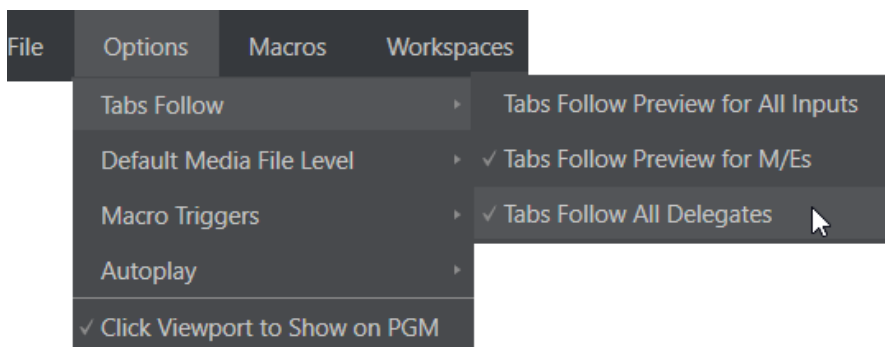
FIGURE 55

- Default Media File Level – the default 'per-clip' audio level applied to imported media files is controlled by this option
- *The Macro Triggers* menu offers the following options:
  - *Tally* – Enables *State Change* macros configured in the *Automation* tab (*Input Configuration* panel) for any video source.
  - *Audio Levels* – Enables the *Run Macro at* (threshold dB) feature for *Audio Mixer* sources. *Disable Hotspots* – Disable macro triggering based on *Hotspot* activity (see Section 8.1.4).
  - *Disable Hotspots on M/Es* – When this is on, *Hotspot* macros are only triggered if the source is visible on *Program* output (including via an *M/E* shown on *Program* output, or a *DSK*).
- AutoPlay
  - *Enable Autoplay Out on M/Es* – Enables *Autoplay's* transition-out behavior for *M/E's* (*Mix* mode) displayed on *Program* out (off by default).
  - *Extend Play* – When enabled along with *Autoplay* in the *DDR* ...

- o Playback will extend past any marked out point, up to the last frame of the file – even if the operator manually removes the *DDR* from output.
- o After the last frame is displayed, the playhead advances to the next playlist item.
  - *Click Viewport to Show on PGM* – When this feature is enabled, clicking a viewport (or tapping a viewport on a touchscreen) will select the corresponding video source on the main Switcher's Preview row and perform the current Background transition to display it on Program output.
  - *Show Tally on Skype Return* – The return video sent to remote Skype TX callers shows a tally overlay.

7.1.3 Macros

Macros provide extremely important production benefits – sufficiently so that we have not only have given them a place of their own in the User Guide (Chapter 17).
Also, note that the *Shortcut Commands* used in macros are listed on your Viz Vectar Plus – Live Production's locally served Home web page.

7.1.4 Workspaces

The *Workspaces* menu opens when clicked to reveal control groups for each connected screen Viz Vectar Plus - Live Production detects. These control the monitor viewport layouts shown on the *Live Desktop* and external *Multiview* displays. *Workspace* features are discussed in 11.3.

7.2 Clock

The Dashboard also hosts a clock which, in addition to showing the current time, can display countdowns to event start and end times when enabled.
To access time features, click the small gear icon next to the timecode display at right in Live Desktop's *Dashboard*.
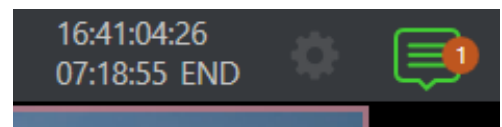
> Hint: You can set the system clock, as for any computer; simply exit to the Windows® Desktop to do so.

7.2.1 LTC Timecode
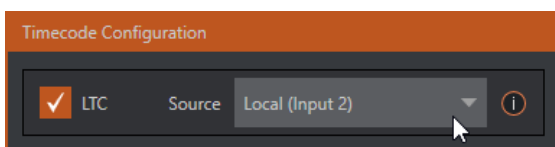
FIGURE 57

Linear timecode has long served as a method of sharing an external timecode reference in video production. Output from an external *timecode generator* is supplied to devices in the video pipeline using a standard audio connection.
Choose an LTC source in the *Timecode Configuration* panel, and the feature will decode time stamps from the audible signal, using the values for clock displays as well as embedded timecode when recording video (if the file format supports this). This is a great asset for post-production purposes.
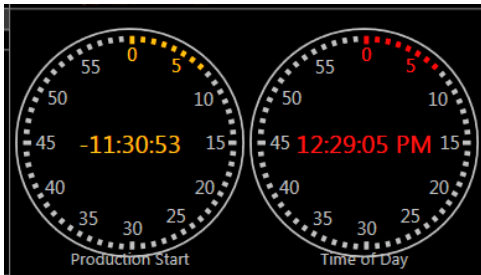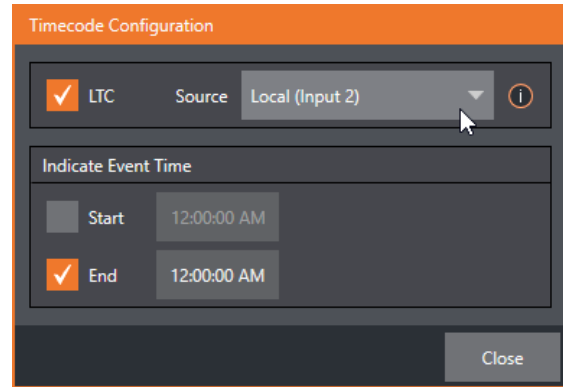
7.2.2 Event Time

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

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

7.3   Notifications

The last item at right on the *Dashboard* is the *Notification* icon (Figure 60). A 'number bubble' indicates how many un-viewed entries have accumulated. Clicking the icon displays the *Notification Pane*, which provides both helpful information and also some very useful tools.
The *Notification* icon can be colored white, green, amber or red. The color indicates the type of messages available for review:

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

The highest priority (un-viewed) item in the list at the moment determines the *Notification* icon color. After you open the panel to review the notifications in the list, the icon turns white.
Individual items can be cleared from the list using the context menu opened with the triangle gadget shown at right when you roll the mouse over an entry, or you can empty the list with one click using the *Clear All* button in the footer of the panel.
Information appearing in the *Notification Pane* can include the following:

▪ Session name, format, and software build number (press Alt + b on the keyboard to update this item)

- Status messages pertaining to operations or system conditions; these may be benign notifications or cautionary. For example, a message indicating that the connection to a control surface has been lost is given an icon with an amber color.   A higher priority warning triggers a message with a red icon.
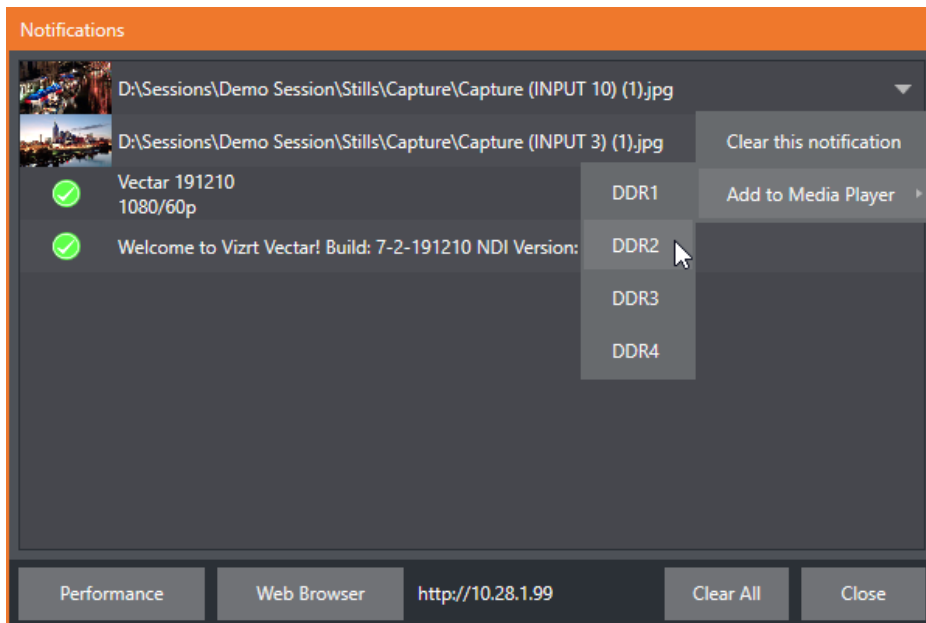
- A special message is added if a clip or still image is added to one of the Session's media file locations (such as the session Clips and Stills folders). These entries show a thumbnail icon at left, along with the filename and path. In this case, the item's context menu includes an Add to Media Player option, which lets you immediately append the new file to a selected Media Player playlist.

Hint: This last feature is particularly handy when adding files across the network, as perhaps when using the DataLink™ for Viz Vectar Plus - Live Production plugin to import images from the popular Chrome web browser.

8 I/O Configuration

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

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

8.1 Input Configuration

8.1.1 Input Tab

Any external NDI Source or local IP source connected to one of the system's input connectors can be flexibly assigned to any Switcher input.

Program Re-entry

This new feature enables any video input setting in local IP source, to select "Program Out", "Clean Out", "Preview Row" or "Main Row", (and allows that input to be used for instance, within M/Es to add additional overlays or other layer combinations.

The main PGM feed can be re-used for other outputs where content can be added and modified to adapt stories with graphics, cropping, aspect ratio, and more. This feature empowers you to make multiple versions of your show easier than ever.
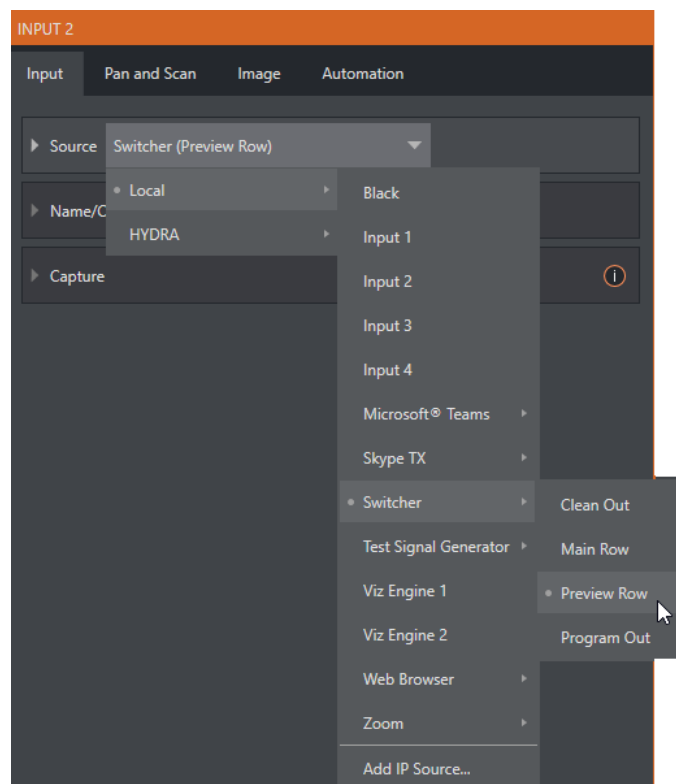
FIGURE 62

The assignment of one of the various types of source to a *Switcher* button (e.g., "Input 1" on the *Switcher*) is made in the *Input Configuration* panel, introduced to us back in Section 3.6.

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

- Double-click the monitor viewport for a Switcher input.
- Click the Configuration (gear) icon shown at lower right when the mouse pointer is rolled over above the viewport.
- If you have a touch-screen, you can two-finger tap the viewport.
- Or, right-click a Switcher input button and select the Configure menu item.

Source

Use the *Source* menu in this panel to assign one of the many sources available to the corresponding *Switcher* input. Available video sources are grouped under labels named for the device supplying them.
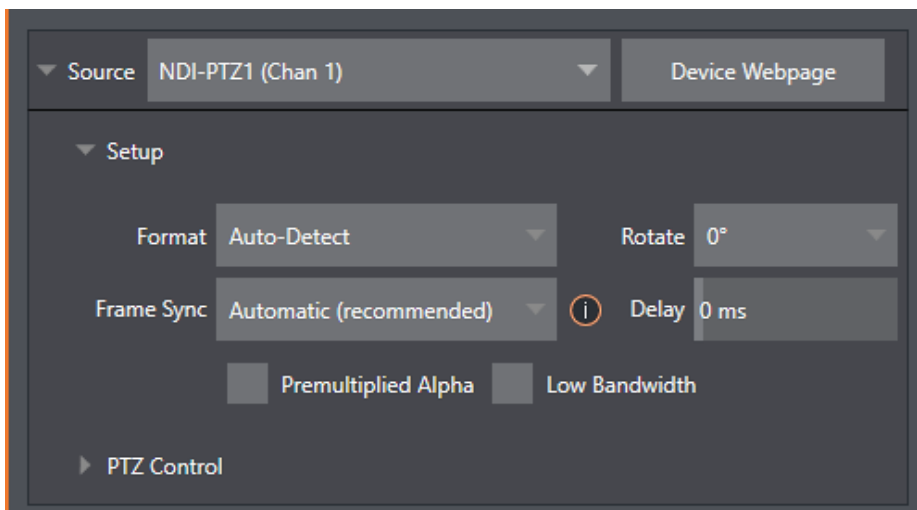
FIGURE 63

The *Local* group in the *Source* menu includes those sources connected locally to the system's IP inputs (e.g., external SDI BNC connectors), any other local sources detected (such as a webcam) and *Black*.

Setup

Format

If you use the twirl-down triangle gadget at left to expand the *Source>Setup* control group (Figure 63), you will see that the *Format* for these diverse source types defaults to *Auto*. In the case of an NDI source, no further settings are required.

Rotate

To complement non-traditional sessions and handle unusual *Switcher* sources (e.g., non-landscape mobile device output) each input now features a new *Rotate* menu, which also includes *Flip* options.

Device Webpage

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

Delay

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

Frame Sync

By default, *Frame Sync* is set to *Automatic* for all external source types, allowing you to work with a wide array of potential video sources without concerns about video timing.
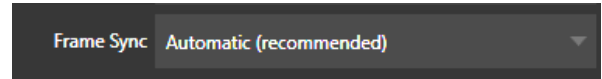
FIGURE 64

This option *(Automatic)* enables the full array of timing correction tools available to achieve smooth and accurate frame timing in your productions, including features that correct for issues caused by 'less than ideal' networks.
The next menu option *(On)* enables full-time frame synchronization and may well suffice in some video pipelines. This alternative has the benefit of ensuring the lowest throughput latency possible on a video switcher using frame-sync (2-3 frames).

Premultiplied Alpha
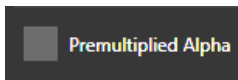
FIGURE 65

If you are supplying imagery (video sources, video clips, or still images) that support transparency by means of an embedded alpha channel, your choice here will be important. There are two 'flavors' alpha channel pixel encoding. The first is often called 'straight', or may be referred to as 'non-premultiplied'. Unsurprisingly, the alternative is 'premultiplied'.
The *Premultiplied Alpha* switch is off by default. Making the correct selection is necessary for correct compositing over other imagery.

Low Bandwidth
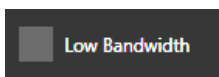
FIGURE 66

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

PTZ Control
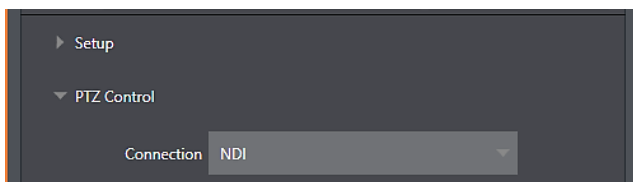
FIGURE 67

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

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

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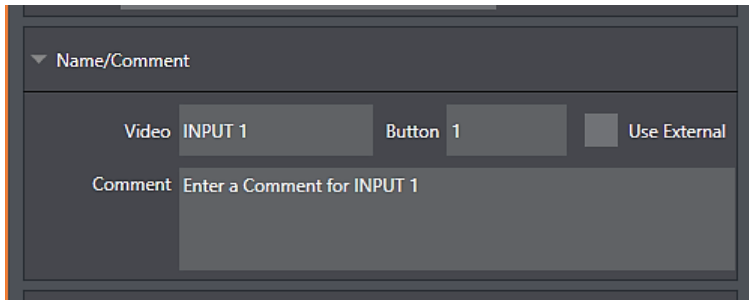
Expanding the *Name/Comment* control group reveals text entry boxes that allow you to provide labels for your video sources – specifically, the *Video* entry will appear beneath viewports in multiviews and some menus (where space permits), and the short *Button* text will be used to label *Switcher*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

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

The *Comment* entry lets you enter memo text that can serve as memory aids, but or another very valuable purpose, too. Specifically, the values entered in these two fields supply the values for special *DataLink* keys. Among other things, the values from these *DataLink* keys can be used to update text values in title pages, or to add information to the filename of recordings.

For example, you could use a macro to automatically display a title page briefly any time you switch cameras. The Name and Comment entries for inputs update the values assigned to DataLink Keys named %PGM Source Name% and %PGM Source Comment% base on Program row selections. You might enter "Bill Jones, CEO" as the Video name for a camera, and "Megadyne Computronics, Inc." as the Comment.

Continue to give unique values to inputs in similar fashion. Then enter %PGM Source Name% on the first line of a title page, and %PGM Source Comment% on the second line. When you change cameras, your macro will display the page, correctly identifying the talent based on the input Name and Comment.

Capture
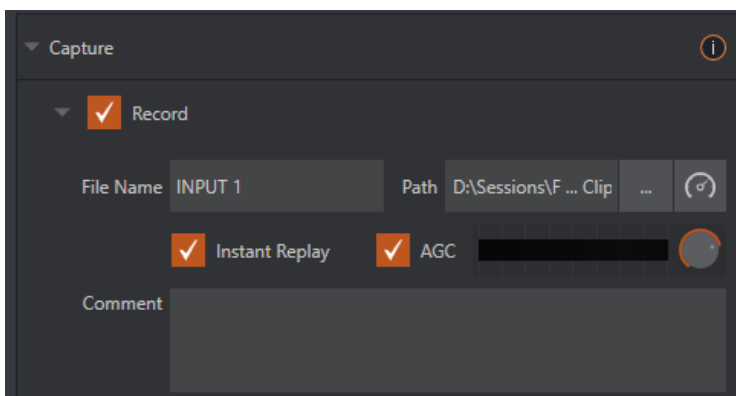
Each Switcher source has a *Capture* group in the *Input* tab. This control group shows settings and options for grabbing still images and, for appropriate sources, recording. These important capabilities are discussed in full in 20, Record, Grab, and Replay. The controls shown in Figure 69 are detailed in Section 20.1.2

8.1.2 PTZ/Pan and Scan Presets

Another control group appears on the lower part of the *Input tab* when appropriate. This group may be labeled either *PTZ Presets* or *Pan and Scan Presets*, depending on the source type (one could hardly be blamed for referring to the latter as 'virtual ptz presets').

In either case, the features and options presented in this group are similar. At the top, you will see 16 numbered preset slots. Rolling over these slots reveals two gadgets: Click the snapshot (camera) gadget to store or update a preset. Click the configuration (gear) gadget to show a *Preset Properties* panel (Figure 70), with two text boxes labeled *Alias* and *Comment*. The entries in these two text boxes, like the *Name* and *Comment* values discussed earlier, provide the values for special *DataLink* keys that store the values from the last PTZ preset applied, as follows:
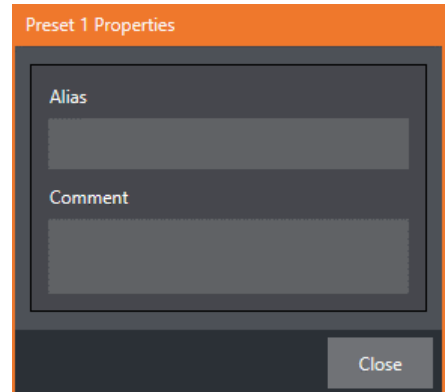
FIGURE 70

- PTZ PGM Alias
- PTZ PREV Alias
- PTZ PGM Comment
- PTZ PREV Comment

Hint: These DataLink keys can be very useful in settings like a 'town hall' meeting, where you might use different PTZ presets to zoom in on a few different council members. In such a case, the last preset applied could update the data shown in a lower-third title overlay.
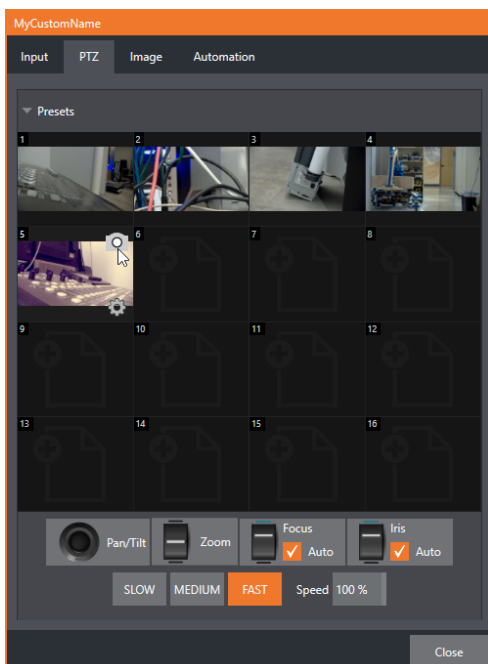
FIGURE 71

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

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

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

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

8.1.3   Image Tab
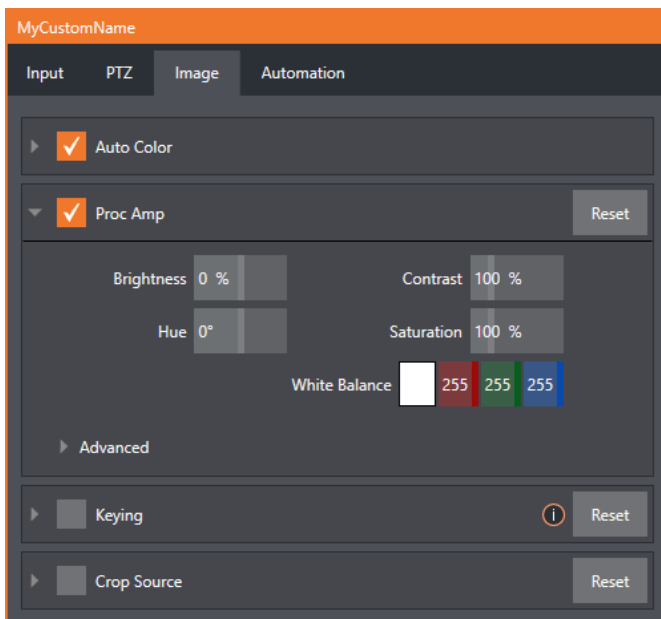
FIGURE 72

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

Auto Color
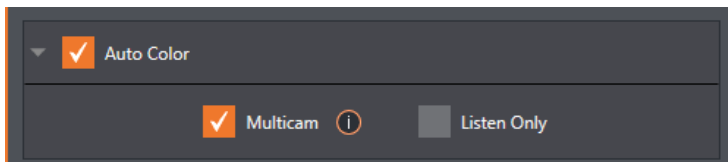
FIGURE 73

Lighting conditions can change dramatically during many live events, especially those held outdoors. Adding to this problem, production usually involves multiple cameras and, all too often, these may not have uniform color characteristics. Ensuring consistent color when switching from one angle to another, avoiding unwelcome brightness or color shifts as evening falls or when a cloud obscures the sun briefly can be troublesome, and expensive.
Auto Color, a unique feature capable of dynamically adapting the color characteristics of your video sources as lighting conditions vary, can minimize these problems. For many productions, simply enabling *Auto Color* is all it takes to produce a show that looks amazingly consistent.

Multicam

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

Listen Only

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

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

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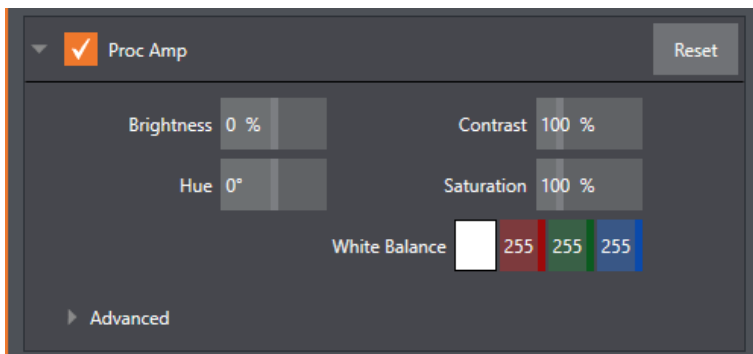
A switch at the top of the *Proc Amp* control group toggles the feature on/off. Other controls operate as follows:

- Brightness: Adjustment range from -50 to +50 IRE (the default being 0).
  As reference, the full luminance range of the visible portion of a video signal can be thought of as '100 IRE units' (named for the Institute of Radio Engineers) – ignoring minor regional variations.
- Contrast – Adjustment range from 25 - 400% (default 100%).
- Hue – Adjustment range between -180˚ and +180˚. Adjusts the master color of the video signal from the attached source, swinging the entire image through the color wheel's spectrum.
- Saturation – Adjustment range from 0-500%. Zero saturation results in a 'black and white' picture; increased saturation results in richer colors. High saturation values can exaggerate the color portion of the signal.
  (Note that over-saturated colors are considered illegal for broadcast transmission and may result in display problems on some devices.)

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

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

Advanced Color Controls
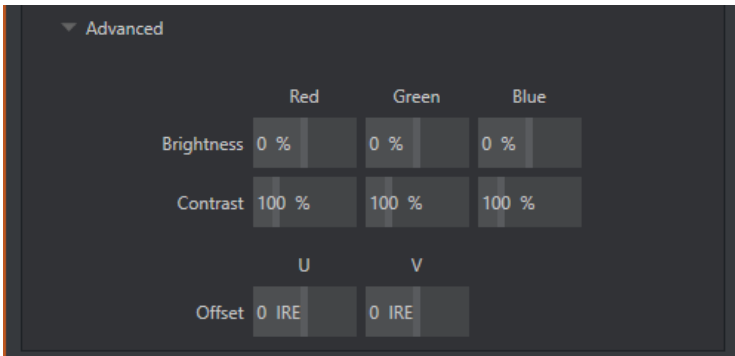
This secondary control group is revealed when you click the expander (triangle) beside its label. In addition to per color channel (RGB) *Brightness* and *Saturation* sliders, it adds *U Offset* and *V Offset* controls.

- The U portion of the video signal carries blue and yellow color information. Rotating the U Offset knob clockwise shifts the signal toward blue, while a counter-clockwise twist shifts the signal toward yellow.
- The V portion of the video signal carries red and green color information. Rotate V Offset clockwise to shift the signal toward red and counter-clockwise to shift the signal toward green.

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

Keying

The Keying control group in the *Image tab* hosts *LiveMatte*, a powerful real-time keying system for live production.

FIGURE 76

Keying is a popular and powerful method of compositing multiple images, whether photos, video clips or live camera streams.

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

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 13.2, LiveMatte.

Hint: When LiveMatte, Proc Amp, or Crop settings are active for a source, bright green, blue and yellow indicators are lit under its monitor.
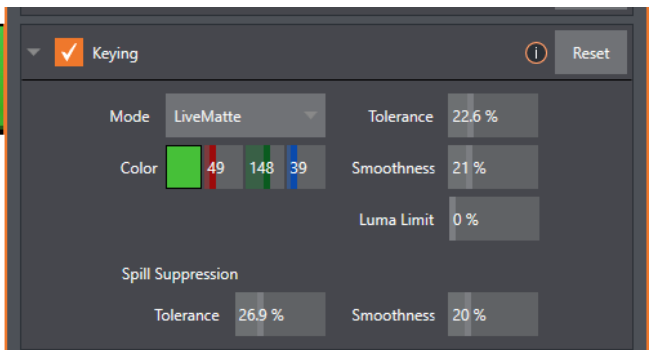
FIGURE 77

Crop Source

It is very common for a source to be supplied with unintentional inclusions; these are often items that remain after chromakeying is applied, but which need to be removed along with the background. (Common examples include audio sources 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.
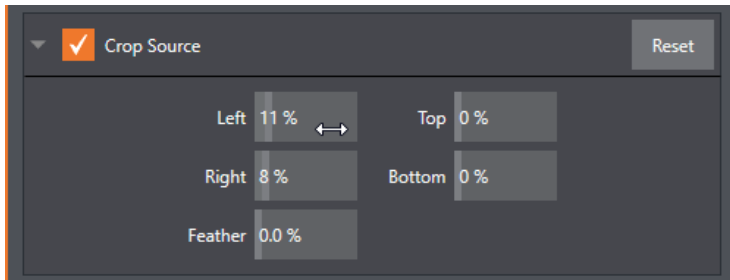
The settings in the *Crop Source* control group can be used to remove such unwanted 'garbage' from the scene, and other purposes, too – such as to isolate a portion of the screen for use as a 'Picture in Picture' overlay.

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

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

8.1.4   Automation Tab

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

Macros, discussed in 17, might be viewed as the basic building blocks of automation. Macros can easily be recorded and edited, and equally easily they can be triggered by a keystroke shortcut, control surface button, or similar means; but that isn't really 'automation', is it? It's actually a manual operation.

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

State Change
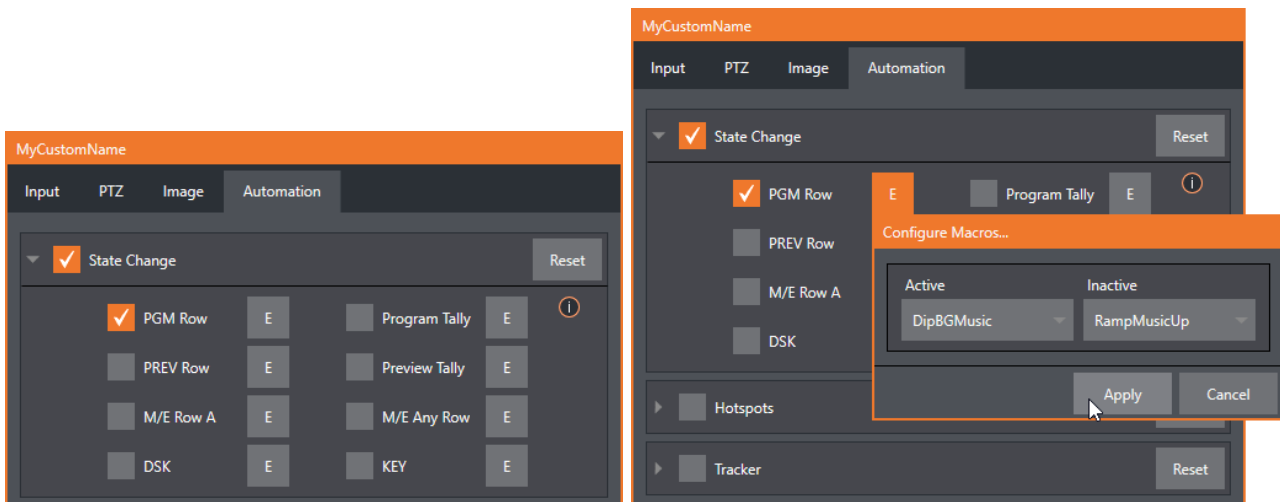
Click the [E] button next to a one of the 'state' options (see Figure 79) to assign macros that will be executed on specific *Switcher* operations that affect the specified state.

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

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

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

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

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

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

The possibilities are truly endless.

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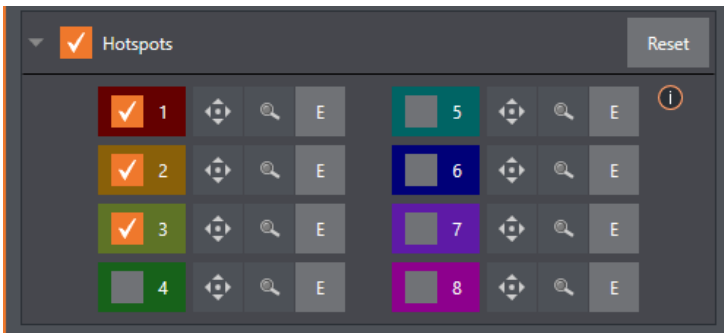
The next control group in the *Automation tab* is devoted to *Hotspots* – another powerful and interactive automation feature. A *Hotspot* is a user-defined region of the screen that (when active) detects opacity changes inside its boundaries (for which reason, *Hotspots* require *LiveMatte* to be enabled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

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

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

Tracker

The *Tracker* control group provides real-time motion tracking features. This feature allows you to choose a colored region of the video frame using tools similar to those found in the *LiveMatte* tab (see 13.2).

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

Adjusting Tolerance

Click the eyedropper, and, while holding the mouse button down, drag the pointer over top of the monitor for the source you want to track (see Figure 81). The *Tracker's* color swatch updates as you drag, until you release the button to finalize your selection.

FIGURE 81

To assist you while making adjustments, a yellow rectangle is overlaid on the video to show the effect of the current *Tracker* settings.

Watch how this overlay is affected by adjustments you make to the *Tolerance* value for the *Tracker*. Raise or lower the *Tolerance* value until the result is steady, not jittering or jumping about.
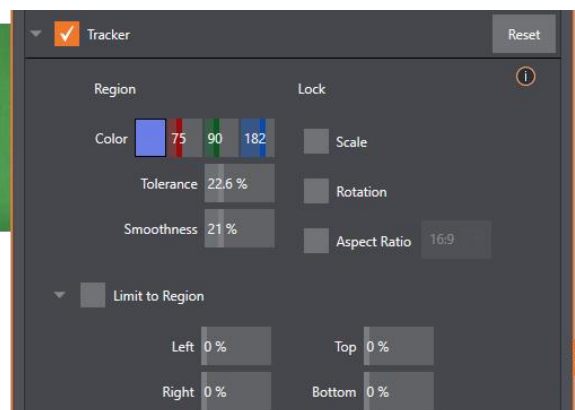
Hint: The yellow overlay disappears when you close the panel (or disable the Tracker), but you can show it full-time if you wish. To do so, right-click the desired viewport, and enable Tracking Markers from the Overlays options group in the menu.

Smoothness

The *Smoothness* setting works just like the *LiveMatte* feature with the same name. Its impact on tracking *data* output may seem minimal, but it can be important when used with the *Advanced Tracking* effect in *M/E* panels (see *Default Effects* 14.5).

Lock

At right are controls that permit you to *Lock* certain *Tracker* attributes, preventing them from changing in the scene.
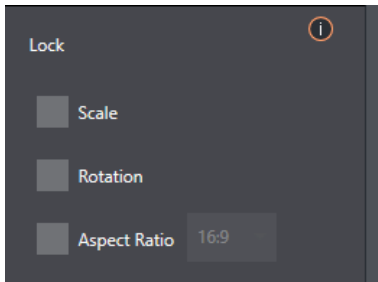
- Lock Scale to prevent the Tracker from automatically compensating when the scale of the tracked region grows or shrinks during motion.
- Likewise, when Rotation is locked, the orientation of Tracker output is constrained.
- The Aspect Ratio lock forces the Tracker to conform to a square (1:1), or rectangular (4:3 or 16:9) shape.

FIGURE 82

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

Limit to Region

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

The settings in this group allow you to limit the area of the frame the Tracker monitors, which can help you sidestep this issue. We'll discuss the application of the *Tracker's* data stream when discussing the *Positioner* tools.
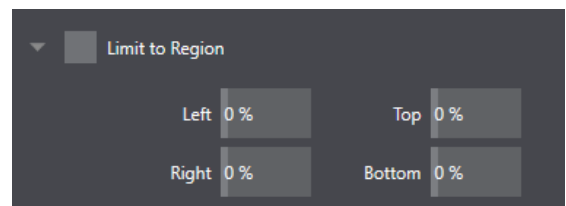
FIGURE 83

8.2   Output Configuration
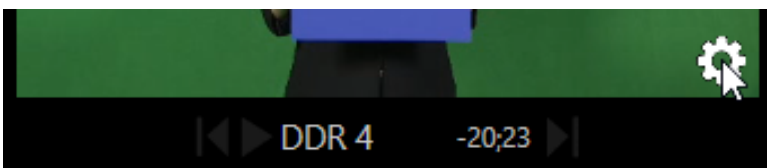
FIGURE 84

Roll the mouse pointer over the *Program* monitor to reveal a *Configure* button (Figure 84) at right in the titlebar below the display. Click it to open the *Output Configuration* panel.

> Hint: As for other viewports, alternatively 'two finder tap' on a touchscreen or, if Click Viewports to Show on PGM is disabled in the Options menu, double-click the mouse on the viewport to open this panel.
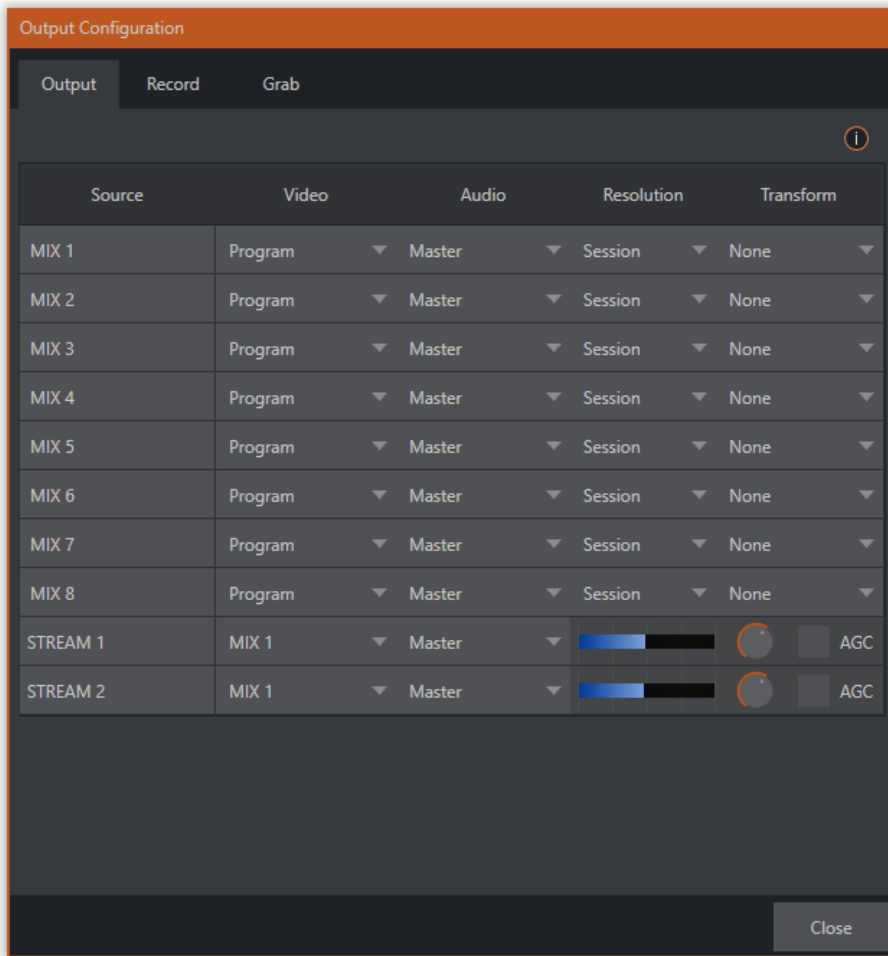
FIGURE 85

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

8.2.1 Output Tab

We discussed *Primary* and *Secondary* outputs back in 3.5. The first four entries in this panel are primary outputs; typically, these are also 'mixed' outputs, hence their default labels – MIX 1, 2, etc. These video sources are sent to the corresponding external SDI output connectors (when provided), and also as NDI (Network Device Interface) outputs.

Video

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

Audio

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

Resolution

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

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

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

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

Transform

Video *Mix* also support independent rotation and flip controls, as well as *Section* options as seen in Figure 87 and Figure 86.
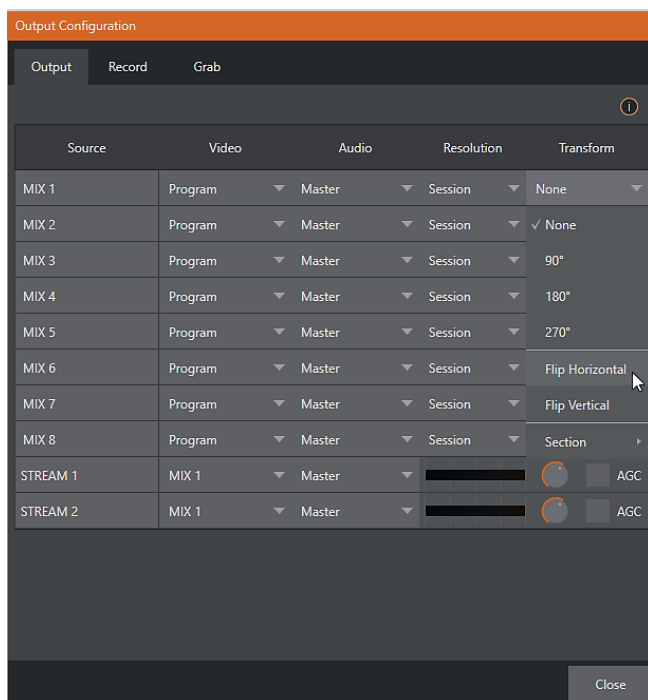
FIGURE 87
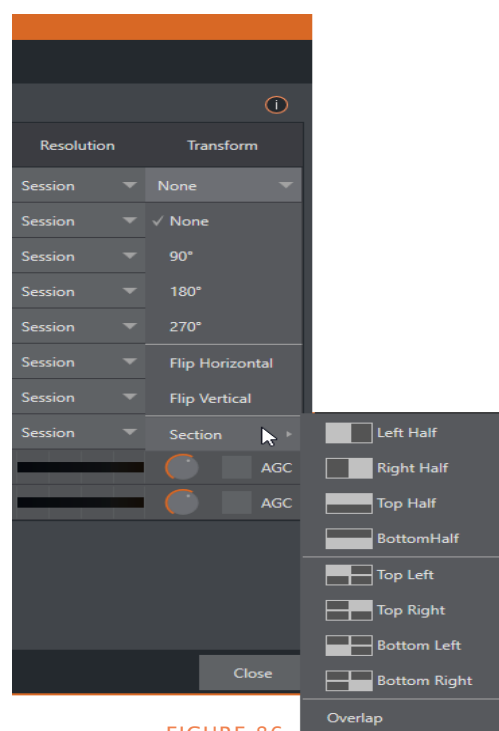
FIGURE 86

Stream

The Stream controls in the *Output* tab let you independently assign any of the primary mixes to one or two streaming encoders. Likewise, for models with multiple audio busses, you can send audio from the *Master* audio mix or any of the *Aux* busses to either streaming encoder.
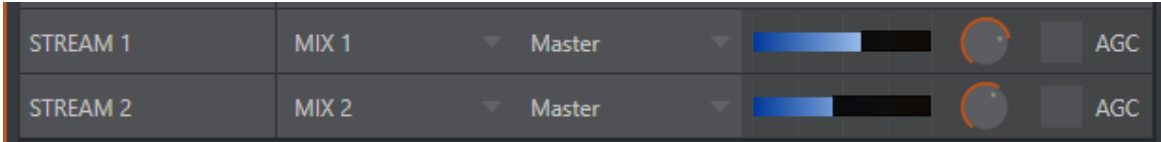
The audio controls also include individual *VU* meters, *Gain* knobs, and an *AGC* (Automatic Gain Control) option. These allow you to modulate audio for the streams separately from your primary audio outputs.

> Hint: Streaming output is always de-interlaced.

Streaming Output involves more options, too, since there are so many different ways to stream. In this panel, you simply configure the audio and video sources sent to the streaming output. All other options and settings relevant to streaming are discussed in 18.

8.2.2   Record and Grab Tabs
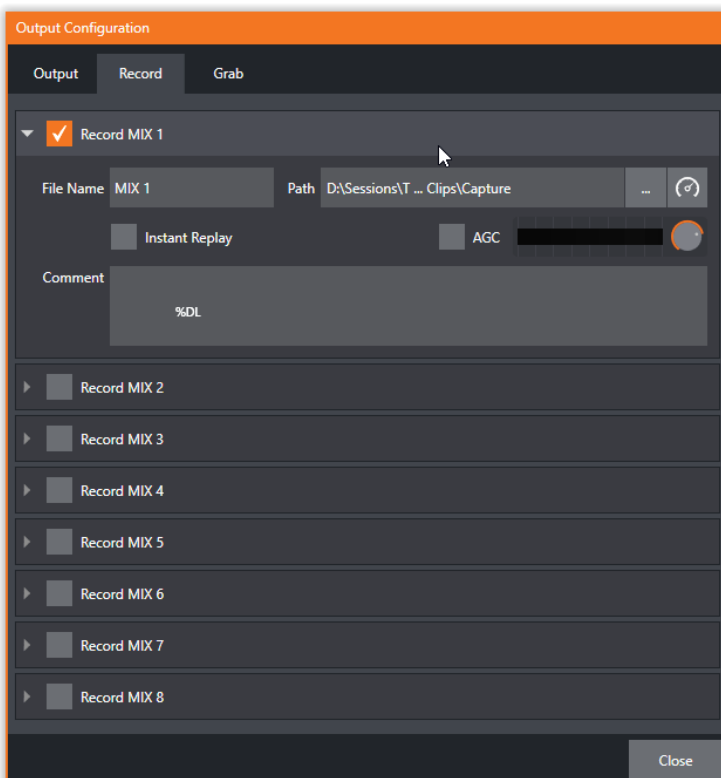
FIGURE 89

Each MIX output source has corresponding *Record* and *Grab* control groups to provide settings and options for capture. These important capabilities are discussed in full in 20, Record, Grab, and Replay. The controls shown in Figure 89 are detailed in Section 20.1.2 (Grab is virtually identical, but for the lack of an *Instant Replay* feature).

9 Viz Engine Integration

Viz Engine is a powerful compositing, real-time 3D rendering, and video playout platform that supplies advanced graphics and video processing for a broad range of Vizrt systems and types of media productions. Using advanced compositing, rendering, and keying, Viz Engine enables applications to maximize creativity and deliver stronger audience engagement through immersive viewer experiences in any program.

Viz Engine is today's most powerful real-time compositor used in the media industry. The platform architecture offers easy re-purposing as requirements change and is built for extensibility as the foundation for multiple Vizrt systems and production use cases.

Viz Engine 4.2, comes with an updated version of Viz Artist. Viz Artist is a powerful graphics design tool that supports a range of production use cases including live motion graphics, virtual sets, augmented reality, and complex 3D animations. Offering an advanced toolset, Viz Artist creates elements for other Vizrt studio or live environment applications to maximize creativity and deliver stronger audience engagement through immersive viewer experiences for all types of programs

9.1.1 Configuration

Viz Engine requires configuration prior to running a session in Viz Vectar Plus - Live Production. These settings will reside in the *Administrator Mode* as discussed in the *5.2.4*. If you have found yourself already in a session and need to return to the Home Page, you can click the large *Back Arrow* displayed at left, or the word "Home" in the session name label.

FIGURE 90

The *Viz Graphic Hub* and License information need to be configured before using Viz Engine for the first time. This is done by launching the *Viz Configuration UI* from *Administrator Mode*.
Launching *Viz Engine* for the first time can take a few minutes while all required shaders are being built for your system.

Note: If using both Viz Engines, configure them separately before using.

Once the configuration is complete, be sure to close the panel in order to save.
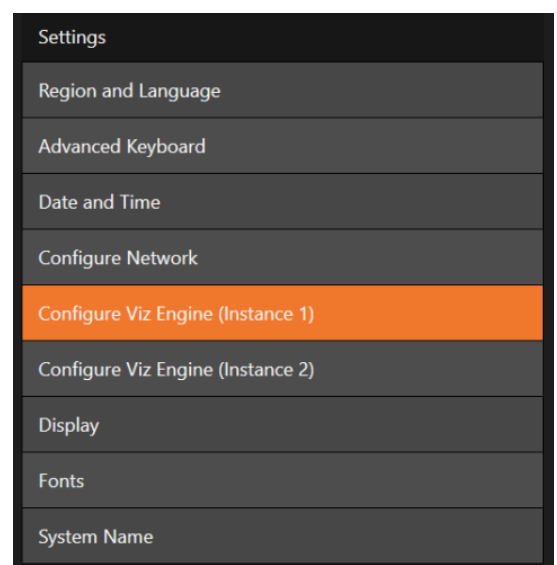
FIGURE 91

System Requirements

- The Codemeter Runtime (installed with the bundle installer) is required to use the WIBU license system. Details can be found in the manual in section "WIBU-based Licensing System". Please refer to the documentation how to apply a license container.
- At least 12 GB of texture memory are required when using both Viz Engine instances in UHD/4K resolutions.
- MultiGPU setups are currently not supported.
- The latest recommended drivers can be found here.
- 1080i resolutions will be automatically rendered in 1080 progressive.

Note: Viz Engine will not start up if you are connected via Remote Desktop, as they do not allow for OpenGL output. You might consider using a VNC client, for example TightVNC, as an administrative back-end too.

9.1.2 Licensing

The Live Production Premium license will install automatically once the configuration starts.
If additional licenses or plugins are required, they need to be installed and configured manually. Every resolution larger than 2K requires a 4K license. This affects all 4K resolutions as well as the 1440/50p and 1440/59.94p in portrait and landscape mode. This is automatically configured, but the license needs to be acquired. A pre-configured 4K licenses will automatically be removed if not needed by Viz Vectar Plus – Live Production.

Referring Documentation:
http://documentation.vizrt.com/viz-engine-guide/4.2/Viz_License_Configuration.html

Note: If you have Anti-Virus installed on your machine, it will need to be stopped or paused momentarily while running the installation.

9.1.3 Sources

Viz Engine is automatically configured and started if a Viz Engine Channel is activated as local input source. There is a maximum of 2 channels. As soon as a local input channels is set to be a viz engine, it will be configured to the best matching resolution and started in the background.

Viz Engines can be controlled by any application like Viz Trio or Viz Pilot. The rendered graphics will be transferred to Viz Vectar Plus - Live Production and can be used as a normal source.
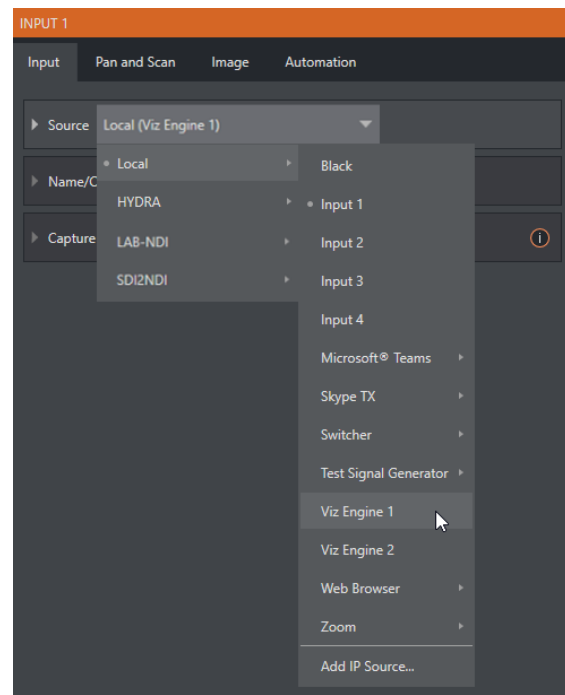
9.1.4 Troubleshooting
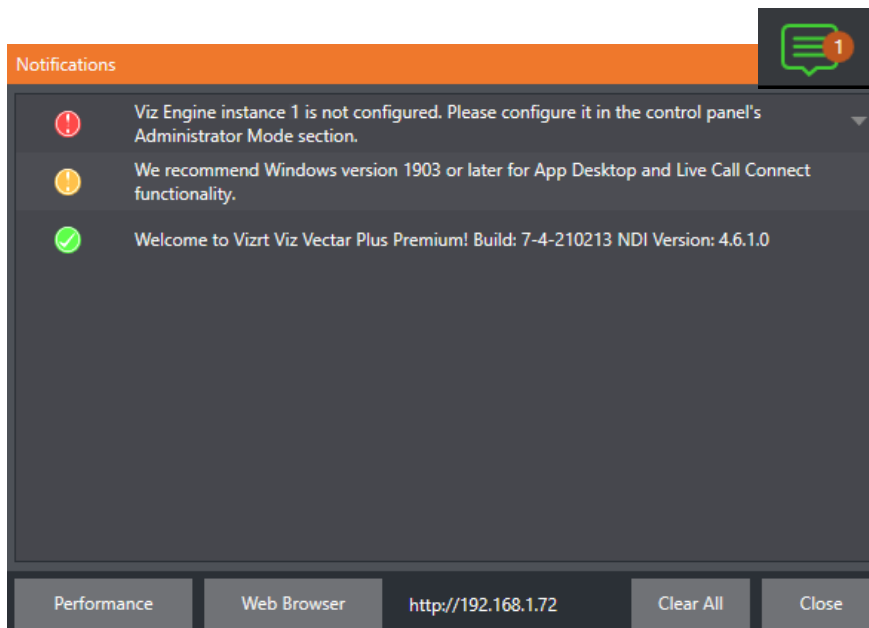
If Viz engine cannot be started correctly, an error message will be shown in the *Notifications* section of the *Dashboard*. The Engine instances will be automatically closed if not needed anymore or if the session is being closed.

An unlicensed Viz Engine will automatically startup in configuration mode. Please make sure your Engine licenses are available, this is done by using the Codemeter WebGui.

Viz Engine requires a Viz Graphic Hub connection, for more detailed information: http://documentation.vizrt.com/viz-engine-guide/4.2/Database.html

Viz Scenes need to have a key plugin or the Auto Key option enabled (http://documentation.vizrt.com/viz-artist-guide/4.2/Scene_Settings.html), otherwise the alpha information is not available and the output stays black. Please note that Viz Graphics need to match the chosen resolution and framerate.

Note: Currently, the Window Capture Input remains black within the Viz Engine UI.

10 Switcher, Transitions and Overlay

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

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

Switcher	Layer Controls
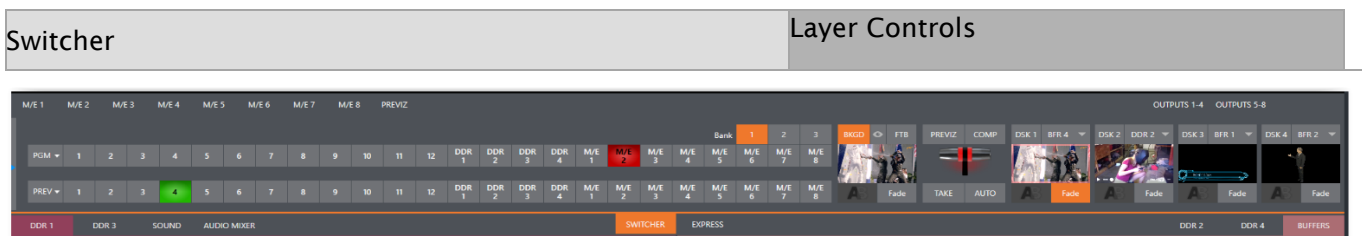
10.1   Switcher Modes

Viz Vectar Plus - Live Production supports two different *Switcher* modes, allowing you to choose which one is best suited to your need for a given program and environment.
The standard *Switcher* interface (Figure 94) provides control over your main *Program* video output using the familiar *Program/Preview* row method.

For less complex productions, the *Switcher's* convenient *Express mode* simplifies the process (Figure 95; see 10.9). This one-button operating mode will be especially welcome in environments where volunteers or less experienced operators are involved.

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

To select the current operating mode, simply click either the *SWITCHER* or *EXPRESS* tab provided at right in the horizontal bar immediately above the *Switcher* pane (Figure 96).
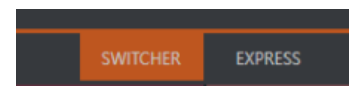
10.2 Switcher Row Banks

In standard *Switcher* mode, two *Switcher* rows labeled *PGM* (Program) and *PREV* (Preview) are shown (Figure 97). Clicking a button in the *Program* or *Preview* row selects the active video source for that bus (note that audio sources can optionally be affected by *Switcher* activity – see 16 Audio).

Viz Vectar Plus - Live Production *Program* and *Preview* rows represent all available video source in "banks" of buttons. The number of banks vary according to the number of sources each model supports.

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

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

10.3 Program/Preview Rows

The video source selections in the *Switcher* rows include all external inputs, including video router sources, internal sources (*Media Players* and *Buffers*), and the output from all M/Es.
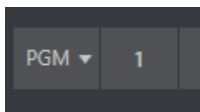
The *PGM* (Program) row selection determines the dominant video stream of the *Background* (BKGD) *video layer* – that is the 'rear-most' layer of the composition sent to *Program* output. Other sources may be mixed above the *Background* layer at times as you apply *LiveMatte*, or as portions of an incoming *Preview* row video source appear during a transition.
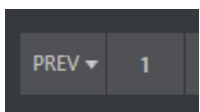
The *Preview row* appears in standard *Switcher* mode. Selections determine which source is queued up for display in the *Background* layer by a subsequent (BKGD) *Take* or *Transition* operation.

10.4 Background and DSK Layers

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

- The Background layer (often shortened to simply 'BKGD') is always the base for the video composition displayed on Program output.
- DSK (<u>D</u>own <u>S</u>tream <u>K</u>eyer, or 'overlay') layers may appear above (in front of) the Background.

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

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

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

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

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

10.5 Selecting Sources

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

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

Hint: Right-click input buttons to select sources from video routers– see Section 3.6.1 (Configuring Routers).

10.6 Linking Switcher Rows

It can be useful to link two (or more) *Switcher* or *M/E* source rows together, so cause them to operate synchronously.   *Program* and *Preview* rows and *M/E* source rows all show a triangle beside the row label at left. Click it to open a menu that lets you set up linking. As you'd expect, rows assigned to the same color groups are linked. A selection made in any linked row updates the selection of all other rows in the same color group to match. Thus Figure 98 shows the *Input A* row for an *M/E* linked to the *PGM* row of the main *Switcher*. The *Ungroup* menu item removes the current row from a group, while *Clear this group* removes all rows from the current group.

10.7 Transitions and Effects

We discussed video layers in 10.4. With this in mind, it's easy to comprehend the layout and use of the *Transition* controls. Let's consider the *Transition* controls in the standard *Switcher* layout first.

10.7.1 Animated Story Transitions

Viz Vectar Plus - Live Production can also employ special transition effects called *Animation Stores.* These powerful effects normally include an embedded full color animated overlay, along with sounds for transitioning in and out (sounds are optional). The audio level for *Effects* is controlled in the Audio Mixer tab below the *Switcher*.

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

> *Note: The Animation Store Creator application is covered in its own manual, which can be opened from the Help menu on the Home page in Viz Vectar Plus – Live Production startup screen.*

10.7.2 Standard (Switcher) Mode

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

FIGURE 99

DSK Controls
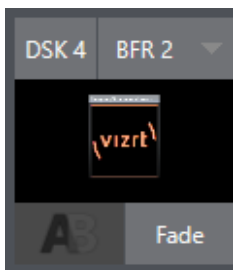
Each *DSK* layer has a live video viewport showing the current source assigned to it (using the menu at right above the viewport) and its own transition effect. Click the transition icon at lower left below the viewport to reveal a palette of different transition presets (Figure 100) provided for quick selection.
Click an entry in the palette to select it, or move the mouse pointer to the "+" sign that pops up for each icon and click to open the *Custom Media Browser.*

FIGURE 100

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

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

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

Transition Delegates
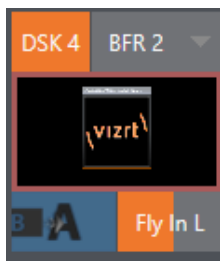
FIGURE 101

You can also control transition progress using the Switcher's *T-Bar* control, at left. The *T-Bar* operates on all *delegated* video layers. To delegate a *DSK*, click its label at upper left (Figure 101) to turn it blue. Clicking it a second time will un-delegate the layer.

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

Transition Timing

FIGURE 102
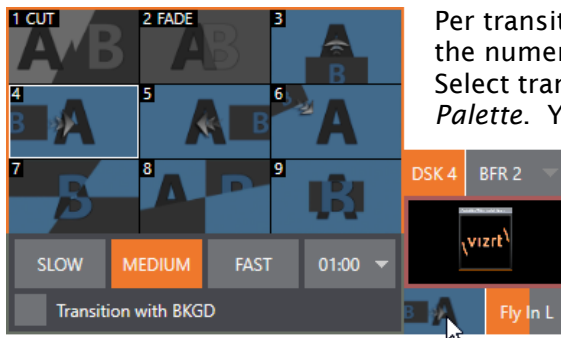
Per transition timing is set and stored in the effect palette, using the numeric duration control beside the effect icon.

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

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

DSK Source Configuration

FIGURE 103
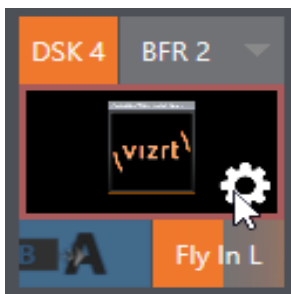
Many more configuration options are available for *DSK*s (and their siblings, *M/E* key layers, too).

To access these settings and features, roll the mouse pointer over the *DSK* viewport, and click the configuration (gear) gadget that appears at lower right (Figure 103).

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

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

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

Position (and Crop)

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

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

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

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

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

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

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

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

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

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

Z-Priority

Normally, *KEY* and *DSK* layers appear in numeric order from 'back' (furthest from the viewer) to 'front'. This if *DSK 1* and *DSK 2* are both displayed and occupy the same position in the frame, the content in *DSK 2* will occlude *DSK 1*.
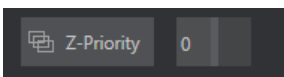
The *Priority* setting in *DSK* and *KEY* layer *Positioning* panels allows you to revise the default layer order on a selective basis. This feature was specially implemented to provide additional flexibility for use with the *Comps* feature.

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

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

Apply with Comp
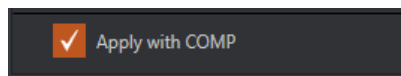
We will discuss the powerful *Comp* system a bit later (10.8), but we'll mention it in passing here to highlight the *Apply with Comp* switch provided in the *Position* control group. At the lowest level, *Comps* can be thought of as presets that store complete *Switcher* or *M/E* setups.
By default, the settings stored in a *Comp* include the *Position*, *Crop* and visibility state for each *DSK* or *KEY* layer. Disable the *Apply with Comp* feature if you want to exclude a given DSK/KEY channel from Comp control, handling it manually instead.

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

Use Source Tracker

We discussed the video *Tracker* back in Section 8.1.4). The *Use Source Tracker* feature lets you assign motion data output from the *Tracker* for any video source to modify the position of the current *DSK* or *KEY* layer by selecting it in this menu.
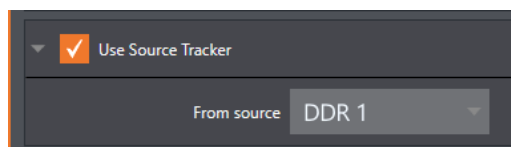
Position settings enabled above in the *DSK/KEY* tab continue in force but will be applied relative to *Tracker* output. (For example, *X* and *Y Position* settings entered in the upper part of the panel result in an offset from the co-ordinates supplied by the *Tracker*.)

Borders, Edges and shadows
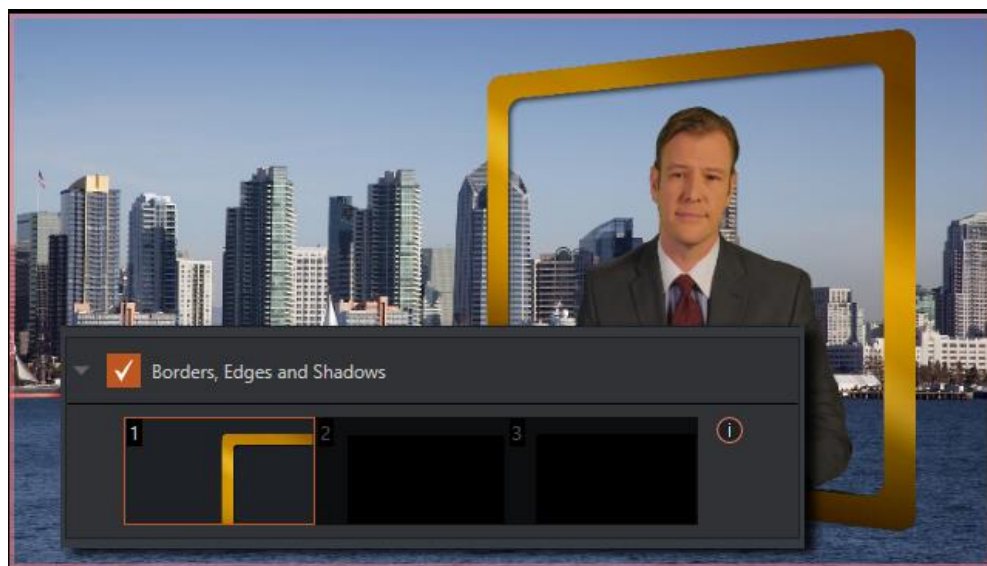
The *Borders, Edges and Shadows group* also provides each *DSK*, *KEY* and *M/E* layer with three quick access *Border* preset slots (Figure 108).

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

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

You can freely scale, position and rotate various Switcher sources, add custom borders, overlays, shadows, and so-on, over custom backgrounds.

In addition to hundreds of supplied borders, you can easily create elaborate custom effects using Photoshop®. You need merely define a Photoshop™ format file with three (rasterized) layers. The uppermost layer contains foreground elements (such as a bezel).   The next layer is treated as a mask based

FIGURE 109

on opacity and defines the part of the source image that will appear in the result. The 'bottom' layer supplies a background to appear behind transparent parts of the source (as, for example, when *LiveMatte* is applied to a source).

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

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

Transparency

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

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

> *Important Note: It's best to use files with straight (a.k.a. "non-premultiplied") alpha channels in Viz Vectar Plus - Live Production Media Players. Premultiplied files will generally not yield correct results when overlaid on other imagery.*
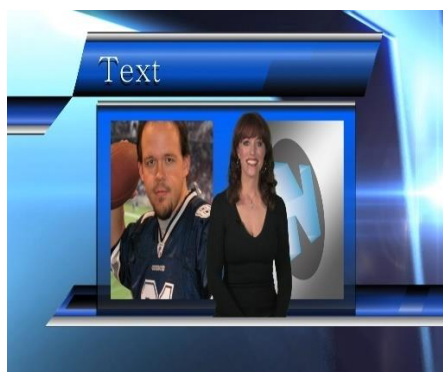
FIGURE 110

DSK layers offer a lot of creative possibilities. You might use *DSK* channels to display a permanent station ID 'bug', superimpose a company logo onto a title page, perhaps to add a 'spinning globe' animation playing in the *DDR* to a lower-third, 'frame' a keyed source composed over a title (Figure 110), or set up many other elaborate effects in this manner.

10.7.3 Background Controls
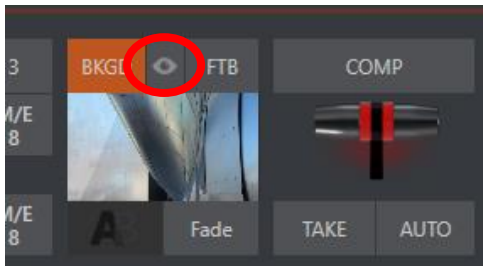
The QuickSelect button (marked with an 'eye' icon to associate it with visibility) is located in between BKGD and FTB. Clicking it updates the Switcher's T-Bar delegate and transition states so that the next TAKE or AUTO operation will remove all visible DSK or KEY layers from output. (On supporting control surfaces, press ALT & BKGD to trigger the QuickSelect feature.)

FIGURE 111

Background Transition Group

Transition controls in this section apply to the *Background* video layer only. In most respects, these tools are identical to the *DSK* transition controls discussed earlier, but there is one difference worth mentioning.
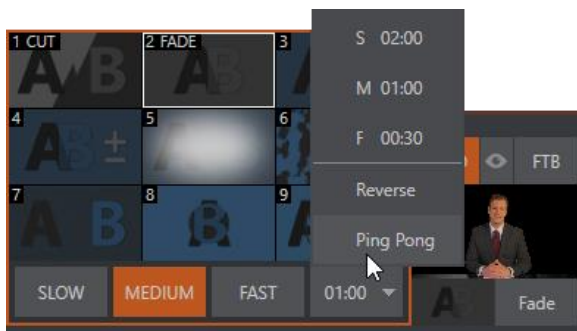
The *Duration* menu for the *Background* transition offers two items not included in the similar *DSK/KEY* controls:

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

FIGURE 112

FTB
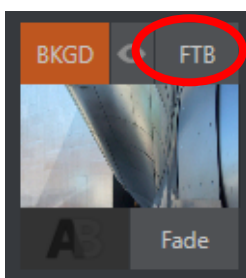
Let's discuss the *FTB* feature next. The acronym stands for *Fade to Black*. The result of clicking the *FTB button* will not likely surprise you very much. ☺ *FTB* offers a convenient method of doing what its name implies – fading *Program output* completely to black. It might help to think of *FTB* as a final video layer added above all others before *Program* output, completely obscuring everything below it.

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

FIGURE 113

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

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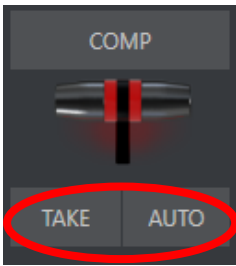
Clicking the *Background* layer's *Take* button (keyboard shortcut *Enter*) performs a straight cut for all video layers that are currently delegated.

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

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

T-bar

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

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

10.8   Comps and MEMs

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

We're going to discuss the *Comp Bin* in full soon (14.7), but at this point we want to distinguish them from *Switcher* MEMs. Bumping the cursor at the left edge of the screen adjacent to the *Switcher* or an *M/E* reveals a *MEM bin* with features that are quite similar. The primary difference between *MEMs* and *Comps* is that the former retain (and apply) all settings in the *Switcher* including source selection.

10.9   Express Mode
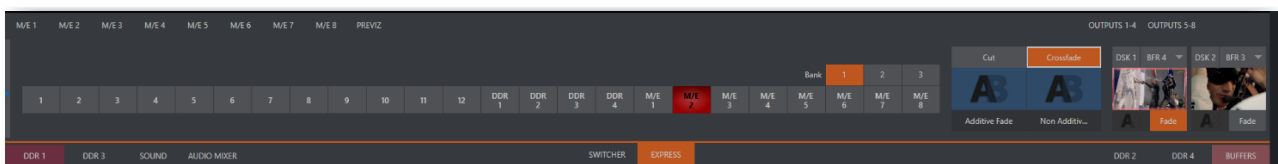
As mentioned earlier in this chapter, the *Switcher's* convenient *Express mode* simplifies the process for less complex productions. To open the *Express* mode *Switcher* view, click or tap the *EXPRESS* tab at right above the *Switcher*.

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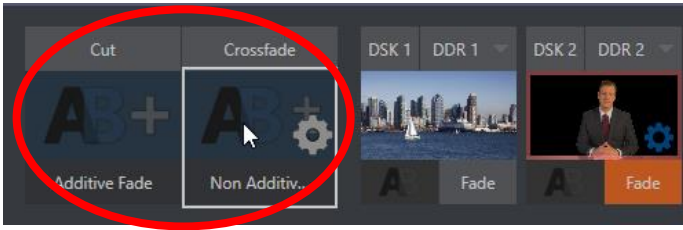
Note the quad-selector located between the single *Switcher* row, and the *DSK* controls at right. *Cut* and *Crossfade* mode buttons top this control group. Simply click or tap either the *Cut* or *Crossfade* button to activate the corresponding *Background transition*.

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

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

10.9.2 Switching

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

10.9.3 DSKs

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

11 Monitoring Your Video

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

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

Among others you will find *Proc Amp*, *LiveMatte, Hotspot, Tracking* and *Edge* controls. (To give some of these the attention they deserve, they are treated individually in 7.2 and elsewhere.)

11.1   Interface and Multiview

Really, the *Live Desktop* provides a number of multiview monitor displays – one on the *Live Desktop* (a.k.a., the "Interface"), normally comprising its upper third, and the others consisting of fully independent displays presented on secondary monitor outputs on the rear connector panel.
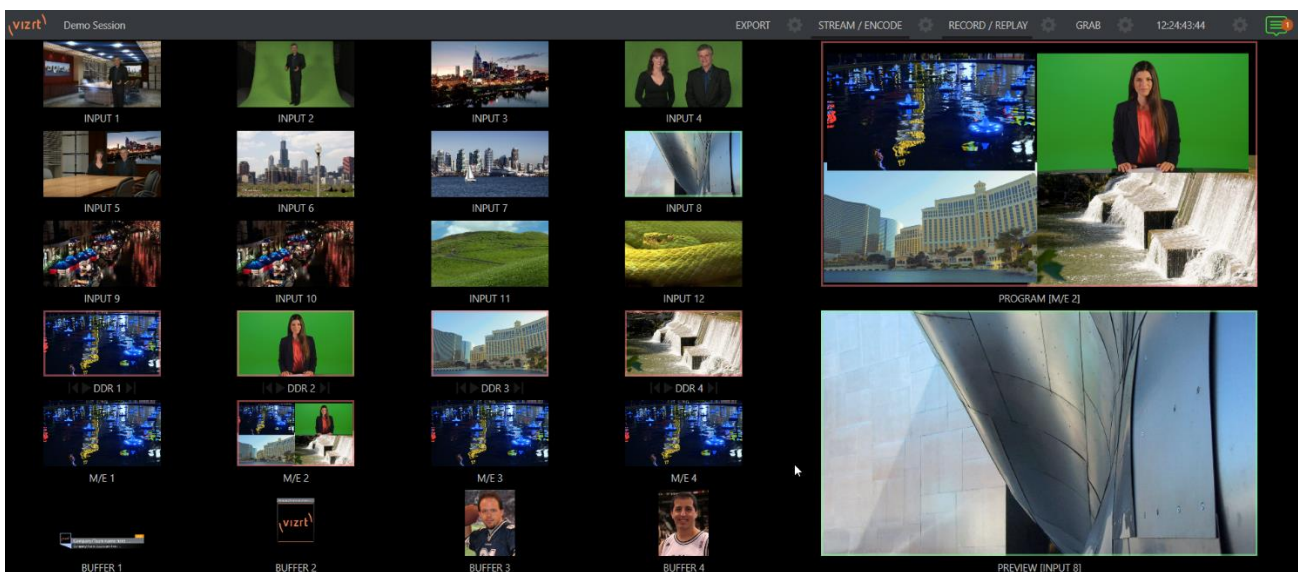
FIGURE 117

11.2   Live Desktop Monitors

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

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

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

11.3   Workspace Presets

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

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

Each viewport in any layout offers diverse input or output source options, as discussed in Scopes 11.4. The settings you select for individual monitors will be retained in the current *Workspace* preset.

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

> *Note: The Display Settings option in the Workspaces menu lets you choose the Resolution of connected monitors, and apply Proc Amp settings to them. Select the native resolution of external display devices for best results. Changing Resolution can cause frames to be dropped, so modifications during live production are discouraged.*
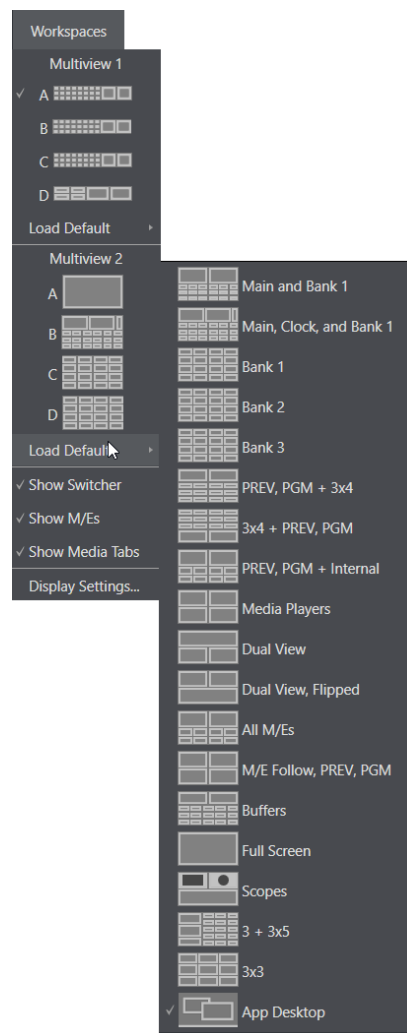
11.4   Scopes
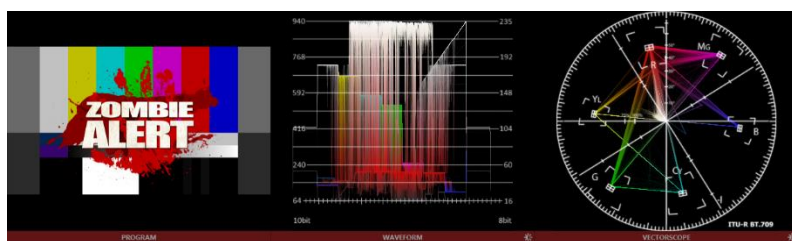
Scopes represent a very useful monitoring option, providing *Waveform* and *Vectorscope* displays. Among other things, these help you to judge *Proc Amp* and *LiveMatte* settings (see Appendix C, Video Calibration).

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

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

11.5 Viewport Options

FIGURE 120

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

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

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

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

Below the basic source selection options in the menu, you'll find another group that provides access to optional *Overlays* for the monitor port. Available overlays include *Checkerboard* (shows a checked pattern wherever transparency exists in the source); *Title Safe* (note this is a 4:3 format safe margin); *4:3 Safe* (a true 4:3 frame edge boundary), *Center Cross* to help with alignment, and *Show Illegal* and *Show Alpha*.

FIGURE 121

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

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

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

11.5.1 Viewport Presets

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

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

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

11.5.2 Configure

One final item completes the monitor viewport options:

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

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

11.6   Viewport Tools

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

FIGURE 123

FIGURE 124

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

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

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

Notice, too, that a snapshot icon appears in the label below most viewports. Click this to quickly grab a still image (images grabbed in this manner will obey the Add grabs to option in the Grab Configuration panel; see 20.3).

The viewports for Media Players (Figure 124) show handy transport control in the label area – from left to right Previous, Play/Stop, and Next. In addition, a progress gauge is shown in the background to show the playhead position and warning colors as playback nears its end.

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

11.7 Program Monitor

The *Program Output* monitor could hardly be more important, hence it's prominent default location at upper-right on the *Live Desktop.*
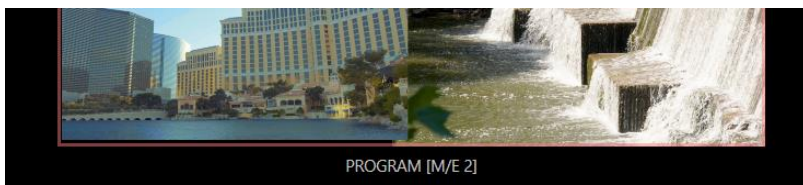
Normally, this viewport shows what the *Switcher* is sending to *Program* output at any moment. The display includes the *BKGD* video layer as well as any other video layers (such as one or more *DSKs,* or *FTB*) displayed above it.

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

11.8 Look Ahead Preview

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

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

- Delegating the BKGD layer indicates you intend the next transition to swap the Program and Preview layers. The Preview monitor will show the Preview row selection as its background.
- When the BKGD is not delegated, that layer will not change during a transition. Consequently, in this case the Preview and Program monitors share identical backgrounds.
- Delegated DSK layers are shown above the background on Preview according to their current state. That is, if a delegated DSK layer is currently displayed on Program output it does not appear on Preview – since the next transition would remove it.

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

M/E Preview and Program

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

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

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

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

12 Media Players & Buffers

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

12.1 Media Players

Vizrt live production system include a bevy of integrated *Media Players*, providing savings, convenience, and opportunities for automation. *Media Player* controls can be accessed in large tabbed panes found in the bottom third of the *Live Desktop*, or from tabs with similar features that appear in the *Input Configuration* panels of *Media Players*.
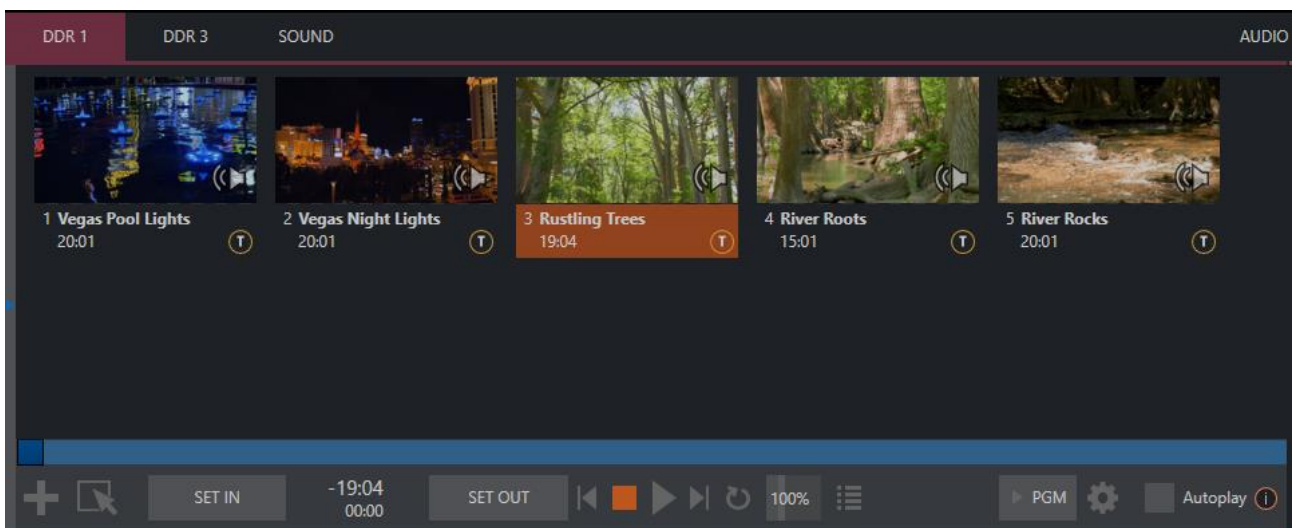
Viz Vectar Plus - Live Production provides *DDRs* (clip players) and/or *GFX* (graphics) players and four *DDRs* in addition to *Sound*).
Media Players can handle numerous media types:

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

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

12.1.1 Playlists

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

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

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

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

Automatic Clip Trimming
Clips (but, for reasons that will become apparent, not still images or titles) in a playlist are automatically trimmed to accommodate the addition of transitions between clips when necessary.
(Otherwise, i.e., if there are no 'un-used' frames to display during a transition, motion will appear 'frozen' during the transition, which is usually undesirable.)
To reset a clip to its full file-length boundaries, press the 'g key (multi-selection is supported, too).

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

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

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

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

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

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

12.1.2 File Operations

- Click the large + (Add Media) button at left beneath the playlist pane to open a custom Media Browser (see Section 12.1.8). Alternatively, double-click in an empty part of the Playlist pane.

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

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

    - Cut
    - Copy
    - Paste
    - Remove
    - Split at Current Frame

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

    - Transcode
    - *Add to Export Media* – see 19.3.
    - *Send to > Buffer n* (Still image and title icons – see 12.3)

- Standard Cut, Copy, Paste and Delete keystrokes are supported for playlist entries.
- Un-playable (missing, corrupt, or unsupported) file icons are dimmed.

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

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

12.1.3 Speed

The playlist context menu item *Speed* permits you to give each clip a custom playback speed. It's important to realize that this *Speed* setting is separate from the Media Player's primary *Speed* control, located in the footer, below the *scrub bar*. The latter setting applies to all playlist items. Both Speed settings are applied during playback. So, for example, if you play a clip with both Speed values set to 50%, the actual playback rate will be just 25%.

12.1.4 Macro Triggers

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

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

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

12.1.5 Transcode

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

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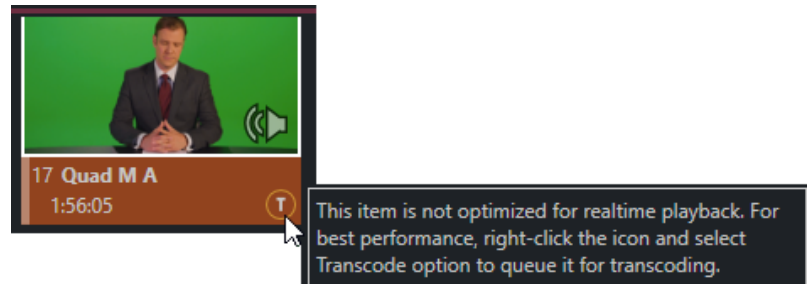
12.1.6 Properties

Display Name

The *Properties panel* allows you to edit the *Display Name* of a file in the playlist. The *Display Name* fields defaults to the filename, but is a local alias, or 'nickname'. Thus, editing the name does not change the name of the file on your hard drive. Roll the mouse over the icon *display name* to see the true filename and its path.

Comment

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

Hint: Both the Display Name and Comment box content for the selected clip are available as DataLink keys, which can in turn be served to live title pages or supplied along with the file to the Publish module.
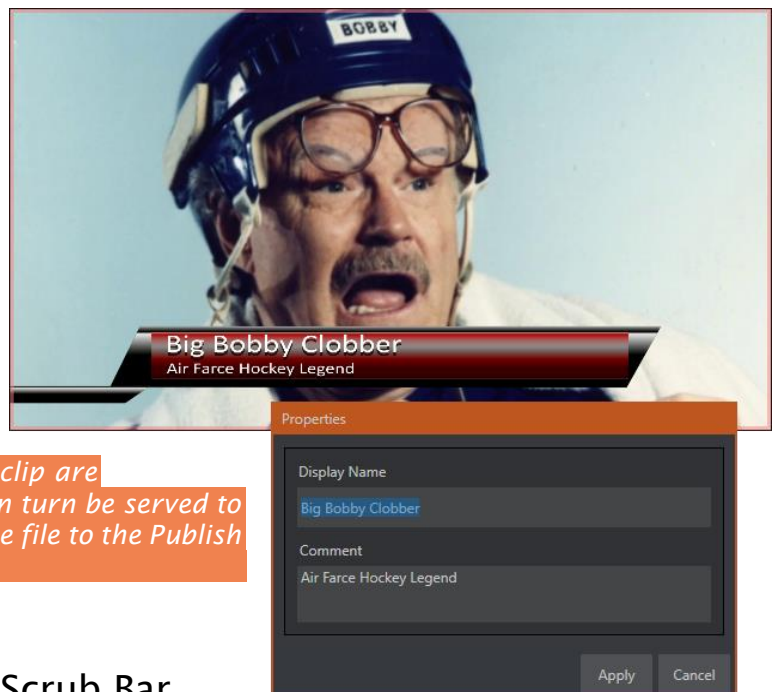
FIGURE 131

12.1.7 Trimming Clips and the Scrub Bar

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

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

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

During playback, the *Scrub-Bar* knob traverses the span between the *In* and *Out Points*. The duration (taking into account trimming operations) is displayed as a countdown in the upper of two timecode fields at left (Figure 132). The lower time display shows embedded clip timecode.

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

It's useful to note that (Quicktime only) clips that are still being captured continue to 'grow' even after addition to a DDR playlist (see Section 12.1.8). These growing clips, featuring the red 'recording' overlay (Figure 133) can be freely extended beyond the bounds of the 'in' and 'out' points they were given when initially added.

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

> **Time-Shifting**
>
> By the way, it's possible to use growing clips to 'time shift' your program:
>
> - Initiate Recording.
> - Add the captured clip to a DDR
> - Press "g" on the keyboard to clear its Out Point.
> - Trim the In Point to taste.
> - Assign the DDR to an output.
> - Wait some length of time and then begin playing the clip.
> - (Of course, all of this could easily be performed by a macro, too.)

ALPHA CHANNEL SUPPORT

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

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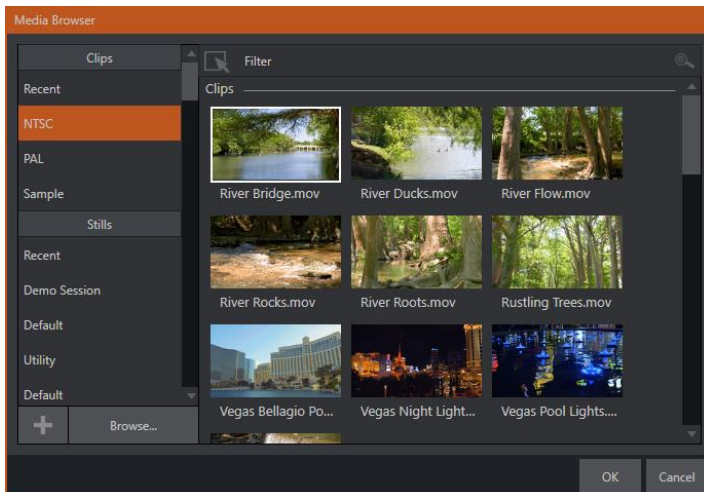
12.1.8   MEDIA BROWSER

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

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

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

Location List

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

Session and Recent Locations

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

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

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

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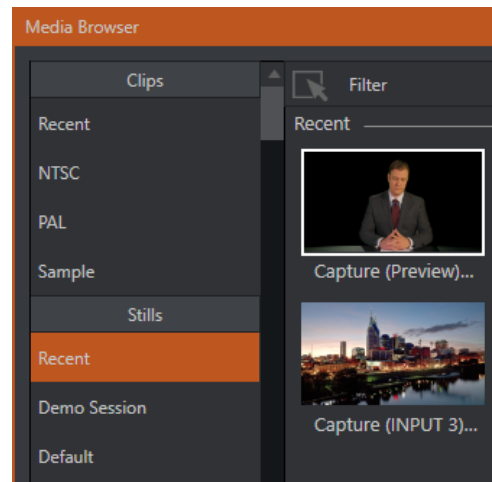
Add Media Location & Browse

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

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

File Pane

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

File Filters

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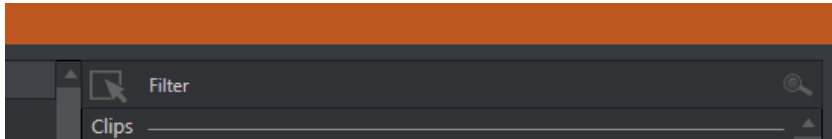
An additional filter appears above the *File Pane* (). This filter quickly locates files matching criteria you enter, doing so even as you type. For example, if you enter "wav" into the filter field, the *File Pane* displays all content at the current location with that string as part of its filename.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

File Context Menu

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

12.1.9   PLAYER CONTROLS

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

FIGURE 136

Time Display

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

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

Playlist Mode
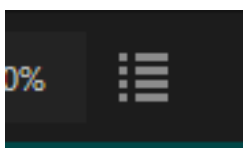
FIGURE 137

Normally, *Media Player* playback *stops* when the *Out Point* of the current playlist item is reached (unless *Loop* is also enabled, in which case playback of the current item repeats until manually interrupted). Clicking the *Playlist* mode button (Figure 137) tells the *Media Player* to operate in continuous play mode, advancing through the playlist items until the last one has played.

Transport Controls

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

- *Previous* button – go to previous playlist entry
- *Stop* (clicking Stop when already stopped goes to the first frame)
- Play
- *Next* button – go to next playlist entry
- (Not shown) – *Double-click* an entry in the playlist pane to begin playback at the start of that playlist entry

Previous, Next and Presentations

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

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

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

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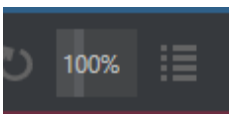
The *DDR* supports variable speed playback between 25% and 400% of the normal rate (100%). Speed can even be adjusted *during* playback.

Note: Certain highly compressed video file formats cannot successfully be played back at rates beyond 200%, even though Speed value is set to a higher value.

As is common for numeric input controls in the interface, drag left or right to adjust the *Speed* value, or click the slider to access a direct entry field allowing you to type a value using the keyboard.

Hint: Press Shift while double-clicking Speed to quickly reset to the 100% default.

Loop

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

Autoplay
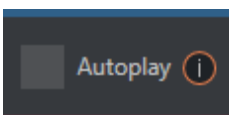
When enabled, the *Autoplay* switch has several important effects. First, it initiates playback automatically when the associated *Media Player* is placed on *Program Out* by a (Switcher) *Take* or *Transition* operation either directly (as a *Switcher* row selection) or *indirectly* – such as by being displayed via an *M/E* channel or *DSK* operation.

Second, if player output is displayed on *Program* the reverse *Switcher* transition occurs automatically as the end of play approaches, whether the *Out Point* of the current item for *Single* play or the end of the playlist. (This behavior is optional for M/Es – see Options in 14.2 and 7.1.1.)

Note: Unlike Switcher transitions, the DSK 'out' effect does not occur automatically as the end of play approaches.

In either case, when the *Media Player* is in standard operating mode (as opposed to *Playlist* mode), the current play position advances to the next item after playback is automatically stopped.

12.1.10   SHOW On (…)

Another extremely powerful feature is nestled beside just to the left of *Autoplay* in the footer of each *Media Player.*
Labeled ▶ PGM by default this feature can target M/Es as well (Figure 141) as the Program row of the main Switcher. It provides unique playback and display abilities that make instant replay a thing of joy, as well as serving other purposes. Click the configuration button (gear) beside the SHOW ON button to display the panel seen in Figure 141.
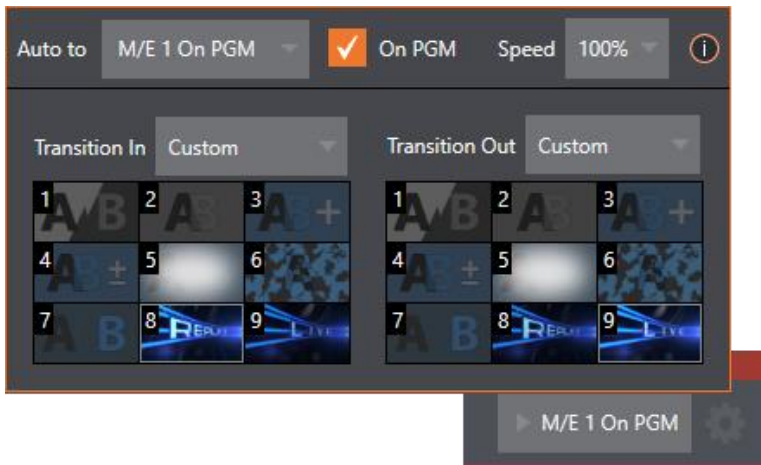
The largest part of this panel contains transition bins for custom *In* and *Out* transitions which will be used to display the current clip. Select *Custom* from the *Transition In/Out* menus to activate these bins. Otherwise, you can select *Cut* or *Current* options.
Note that the bin content displayed is synced with the *Background* transition bin for the target video bus, be it *PGM* or a designated *M/E.*   Selecting *Current* uses the current selection in the *Background* transition bin of the target bus.

> *Hint: Unlike other transition bins, these icons do not show a "+" sign gadget on rolling the mouse over them. To replace the effect in slot, modify the content of the Background transition bin of the target you have selected for SHOW ON.*

Once configured, clicking the *SHOW ON (…)* button will do the following:

- Swap the current BG transition for the main Switcher or a designated M/E for a custom Animation Store (such as "Replay!") or other specified transition.
- Transition the current DDR selection in on the main Switcher's PGM row, or the A row of an M/E.
- Play the clip (overriding the DDR's own Autoplay setting, if necessary).
- Transition back to the original program using a custom transition (such as "Live!) when done
- Swap the Background Transition back to the original selection

> *Hint: Using Replay complementary features, SHOW ON functionality can be triggered by simply adding a clip (with custom length and speed defined in the Replay menu) from any source being captured to a DDR. Thus, a single button click or numberpad key press can trigger all of this.*

M/E on PGM

In a variation on this operation, the *On PGM* switch, which is available whenever the target is an *M/E*, provides a different mode of operation. In this case, the output of the *Media Player* is immediately selected as the top row source of the target *M/E*, and the *M/E* is transitioned in on the main Switcher's *PGM* (Program) row.

This unique feature allows you to use the main *Switcher* to display the *Media Player* output – including instant replays – with *KEY* layers (such as 'scorebugs') composed above it.

12.1.11   MEMs

Another very useful feature of Media Players is the MEM Bin, which provides quick and convenient access to stored playlists. MEM slots also store the state of various Media Player controls.

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

When you change playlists by selecting another *MEM slot*, it's almost as though you are accessing another *Media Player*. Use *MEM slots* for quick access to different categories of content for use during a live presentation, playlists prepared for different clients, or for completely different programs you produce.

 MEM slots can be named and can also display a small representative image (taken from the first entry in the playlist). As you move the mouse over a *MEM slot* icon it expands, providing an enlarged view of that playlist item's first frame.   To populate a new *MEM slot*, simply click a blank icon.

To name a *MEM slot*, right-click it to open a context menu, and select *Rename*. Other menu options include *Delete*, *Export* and *Import* (the file will be saved with the extension '.pst').

Previewing MEM Slots

At times you may wish to preview the contents of a different Media Player *MEM slot* without disrupting playback of the current playlist. When a clip is playing, a small white 'play indicator' is shown over the icon for the currently selected entry in the fly-out *MEM slot bin.*

If you select a different MEM slot while the current clip continues to play, the playlist bin view updates, but the original item continues to play. The transport controls (Play, Stop, etc.) at the bottom of the tab remain *dedicated to the active playlist – that is, the one actually playing, rather than the one currently being previewed in the tab.

To change to the previewed MEM slot immediately – ending playback and display of the current item – you can do so by any of the following means:

- Double-click an icon in the previewed playlist.
- Or press *Stop twice, and then Play (playback of the active item ends with the first Stop command; the second sets the playhead to the start of the current item in the new playlist).

* Normally, pressing *Stop* a second time when a clip is playing resets the playhead to the start frame in the *same clip*. The exception above occurs only when you are previewing the content of a different *MEM slot* during playback.

12.1.12   Network Sharing

Default media file folders (*Clips*, *Stills*, etc.) are maintained for each session. This approach makes it easy to locate items using the *Custom File Browser*, and is also convenient for other file management purposes.

The default media locations for the *active* session can be made accessible across your local network. *Share Media Folders and Buffers* in the *File menu* is on by default, and allows network clients to update media in the active session, even while live. The following session media locations are dynamically shared:

- Audio
- Clips
- Stills
- Titles
- Buffers

Note: Several 'non-session dependent' locations in the main application folder are also shared. This allows applications running on external systems to export directly to the local system. These network shares are unaffected by the Share Media Folders and Buffers setting.

Transferring very large files across a network can time-consuming and impacts both disk access and network resources.

When these resources are already heavily taxed, dropped frames on streaming or video outputs, or sluggish response to controls may result.

We strongly urge you to gather media assets before starting your live productions whenever possible.

When suitable content is added to these shared folders, the *Media Browser* provides immediate access to it. Simply select the session name (under *Clips*, *Stills*, etc.) in the *Location List* at left to reveal the updated files in the *File Pane* at right.
This is wonderfully convenient but should be approached with a measure of common sense. Network bandwidth has fixed limits. Be judicious when transferring large files while 'live'. You may be using the network for many purposes – Including streaming, or NDI video feeds from a 3Play® or other third-party software, as well as any unrelated traffic on the network.

12.2 Title Pages

You can create title pages and graphics in Adobe Photoshop® and display these as images in (for example) as DSK. Loading a PSD file created in Photoshop into a *Media Player* or *Buffer* automatically compiles an *editable* title page (CGXML) file that works just like the *Basic* title pages supplied with Viz Vectar Plus – Live Production. The text remains editable, and embedded images can be marked replaceable too.
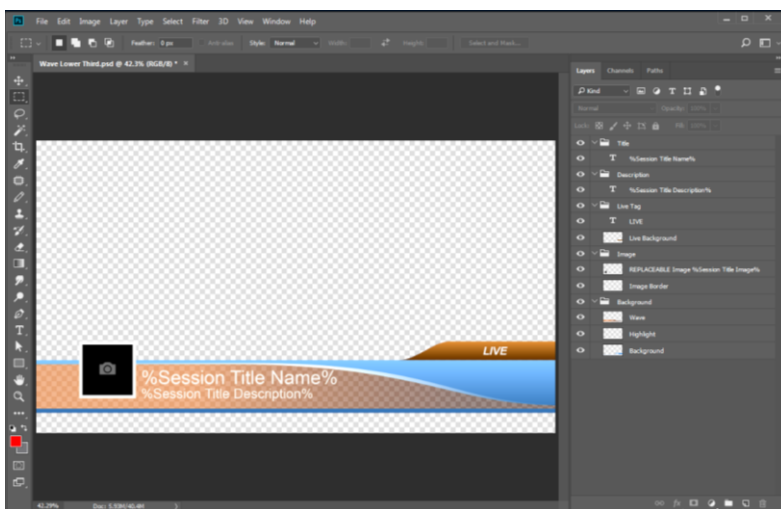
FIGURE 143
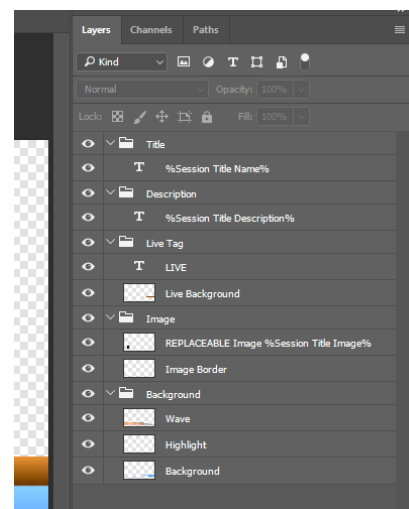
FIGURE 144

To make an image replaceable, add the string "REPLACEABLE" to the layer's label in Photoshop. You can even assign a *DataLink* key to the layer in the same fashion – naming the layer in the format "REPLACEABLE %twitterpic%", for example (without the quotation marks, of course).

A single title page can actually be used to display a whole theme pack of CG elements, and likewise (using *Data Presets*) a single title page can be updated to show individual player statistics for a whole team, and so on – all with a single click.

12.2.1 Editing Title Pages

On mouse-over in a *Media Player* or *Buffer*, title page icons display a *text edit gadget* in their lower-left corner (Figure 145).

Click this button (or select *Edit Title* in the icon context menu) to open the pop-up *Title Page Editor*.

Opening the *Title Page Editor* during playback is permitted, so that *Title Page* content can be edited even during display (changes are detected and shown immediately).
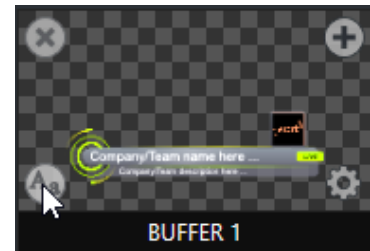
FIGURE 145

> *Hint: The panel can be re-sized by dragging its lower-right corner, and re-positioned by dragging its titlebar.*

When you move the mouse over text in the *Title Page Editor's* preview pane, a white bounding-box appears. If you click once inside the box it turns yellow (Figure 146), indicating the text object is selected, and a text edit field opens.
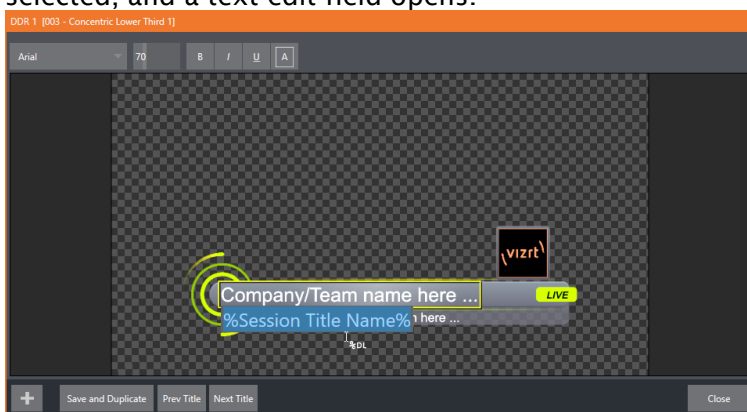
FIGURE 146

> *Hint: When the box is yellow the text can be nudge either a pixel at a time using ALT + the arrow keys or five pixels at a time using SHIFT+ALT+ the arrow keys.*

Press *Enter* or click outside the box to complete editing operations or press *Tab* to advance to next entry field (press *Shift + Tab* instead to jump to the prior text field).

Note that the cursor keys – that is, the left/right and up/down arrows – allow you to navigate between text fields on the current title page. (If the text edit box is open, left/right arrows change the edit point as usual, but up/down closes the edit box, and subsequent cursor key actions move to the next object.)

> *Hint: A red line under a character or word indicates the spell-checker is questioning its spelling. Right click the word to open a menu suggesting alternatives. Click any entries shown if you wish to update the original.*

12.2.2 Header Tools
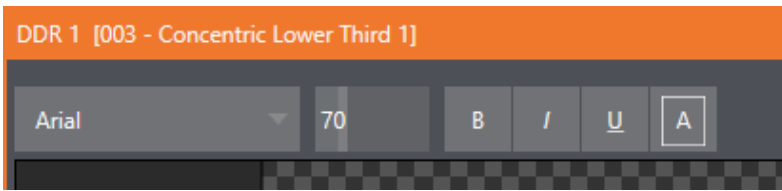
The header of the *Title Page Editor* holds an assortment of text attribute controls. These include a *Font* selector menu, numeric *Size* control, and *Bold*, *Italic*, *Underline* and 'ALLCAPS' switches.

> *Hint: Layer and Data Preset controls may also appear here when editing a title page from a Buffer.*

12.2.3 Footer Tools

You can click *Close* when finished with the current edit, but often you'll find the *Save and Duplicate* feature handy. Click it to store your edits to the current title page, create a clone of item in the playlist, and load the new page for editing. This is a great way to quickly produce a number of matching pages.

> *Hint: Press Ctrl + s on the keyboard to perform this 'save and duplicate' operation without using the mouse. Similarly, PageUp and PageDown keys perform Previous and Next operations.*

The *Prev* and *Next Title* buttons let you store your changes and move to another title page in the playlist without the tedium of closing the *Title Edit* pane.

Stand-in Images

Images embedded in *Title Pages* may be locked, or they may be editable stand-ins. When you roll the mouse over an embedded image and a white border is displayed around the image, the image is a *stand-in*. Click a stand-in to open the *Media Browser* and select a replacement image file (hold Shift while clicking to use the system file explorer instead).
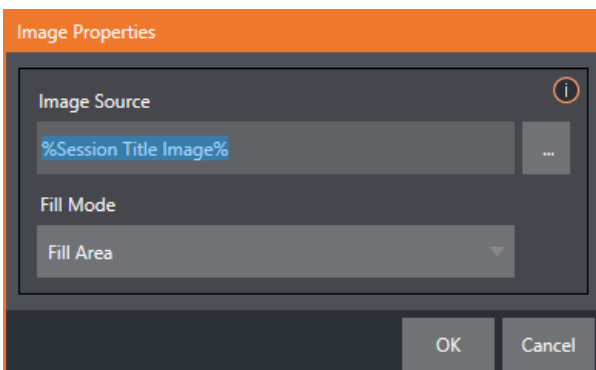
If, instead, you right-click a stand-in image, a context menu lets you select one of several optional methods of fitting the source image to its frame. Choosing *Stretch* causes the image to completely fill the frame. *Fill Area* retains the interested image's original aspect, cropping if necessary, to fit inside the frame.

Show All Image also retains the original image aspect but fits the entire source image inside the frame (which may result in 'pillar-boxing' or 'letter-boxing'). This menu also allows you to open the *Image Properties* panel (Figure 149). It provides the same set of *Fill Mode* options but adds an *Image Source* box supporting direct entry. The *Image Source* box comes into play in connection with the next (extremely important) topic – *DataLink*.

12.2.4 DataLink
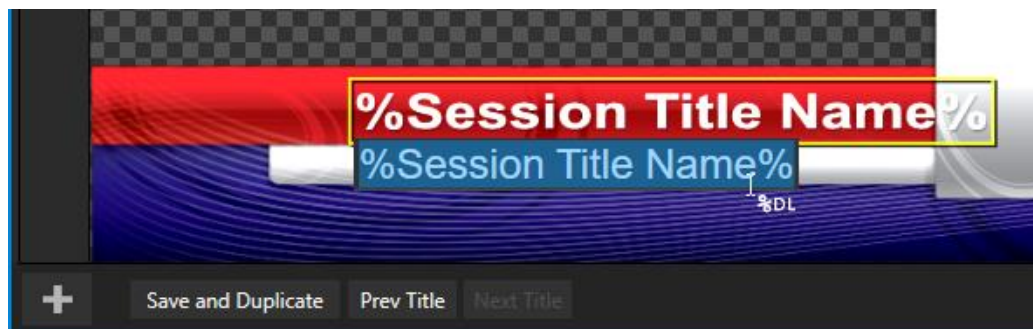
Both text and images on title pages accept *DataLink keys* as input. The Title Editor tells you which entry boxes accept *DataLink* keys by showing a custom %DL mouse pointer, as shown in Figure 150.
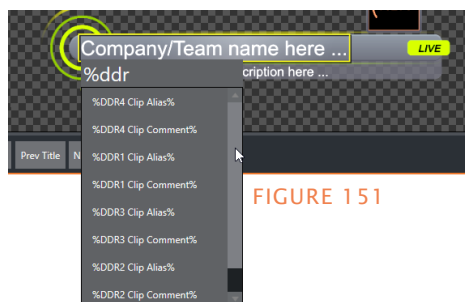
Making key entry even faster and easier to use, all available *DataLink keys* are shown in the drop-down menu as soon as you enter a % sign into an entry box (*key names* are in the format %*key name*%). If you continue typing, the list shown is filtered to show only relevant key names (Figure 151).

A line of text or image on a title page that has been set to a key name will be automatically replaced by the current value assigned to that key when the page is displayed.

There are endless uses for *DataLink*, and many ways to supply and update values assigned to *DataLink keys*.

For just one example, refer to the heading Configure DataLink Keys in Section 5.3.2. And do not fail to take advantage of the power and convenience of the DataLink™ web browser extension, which makes it easy to populate your title pages over the network from a web browser running on virtually any platform.

12.3   Buffers

The system's powerful *Buffer* implementation provides a large number of alternative graphics and animation sources for *M/Es* (including their associated *KEY* channels), the main *Switcher* and its *DSK* channels. *Buffers* are sometimes even more useful than similar imagery supplied from *Media Players*. The tabbed *Buffers* module (Figure 152) shows icons and controls for fifteen *Buffers*.
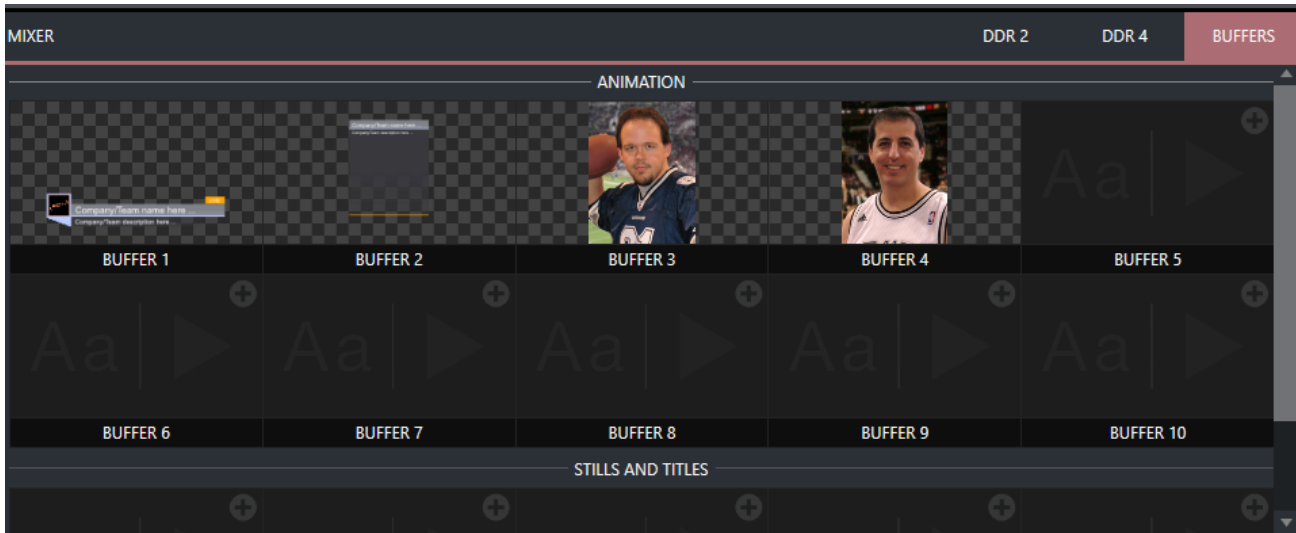
Buffers are retained in *Switcher Memory* for immediate recall and display. Using a buffer for a specific *DSK* or *M/E* channel (rather than a *Media Player*) eliminates the risk of accidentally displaying the wrong graphic, as might otherwise happen if the current *Media Player* item selection was not the one intended.

12.3.1 Buffer Types

Buffers support the following media types:

Animation effects

These are short duration full-motion video effects prepared in your favorite graphics or video applications and compiled into an effect by loading them into a *Buffer*. These effects auto-run on display following a *Take* or *Auto*. Playback runs the effect, and then holds the last frame.
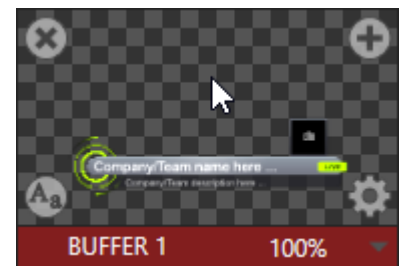
FIGURE 153

Graphics

- *Images* – 24 bit or 32 bit (with embedded alpha channel) images.
- *Title pages* – editable *title pages*, identical to those served up by the various *Media Players*. Layered PSD files will be automatically converted to editable CGXML files with layer visibility support in the Title Editor.

Selection and display of *Buffers* is controlled by buttons on main *Switcher* source rows, *M/E* rows, and similar options in *DSK* and *M/E KEY* source menus. The top ten buffer slots support all animated effect types, titles and graphics, while the remaining five slots support still image files or title pages. The remaining buffer slots are restricted to graphics content, including popular image formats.

12.3.2 Selecting Content

An *Add Media* [+] button appears at upper-right when you move the mouse over a *Buffer* icon. Click this to display the *Media Browser*, and then pick a suitable file to populate that *Buffer*. Alternatively, drag an item from a Media Player onto a Buffer slot.

Or, right-click a still image or title page icon in a *Media Player* and choose *Send to* from the context menu (select a specific buffer slot using the hierarchical menu). Note that, this *Media Player* menu item only appears for *still image* formats and *title pages*.

> *Note: Generally, Buffers are linked to the original source file on disk. Having added a file to a buffer using the "Send to (Buffer x)" menu, the item can be removed from the Media Player. The buffer link will only fail if the original file is moved or deleted from the hard drive, with one exception: editable title page buffers are fully independent of their original source files.*

12.3.3 Buffers Menu

Right-click a thumbnail icon in the *Buffers* pane to open a menu offering two items:
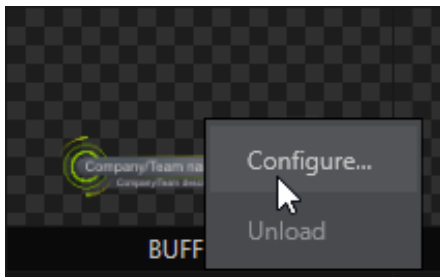
- Configure opens the standard configuration options, including cropping, color processing, and even LiveMatte keying.

- The Unload option clears the effect, freeing Switcher Memory reserved for effects.

When the mouse pointer is over a *Buffer* icon, the small [x] gadget shown the upper-left corner provides another method of unloading an effect. Likewise, the *Configuration* (gear) icon that appears at lower right opens the *Input Configuration* panel for the *Buffer*.

12.3.4 Buffer Watch Folders

If you wish, you can share the *Frame Buffer* folder, which contains any *still images* used in *Buffers*, across a network. The *Share Media Folders and Buffers* is easily enabled even during a live production using the *File* menu at the left-hand end of the *Dashboard*.
The files which serve individual *still image* buffers are located in clearly named sub-folders of the *Frame Buffer* folder for each session. These folders are arranged as follows:
Sessiondrive:\Sessions*sessionname*\Frame Buffer\Buffer (#)
e.g., D:\Sessions\MySession\Frame Buffer\Buffer 3
The *Frame Buffer* folder for the current session is accessible on the network when sharing is enabled. This allows *still image* buffers to be updated across a network using suitable graphics application (such as Photoshop®).

> *Note: This special share name assignment is dynamic. Network sharing is activated, and the current Buffer path is automatically updated whenever you enter a session with the option enabled. This ensures that applications on networked systems can remotely access and update buffer graphics for the current production session.*

The *Frame Buffer* folder is a "watch folder". When you save an image for a given buffer, the buffer updates even if it is currently displayed, allowing you to refresh overlays instantly across the network.

- Still image Buffers are normally stored using the popular 32 bit PNG (Portable Network Graphics) format, but other formats are also supported.
- Specific filenames are not important in the buffer workflow. Actually, multiple media files with different names can reside in buffer folders.
- The Buffer always shows the 'newest' file – that is, the one with the most recent modification date.

12.3.5 Using Buffers

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

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

- Main Switcher
- *Program/Preview*) rows – all 15 buffers are directly accessible in the *Switcher*
- *DSK* channels – choose a specific *buffer* using the *DSK's* drop-down source menu.
- M/E banks
- Select a *Buffer* on an *M/E* row just as you would for the main *Switcher*.
- *KEY* channels – choose a *buffer* for any *KEY* channel using its drop-down source menu.

Buffers allow abundant use of animation throughout your productions – as layered graphics overlays, etc., all without tying up precious *Media Players*. (Consider that in addition to the *Buffer* cross-points in the main *Switcher*, *M/Es* also support *Buffers*. Given that M/Es are re-entrant, layering possibilities are nearly endless.

12.3.6 Keying, Proc Amps and More

It's worth noting that you can apply *LiveMatte, Proc Amp* and *Edge* (cropping and feathering, when supported) settings to individual *Buffers* by opening its *Input Configuration* panel. Of course, you can also apply *Position* settings, including *Rotation* and *Scale,* in *DSK, M/E* and *KEY* channels.

12.3.7 Buffer Presets
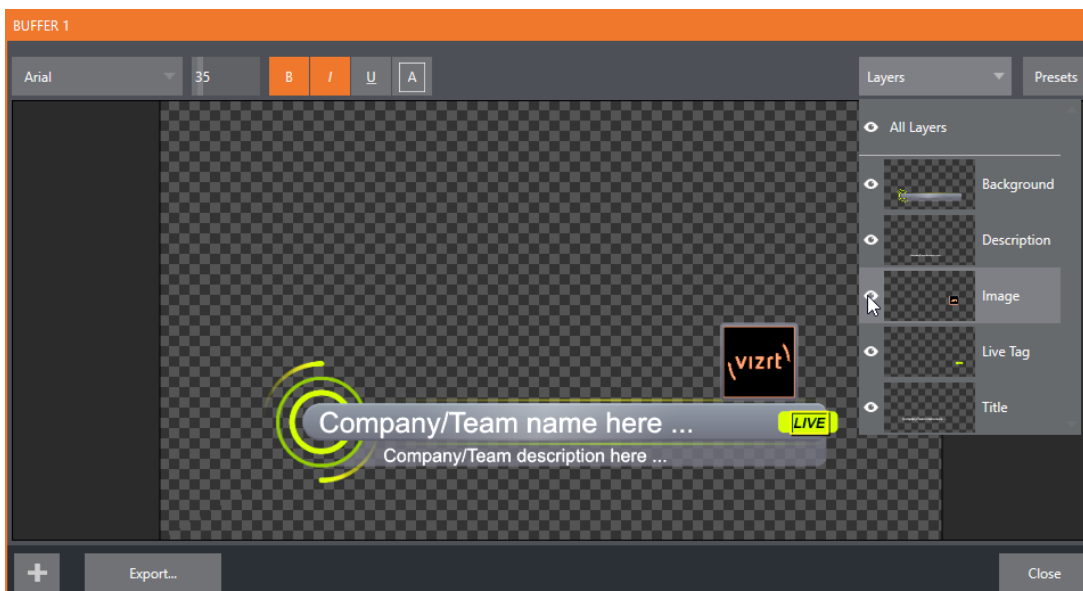
FIGURE 155
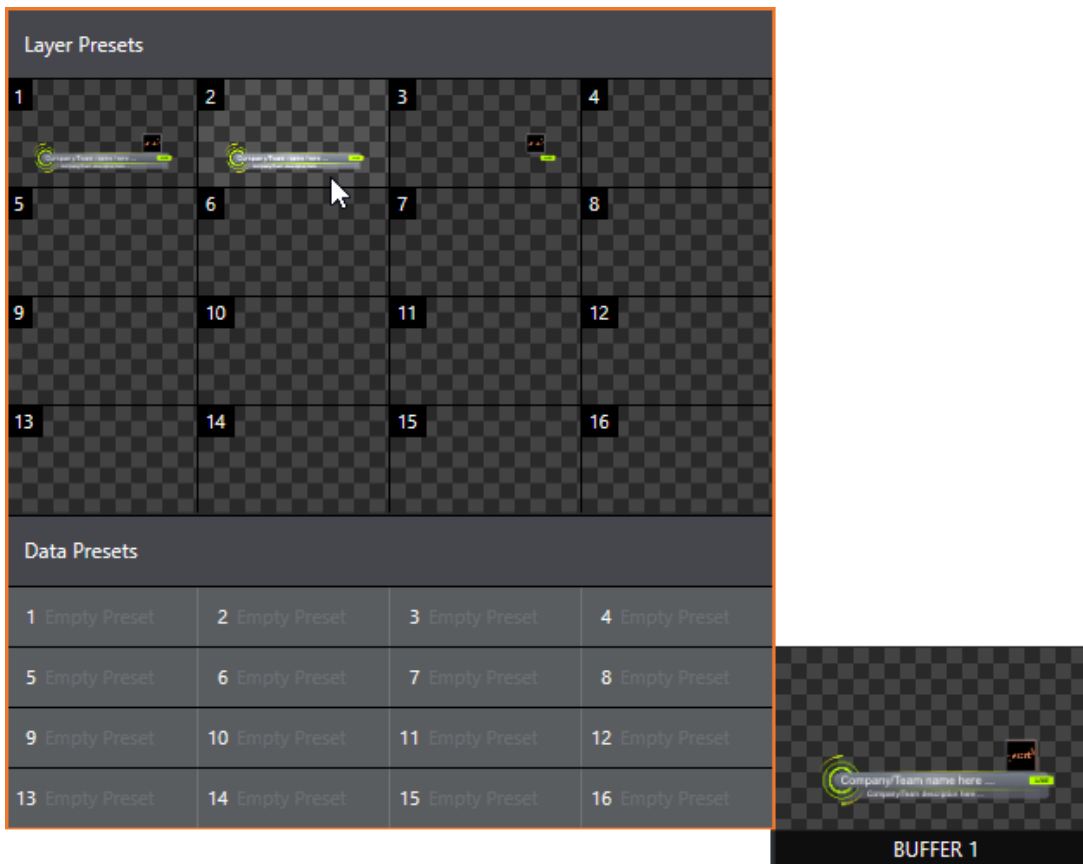
When a standard page is loaded into a *Buffer*, clicking its thumbnail icon reveals a list of *Data Preset* slots. Each preset stores the text data and (replaceable) image content link for the title page. A single click recalls a complete data set and immediately updates the page.

This is incredibly useful, of course, because you can (for example) store the names, player numbers, images and the like for the members of a sports team and recall these immediately with a click (or by executing a macro). And because the text values can include DataLink™ key names, it's even possible for statistics on a title page for a given player to be updated in real-time from external sources or text, xml or CSV files in a watch folder.

13 PTZ Control

Once primarily used in security applications, robotic or 'PTZ' (pan, tilt, zoom) cameras are appearing on the production scene in ever increasing numbers. The PTZ implementation makes it easy to operate multiple (supported) cameras from the Live Desktop or a control surface.

Any external *Switcher* input can be configured as a PTZ cam, controlled directly from the *Live Desktop* or using a control surface. In addition to pan, tilt and zoom control, you can control *White Balance* settings, *Focus*, *Iris* (or 'brightness'), and *Animation Speed* ('travel speed') settings for your PTZ cameras.   A convenient and very visual *PTZ preset* system is included, too, allowing you to 'lock in' your shots and access them quickly.

13.1   Input Configuration, PTZ Tab

All of the controls and features just mentioned are located in the *Input Configuration* panel, specifically its first tab, which is labeled simply *Input* (Figure 157 and Figure 158).

13.1.1 Connecting
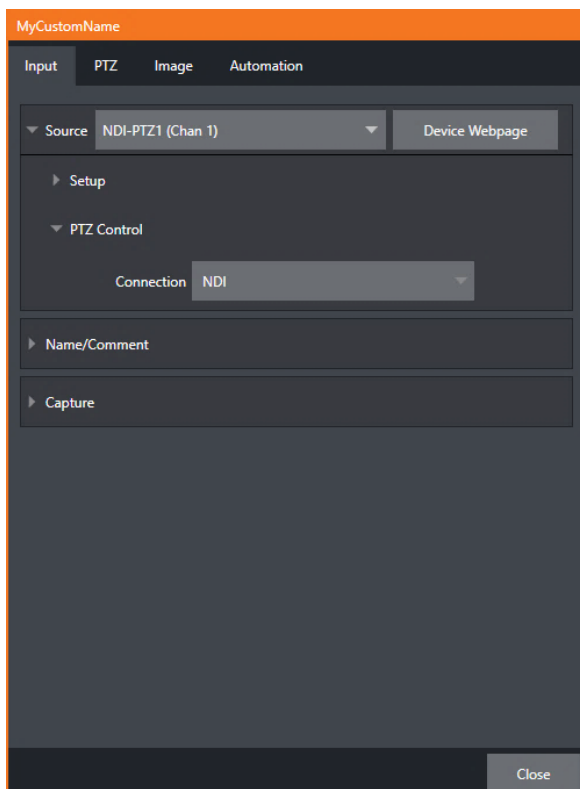
FIGURE 157
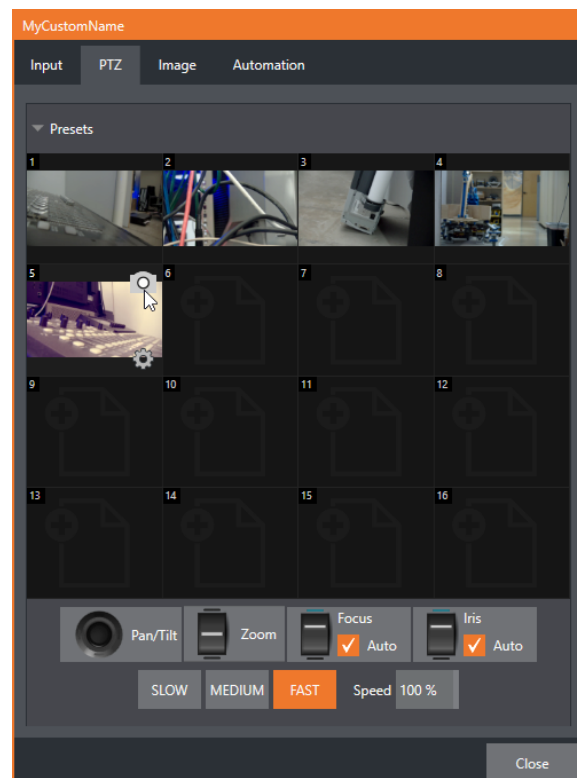
FIGURE 158

A few steps are required before you can control a PTZ camera.

1. First, connect the camera's output to a Switcher input – see 8.1.
2. Next you must configure the control connection to the camera by selecting its type.
   - Since the default *Connection* type in this group is *NDI*, you can skip this step for an NDI camera, which eliminates all of the settings you would otherwise need to configure.
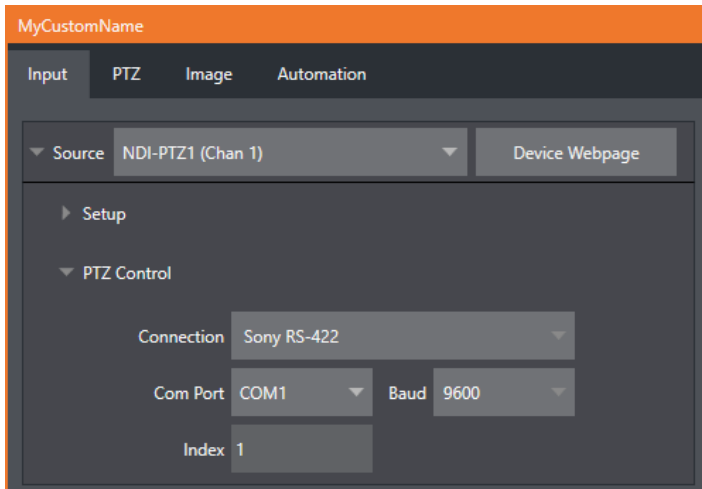
FIGURE 159

For non-*NDI* sources, use the *Connection* menu to choose the correct PTZ protocol for your device, and continue to enter other data as required for that protocol.

Having performed these steps, you are ready to expand and use the *PTZ Presets* control group in the same panel, discussed next.

13.1.2 PTZ Operations

In this group, a set of manual *Pan/Tilt, Zoom, Focus* and *Iris* controls sits just beneath a large *PTZ Preset* bin. Drag the mouse on these controls to make manual adjustments.

Speed controls, including *SLOW*, *MEDIUM* and *FAST* presets along with a numeric speed control allow you to modify the speed with which presets are applied.

Options
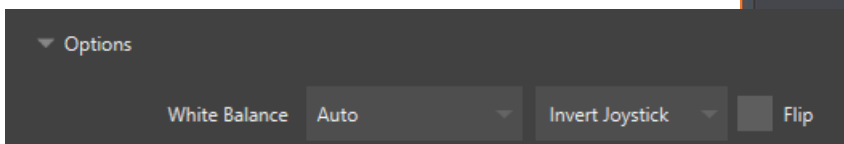
FIGURE 160

FIGURE 161

Expand the *Options* control below the PTZ speed group to access *White Balance* options (which may vary based on the camera model connected) and an Invert menu that lets you reverse the effect of joystick operations.
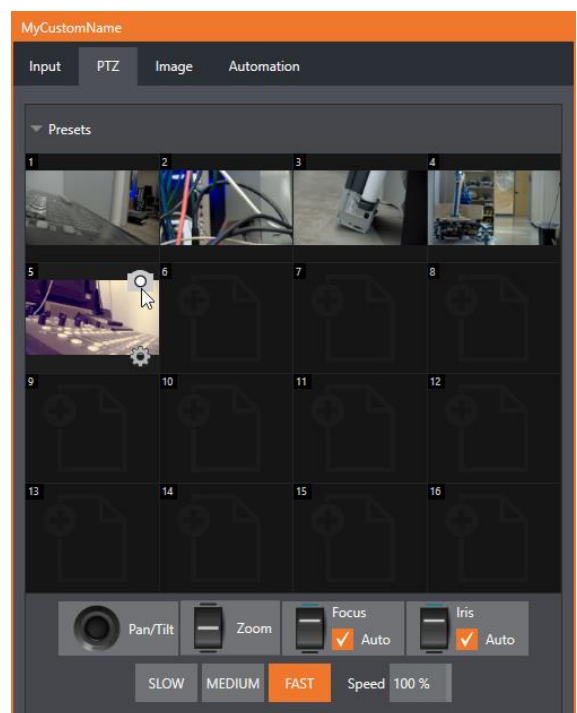
13.1.3 Presets

The *Preset Bin* shows sixteen thumbnail icons for the currently *PTZ camera.*
Click a preset to select it, and the camera automatically begins moving to
the new position.
To configure and store a preset:
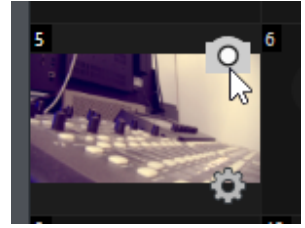
1. Use the Position, Zoom and Focus controls mentioned in the previous section to navigate to the desired camera angle, etc.
2. Then move the mouse over the preset icon you wish to store (or update), and click the Snapshot (camera) gadget that pops up at upper-right corner of the icon.

Hint: Hold Shift when clicking the Snapshot icon to update the representative thumbnail image without modifying the preset already stored in that slot.

3. (Optional) Click the Configuration gadget (gear) to open a Properties dialog that lets you assign a different Alias and Comment to each preset. (These entries also provide values for DataLink keys that can be used in the usual ways.)

Hint: See also Section 11.5.1, Viewport Presets, to learn how to display and use presets in your multiviews.

13.1.4 PTZ and the Control Surface

Pan, tilt, zoom control, and preset selection for connected robotic cameras are also directly supported on some Vizrt control surfaces. See Chapter 21 for details.

13.2   LiveMatte

Although its controls are deceptively simple, the LiveMatte™ feature employs powerful chromakeying technology capable of extremely high-quality results. Used alone or in conjunction with DSKs and M/E Overlays, you will find LiveMatte can play a 'key' role in your live productions.

As we mentioned earlier, chromakeying – or simply "keying" – is used to combine images by eliminating a portion of a foreground image (effectively cutting a digital 'keyhole' in it) to reveal another background.

FIGURE 163

LiveMatte™ controls are located in an expandable group in the *Image* tab of the *Input Configuration* panel for each *Switcher* source. To access them, click the *Configure* button (gear) that appears above an onscreen monitor in the *All Monitors* tab.
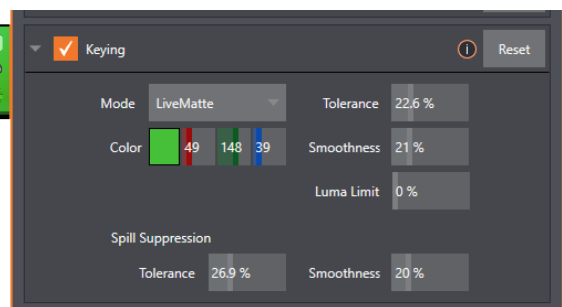
The method by which part of the image is defined as transparent is generically referred to as chromakeying, for its dependence on the color values (chrominance) of the video stream. (LiveMatte's mature algorithms far exceed typical chromakeying techniques to provide real-time results, but for our discussion it's not necessary to get into all of the details; suffice to say it works very well, and is easy to configure.)

Hint: Crop controls in the Input Settings tab can serve as a 'garbage matte' tool for chromakey sources.

13.3   Understanding Keying

Chromakeying has become an essential tool in video and film production. Typically, foreground footage is shot in front of a blue or green screen, and then that background color – the *key* color – is treated as transparent, allowing another image to be inserted. For example, when you see a tv meteorologist in front of a weather map, that person is almost certainly posed in front of a green screen. The background is 'keyed out', to be replaced by computer generated imagery.

FIGURE 164

Of course, if you choose poor settings, foreground areas may inadvertently be cut away as well. Or, some areas that should be transparent may be only partially keyed. Good keying often requires judicious balance between 'too much' and 'too little'. Let's consider the tools provided to help you achieve a great result.

13.4 Matte

The term *Matte* refers to a black and white representation defining the transparent (background) and opaque (foreground) parts of an image during compositing.
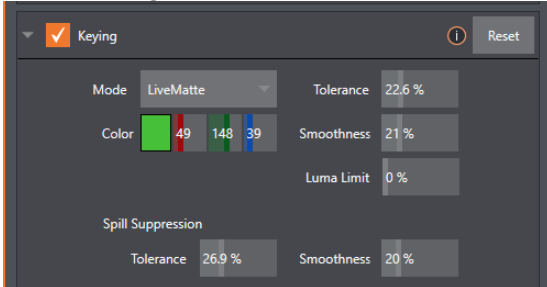
FIGURE 165

FIGURE 166

Portions of the matte that are grey are treated as semi-transparent, which is very useful in progressively smoothing edges between foreground source material and inserted background imagery.

LiveMatte supplies a digital version of this traditional tool. As you would expect, controls in this group allow you to define and adjust the matte for the corresponding video input.

13.4.1 Color

Initially, *LiveMatte* removes a specific color from the foreground image. This color is chosen using the *Color* button. To choose this key color, click on the *Color* sample box and keep the mouse button depressed. Drag the *eyedropper* tool over one of the video monitors to choose the color you wish to *remove* and then release it. The neighboring 'color well' is updated to show the color selected.

> Hint: Enable the Lumakey switch to disregard hue and base the effect solely on luminance.

13.4.2 Tolerance

No physical greenscreen is *perfectly* comprised of one color. Wrinkles, folds and shadows along with the seemingly inevitable uneven lighting result in difference. For this reason, *LiveMatte* supplies a numeric slider labeled *Tolerance j*ust beneath the *Color* picker.
The *Tolerance* setting allows you to broaden the range considered as the key color, including more 'near-neighbor' colors to be included in the matte. A low tolerance removes only color values close to the primary or key color. As you raise the tolerance, you extend the range of values on either side of the primary color that will be treated as transparent. This allows you to deal with those imperfections we mentioned.
On the other hand, it may be that there is (usually unplanned for) detail in the foreground that is somewhat similar to the key color. Reducing *Tolerance* may allow you to prevent unwanted holes appearing when the subject opts to wear his St. Patrick's Day tie.

13.4.3 Smoothness

Smoothness defines a further tolerance factor, and a very useful one. We want our keyed foreground to blend smoothly into the background – rather than to stand out in hard relief like a postage stamp or decal. *Smoothness* serves this purpose, by defining a falloff zone of partial transparency. Don't overdo it though, as aggressive settings can cause the foreground to become unnecessarily 'muddy'.

13.4.4 Luma Limit

When working with poorly-lit backgrounds (or poor-quality footage), the color *Tolerance* range separating the foreground (talent) from the background can be extremely narrow.
This problem can be aggravated by the subject's choice of clothing, or when there are harsh shadows. There is often a strong chroma component (and associated chroma noise) in dark foreground areas. The 'noise' may be partially or completely transparent when tolerances are critical. Because the noise varies over time, 'holes' in the foreground can result, and even worse these may flicker on and off from one frame to another.
LiveMatte's *Luma Limit* control makes it possible to overcome this issue. In essence, it restricts the chromakey operation based on luminance (brightness) values. Dark foreground areas which typically cause the problems just described normally have quite different luminance values from the background color, which is usually brightly illuminated. In simplest terms, problem areas of this type can be decisively 'pulled' back into the foreground by pre-filtering the chromakey effect around a luminance threshold.
Generally, try to set up the best key you can *before* raising the *Luma Limit* from its default value of zero (no effect). Then gradually raise the limit until you are pleased with the result.

13.5   Spill Suppression

The term 'Spill' refers to key color unintentionally reflected or 'spilled' onto the foreground subject. For example, a little green spill often appears on the shoulders of someone in a greenscreen shot.
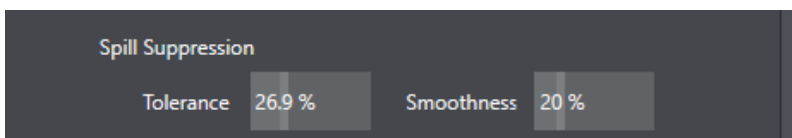
The *Spill Suppression* controls let you remove key color spill in your scene by reducing the amount of that color in the foreground, where it doesn't belong. The net result is that the impression of spill color is eliminated, or at least reduced to the point where it is not objectionable.
Use the *Tolerance* and *Smoothness* controls under *Spill Suppression* in similar fashion to the controls by the same name discussed earlier. Endeavor to subdue spill without *overdoing* it, which could result in an unsightly gray fringe around offending edges of your foreground.

13.6   Compositing

When you enable (and configure) *LiveMatte* for an input, the onscreen monitor for that input shows the source keyed over a checkerboard pattern (when the Checkerboard option is selected in *Overlays* for the monitor.)
If you select the (*LiveMatte*-enabled) input as *Input A* in an *M/E* tab in *LiveMatte mode*, the keyed source is overlaid on sources in lower input rows. You will see the composite result when the output is assigned to either the *PGM* or *Preview* row.

13.7   Fine Tuning

You'll find *LiveMatte* easy to configure with a little experimentation – but a few handy workflow tips follow below.
You may find it useful initially to turn *Smoothness* off or nearly so. Likewise begin with a low value for *Tolerance* – perhaps just 5-10, or so. Put the video source on *Preview* or *Program Output* before you do so, to provide a larger view to help you assess your settings.

Pick your primary *Color*, but – before releasing the mouse button – slide the eyedropper around to different parts the background. Watch the monitor as you do so to see how the area of transparency is affected by different Color choices. Release the mouse when you find the color that produces maximum results. It's often preferable to pick an 'average' color from a location fairly close to the boundary between the background and foreground regions.

Now you can start to ramp up *Tolerance.* Bring it up slowly until most of the background color has been eliminated, cutting away most of the background to within a few pixels of the foreground/background boundary. Now raise *Smoothness* to fine tune that edge region, and you're nearly done.

Before considering your settings final, make sure to test the result using a moving source. This will sometimes reveal that overly aggressive settings cause small 'blocks' of pixels in the edge region to appear to snap on and off during motion - as they either qualify or disqualify for inclusion in the resulting matte. (A little reduction in *Tolerance* and increase in *Smoothness* will usually resolve this problem.)

> Hint: It can be useful to zoom in using Position controls when fine tuning LiveMatte.

13.8   Lighting for LiveMatte

We'd like to offer a few suggestions here to guide you in preparing your set. The single most important aspect of 'pulling a clean key' is lighting. The lighting should be even and diffuse. Bright 'hotspots' and shadows create different shades on the wall, and overexposed areas lack sufficient color for clean keying. (It is not how *much* light you have on the key wall, but how *evenly lit* that wall is.) Naturally, you want to keep your green (or blue) screen clean and free of wrinkles, ripples, folds, tears, or other blemishes, as well.

Second, the distance from your talent to the screen behind can make a profound difference in key quality. When the subject stands too close to the key colored background, the key color reflects back onto the subject, creating a green or blue fringe that is difficult to remove. If you have available space, move your subject farther away from the wall.

When good distance is out of the question, you can improve things somewhat by placing lights above and behind the talent, lighting them from behind with a complimentary color filter over the light to 'cancel out' unwanted reflection (for green use a magenta filter; for blue, orange or amber. Don't overdo back (or top) lighting, however. The limited dynamic range of the camera means there will be little useful color data in badly over-exposed highlights. This can make it next to impossible to separate fringe zones (such as hair detail) from the background (especially when this is also overexposed).

13.9   Crop Source
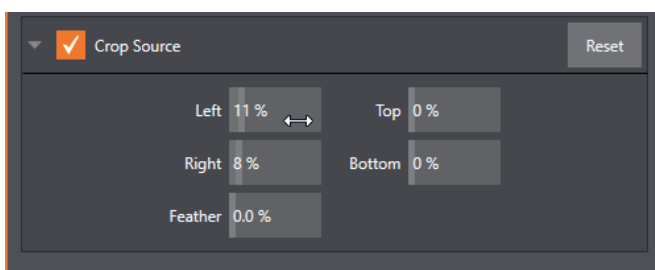
FIGURE 168

We discussed this feature back in Section 0, but wanted to bring it up again in our discussion of *LiveMatte.* It is common for unwanted items to remain after chromakeying.

Common examples include audio sources or lighting fixtures dangling from above, or perhaps a harsh crease, blemish or tear in the background screen. *Crop Source*, located in the *Image* tab just below *LiveMatte*, can serve as a 'garbage matte' to remove this sort of intrusion.

14 Mix/Effect (M/E) Tools

M/E banks provide truly awesome production power and convenience. Pre-configure multi-layered compositions and switch them as easily as you would to any single input, or use an M/E to control a special purpose sub-mix.

We introduced *M/Es* (Mix/Effect banks) way back in Section 2.2.8, but it's time for us to look at these extremely powerful tools in greater depth.

14.1 Overview

The *Mix Effects*, labeled *M/E 1, 2* and so on, sit just above the main *Switcher* on the *Live Desktop*. Click an *M/E* tab (label) to expand or collapse the corresponding *M/E.* When expanded, *M/Es* occupy the area of the *Live Desktop* between the monitors and the main *Switcher*.

*M/E*s are presented individually in tabbed panes, each corresponding to a button in the main *Switcher*. Eight *M/Es* are available to fulfill your diverse requirements.

As you would expect, selecting an *M/E* button on the (main *Switcher*) *Program* row displays the output from the corresponding *M/E* on *Program Output*. Likewise, punching an *M/E button* on the *Preview* row cues up that *M/E* bank's output for an upcoming *Take* or *Auto* operation. This makes it easy to *Take* or *Auto* directly to, from, or even between *M/Es* with a single click.
The Program (PGM) feed can be re-entered into any M/E bus which offers easy versioning of live content. The main PGM feed can be re-used for other outputs where content can be added and modified to adapt stories with graphics, cropping, aspect ratio, and more. This is an exceptionally powerful feature, and one offering endless creative possibilities.

> *Note: Self-referential reentrancy (i.e., re-assigning a given M/E as one of its own sources) is not supported. However, you can often mimic effects of this sort by using multiple channels in another M/E.*

14.2 M/E Modes

At first glance, an *M/E* panel in its default operating mode ('mix', or transition) is scarcely distinguishable from the main *Switcher*. However, each *M/E* actually present two *different* operating modes:

Mix (the default mode): A secondary switcher layout, with controls and options that are very similar to the main *Switcher*.

- Effect mode: The M/E is configured for compositing or utility effects.

The *M/E* mode is automatically established based on the type of effect you load as its *Background* effect. Effect selection is done in the usual way using the *Media Browser*.
Click the + sign gadget that appears at upper right when the mouse is over the thumbnail icon for the *Background* effect.

For the most part, you will initially see very little difference in the *M/E* panel when you change modes.

- In either mode, source button rows labeled A through (B or D) are arranged at left.
- The number of layers shown varies according the effect selection you make, from two effect layers to four.
- At right are four KEY control groups. In most respects these are identical in appearance and practice to the DSK controls located in the main Switcher.
- Even the central control group mimics the main Switcher, with its Transition controls and options, T-bar and so on.
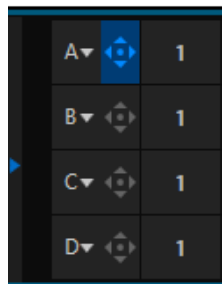
Autoplay and the M/E
One notable point regarding an *M/E* in *Mix* mode and the main *Switcher* involves the *Autoplay* feature (see Section 12.1.9).
To avoid undesirable consequences for *Media Player* content aired on the all-important main *Program* output, *M/E's* in *Mix* mode trigger *Autoplay* operations within the same *M/E* only.
As well, a switch in the Dashboard *Options menu* toggles *AutoPlay*'s triggering of '*Auto* out' transitions.

14.2.1 Mix Mode

Really, an *M/E* in *Mix* mode *is* a switcher:

- Input rows labeled A and B behave just like the main Switcher's Program and Preview rows
- Transition controls work in the usual manner
- KEY channels stand-in for DSKs and behave similarly
- M/E output can be routed to primary outputs and Record module

14.2.2 Effect Mode
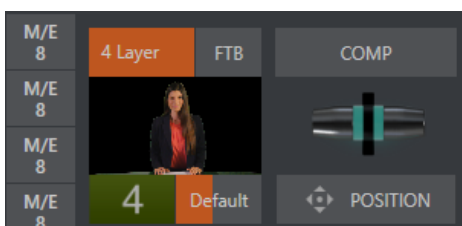
Even casual scrutiny reveals some (outwardly) subtle differences in the *M/E* control configuration when a *LiveSet* is loaded as the *Background* effect selection (Figure 172), as follows:

- The Take/Auto buttons located beneath the T-bar and Transition icon are replaced by a Position button.
- As required, as many as 4 input rows (A, B, C, and D) may be shown in Effect mode.
- Positioner controls may appear for these input layers.

Let's consider the reasons behind these changes in the interface. An *M/E* in *Effect* mode allows preparation of a composite of two or more video sources, whether for direct output, or as a source for the main *Switcher*, or as an input for other downstream channels (including other *M/E*s). Even in *Mix* mode, an *M/E* provides access to effects – including *Position* and transition effects and animating *KEY* layers via the *Comps* feature. In *Effect* mode, however, an *M/E* asserts its real-time compositing and effects prowess more aggressively.

14.3   The T-Bar

In a mix effect, the *T-Bar* and associated controls match the main *Switcher*. The drop-down *Duration* menu in the footer of the pop-up effect bin offers several convenient presets.
It's different in an M/E displaying a compositing effect (such as the Default>4 Layer effect), however. In this mode, dragging the *T-bar* vertically adjusts the virtual 'camera distance' for the active effect between 100% and 400%. (Timing controls for 'virtual camera move' are located in the footer of the *Comp* bin.)

> Hint: The maximum duration for an animated zoom is 30 seconds.

14.4   Input Position Controls

Position controls for all appear to the left of all input rows. Click this button to open the input's *Position* panel. These controls replicate those discussed previously, under the sub-heading DSK Controls in Section 10.7.2.

14.5   Default Effects

As mentioned, in *Effect* mode an M/E may support up to four input layers. The *M/E* doesn't *transition* between *A* and *B* in *Effect* mode. Instead, effects of various types are applied to the selected video inputs.
Let's consider the effects in the *Default* group as examples:
Click the + sign shown when you move the mouse to the effect icon located beside the effect duration. This opens the *Media Browser*. Select the effect group labeled *Default* under the *LiveSet* location at left. With the exception of *Advanced Tracking* effects, these effects are straightforward compositing effects involving multiple video layers. *Effect* output (i.e., the *background* prior to *KEY* overlays) is the sum of all input layers.
If the source assigned to input *A* is fully opaque, any content in the layers below is hidden. When input *A* is at partially transparent, the source assigned to input *B* is blended into the *M/E* background layer, and so on.

The output of active *KEY* layers is then added to the effect output before passing the combined result onward as the final *M/E* output.

Advanced Tracker

As we mentioned, effects can be 'simple' compositing effects, like most of the *Default* group, or more advanced. The latter can vary widely, from relatively simple utility effects to image processing and advanced compositing effects.
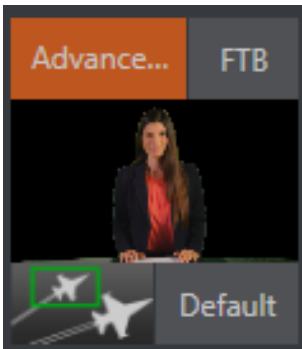
FIGURE 174

For example, we mentioned that one member of the Default group is unique.
The *Advanced Tracking* effect takes three video sources to produce a result that would otherwise require the use of an additional *M/E*.
Set up this effect as follows:

1. Click the label above the Effect icon and use the Media Browser to select the Advanced Tracker effect from the Default group.
2. Add the clip named Tracking Example.mov from the (NTSC or PAL)>Tracking file group to the playlist for DDR 1.

o Enable Loop mode for DDR 1.
o Add the clip named "River Bridge.mov" (or another clip you like better) to DDR 2, set it to Loop as well.
o Add an attractive full frame graphic to the DDR 3 player.
o Select M/E 1 on the main Switcher's Program row, to make it easy to view the result of the following steps.
o In the M/E 1 tab, select DDR 1 on the input A row.
o Select DDR 2 as input B.
o Select DDR 3 as input C.
o Double-click the monitor for DDR 1 to open its Input Configuration panel.
o Continue to configure both LiveMatte and the Tracker for the video clip in DDR 1:
o In the LiveMatte tab, click Reset to update the keyer settings to their defaults, and enable the LiveMatte switch at upper-left.
o Use the Scrub bar under the playlist in DDR 1 to advance through the clip until the colored card is visible in the frame.
o Switch to the Automation tab, and expand the Tracker control group.
o Click the Color picker (eyedropper) keep the mouse button held down, and drag the pointer over the color card and release to assign that color to the Tracker for DDR 1.
o Boost the Tolerance setting to 34%.
o Press Play for both DDRs.

Let's take a moment to review our progress, before completing setup steps:

On the *Program* monitor, you should see the talent clip overlaid on the image from *DDR 3* (*LiveMatte* is turning the green pixels in the *DDR 1* clip transparent). You'll also see imagery from *DDR 2* displayed wherever the (originally) blue card appears in the frame.
What's happening is that the *Advanced Tracking* effect is applying the values from the (DDR 1) *Tracker* for a secondary iteration of *LiveMatte.* Our *LiveMatte* settings cut away the

green, revealing the *C* layer behind. Afterward, the blue color range is also keyed out, revealing the *B* source through the transparent region where the blue card is.

Up to this point, the effect takes advantage of the *Tracker* color values, applying them as a secondary keyer – but we haven't yet done anything with the actual *motion data* the *Tracker* is supplying. Let's do so now.

1. Click the Position button for input B to open the Position Panel for that layer.
2. Select DDR 1 in the Use source Tracker menu.
3. Enable Follow Tracker ().
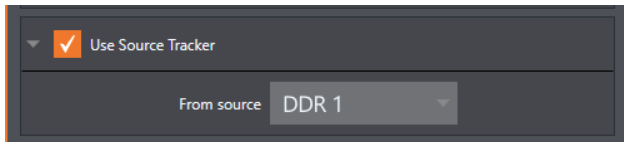
The result on your *Program* monitor should look much like Figure 176; full motion video appears wherever the orange card appears in the foreground clip. This is the standard setup for the *Advanced Tracking* effect, though it's possible to use it in different ways too.

> *Further Notes: Advanced Tracker 2 provides much improved compositing. (The original effect is provided for legacy purposes, but might also produce a better result in rare cases where a source has embedded transparency). Among other benefits, the newer effect performs spill suppression at the edges of the tracked region. Using the size (etc.) parameters of the tracker, the region being tracked can be made slightly larger to taste, to moderate this effect.*

 Now would be a good time to test the effect of the *Scale*, *Rotation,* and *Aspect* controls in the *Tracker* tab for *DDR 1* (remember you can double-click the *DDR 1* monitor to open this panel).

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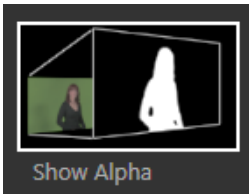
Effects can take other forms as well. We've looked at the *Default* effects group; now let's consider *Utility* effects.

If you were following along in the previous section, replace the current effect in *M/E 1* with the *Show Alpha* effect from the *Utilities* group.

Applying this effect immediately causes the display on the *Program* monitor to update, showing the content of the alpha channel for input *A* (*Input B* is ignored).

FIGURE 178

The current input *A* source is keyed, so the effect displays black on *Program* out wherever transparency exists in the foreground, white for full opacity, and shades of gray for in-between blends.

With this in mind, it won't be hard to guess what *Show Inverse Alpha* does. In contrast, the *Show Color* effect in this group passes the full color output of *LiveMatte prior* to being multiplied by the alpha channel.

(It might seem as though this would be identical to the original source, but you may notice subtle differences. This is because of the *Spill Suppression* processing.)

Let's look at another of the effects in the *Utilities* group, *Color Correction*. Replace the current effect with the *Color Correction* effect. You'll notice that M/E 1's output on the *Program* monitor is now rendered in monochromatic grayscale. Drag the T-Bar down to affect the *M/E*'s color saturation. Click the mouse on the *Position button* below the T-Bar and drag to modify *Hue*.

Finally, the *Make Legal* effect ensures the output of an M/E is within broadcast signal tolerances.

3D

The *Anaglyph (Red, Cyan)* effect found in the *3D* category is a special purpose tool.

The anaglyph method of displaying 3D imagery depends on stereo video inputs that are filtered and composited into a single output stream.

In turn, this combined stream resolves into 3D when viewed through special glasses with red and cyan (blue-green) filters for left and right eyes respectively.

FIGURE 179

Viz Vectar Plus - Live Production provides easy access to anaglyphic technology by means of the *Anaglyph* effect. The effect combines 2 video inputs selected in an M/E. 3D output can then be switched easily like any other source. No complex configuration steps or tricky control surface operations are required.

Photoshop Blend

The effects in the Photoshop Blend folder apply well-known blending modes to the A layer in the M/E as these are blended with the B layer. The resulting compositions can serve many purposes, such as adding animated 'bokeh' style overlays using DDR clips or adding interest to still overlays such as vignettes or titles.

14.6   Key Channels
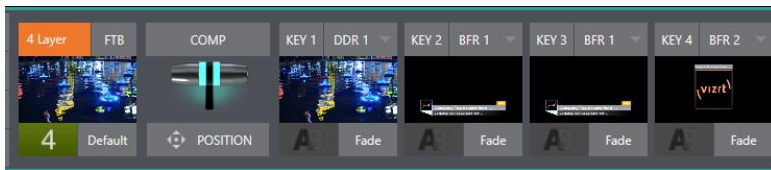
In *almost* all respects, the *KEY* channels in *M/E* panes match the *DSK* channels found in the *Switcher's* main *Transition* section. Unlike the *DSKs*, though, they constitute a 'pre-main *Switcher'* sub-layer. This means that *KEY* channels are applied *before* the composition is sent to the *Switcher* (or another *M/E)*. Thus, content in a *KEY* channel appears beneath anything displayed via the (*Switcher*) *DSK* channels.

Likewise, KEY channel selection and Position controls largely work just like their DSK cousins, discussed earlier, with two notable exceptions. We'll consider these exceptions next.

14.6.1 Key Layers and Autoplay

It's worth noting that the behavior of *Autoplay* for *Media Players* selected as sources for *KEY* channels conforms to the way it works for other *M/E* sources. That is, newly displaying a *Media Player* with *Autoplay* enabled in the *A layer* or a *KEY* layer for an *M/E* will trigger playback, but – by default – at the end of play the 'out' transition (and subsequent advance to the next playlist item) does not occur.

This default behavior can be overridden by checking the *Options* menu item *Enable Autoplay Out on M/Es*.

14.6.2 Augmented Reality
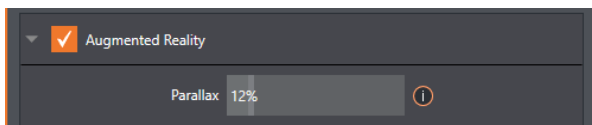
In one other unique and powerful departure from *DSK* features, the *Positioner* for *KEY* layers has an added feature labeled *Augmented Reality* (Figure 181).

> Note: The Augmented Reality feature is for use in M/Es that are assigned to compositing effects that allow 'pseudo-depth', and has no effect when a Mix effect (transition) is loaded as the Background effect for the M/E.

FIGURE 182

Any *KEY* layer with the *Augmented Reality* switch enabled is treated differently from a normal KEY layer in several respects:

- First, it does not merely appear above the main M/E layer composition you configure at left, as a typical KEY channel would. Instead, it is treated like another main layer added above the standard M/E layer rows.
- Thus when you zoom or pan the M/E, the KEY layer zooms and pans right along with it, making its content appear as though it were embedded in the scene (Figure 182).
- (This lets you effectively add one or more virtual layers to a LiveSet composition at any time, with complete control over positioning within the composition.)
- With the associated Parallax setting at 0%, the KEY source is locked to the background formed by the layers below it in a 1:1 relationship. When the 'camera viewpoint' changes, the KEY layer moves in exactly the same amount and direction as the background.

  Hint: You can use this ability to 'pin' a graphic element into a LiveSet.
- Raising the Parallax value modifies the motion and of the Augmented Reality KEY layer during panning and zooming, making it appear closer to the camera than subject matter behind it. This enhances the impression of three dimensional depth.

Finally, note that the *Tracker* feature can also be used along with *Augmented Reality* and *Parallax* to produce uniquely dynamic motion graphic compositions.

14.7 Comps
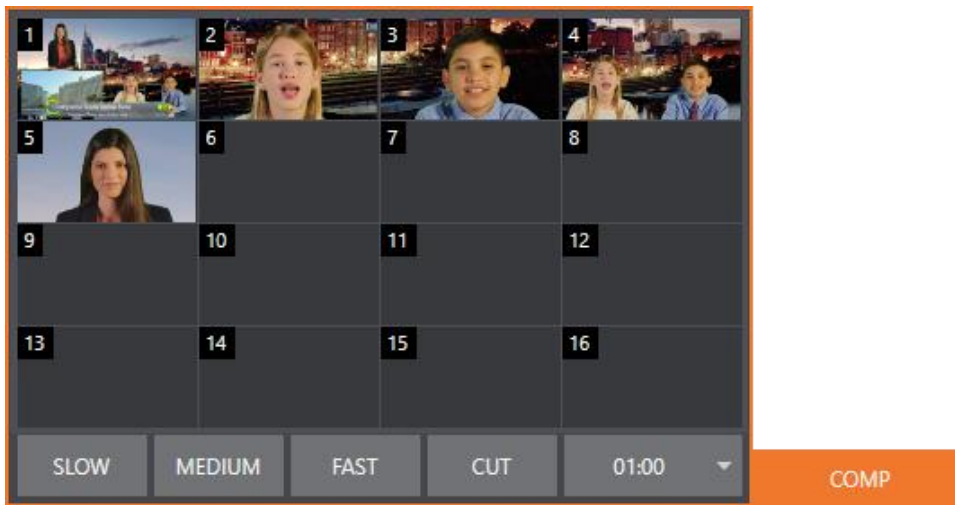
Different 'virtual camera' positions, along with other *M/E* attributes, can be stored in the *Comp Bin* associated with each *M/E*. In particular, *T-Bar* and most *Positioner* attributes for all layers in the module are stored in a *Comp* and are re-applied when you click the *Comp* icon later. This includes such things as cropping and edge-feathering performed using *Positioner* settings (layer source selections are not stored, nor are *Border* or *Tracking* settings.

14.7.1 Managing Comps

Having prepared a composition you wish to keep, storing a corresponding *Comp* is simply a matter of clicking the *COMP* button above the *T-Bar* to open the *Comp Bin*, and clicking an empty position. An image grabbed from output of the module is displayed to represent the *Comp*.

If you later wish to revise a *Comp*, you can do so either by rolling the mouse over it and clicking the 'snapshot' icon shown at upper-right (Figure 184) or by right-clicking the icon and selecting *Update* in the context menu that appears (Figure 185).
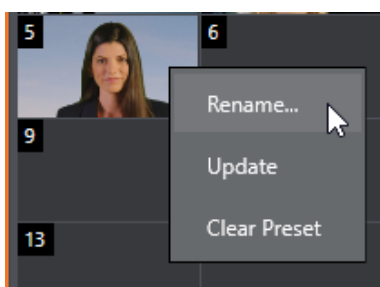
The context menu also allows you to *Rename* a *Comp*, update it, or clear it entirely.

14.7.2 Animation

Making a selection in a *Comp Bin* changes the current composition of layers displayed by the module to the new one. Changes can be immediate or animated over time. The timing controls in the footer of the *Comp Bin* determine the duration of the move from one position to another, while transition effects for layers are governed by their individual effect durations.

> *Hint: The main Switcher also hosts a Comp Bin. However, only Mix effects are supported in this case.*

It's worth noting that, since *T-Bar* states are stored and applied by *Comps*, transition effects can be applied by selecting a *Comp*.
Let's discuss an example:

- Suppose KEY 1 is a lower third title overlay and has a 'fly on' type transition assigned to it.
- Comp 1 was stored with KEY 1 not visible.
- Comp 2 was stored with KEY 1 hidden.
- Click Comp 1, then – a moment later - Comp 2.

The result is that *KEY 1* will animate in and out according to the state stored in each *Comp*. Actually, *Comps* can apply transitions to multiple layers at one time with a single click. Animation between the current layer states and settings is not limited to the effects provided by transitions, however. Let's consider a different example.

- Select Comp 2, ensuring that KEY 1 is visible.
- Use the Positioner controls for KEY 1 to slide the lower third title off the page, completely hiding it from view.
- Store a new Comp.

Switch back and forth between these two *Comps* and you'll notice that animating the layer's position of the layer has effectively allowed you to create a custom transition. Experiment with other settings, such a Z or Y axis rotation and you'll begin to see just how much power *Comps* give you.
Using these and other settings to animate the various video layers, very complex compositions can be introduced into your production with a single click in the *Comp Bin*.

15 NDI Output Routers

In video production, outputs are a BIG deal, typically in scant supply, and expensive. Imagine a system where you could have a nearly endless supply of outputs. NDI makes this dream a near reality. Viz Vectar Plus - Live Production supports virtually unlimited expansibility in this respect and provides direct and convenient control over your output sources.

Earlier, we mentioned that Viz Vectar Plus - Live Production provides eight special NDI outputs, beyond the already large number of external SDI and NDI outputs available. These latter outputs are labeled *OUT 1-8*.
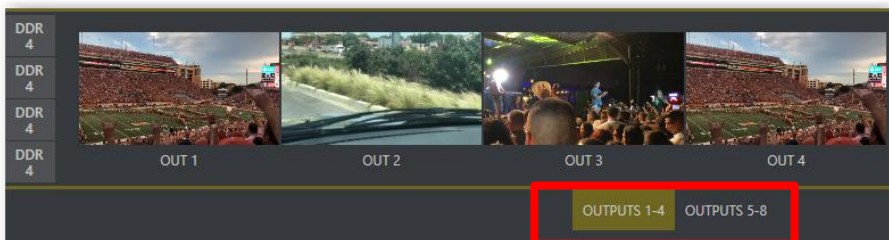
FIGURE 186

Figure 188 highlights two tabs labeled *OUTPUTS 1-4* and *5-8*, situated just beneath the main *PROGRAM* output viewport (Figure 186). Clicking a tab reveals one of these two specialized crosspoint panels, which appear in the same place that *M/E* modules are normally shown.
The features of these panels are very similar to those normally provided by an expensive external *matrix routers*. Each row in these tabs determines the source sent to the output named at left. The monitors at right show the video from the currently selected source.

FIGURE 187

You can assign many different sources to each of these 8 NDI outputs. As elsewhere, the source buttons occupy three banks, similar to the *Switcher* source rows (the same *Bank* buttons used for the *Switcher* change the banks shown in the *NDI Output Router* panels, although their content is somewhat different). Outputs can be individually renamed by editing the labels shown at left (Figure 187).
Output source options include the displays and audio assigned to any of the four primary outputs, but also any other Switcher source with the exception of M/Es and animated *Buffers* (a *Buffer*

holding an animated source will output a still image, which may nevertheless 'still' be useful for some purposes).

15.1   NDI Output Applications

This means you can simply assign one of these outputs to a suitable downstream system or device, and 'hot-punch' them at will. Downstream NDI-enabled devices connected to one of these outputs can thus be effectively re-configured directly from Viz Vectar Plus - Live Production *Live Desktop* or *Control Surface*, which provides special support for this feature.
The potential uses of these outputs is nearly unlimited:

- Supply external NDI monitoring solutions (such as the NDI Studio Monitor application included in the free NDI Tools Pack).
- Recorded them anywhere your network runs using NDI IsoCorder.
- Converted them to legacy external SDI or SMPTE 2110 IP formats for connection to other studio systems using your choice of the (optional) Viz SDI IO and Viz 2110 IO modules.

Note: Each IO supports up to 4 external SDI output channels and a full suite of production tools including per-channel overlays (which can be still images, animated clips, or even other NDI sources), allowing you to re-combine and re-brand your video endlessly.

16 Audio

Less than 100 years ago, movies were silent. We've come a very long way since "The Jazz Singer" (1927, Warner Bros.), and great audio now plays a huge role in video production. Vizrt live production systems provide an extensive set of professional quality audio tools, which we'll explore in this chapter.

Basic configuration were touched on back in Section 3.3.1. A tabbed pane labeled *Audio Mixer,* found just below the main *Switcher* presents more precise control over individual audio sources and outputs.

Compact sub-panels in this pane provide configuration and control for individual audio sources and also audio outputs as follows, from left to right:

- Audio sources (audio INPUTS 1-15)
- APPS – a special input provided for use with *Live Call Connect*
- TALKBACK – a special input provided for use with Skype TX inputs
- Internal sources – Media Players, and Effects (sound embedded in Animation Store transitions)
- Stream – controls streaming output to the web
- Aux 1 to 3 – controls for Aux audio busses
- Phones – volume control for the system's headphone output
- Master – controls the primary audio bus
- Audio level control for individual recorders are provided elsewhere

16.1 Audio Specifications

Audio conforms to SMPTE RP-155. The maximum input/output level is +24 dBu. Nominal input level is +4 dBu (-20dBFS), and the sample rate is 48 kHz. Levels above 0dBVU are shown in red in the *VU meters*, to caution you that overly high levels can result in clipping in recordings.

16.2 Phones

Utilize Supplemental Audio to route Phones anywhere you would like. Normally routing this to the 3.5mm headphone port on the back of your system's motherboard makes for a good and easy solution to preview you audio.

The *Phone* output is also affected by *Solo* switches located at the bottom of each control group in the *Audio Mixer*. When *Solo* is enabled for one or more sources – or outputs – *only* the soloed sources are sent to the connector. (See *Solo* in Section 16.7.2 for more information on this feature.)

16.3 VU Meter Calibration

VU (Volume Unit) *meters* are located right above the *Volume* control sliders throughout the *Mixer*. The calibration of the *VU meters* can be changed to suit your preference.

A menu at left beside the *Input* labels opens a small menu (Figure 189) offering three options as follows:
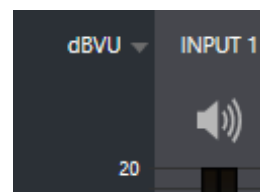
- dBVU – most familiar to users of typical audio mixers
- dBFS – dB 'Full Scale' – the digital standard; see the heading Audio Headroom in 3.7
- dBu – based on a voltage of 0.775 VRMS (a shy scale rarely seen in public, supplied for completeness, comparison, and the amusement of audiophiles)

16.4 External Sources

Columns in the first set of control groups are numbered as *Input 1- 16.* Each of these can be assigned to any available audio source – whether sound supplied to external SDI embedded audio from one of the four external SDI inputs, available NDI source, or other system audio source (including network audio sources like Audinate's Dante™, with appropriate drivers.

> *Note: Dante support requires an inexpensive user license from Audinate™.*

You may choose to think of these audio sources as being associated with the same-numbered *video* inputs in the nearby rows on the rear connector panel. This linkage, though the default, is not strictly enforced, however. You can connect directly to any external audio source in the *Advanced Configuration* panel (see 16.10). Also, for reasons of your own, you may well prefer to treat various audio sources as independent of the nominally associated video input. The *Follow* (audio follows video) features play an important role in this context – see the sub-heading Follow Program Video in Section 16.11.1.

16.4.1 Connection Type

FIGURE 190

Naturally, only one connection can be active for a given audio input at any moment. To access the *Connection* menu, move the cursor into the label of an input, and click the *Configure* (gear) button that appears there. The *Advanced Audio Configuration* panel will be shown.

The drop-down *Connection* menu at the top of this pane allows you to assign any one of the supported sources connected to the system to this *Audio Mixer* control column.
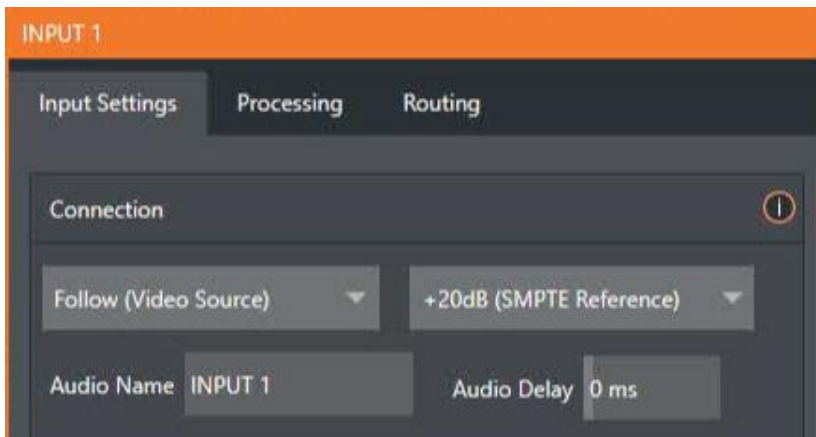
- Local
- Local sources support different connection types, as determined by a menu at right in the same group. This option typically defaults to *Auto-detect*, but may include *Line, Mic, or Embedded* (which is the correct setting for audio included with an NDI video connection).
- Dante sources (network audio from systems supporting this protocol from Audinate™).
- Follow (Video Source) – this is the default selection, and causes the control column to follow the same numbered video Switcher input.
- All available NDI audio sources.

Note: Channels 1 and 2 from Master and Aux 1 are always placed on Dante output channels 1-4, respectively.

16.5   Local Skype TX Callers and Mix Minus

The default Connection option for external Audio Mixer inputs is Follow Video Source. When an audio input set this way is assigned to a Local>Skype TX Caller channel, the audio control group is automatically assigned to govern incoming audio from that remote Skype caller.
It is not necessary to use an *Aux* audio bus to configure a special audio 'mix minus' to return to the remote Skype caller in this case. The return audio for Skype TX is handled automatically, ensuring that (except when the *TalkBack* feature is engaged) the remote caller will receive a special mix comprised of the *Master* mix with the remote caller's sound removed.

16.6   TalkBack

The Audio Mixer input labeled *TALKBACK* serves a special purpose, providing a way to converse with remote Skype callers off-air (i.e., without intruding into your live program). You can choose what audio source to supply for *TalkBack* purposes from a variety of input types, as discussed in the previous sections.

As mentioned earlier, by default the *Connection* option for an external *Audio Mixer* input assigned to a Skype TX™ channel allows the corresponding control group to govern incoming audio from that remote Skype caller. In this case (that is, when an audio control is 'listening' to incoming audio from a Skype TX channel), a new button labeled *TALK* appears beside the group's SOLO button. When the *TALK* button is lit, audio you supply via the *TALKBACK* input (typically a microphone connected to one of the inputs on the system's backplane, or perhaps the system *Stereo Mix* supplying audio with sound from a 1/8" motherboard audio input) is sent to the remote caller, temporarily replacing the normal mix-minus sound that remote caller would otherwise hear.

At the same time, the Mixer sends incoming sound from the remote Skype caller to its *Headphone* output, enabling you to have a two-way conversation off-air.

> *Hint: You'll want to take steps (such as by enabling Mute, or perhaps Follow Program Video) to prevent sound from the Skype caller being sent to your live audio mix during TalkBack conversations.*

16.7 Common Controls

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

16.7.1 Mute

Mute switches for inputs and outputs appear as speaker icons located just above in the main *Mixer* panel. A single switch controls multiple channels, as appropriate for that source. Enabling *Mute* removes the sound from that source from all downstream audio mixes and outputs.

> *Hint: Muted sources still show signal activity on the VU meters, but levels are drawn in gray rather than full color. This is also true for sources with Follow set that are not currently audible on output.*

One important exception to *Mute* operation involves recording. The IsoCorder™ feature lets you capture any MIX a/v output - i.e., the primary output or outputs, or directly from IP audio and video inputs with matching numbers. That is, the audio recorded with the video is taken from the audio input having the same number as the video input. In this latter case, the captured audio is routed directly to the recording module *prior* to most adjustments in the *Audio Mixer* – including *Mute*.

16.7.2 Solo

Solo implementations and options vary widely in the audio industry, but broadly speaking, all variants provide very useful functions. The *Solo* feature offers remarkable flexibility without overly confusing complexity.

Consider a few basic design concepts:

- Enabling Solo for a source sends its (post-fader) sound to the Phones output and removes all other sources from that output.
- Solo has no impact on audio mix (es) sent to any other output.
- This Solo feature is normally what it called 'exclusive Solo' (or 'X-Or' type). This means that enabling Solo for a given source disables all other Solo buttons.
- It is possible to use what is called 'Solo latching', ganging multiple sources for Solo output. Hold down the Ctrl key and click additional Solo buttons to add or remove their respective audio contributions from the latched Solo group.

Auditioning an Audio Source

It can be very useful to be able to preview one or more audio sources, doing so *without* allowing the test sound to be audible on *Program* output. Typically, this need arises in connection with testing audio sources that will be used in the production.
To audition an audio source in this manner:

1. First Mute the source, removing it from primary outputs.
2. Then enable Solo to hear it on the Phones output.

16.8   Internal Sources
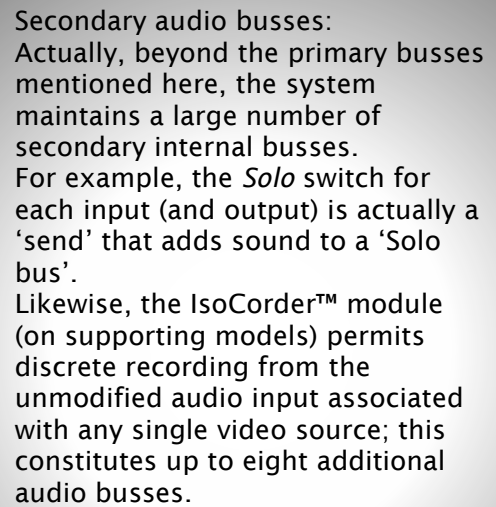
Besides external audio sources, sounds played from internal storage volumes (including removable media such as external hard drives or 'thumb' drives) via the *Media Players* (*DDRs*, etc.) can be added to the output mix.

16.8.1 Media Players

Video and audio-only files in *DDR* playlists, along with audio files in the *Sounds* player, may contain one or more audio channels. At most, *Media Players* output the first four audio channels of multiple channels; additional embedded channels are ignored. Other options and controls in these sub-panels are similar to those provided for external audio sources.

16.8.2 Effects (Transitions)

This control group governs the sound embedded in *Animation Store Transitions*. The remaining control groups in the *Audio Mixer* are dedicated to various audio outputs. We'll come back to them in 16.9, but before we do so, let's drill further down into more advanced audio options and tools.

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

16.9   Output and Primary Bus Controls

As has been discussed, the *Mixer* on most models support four primary audio busses – *MASTER* and *AUX 1-3*. Each of these is represented by its own control group in the *Audio Mixer* output section, and regulates sound sent to physical connectors or to 'logical outputs'.

Hint: Shift + double click Volume knobs to restore their default values (0dB).

Settings in all of the control groups in this section take effect downstream from all audio sources, further modulating and processing audio sent to outputs as the *AUX* and *MASTER* mixes, for recording, and for Internet streaming.

16.9.1 Headroom Notes
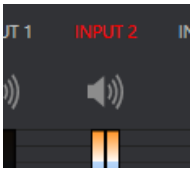
In digital audio systems, signal levels that exceed maximum values are uniformly assigned the maximum value, a condition known as "clipping". Clipping inevitably results in annoying audible issues.

Worse, over-modulation that may not be apparent while listening during live production may nonetheless appear in recorded files. This is often true even when levels *appear* to be below the ceiling level (0dBFS, the maximum allowable digital level).

Hint: When clipping has occurred, the label for the problem channel turns red briefly, as seen in Figure 192.

Due to this problem, digital audio system designs customarily allow substantial 'headroom' above the benchmark 'alignment level', making over-modulation much less likely. Often this allowance seems high to those familiar with audio systems; headroom levels between 18 and 24dB are not uncommon in professional digital audio realms.

You can apply level control to suit your own preference in this regard, using the separate *Record* (and *Stream*) level controls discussed shortly.

For example, levels set at -20dBFS in the *Record Configuration* panel approximate typical professional practice. This has no impact on levels at the system's audio outputs, and all but ensures clipping in recorded files will be avoided.

Advanced users can thus record files conforming to regional standards or personal preference, substantially reduce the possibility of audio clipping in recorded files, and even adjust the level on the fly if necessary.

The main point to remember from all of this is that for digital audio recording "less is often more". When it comes to levels, by all means go as high as necessary – but it's equally practical to go no higher than necessary.

Hint: The Audio Mixer also provides Compressor/Limiters for each input and output. These can also be invaluable in defeating clipping due to over-modulation.

16.9.2 Stream

Level controls for the stereo audio that accompanies *Streaming* outputs are provided in the *Output Configuration* panel (see 8.2).

16.10 Advanced Configuration

The controls for all inputs (including internal audio sources) as well as the *Effects*, *Stream*, *Aux* and *Master* output groups include a configuration button shown when you move the mouse over the input label.
The familiar 'gear' icon opens the advanced *Audio Configuration* panel. We touched on this panel briefly when we discussed selecting and configuring *Connections* for external audio inputs. The *Audio Configuration* panel (Figure 193) offers many more important features and controls, however. Let's explore these now.

16.11 Input Tab

Audio Delay

Audio and video arriving at inputs in sync will *maintain* sync throughout the system to output or recording. However, you should note that *upstream issues* can cause video to arrive at system later than the corresponding sound.
To mitigate this sort of external problem, the Audio Mixer provides an adjustable *Audio Delay* feature.
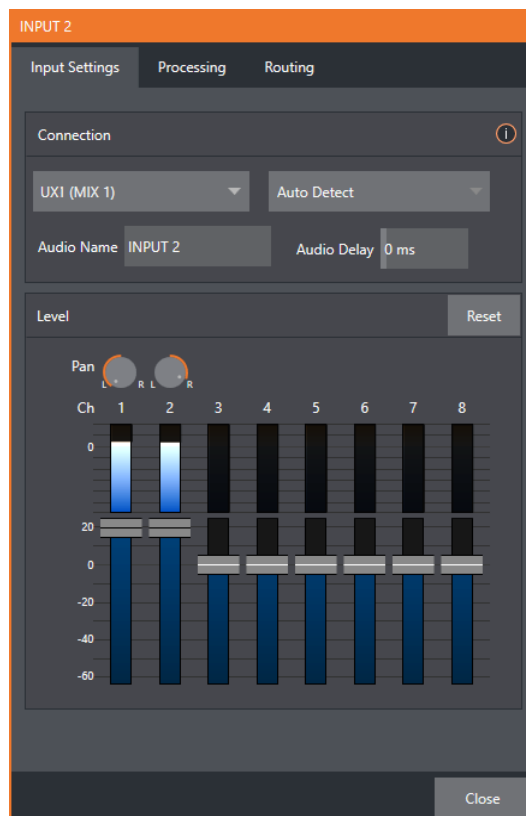
FIGURE 193

E.g., many cameras support simultaneous digital and audio output. In-camera processing can delay digital a/v output, resulting in audio output actually leading the digital output by a meaningful measure.

Gain

On selected models, and usually for sources set to *Mic* input type, *Gain* knobs may appear in the *Input Settings* tab to allow you to compensate for audio source variances.

Pan

The *Audio Configuration* panel also provides *Pan* controls. *Pan* is a very useful feature; it adjusts *placement* of sound from source audio channels on the stereo channels comprising the audio mix(es).   Using *Pan*, you can place all or part of *channel 1* onto *channel 2*, and vice versa.

- When Pan is set to the extreme left position for channel 1, its audio is sent exclusively to the first channel for the Input 1 group.
- Centering the Pan 1 knob splits the sound from Input 1 equally onto channels 1 and 2.
- Sliding Pan for channel 1 fully clockwise results in that source only being audible on channel 2.

Pan also modulates the sound levels on the left and right channels so that the overall volume neither rises nor drops as a result of adjustments.

16.11.1   Processing Tab

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

Equalizer

The seven-band equalizer allows you to 'shape' sound to taste, accommodate sources with different acoustic characteristics (say, mismatched mics), minimize feedback or roll off unwanted parts of the audio spectrum.
Enable or disable the *Equalizer* using the switch beside the label above its control group. The vertical sliders attenuate or boost the tonal range centered on the frequency shown at the top. The effect applied falls off gradually as sound draws closer to neighboring frequencies on either side. Click *Reset* to return all sliders to 0dB.

FIGURE 194

Compressor Limiter

The *Compressor/Limiter* is capable of preventing clipping (see Section 16.9.1) from unexpected peaks or transients, and making talent sound better than they do in real life, bringing voices, music and other audio sources into an optimal dynamic range. Being able to do this independently for each output too is icing on the cake, especially for Internet streaming, as it ensures correct levels at any time.

Threshold

Sound above the set *Threshold* level will be compressed; the amount of compression and the manner in which it is applied are both dictated by the other settings.

Ratio

A *Ratio* of 4:1 means that if input level is 4 dB over the threshold, the output signal level after compression will be just 1 dB over the threshold. The gain (level) is reduced by 3dB. Very high ratio settings are the reason the word "limiter" is part of the label for this feature.
The highest ratio setting will effectively reduce any signal that would rise above the threshold all the way down to the

Compressor … Limiter – what's the difference, anyway? Compression and limiting are not really different processes, but rather a matter of degree and perceived effect. Compression, ideally, takes the form of a subtle, almost imperceptible modulation of the sound level to bring it into a more pleasing and convenient range. A limiter is applied more for the purpose of managing, even 'crushing', unwanted spikes and transients.
That distinction aside, a limiter is essentially just a compressor set to a high ratio and, generally, a fast attack time. Audio engineers typically consider 'compression' with a ratio of 10:1 or more as 'limiting'.

threshold level (with the exception of a brief period during a sudden increase in source loudness, as dictated by the *Attack* setting).

Attack

Attack is also in milliseconds. The setting represents the amount of time it takes for the gain to change by a specified amount.

It would not be grossly incorrect to think of this setting as changing the slope of a graph depicting how aggressively the compressor pursues the target value (defined by applying the *Ratio* setting to the amount the signal surpasses the *Threshold*). Shorter values are more aggressive, while longer values are more subtle (and tend to be less noticeable to the audience).

Release

Release is like *Attack* in many ways but refers instead to the speed with which the compression effect is removed as a source signal falls back on its own so that it no longer exceeds the *Threshold*.

Gain

Naturally, compression impacts the overall output level of the source or output. The *Gain* control allows you to compensate, bringing the post-compressor/limiter signal back to a comfortable nominal range.

> *Hint: Different circumstances call for different Attack and Release strategies. For example, much less aggressive settings could work nicely for vocals, but fail badly when applied to a snare drum. Many websites provide suggestions on establishing the best compressor/limiter settings for different environments.*

Noise Gate

The *Audio Mixer's* advanced options panel also include a configurable *Noise Gate* for each audio source, as well as all outputs. This lets you ensure that unwanted low-level sounds are prevented from inadvertently intruding into the mix.

Automation

Several different per-input automation features are found in the *Processing* tab.

Follow Program Video

Enabling *Follow Program Video* options for an audio source directs it to track switcher operations affecting the related video source.

Audio for sources with *Follow Program video* enabled in the *Audio Configuration* panel is automatically removed from mixed outputs until one or more specified video sources are actually displayed on *Program Output*.
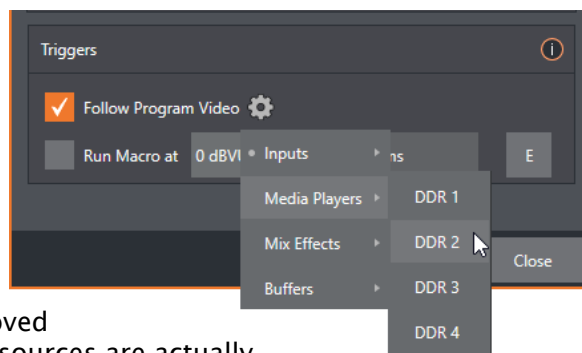
FIGURE 195

> *Hint: When the corresponding video source is not displayed on output, the audio source's VU meter level is displayed as a grayscale.*

Run Macro at

The nearby *Run Macro at* (value in dB VU) is part of the *Audio Mixer's* powerful automation toolset. Click the *E* (Event) button to assign macros to run when the sound level for the input passes the threshold audio level (transients such as a brief cough are filtered out).

In this manner you could, for example, automatically perform a 'hands-free' camera switch to show someone who begins speaking, and then automatically switch back again when he stops.

Note: Not included on some models.

16.11.2   Routing Tab

A main tab labeled *Routing* appears in the *Configuration* panel for all sources (Figure 196). The controls in this group determine output routing of the various channels supplied as inputs to the various output mix busses (*MASTER, AUX 1*, etc.) Let's discuss what an audio bus is and its uses before proceeding.

Busses and Outputs

Consider a very basic audio mixer. Its main audio signal path, from input to output, is properly called the 'master bus.' Sound supplied to one or more inputs is placed on this master bus (in the jargon of audio processing, this is called a 'send'), which ultimately flows to output connectors. Slightly more advanced mixers often provide more than one 'send' for individual inputs. For example, the sound from all inputs may be sent to the master bus, comprising the 'master mix'. A different mix, sometimes called a 'sub-mix', might also be created by sending certain signals to a secondary ('auxiliary', or 'Aux') bus.

Hint: A secondary mix, prepared on an Aux bus, can serve many purposes. For example, you might wish to record a mix with all sound from talent audio sources but that excludes any sound effects or music.

Let's summarize what we have learned so far: A 'send' pipes audio signals from an input to a discrete pathway called a 'bus'. Multiple sends can be used to place sound from a given source onto one or more internal busses.

What else should we know?

Each audio bus is discrete. Each can be directed along different output paths. And even when the blend of signals it carries is otherwise identical to another bus, it can be *processed* separately. Thus, its levels, equalization, and compressor/limiter settings can be unique.

The *Audio Mixer* provides four primary *audio busses*. These are identified in the *Audio Mixer* as:

- MASTER
- AUX 1, 2 and 3

The *Audio Mixer* provides controls for each of these busses, allowing you to manage levels and signal processing. It is important to understand the distinction between *busses* and *outputs*.   Now that we understand the former, let's consider the latter.

An *output* may be physical, or virtual – i.e., it may involve a connector on the rear panel, or not. For example, audio recorded internally does not require an output connector. Likewise, it may initially be digital.

Note: Outputs 1 and 2 are permanently assigned to MASTER and AUX 1, respectively. In contrast, digital (or 'embedded') outputs are configurable in the Output Configuration panel.
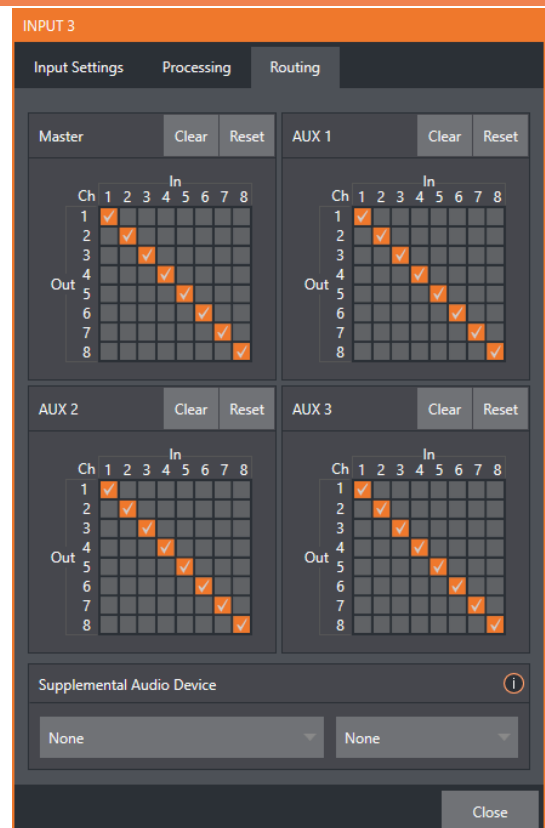
FIGURE 196

Sub–Mixes and 'Mix Minus'

At times you may require specially configured audio mixes. For instance – some installations call for sending audio from one or more internal sources (such as a *DDR* or the *Sound* player) to a secondary distribution system. Alternatively, you may want a 'clean' output from one or more sources for use apart from the main output mix.

Specialized sub-mixes of this sort are often referred to as 'mix-minus,' since one or more sources are deliberately subtracted from the mix. Mix-minus capabilities can be invaluable for productions like 'phone-in' shows. The remote caller needs to be able to hear the interviewer. Yet - if you simply send the main mix back to him, he is forced to endure a late-arriving echo of his own voice. Needless to say, this would be undesirable.

Suppose your interviewer is speaking into an audio source connected to channel 1 of *Input 1*. The audio from your remote interviewee is routed into *Channel 2*. You could easily supply both to your *Master* bus for your program output needs, but remove channel 1 from *Aux 1*, and remove channel 2 from *Aux 2* to provide mix minuses to send back to both parties.

This approach eliminates annoying echoing, feedback and the like. Meanwhile, both participants can be heard on the main *Program* output. Also important, independent control and signal processing is provided for each part of the pipeline.

Mix Minus for External Audio Devices

The *Routing* tab provides 8x8 matrix routing panels for each input, allowing for more sophisticated mixes than the example above. Viz Vectar Plus - Live Production supports 8 channel NDI output, so it's possible to route a unique mono mix-minus on each of these channels for an Aux bus. Thus, a single NDI a/v output stream can provide all of the mix-minus needed for up to eight external callers

For clarity, let's consider a slightly less demanding example. We'll assume that you have configured Switcher inputs 13-16 to receive audio from four unique remote callers. We can use video MIX 2 to supply Program video to each caller (if the equipment supports video return). We will configure AUX 1 as the Audio source for MIX 2, then assign a unique (mono) mix minus to four of its channels to supply return audio for each caller.

- In the Output Configuration panel, assign Aux 1 as the Audio source for MIX 2.
- In the Audio Mixer, open the audio configuration pane for Input 13.
- Access the Routing tab and click the Clear button above the Aux 1 routing matrix.
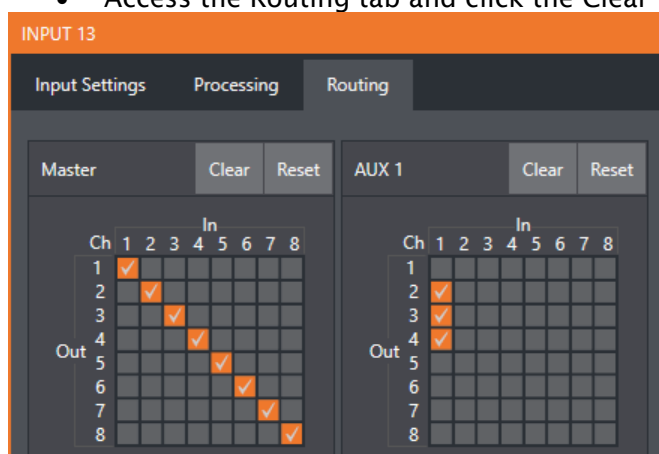
FIGURE 197

- Checkmark channels 2, 3 and 4 in the column below *in 1* (see Figure 197). This routes sound from the first incoming caller to all *Aux 1* output channels *except* channel 1.
- Open the audio configuration pane *Input 14* and, in the *Routing* tab, clear the *Aux 1* matrix.
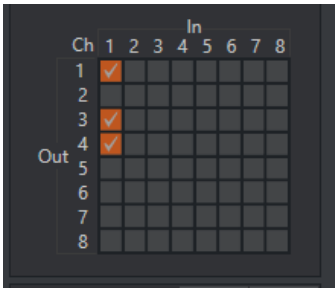
FIGURE 198

- This time, checkmark channels 1, 3 and 4 in the column below *In 1*. This routes sound from the second incoming conferencing apps caller to all *Aux 1* output channels *except* channel 2.
- Repeat the steps above for audio inputs 15 and 16, omitting the *Aux 1* checkmarks under *In 1* for channels 3 and 4, respectively.

That's it – you've got the perfect mix minus configuration for return to four callers, using a single NDI output.

16.12 Supplemental Output Devices

Viz Vectar Plus - Live Production features two additional menus provided at the bottom of the *Routing* tab, under the heading *Supplemental Output Device*.

The left-most menu in this group lists any add-on output devices detected by the system. Viz Vectar Plus – Live Production's support for ASIO drivers allows you to easily transmit or receive audio using these popular 'audio over IP' protocols.
For example, 'transmit' channels from Audinate's Dante network audio protocol will be listed here if you have installed Dante Virtual Sound Card software. Or, in similar fashion, you may have installed drivers. The audio connections on the motherboard are also listed here.
Making a selection results in the sound from source being sent to the corresponding audio channels of the designated output. You can, for example, send your *Media Player* output to an external IP mixer supporting the same protocol, and route that mixer's out back into your Vizrt system for output with your video.
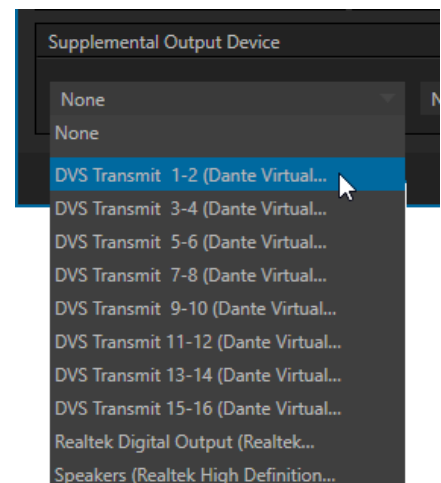
FIGURE 199

> Note: Apart from the AUX and Master mixes, routing or mixing is not applied to supplemental outputs. Each source channel is mapped to the corresponding output channel in 1:1 fashion, limited by the number of channels the output driver supports (e.g., a stereo output will always transmit channels 1 and 2 from the source).

16.13 MEMs

Roll the mouse to the left edge of the screen in the *Audio Mixer* to show its *MEM* bin. Audio *MEMs* work just like their counterparts in the *Media Players* (see Section 12.1.11).
MEMs are a convenient way to quickly store and recall audio steps and settings for different venues, productions, and users.

17 Macros and Automation

Macros smooth out your workflow, reduce complex operations to a single button press, and make it easier to produce sophisticated programs. They provide many opportunities for both workflow streamlining and creative applications. (As well, macros can reduce or eliminate embarrassing operator errors.)

One of the hardest things about live switching is keeping up with the action. We're only human, limited as to how fast our fingers can move, recall and perform important sequential steps, and so on. Macros are the answer to that dilemma. Record any sequence of events as a macro and play it back with one click. Alternatively, trigger it with a keystroke, control surface operation, or *HotSpot*.
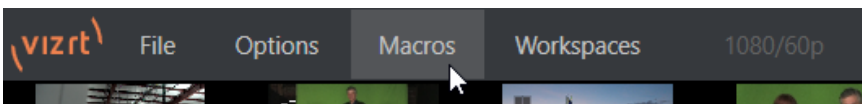
FIGURE 200

Macros can do almost anything; Preload and play content, modify audio settings, automate complex switcher sequences or perform synchronous operations. The compelling usefulness of macros justifies the prominent *Macros* menu placement in the *Dashboard* at the top of the *Live Desktop*.
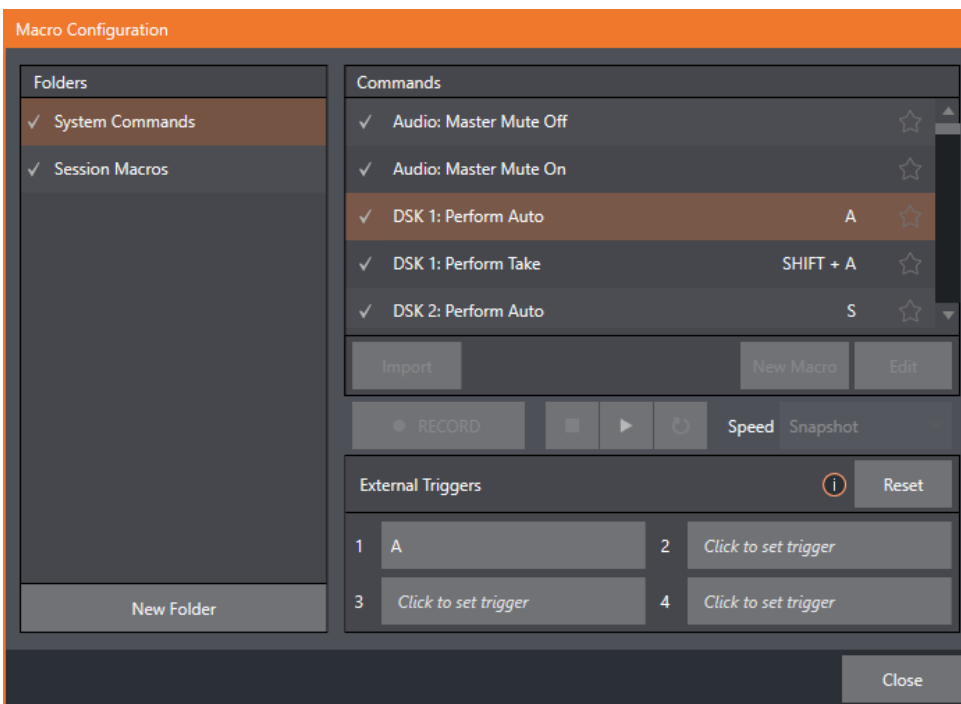
FIGURE 201

Click *Macros* to show a menu containing a *Configure Macros* item. This opens a large panel that allows to you create, organize, and even edit macros.

17.1 Creating Macros
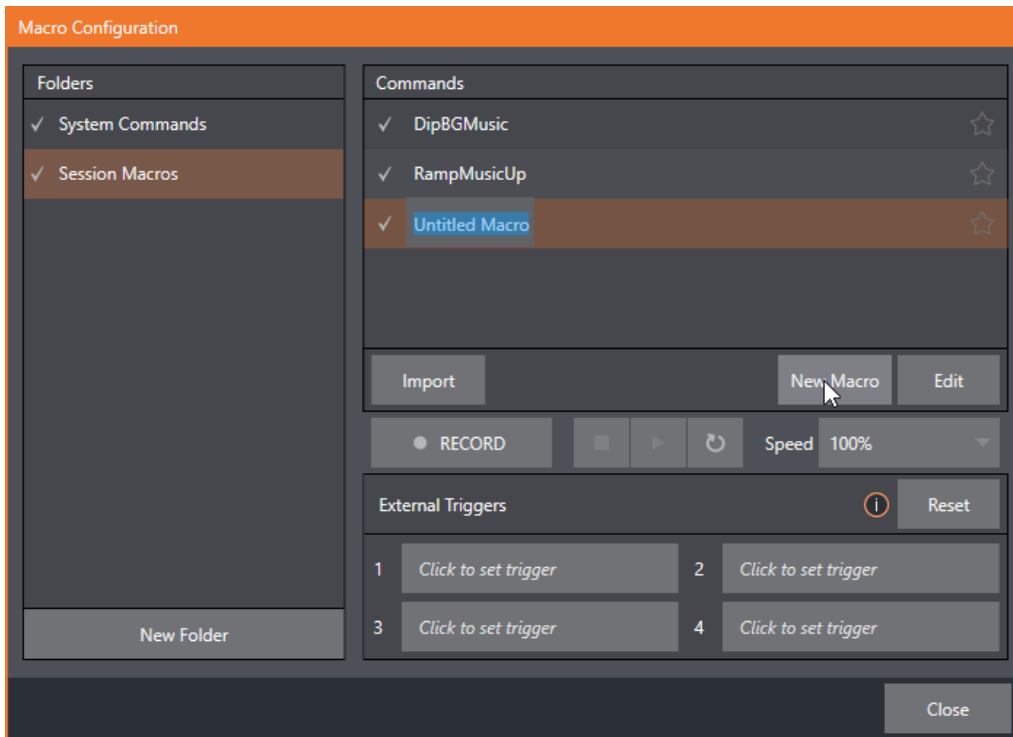
Creating a new macro is simple. Select a folder in the *Folders* column at left to contain the new entry (or add one, using the *New Folder* button below), then click the *New Macro* button below the *Macros Bin* at right.

Continue to define the macro by clicking the *Record* button at the bottom of the panel, and then just go ahead and perform the sequence of operations you wish to include in the macro. You can use mouse, keyboard, and *Control Surface* operations when doing so.

When finished, click the *Stop* button to complete recording. Test the new macro by clicking the *Play* button. You'll notice that an animated bar in the background of the macro entry in the list tracks playback progress. Of course, you can modify the playback rate using the menu next to the *Record* button. You can even set macros to loop using the button at extreme right.

17.1.1 Speed and Snapshot Mode

The Speed menu lets you modify the playback rate of your macro. One option in the *Speed* menu bears explanation: When you choose *Snapshot* as the macro's speed, you essentially force it to jump to its end result as fast as the system can get there. *Snapshot* mode is very useful for macros that configure the system to a particular state.
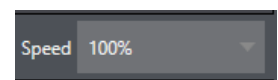
As an example, you might want to quickly disable *LiveMatte* for all *Media Players* at once. The possibilities are endless.

> Hint: You can record a macro that includes other macros. Depending on your order of operations, you may need to re-highlight the newly recorded macro in the list to show its Stop control (to end macro recording).

17.1.2 Triggers
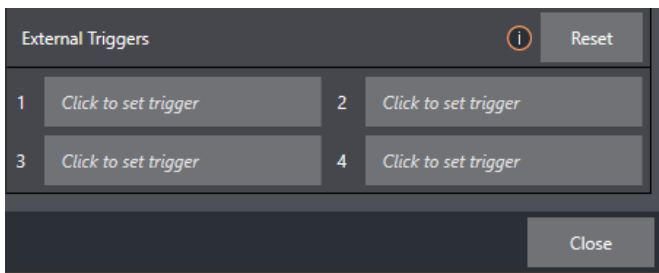
The Triggers controls located near the bottom of the Macro Configuration panel allow you to configure one or more ways to launch macros. For example, select a macro, click in one of the Trigger boxes, and then press a suitable keyboard shortcut to assign it to that macro.

17.2   Managing Macros

The *Macro Configuration* panel has management features such as folders, rename, clone, and hotkey assignment, as well as *Import* and *Export* (use these to copy macros to other units, and for backup).

> *Hint: Premium Access membership unlocks additional and very useful import/export file format options for macros, including JSON, Excel (.XLSX), and even a working Javascript (.js) example.*

17.2.1 Session Macros

It's easy to keep macros designed for use with a specific production organized and accessible, thanks to the *Session Macros* folder in the *Macro Configuration* panel. Macros in this group are exposed within that session only (or new ones based on it, if the operator uses template sessions).

17.3   Automation

We have discussed related macro trigger and automation features elsewhere in this Guide, notably in Sections *Automation Tab* 8.1.4, and Macro Triggers 12.1.4. Please refer to these sections for details.

18 Stream/Encode

Live webcasting has dramatically altered the broadcast landscape. Information can now be shared among audiences around the world with very small transmission costs. The live streaming market provides many creative and profitable opportunities. When it comes to taking advantage of this new medium, your Vizrt live production system places you in the forefront of all the excitement.

18.1 Introduction

Encoding for a/v streaming and other purposes involves a wide variety of attributes. At times, too, account login details are required for your streaming service or CDN (Content Delivery Network). Further, you may maintain multiple streaming service accounts for different purposes, as well. In addition, you may capture encoded video files for other purposes.
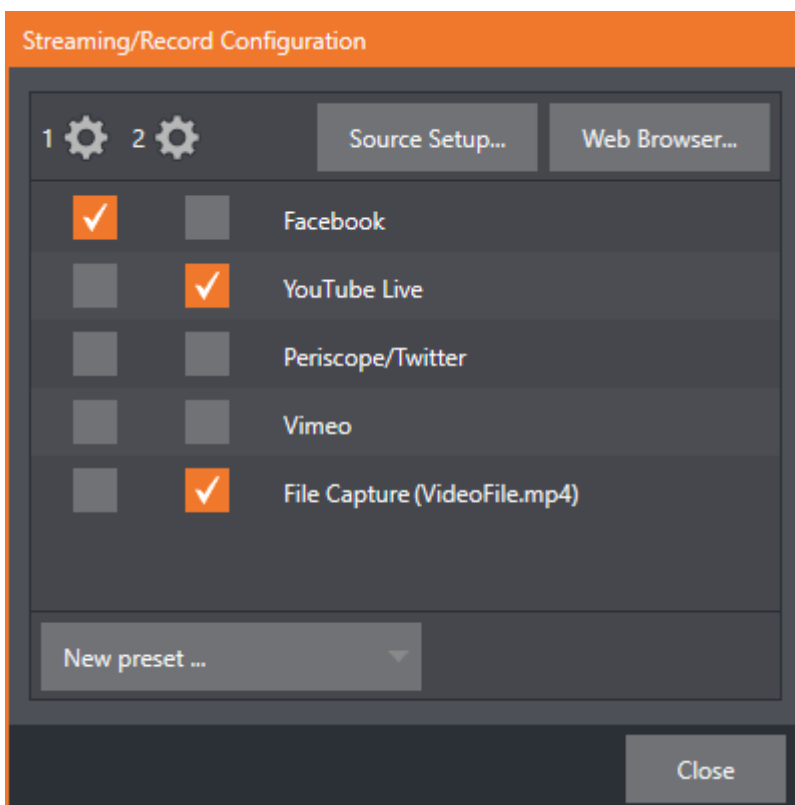
FIGURE 205

Viz Vectar Plus – Live Production *Streaming Configuration* panel supports the creation and configuration of all of the information and settings you are likely to need in this context.

18.2   Configuration

To open the *Streaming Configuration* panel (Figure 205), click the *Configure* button (gear) at right of the *Dashboard*'s large *STREAM/ENCODE* button.

18.2.1 Source Setup
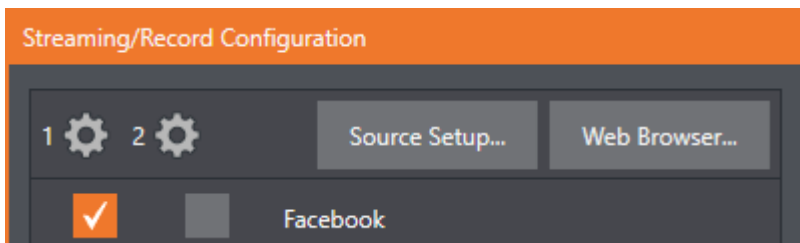
FIGURE 206

To assign video and audio sources to either of the two streaming encoders, click the *SOURCE SETUP* button in the header of the *Streaming Configuration* panel (Figure 207). Doing so opens the *Output Configuration* dialog, where you can continue to choose audio and video sources, and adjust audio volume.
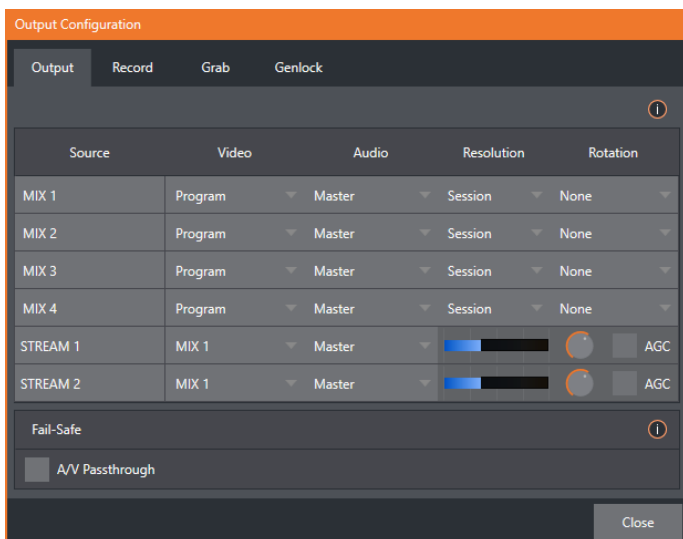
FIGURE 207

18.2.2 The Web Browser

The *Web Browser* button in the header of the *Streaming Configuration* panel does what you would expect, opening a web browser. This feature is provided for your convenience when working with web streams or your content delivery network account. We do not recommend general purpose web surfing during live operations.

> *Hint: If the web browser is hidden from view because a Live Desktop operation took precedence, you can re-use this button to bring the browser window to the front again.*

18.2.3 Configuring Encoders
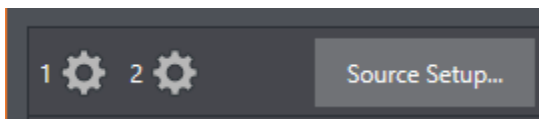
Settings for the two encoders are configured in the *Configure Encoder* dialog (Figure 209). Open this dialog by clicking the configuration (gear) icon for either encoder at left in the header of the *Streaming Configuration* panel.
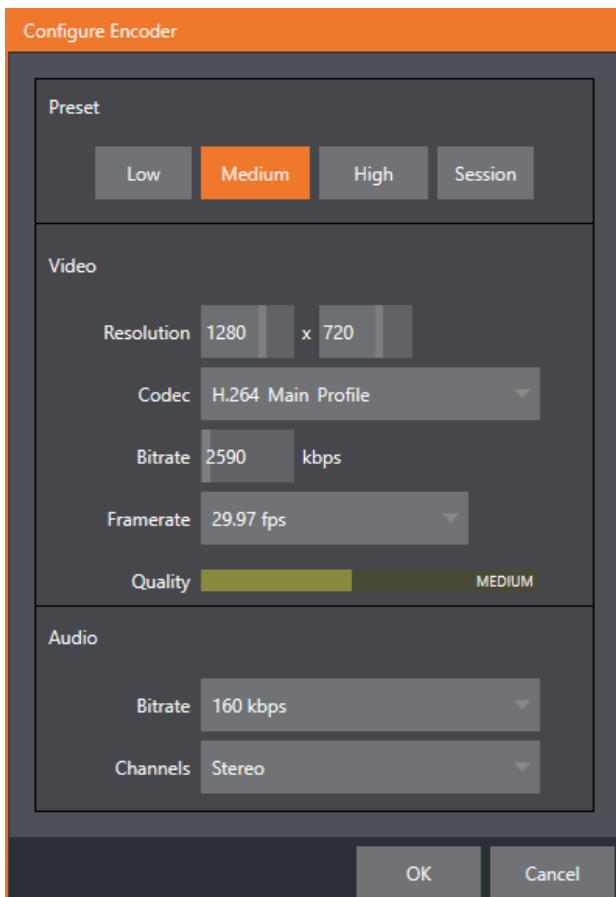
Select an encoder *Preset* (such as *Medium* or *High*), or manually configure custom settings using controls in the *Video* and *Audio* control groups below, and click *OK*.

18.3 Presets

The information for a given CDN or other encoder target is also retained in a *preset* (e.g., Facebook, YouTube Live, etc.) New presets are added to the *Streaming Configuration* panel using the *New Preset menu* at left in the footer of the panel.

> Hint: A default File Capture preset allows you to capture output from either encoder to a file.

At left in this panel are two columns of checkboxes; these allow you to send the output from either *Encoder 1* or *2* to the presets at right.
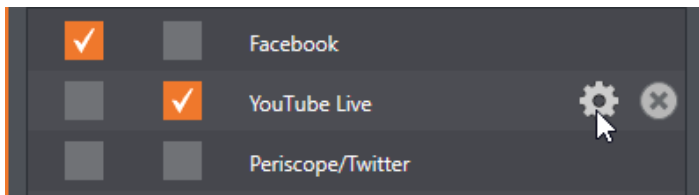
FIGURE 210

If you move the mouse pointer over a *Preset,* two new gadgets are shown at right (Figure 210). Click the familiar *Configure* gear to open a suitable dialog. It may invite you to enter your account credentials for a site and *Sign In*, or provide suitable controls for other relevant settings that are required. Or, for a *File Capture* preset, you can choose the path for encoded file output.
Not surprisingly, clicking the little (x) gadget instead will delete the *Preset*.

18.3.1 Custom Presets

In addition to the many recognizable names listed in the *New Preset* menu, you will observe a menu item labeled *Custom*. The dialog this selection opens allows you to enter the details typically required by generic streaming services.
In some cases, a CDN (Content Delivery Network) service may provide you with an XML file containing the recommended configuration settings related to your streaming account. (The *Import Settings* button in the Custom Connection dialog can be used to load this file, supplying the necessary values for streaming via the service automatically.)

18.4   Initiating the Stream

When you are ready, initiate streaming to the Preset targets you have check-marked in the Streaming Configuration panel by clicking the STREAM/ENCODE button in the Dashboard at the top of the Live Desktop panel. (The button will display elapsed time during streaming/encoding.) Once streaming has started, clicking the presets will start or stop that individual preset independently from the others.

> *Note: It should be noted that you cannot click a Preset streaming on one encoder and expect it to switch to the other encoder. You must stop the first encoder, the select the other encoder.*

18.5   Streaming Strategies

One of the best approaches when beginning (to stream your productions) is to establish a relationship with a commercial streaming media provider. A good provider can guide you past firewalls, provide public addresses for everyone to view your stream, and provide no end of valuable guidance.
And it may not be as expensive as you think (costs vary based on considerations such as how many viewers you expect, how much web bandwidth you use each month, and so-on). Some services based on an advertising model will even host your stream free.

18.5.1 On Demand or Live Streaming?

Not all 'streaming' is 'live streaming.' The difference is similar to i) watching a television program you previously recorded at a time convenient for you, or ii) watching a live event.
On demand streams are stored on a server (often supplied by an external service provider), ready to be transmitted whenever a viewer wishes. Live streams are available at the time they are broadcast, such as during a live concert or event.

On Demand Hosting

The *Record* module permits you to capture your productions to a local hard drive. The resulting files can be hosted on a network later, so viewers can connect whenever they like. If you have the resources available, you can host the video yourself – but if many people will likely want to view your production, you will likely avail yourself of a service to stream it on your behalf.

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

Live Streaming

Live streaming is a growing international market, and one you may well wish to serve. This form of streaming is a somewhat more demanding implementation. Rather than record a file and deal with it later, live video is transmitted over the network (effectively in real-time, give or take a little 'time in the pipe' as it were.)

Delivering a good quality stream requires that you consider both your network connection capabilities and that of your viewers. As well, to ensure reliable delivery, you will ideally have some idea of the size of your audience.

Naturally, streaming video is highly compressed to reduce bandwidth demands and make it available to a wider group. The decision as to which encoding format to use for your live stream is up to you or – in some cases – your client. Here are some things to consider:

- Some corporate and institutional network administrators opt to support one or another format exclusively. (Check with your IT department to find out if this affects your decision).
- RTMP and RTSP combined have a very wide installed user base, and work well across multiple platforms (PCs, Macs, Linux, etc.).
- SRT is an open source protocol that is managed by the SRT Alliance. It can be used to send media over unpredictable networks, like the Internet. More information about SRT can be found here - https://www.srtalliance.org/

RTSP Stream Decoding

The processing demands from high-quality video applications and devices have increased in the last few years. As video content continues ever-expanding, technology evolves to handle the demand. Vizrt will take advantage of GPU hardware acceleration for all stream decoding.

Unfortunately, some streams are simply incompatible with the GPU decoder. We recommend that the originating stream vendors look to solve the compatibility and take advantage of modern GPU decoding. We also understand that Vizrt users of may not have that option and must wait for vendor development cycles.

As a workaround, if a stream is found to be incompatible, you can append the URL with a command that instructs Viz Vectar Plus – Live Production to not use hardware acceleration.

(optional components are enclosed in square brackets)
rtsp://\[username\[:password\]@\]ip_address\[:rtsp_port\]/server_URL\[?param1=val1\[&param2=val2\]…\[**&hw_accel=false**\]\]
For example, the original URL of:
rtsp:// stream_IP_address.com:554/myStreamserver

Would change to:
rtsp://stream_IP_address.com:554/myStreamserver**?hw_accel=false**

Bandwidth Considerations

You'll often hear the term 'bitrate' in connection with streaming. This expression refers to data throughput per second (generally measured in Kilobits per second, or Kbps.) You could think of this as being like water flowing through a hose. You control the 'faucet', because you get to choose the *streaming Profile* setting in the system's *Configuration* panels. However, you don't own the 'hose' – or, at least, not the *entire* hose.

Once the stream leaves your immediate environment, even if you can supply good throughput locally, bandwidth may be constricted elsewhere along the transmission path. The level of Internet traffic can impose limits, but another major factor is the sort of connections your viewing audience may have.

Consider an example scenario: Even though you know that most of your audience is going to connect to your program using (relatively slow) wireless devices, you use a very high outgoing bitrate – thinking that this will surely be enough to fill the need. The fact is, though, a high bitrate actually ensures their experience will be poor.

The client player tries to play at the specified bitrate, but (in this example) the wireless bottleneck impedes flow. It is as if you connected a fire hose on your end, giving them a suitable high capacity nozzle for their end – but in the last stage of flow, the stream must pass through a small garden hose. Sadly, the stream will be quite insufficient, and output from the 'nozzle' (the client player) will falter badly.

For reliable performance, try to ensure the potential upload bandwidth from your system to the net is around twice the bitrate you choose. You *can* broadcast at a rate closer to your actual ceiling, but reliable performance cherishes headroom.

Also consider the expected download abilities of your viewers. Ideally, a safety margin 1.5 times the stream's bitrate is desirable. This may mean you need to consider using a lower resolution, or lower framerate for your stream – but doing so when required will generally deliver a smooth result, and is the wise course. (Nothing inclines viewers to turn away quicker than a stuttering, start and stop stream. See "Speed Tests" in Section 18.7.1 for some useful resources.)

18.5.2 Streaming Media Providers

Using a commercial streaming media provider (sometimes referred to as a Content Delivery Network, or simply 'CDN') bypasses otherwise high-bandwidth requirements for the encoding computer. When you have made arrangements for a streaming media provider to distribute your stream, the encoder only needs enough bandwidth to get a single a/v stream to the provider. All end users connect to the *provider* to view the stream.

Most streaming providers have access to massive bandwidth (and often, with very little notice, they can scale up your allotment to meet a temporary need.) Since your local bandwidth is really only used for uploading a single stream, you can send a high quality stream, secure in the knowledge that it will not degrade as soon as a second viewer attempts to see it.

18.6   Production and Capture Considerations

If you're not intent on live streaming, but wish to capture a live switching session, you would likely record at full resolution using the *Record* button (rather than *Stream*). The high quality captured files can then be used later in a *DDR*, or perhaps be transferred to another computer (even on a different platform) for external processing or editing.

> *Hint: an external hard drive to transfer the files between systems, or simply transfer them across a local network.*

You can always convert these files to a streaming file format if you later decide you'd like to supply them for 'on demand' Internet viewing. This lets you retain best quality right through to final output. When you eventually encode for streaming, you can choose settings that best suit the intended audience and streaming environment.

At the very least, if (perhaps to save conversion time) you capture video for web distribution, it's best to capture it at least at the size that you intend for final output. This helps ensure satisfactory video quality for your viewers. When video is compressed (as it invariably is for web viewing) you can lose important detail; compressing a full-screen video down to a quarter or a sixteenth of its size is a lesson in humility!

Other Factors

Other variables to keep in mind when you're creating video for the web are contrast and motion. During video encoding for web distribution, a fair amount of video information and detail can be lost. For this reason, good lighting of your source video is essential.

Also, web streaming doesn't handle detail, transitions and motion all that well -- so your best shots should be close up, and without a lot of movement. Too, audio from cameras and camcorders is rarely as good as that from external audio sources. You should at least use a clip-on lavaliere audio source, if not a directional or shotgun audio source to be sure you record only the audio you really want. Finally, for high quality streaming, consider using a 720p session, even when your cameras may be SD and interlaced (there is no particular benefit to working in SD when your goal is a smaller streaming output.

18.7   Diagnostics and Troubleshooting

As technologies go, video streaming is still in its adolescent phase, at best. There are a lot of different standards and diverse environments to consider. You have the necessary tools, but there are still some teething problems you may encounter. This section will point you in the right direction to overcome them.

18.7.1 Testing your Stream

When it comes to using your system in a professional live production environment (i.e., your bread and butter depends on getting it right, and now - not tomorrow), failure to test beforehand is not merely unwise - it can be professional suicide.

You should already be aware of the need for redundancy in a professional environment (you didn't bring just one camera, did you?) As reliable as any device may be, Murphy's Law has not been repealed … so you plan for this, bringing the appropriate equipment, such as uninterruptable power supplies, backup recording devices (there's no shame in having a VCR backing up your digital record – 'low tech' still has a place in the grand scheme.)

But you also need to perform onsite testing, to ensure your live stream is working well before 'zero hour.' No-one will thank you for excuses, no matter how brilliantly they point the finger at forces beyond your control.

1. Set up and enable a test stream.
2. You can use the integrated web browser to scrutinize the stream, but you should probably confirm using an external system, too.

Success at this point does not necessarily mean you're done. You may be able to see the stream locally, but can someone outside the local environment connect to it over the Internet? The best way to find out is to have someone at a remote location verify that your stream is streaming properly. If it is, great! Otherwise, keep reading…

Testing with Ping

Before your stream can be seen - whether on a local intranet or the Internet - client computers (or your service provider) need to be able to establish a network connection with your local system and it's encoder.

Ping is a humble but effective tool to ensure the basic connection exists, thus it can help you with streaming, *NDI®* connection issues, too (and it works just fine in a multi-platform environment!)

Ping sends a small set of data packets to the target host (IP number), then 'listens' for an echo response in return. Ping estimates the round-trip time in milliseconds, records any data losses, and displays a summary when finished.

Bottom line, if you can't 'ping' your target, your connection has problems (the problem might be as simple as a bad cable connection). To issue a ping, you need know the IP number of the target computer.

Finding the target IP number

For Windows XP®

1. Select Run from the Windows® Start Menu (look in the Settings sub-menu if it is not listed at the top level).
2. Type "cmd" (without the quotation marks) into the dialog, and press Enter on the keyboard.
3. In the command shell that opens, type "ipconfig" (without the quotation marks) and press Enter again.
4. The IP Address for the system will be reported in the window, along with other data.

For Windows Vista® (or later)

1. Type "run" (without the quotation marks) into the Search field, then press Enter on the keyboard.
2. Type "cmd" (without the quotation marks) into the dialog, and press Enter on the keyboard.
3. In the command shell that opens, type "ipconfig" (without the quotation marks) and press Enter again.
4. The IP Address for the system will be reported in the window (listed next to "IPv4 Address"), along with other data.

To find the IP Address for a system running OS X®

1. Click the Apple icon at upper left on the Desktop, and select About This Mac.
2. Click More info … in the panel which opens.
3. Click Network in the Contents column at left.
4. The IP number for the system will be listed in the right hand pane.

Issuing a Ping

Ping is a command line program, and must be run from a command shell on the issuing computer. To open a command shell and send a ping, follow the procedure below that applies.

Windows®

1. Repeat the steps you performed above to re-open a command shell.
2. Type "ping" (without quotes) followed by a space and the target IP number, as in the image below – then press Enter.

FIGURE 211

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 212. A success ping will display a report like Figure 213.

FIGURE 212

FIGURE 213

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.

18.7.2 Speed Tests

Are you sure your upload bandwidth is adequate to the bitrate you've set for your stream? Why not test and make sure? Again, a number of websites provide free speed testing. These will give you a basic idea of what your local bandwidth really is.   One site which provides a list of online speed test resources is: http://www.dslreports.com/speedtest?more=1

18.7.3 Where is the Problem?

With regard to streaming issues, don't overlook the fact that your Vizrt live production system is just one of the pieces of the puzzle. There are many others that are just as important. One useful thing to try is to check the streaming file. Archive the streaming output file locally, and then examine it to see if it has any problems. This file corresponds exactly to what the encoder is sending the downstream server. In cases of sync problems, low frame-rate problems, audio popping problems, etc., if it's an encoding issue, the problem will be seen in this file. On the other hand (if the file looks good), then the issue has to be after the encoder (perhaps a network problem or CDN configuration mismatch).

19 Export

The Export feature allows broadcasters to publish clips and stills from events like syndicated sports, entertainment or news programming to social media sites even while the live action and capture continues. Networks, corporate users and others with sophisticated website and distribution needs can deliver content moments after events occur for all manner of timely applications.

19.1   Overview

In today's broadcasting world, a single program feed is often inadequate, inappropriate, or both. More and more viewers ingest media from multiple sources, even simultaneously. A live (and lively) online presence is critical for many productions with little or no traditional broadcast following. Publishing supplemental content such as backstage feeds, locker room interviews, pre and post-game chatter, etc.), via such popular Internet sites as Facebook®, YouTube®, Twitter®, etc. provide many opportunities for brand extension and monetization. In addition, the Export feature supports both transcoding and distribution to local or networked storage for archival or post production purposes.

Once you create presets for your social media accounts and other publishing targets, the *Export* tools in the *Live Desktop* make it quick and easy to distribute selected content to multiple sites even while production and recording is still underway – just perfect for concerts, galas and sport events.

19.2   Export Menu

The *Export* feature's user interface conforms in large measure to *Stream*, which we just discussed. Click the *Configure* gear next to the large *Export* button in the *Dashboard* at the top of the screen to open the menu (Figure 214).

At the top (where you would see *Web Browser* listed in the *Stream* menu), is an *Export Media* item. This opens the panel which allows you to manage media files you intend to export. We'll discuss this panel soon.
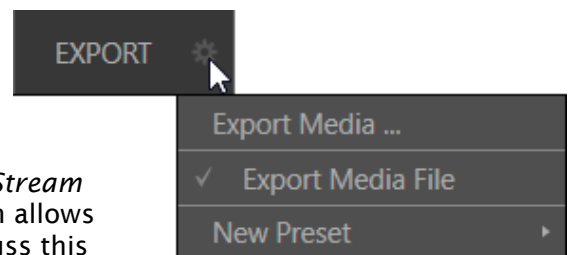
FIGURE 214

19.2.1 Preset List

Below the *Export Media* menu item is a list of any presets you have configured as *Export* targets. (Before you actually create any presets for yourself, this list shows only the default *Export Media File* entry, a transcoding preset which cannot be deleted.)

Notice that each preset listed in the menu can be checked or un-checked. When you add media files to the *Export Bin* (by any method), the check-marked entries determine which *Export* targets are *automatically* assigned to them (you can also manually modify the presets for each item in the *Bin* at any time).

Hint: When the mouse pointer is over a preset in the Export menu, two gadgets are shown at right; the familiar gear allows you to modify the preset, and the (x) will remove it from the list.

19.2.2 New Preset

Let's consider the *New Preset* menu item. Click this to display a sub-menu listing various supported *Export* targets (such as Twitter, or Facebook). Select an item here to open a dialog that lets you create a custom preset that will then appear in the list discussed just above.

For most external sites (i.e., social media sites or ftp sites), the dialog requires you to enter account credentials. Typically you will need a *user name* and password for your social media accounts, as well as FTP servers (credentials are tested when you press *OK*, and will report an error if a problem exists).

19.2.3 Social Media Sites

Export can publish media to Facebook, Twitter, YouTube, and many more sites and services. Other connections may be supported as it becomes possible to do so.

19.2.4 Transcode, SMTP, and FTP

The *Transcode, FTP* and *SMTP* options let you handle various file conversions and publishing to local (or networked) storage volumes, or even as email. These are very useful output alternatives, effectively providing live export methods that do not force you to wait until production ends. This can be invaluable for collaboration, whether local or remote.

Transcode exports provide options to re-encode video in different formats before sharing. Select suitable options for your target device or application. For SMTP, replace the dummy email server entries with those of your own mail service.

19.2.5 Watermarking

To avoid unauthorized of use private or copyrighted media, you may want to add a watermark before exporting it to public sites. The *Watermark* feature in the footer of the various *Export* preset configuration panels allows you to select a suitable overlay image.

The image you select will be composited onto exported video or still image files. It should normally be a 32bit still image file (supported formats include popular formats such as PNG and Targa) that positions the watermark correctly in the frame taking into account the resolution and aspect of exported files.

19.3   Export Media

Having discussed configuration of export accounts, let's move on to look at live operations. In the Dashboard's *File* menu, select the *Export Media* item to open this panel (Figure 215), which allows you to manage the list of clips and still images you wish to export.
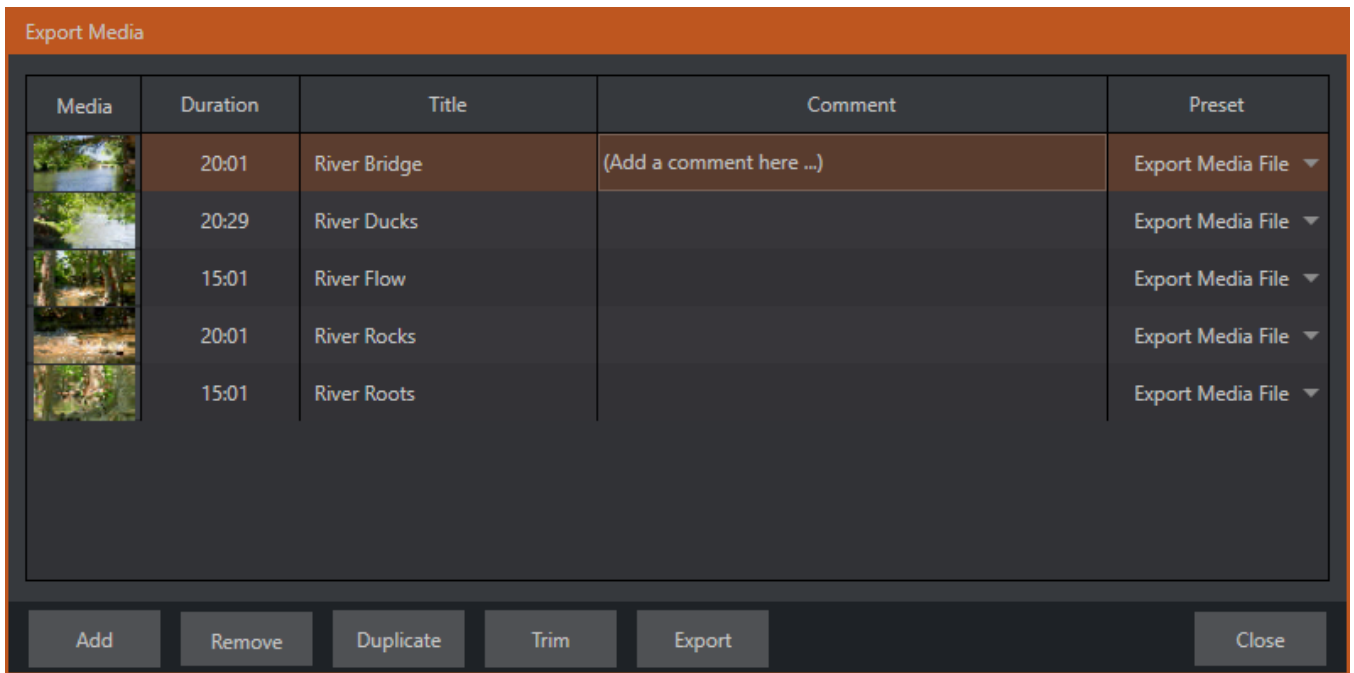
FIGURE 215

The features of the *Export Media bin* are powerful, but not hard to grasp. Click the *Add* button in the footer to open a *Media Browser,* which you can then use to select (and multi-select) content you wish to export. You can choose items from your current session or another location. These files will be added to the bin, but they will not be exported at this point.

> Hint: You can Add and even Upload files that you are currently recording, even before pressing Stop. These files will be found in the virtual Session Recordings folder the Media Browser shows for the session.

19.3.1 Metadata

FIGURE 216

Information is displayed for each media file added, including the file name (or 'alias', in the case of files added from a *Media Player* playlist, as we will discuss later), *Duration,* and *Preset* (depending on settings, multiple entries pointed at different destinations may be added in one operation). The *Comment* column allows you to add remarks that will be sent along with the upload to sites that support this. Click in this column to enable keyboard entry, or navigate to it and simply start typing. Press *Enter* or click elsewhere to end editing.

Similarly, type in the *Title* column entry to change the title supplied for the file to social media accounts, but note that this has no effect on *FTP* or *Transcode* preset operations.

19.3.2 Presets

The *Preset* column provides a menu allowing you to change the export preset or even add multiple targets for each individual item in the bin. A checkmark beside a preset indicates the target is active.

Of course, *Preset* selections can vary from one item in the *Bin* to the next. Obviously, if no checkmarks appear here, the entry on that row is not fully configured, and will be ignored by the *Export* processor.

19.3.3 List Management
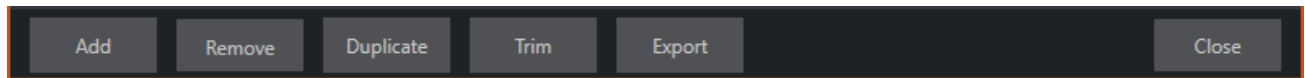
We touched on the *Add* button in the previous section. Three other nearby features help you manage your *Bin* entries.

- Remove, as you'd expect, deletes entries from the Bin, doing so without any effect on the source files.
- Duplicate clones selected entries. You may prefer this way of publishing an item to multiple targets (over adding multiple checkmarks to the Preset column for a single entry) at times.
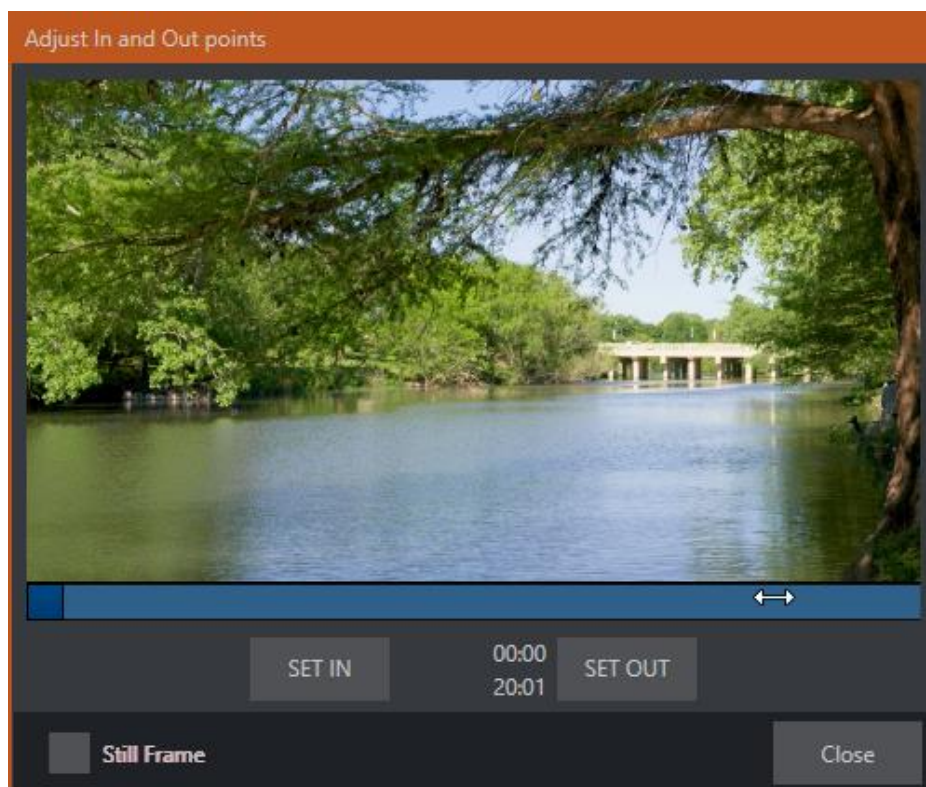
- For example, the encoding settings for one target may involve longer processing than you want to allow at the moment. Using a duplicate entry, you can defer processing that entry until a more convenient opportunity.
- Click the Trim button in the footer to open a trimmer pane (Figure 218) that allows you to set the In and Out Points for clips you plan to share (some file formats do not support trimming).
  Clips that are added while still being captured can be re-trimmed to take advantage of file 'growth'.

Hint: Checkmark the Still Frame switch to select a frame and convert it to a JPEG image file on upload.

19.3.4 The Export Button
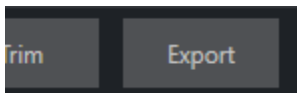
Also located in the footer of the *Export Bin*, the *Export button* is a toggle; that is, like the light switch in your foyer, it has two states – on and off.
When lit, the *Export processor* is activated, and is either watching for qualified entries *Bin* entries to appear for exporting, or actively processing those that are 'ready to go'.   (Conversely, of course, no light, no go …)

> *Note: The footer Export button is linked to the larger Dashboard Export button, which does the exact same thing.*

19.3.5 Other 'Add to' Methods

Let's handle the final details you need to become a social media maestro. It seems obvious that manually managing the minutiae of exporting could intrude into the already hectic life of a switcher operator. Live production already demands a lot of attention.
Using *Add* in the *Export Bin* panel, entering comments, etc., would be quite a distraction. For this reason, Export makes it as simple as possible to share your media, as follows
Once you have configured your *Export* presets, check-marked one or more in the *Export* menu, and decided whether to add checks to *Stills*, *Clips*, or both in the *Auto Queue* menu, you have eliminated a good deal of the fuss. But we can do better yet – in two ways:

- You can add either stills or clips to the Export Bin from the playlist of a Media Player.
- Second, you can even automate the matter of adding custom titles and comments. Grab, Record as well as the Media Players all support individual custom Names and Comments, which will supply the corresponding metadata for your Export Media additions.
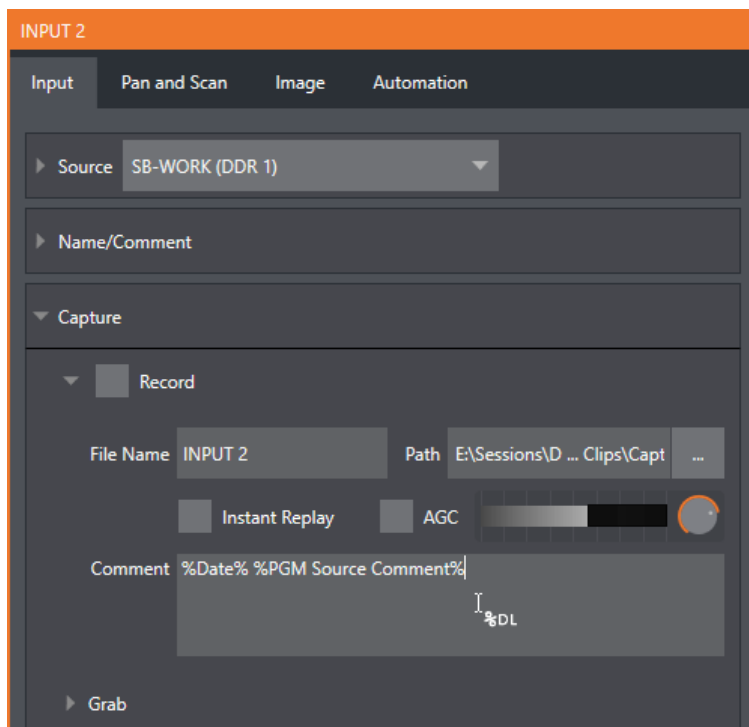
- Better still, the Name and Comment fields for Grab and Record features support DataLink (compare Section 12.2.4). This lets you automatically supply unique and meaningful information to social media sites along with your Export uploads. You can even mix DataLink keys with literal text, to produce comments that embed things like the current time, the current score of a game, or the name of the person on camera at the moment into coherent sentences (Figure 220).

20 Record, Grab, and Replay

You will often want to capture video clips from external sources, as well as to record your own live productions. Similarly, it can be quite useful to be able to grab stills from Program output for use in the current production. This chapter will provide everything you need to know about this topic.

20.1 Record

Vizrt live production systems provide a great deal of flexibility when it comes to capturing your program, selected elements of it, and a wide array of internal and external sources (with embedded timecode). Using IsoCorder™ technology, Viz Vectar Plus - Live Production delivers powerful recording capabilities.

As Viz Vectar Plus – Live Production primary outputs are configurable, you can use them to capture *Program*, *Program (Clean),* individual *Switcher* sources, *M/E*s, and more.
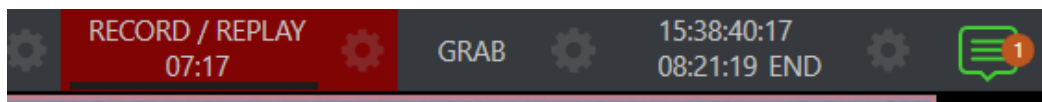
FIGURE 221

Recording is easily enabled and disabled by clicking the large *RECORD* button in the *Dashboard* (Figure 221).

During capture, a nearby time counter tracks the length of clips recorded with the current base filename, and a horizontal VU meter beneath the button assures you that you are capturing audio.

> *Note: It is not necessary to interrupt recording to add a clip that is being captured to a DDR playlist or the Publish Bin. Clip icons show a red 'recording' indicator on clips currently being captured in playlists, the Publish Bin, and in the Media Browser.*

20.1.1 Record Configuration

Of course, before you begin recording, you'll want to determine *what* to record, *where* to record it to, and so on.

To support IsoCorder's flexible ability to capture almost anything, settings and controls for recording are provided in the individual *Input Configuration* panels as well as the *Output Configuration* pane. Click the *Configure* button (gear) for the control panel of the source you wish to configure to access these settings.

Let's review the features and settings found in these control groups.

20.1.2 Capture Controls
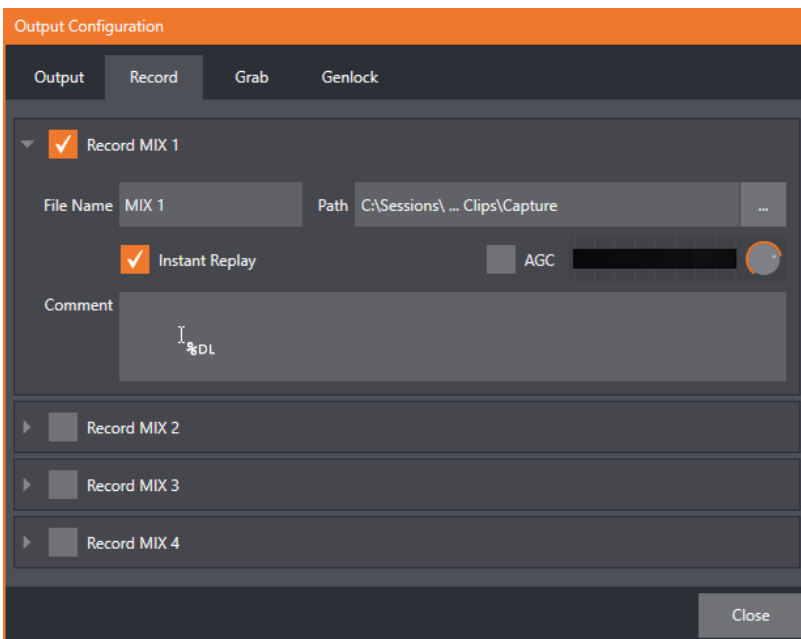
FIGURE 222
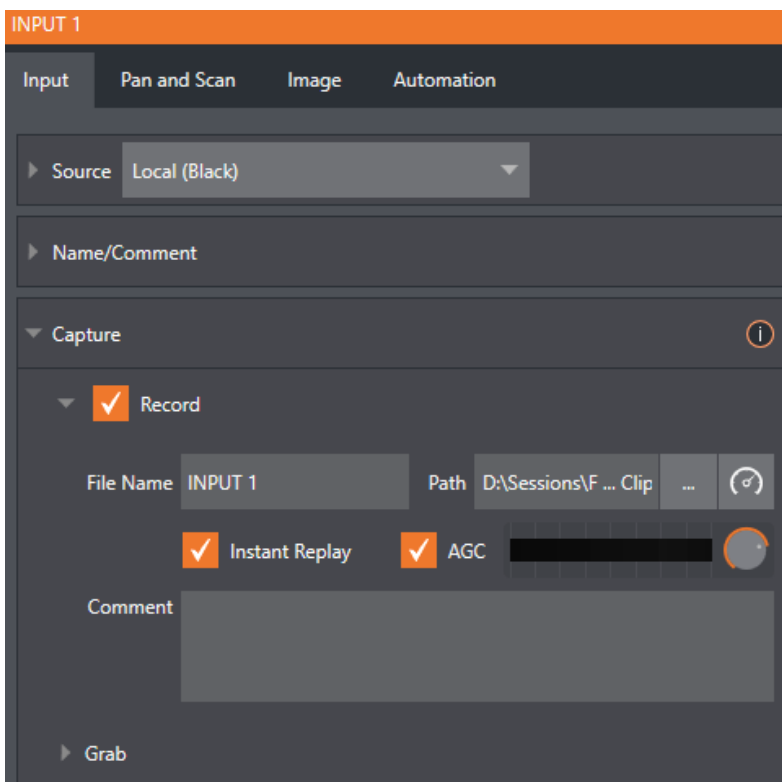
FIGURE 223

Whether you are setting up a recorder for a video input or output *Mix*, the *Capture* control group features are the same.

- A switch at the top is used to enable or disable the recorder
- Filename and path text boxes appear just below.

- A convenient Drive Speed Test button appears to the right of the Path field. Click it to open a utility that lets you evaluate the speed and capacity of your storage volumes.

Note: The same source cannot be selected for multiple recordings. For example: "IN 1" cannot be selected as the source for two recorders.

Filename and Comment

IsoCorder uses the source name to supply the default filename for each recording (names are numerically incremented automatically as well), but these can be edited. Conveniently, DataLink key system allows you to insert dynamic values from real-time production sources into the filename. For example, every recorded or grabbed file can automatically incorporate a date stamp, identify the input selected on the *Program* row at the time of capture, and so on. This is useful not only in locating files from specific sources later, but also when posting media to social media services using the *Export* feature.

Note: IsoCorder captures a low resolution 'preview' file along with the high-quality recording. We do not recommend deleting or moving these supplemental files when using the recordings on a Vizrt product, as doing so will result in higher resource usage during live production.
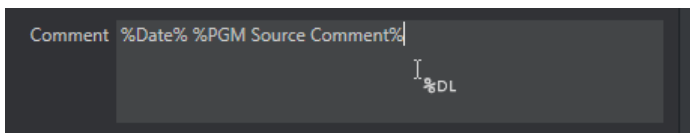
The *Comment* entry can likewise use *DataLink* values, and in turn can be used to provide metadata to title pages that refer to the captured clip's comment.

Path

Click the three dots at right beside the *Path* field to select from available storage volumes as targets for the recording.

Caution: It is recommended that any single drive be tasked to capture one or two video sources at most. A warning message is displayed if you exceed this number when assigning Destination settings. You are allowed to exceed this limit, however, when you are confident that very fast volumes are capable of handling the load.

Audio Level

The *Audio* Level control lets you set the volume independently for each source you capture, and feature a convenient AGC option (Automatic Gain Control).

File Format

IsoCorder records a high-quality Quicktime file. (You can use the *Transcode* function in *Export* to supply files in a number of different formats, when necessary.)

20.2   Replay

Not too surprisingly, the *Replay* switch in each *Capture* control group enables instant replay features for individual recorders. Before considering how to actually perform a replay, let's examine the *Dashboard* menu *Replay* options, which affect its playback settings.
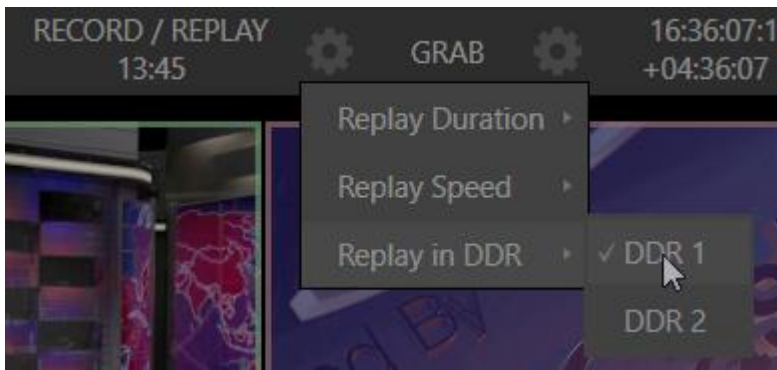
- Replay Duration – determines the length of replay clips added to the DDRs
- Replay Speed – set the playback speed for clips added to the DDR using the replay workflow
- Replay in DDR – select a DDR as the target for replay clip playback

20.2.1 Instant and Deferred Replays

The method of triggering a replay varies depending on whether you want to replay a clip captured from a *Mix* (output) or directly from a *Switcher* input.

20.2.2 Switcher Source

When the *Record* and *Replay* switches in the *Capture* control group for a *Switcher* source are both enabled, special replay controls are shown beneath its buttons on the *Program* and *Preview* rows of the *Switcher* (Figure 226).

Click the replay button beneath the *Program* row to trigger an instant replay using the DDR's *Show On* (PGM) feature and settings. (Or, hold down CTRL and click the larger Switcher button itself to do the same thing.)
The similar button beneath the *Preview* row is even more useful; it adds the replay clip to the *DDR*, and leaves it selected, but does not play it on *Program Out* immediately.
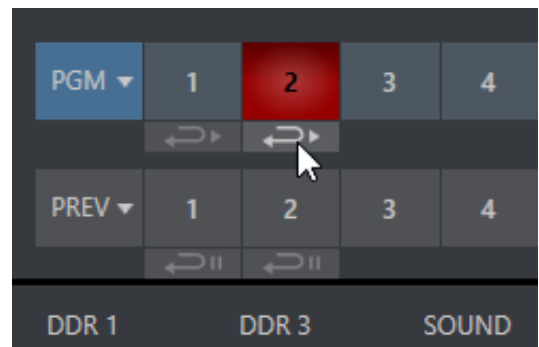
When you are ready to insert the replay clip into your program, press the keyboard *CTRL* key and the *Spacebar*. This will trigger the *Show On* (PGM) feature for the DDR currently assigned to replay duties. This workflow lets you defer replay playback until a more appropriate moment.

20.2.3 Mixed Output

Since outputs do not appear on the *Switcher* rows, the methods above do not apply. Instead, simply press a number pad key from 1-4 to trigger an instant replay from the corresponding output (Mix 1-4) recorder.

> *Hint: It's possible to assign an NDI output from the system to one of its own inputs if you prefer to use the same method as described earlier for your output replays.*

20.3 Grab

At times, all you really want to capture is a still image from the current *Program Output* video stream (or perhaps, an input). This is the purpose of the *Grab* function.
Grab is represented by a large button in the *Dashboard* at the top of the screen, and smaller grab (camera) icons which appear at upper-right on *Switcher* source viewports. The former grabs stills from MIX outputs (when enabled individually), while the latter grabs an image from specific *Switcher* sources.

The Grab menu

Click the *Configure* button (gear) next to *Grab* in the *Dashboard* at the top of the *Live Desktop* to choose a target *Media Player* for grabs. Otherwise, input and output grab configuration options are very similar to those described above for recording.

> *Note: De-Interlacing is automatically applied to avoid a 'comb' effect caused by inter-frame motion in fielded sessions.*

21 Control Surfaces

This chapter introduces the Viz Vectar Plus - Live Production control surfaces, helping you to see how they complement your system and bring added ability to your production setup.

The discussion also covers how to properly connect your live production system to the control surface.

Viz Vectar Plus - Live Production provides unrivalled live production power. With a matching control surface, all that power is right at your fingertips.

Two Viz Vectar control surfaces have been prepared for varied requirements. In large measure the functionality provided, and workflow is identical, regardless of which you use. Vizrt quad row panel is a large and powerful 'four-stripe' unit, delivering precise control over your program, allowing you to produce your show quickly and confidently. Vizrt dual row panel is its more compact sibling.

21.1 Connection and Configuration

Simply connect the control surface unit to the same *network your Vizrt live production system is on. Both Viz Vectar control surfaces require a standard, 3-prong AC power connection. You will need to pair a control surfaces with a specific live production unit to control, as described next.

The control surface and your Viz Vectar Plus - Live Production should be connected to the same subnet.

21.1.1 Pairing Systems and Surfaces

Viz Vectar Plus - Live Production auto-detects compatible control surfaces on the same network. Often there will only be one such surface, which makes setup easy. At other times, though, you may be in an environment with more than one surface, more than one live production system, or both of these conditions.
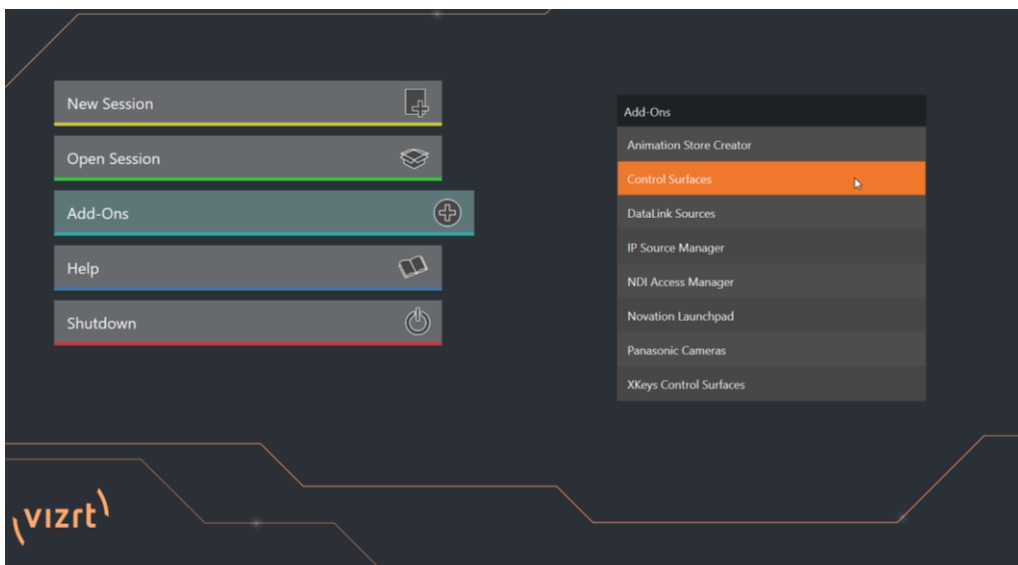
FIGURE 227

To allow you to manage these control connections, the *Control Surfaces* configuration utility is included in the Launch panel's *Add-Ons* menu.

1. Click the *Add-Ons* button on the main menu on the *Home page* in the *Launch* pane to show the list of installed add-on applications.
2. The utility will automatically identify and list qualified control surfaces it finds on the network.

3. Each surface discovered is listed in a numbered row. The ID number for the row is not permanently associated with a particular surface, and may change as surfaces are added to or removed from the network. The ID number does serve a very useful purpose, however.

If you look at the top-left LCD display panel of an un-paired control surface when this utility is open, its ID number is temporarily shown. This makes it easy to match an entry in the panel with a specific physical surface.

4. Once you identify the surface you want to use, simply checkmark it in the list to claim it for the local system (the steps in the next sub-heading, Setting the Channel, will complete the communication connection to the surface).

5. You can also enter a brief description ("Master Control CS") into the Memo field, for later reference.

Setting the Channel

6. Finally, notice that a Local Channel menu is provided for each surface – or more accurately, for each echelon, or two stripe pair on the surface (see Section 21.2.1). Let's discuss this detail a bit further.
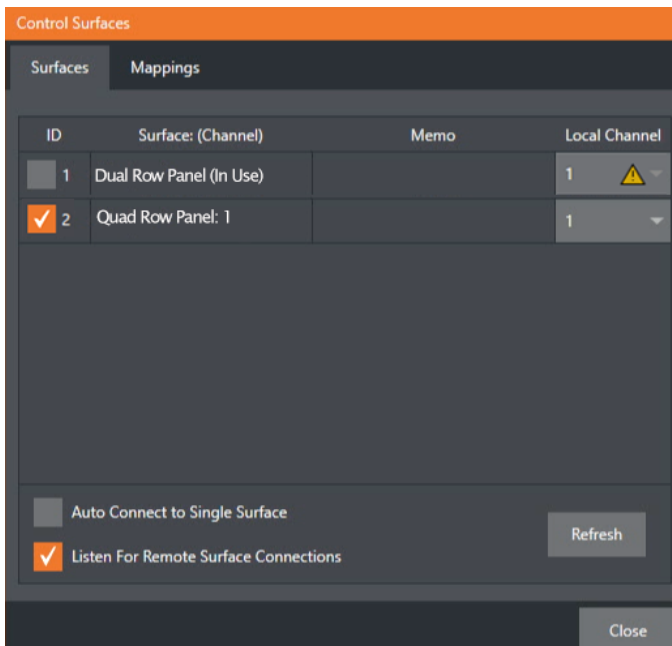
FIGURE 228

The *Channel* menu controls just one of two related channel settings – this one (on the local host), and another channel used by the control surface itself. These combine to let you connect to and control alternate live production systems.

> *Hint: You might think of the control and system channels as being like the channel settings of two 'walkie talkies' (2-way radios). For two-way radios to connect, both units must be on the same channel. Similarly, the channel selection displayed in this software pane tells the local system to communicate with the selected (check-marked) control surface on the channel you choose. Of course, the control surface must also be set to the same channel for successful communication.*

The *Control Surface* utility identifies the channel each control surface is on by a number from 1-8 after the colon in the *Surface: (Channel)* column. Normally, you can simply set the *Local Channel* to match this value (a 'bang' is shown if the channel the surface is set to does not match the *Local Channel*).

If you find it necessary to modify the channel the *control surface* is set to, proceed as follows:

7. Hold down the *SHIFT, CTRL and ALT buttons on the control surface at the same time for a couple of seconds to enable channel select mode. The left-most LCD display in the first stripe in the echelon updates to show channel selections, and a button in the PGM/A row lights to show the current channel. Tap another button in the row to change the selection.

> ** For the four-stripe Viz Vectar L panel, you must repeat this operation in order to match the second echelon's channel setting to that of the first. Press and hold the number pad buttons labeled 1, 2 and 3 in the third stripe (rather than SHIFT, CTRL and ALT) in this case; then make your channel selection using the A button in the PGM/A row of the third stripe. With these settings you can, for example, set one system to listen to a certain control surface on channel 1, and set a different system to listen to the same control surface on channel 2 – then easily go from controlling one system to controlling the other by updating the surface channel setting.*

21.1.2 Button Backlighting

▪ Press the LAYER SELECT B and D buttons (see Section 21.3.6) together, and keep them pressed down.

21.2 Control Schema
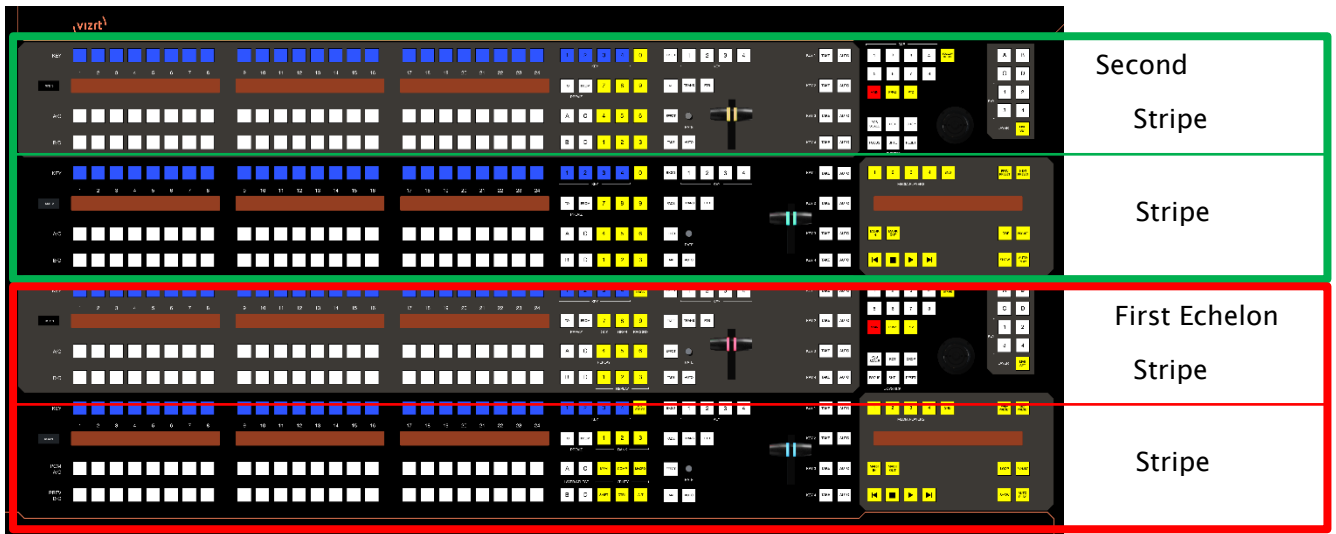
FIGURE 229

Generally, you can think of the various control groups provided as being organized into horizontal 'stripes'. In turn, two stripes are paired together in upper and lower echelons, as shown above.

21.2.1 Stripes and Echelons

Broadly speaking, the control layout of the all stripes is quite similar, and the second echelon is nearly identical to the first. However, the first echelon is unique in providing several common controls (e.g., SHIFT, ALT, BANK, etc., conveniently locating these right under your hands at rest.

This being so, it's not hard to see that the first echelon – that is, the one nearest the operator – can be considered dominant, even vital, while the second echelon plays a supporting role.

We'll cover the functions assigned to these controls in due course but, for now, let's continue our exploration of the control surface topography by looking at stripe organization, and the distinctions between odd and even stripes.
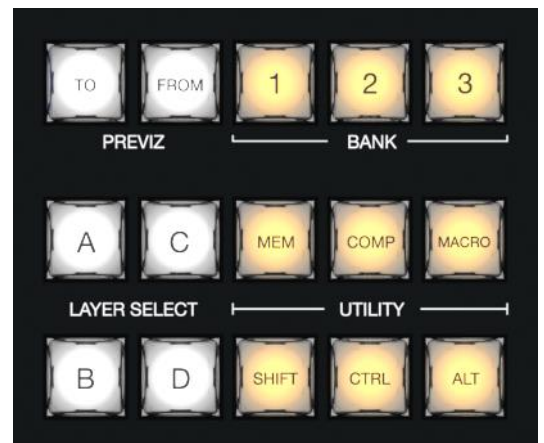
FIGURE 230

21.2.2 Control Columns
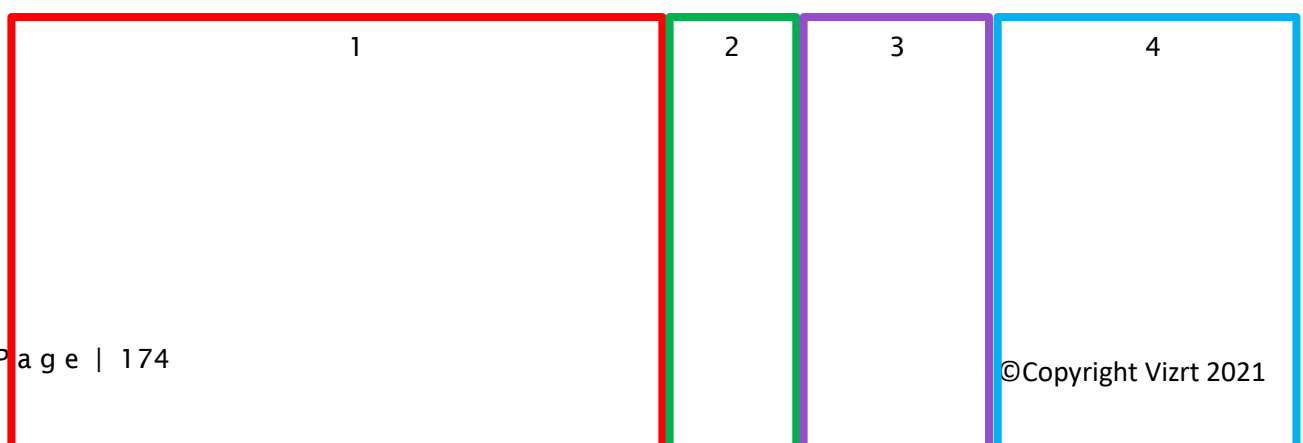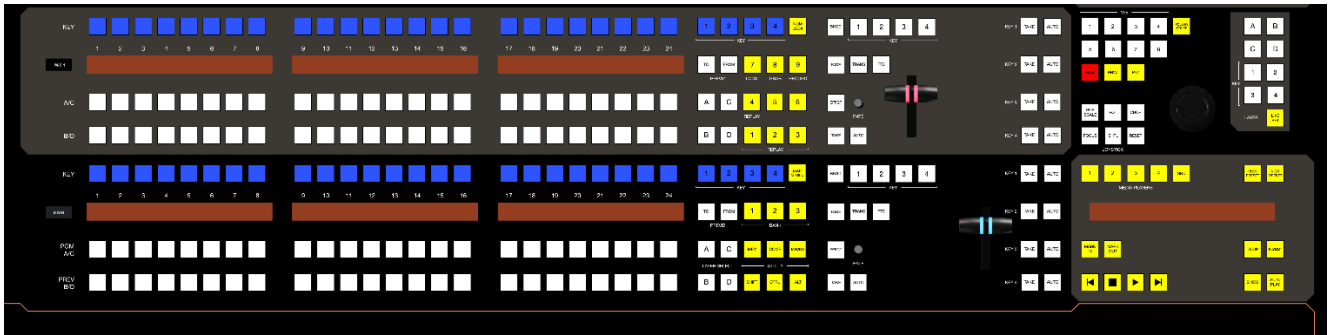
FIGURE 231

Controls in each horizontal stripe can be grouped into the following four columns:
1 – Selection: choose video sources
2 – Command: control operations and options
3 - Layers & Effects: transitions and layer visibility
4 - Joystick & Media: layer position and *PTZ* control, plus *Media Player* control
In the sections that follow, we'll look at each the functions of controls in each of these columns more closely, but first, let's sidestep briefly to talk about displays.

21.2.3 Displays

1. Selection and information
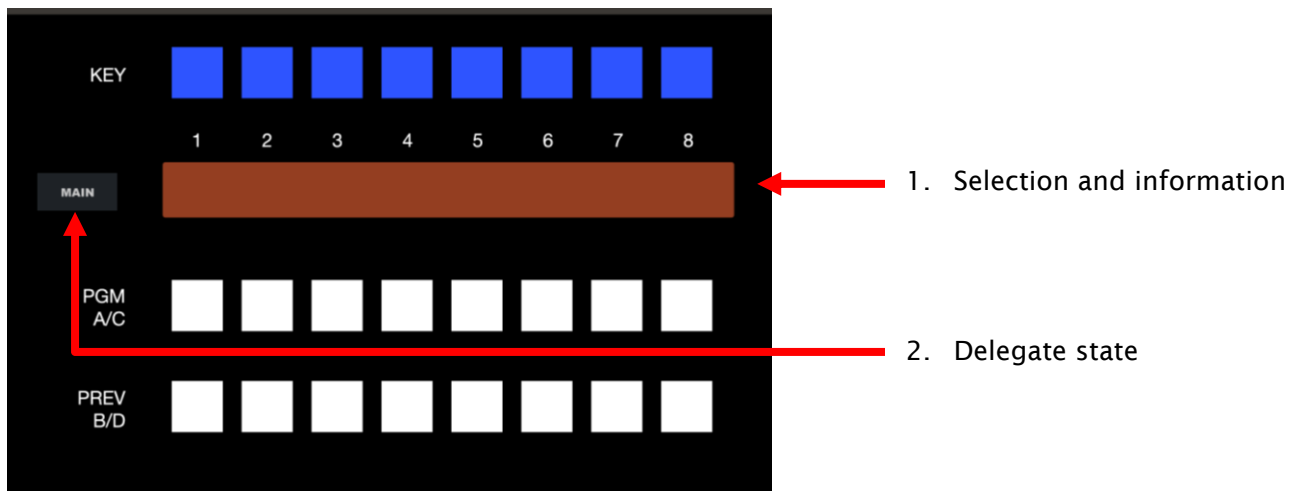
2. Delegate state

FIGURE 232

Both Viz Vectar control surfaces feature helpful indicators and system feedback by means of illuminated displays.

1. An OLED display positioned just left of each stripe normally shows the delegate state for the associated stripe. For example it may show that the stripe has been delegated (or 'assigned') to control the Main switcher, one or more M/Es, or for one of Vectar's supplementary routed output.
2. The blue LCD panels spanning each stripe just below the KEY row show labels identifying the selection that would result from pressing a button in the same column.

Hint: The numbers 1-24 are silkscreened above the LCD panels as a further aid when making selections.
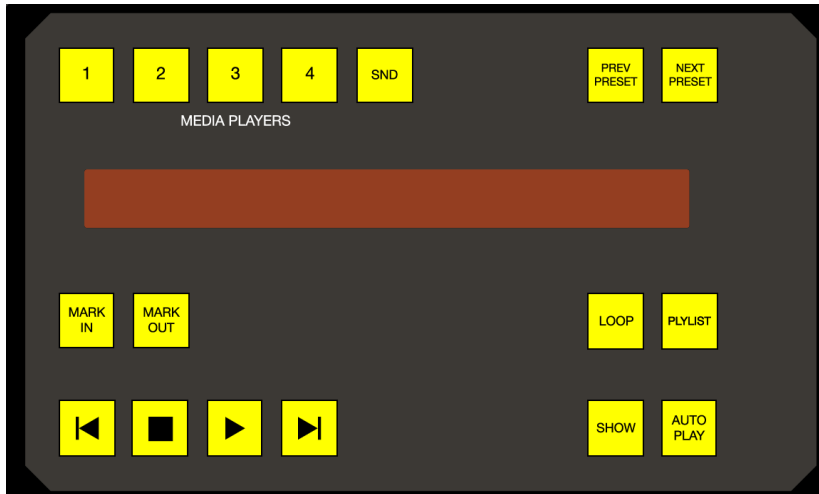
3. Another LCD strip appears in the Media Players group at right in the first stripe, and third for the four stripe surface.

Item 1 above raises the question, "How do I delegate a stripe to control the desired module?" Let's go on to talk about this, beginning by discussing what "delegating" means in the context of a control surface.

21.3 Primary Command Group

We saw earlier that the second column of buttons in each stripe provides access to important control operations and options.

The *Command* group in the *first stripe* (nearest the operator) has some unique features that actually govern other sections of the overall control surface. We'll refer to this as the *primary Command group*. Among these special controls are several that we can describe as 'delegate' buttons.

For example, consider the four buttons labeled *KEY* in the top row of this group.
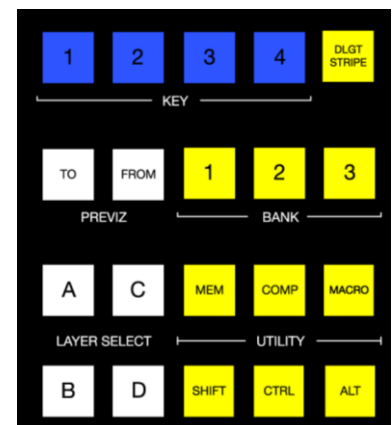
21.3.1 KEY

Pressing one of these buttons, labeled 1-4, 'delegates' or assigns the buttons in the 24-button *KEY* selection row at left in the same stripe to govern the active source assigned to one or more KEY (or DSK) layers.

Hint: Delegate buttons usually, though not always, support multi-selection.

21.3.2 DLGT STRIPE

The remaining button on the topmost row of the *primary Command group* is labeled *DLGT STRIPE*, which is an abbreviation of 'delegate stripe'.
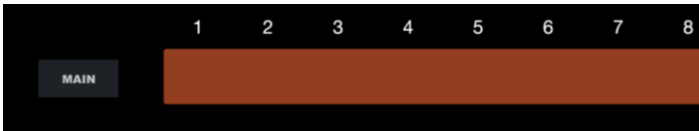
FIGURE 236

When you press and hold *DLGT STRIPE*, the LCD displays in *each* stripe update to show the names of the available switcher busses (*MAIN, M/E 1, 2, etc.)* and MIX 1-4. In this state, press one or more buttons in the PGM/A row beneath and release the *DLGT STRIPE* button to assign the stripe to the designated bus or busses.
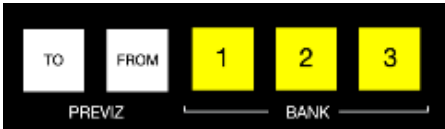
FIGURE 237

Hint: The QuickSelect button (marked with an 'eye' icon to associate it with visibility) is located in between BKGD and FTB. Clicking it updates the Switcher's T-Bar delegate and transition states so that the next TAKE or AUTO operation will remove all visible DSK or KEY layers from output. (On supporting control surfaces, press ALT & BKGD to trigger the QuickSelect feature.)

21.3.3 BANK

Another set of delegate buttons sits in the second row (counting from the top) of the *primary Command group*. This group is labeled *BANK.* As you know by now, the *Switcher* crosspoints of Viz Vectar systems are organized in banks comprising 24 columns.
Similarly, *Switcher* sources are presented in banks on Viz Vectar control surfaces.
Press the desired *BANK* button – 1, 2 or 3 – to determine which group of sources is currently delegated to the *Switcher* rows in all stripes. The displays above the selection rows will update accordingly.

> *Note: Bank buttons do not support multi-selection.*

Split Banks

Ordinarily, the *Switcher* and *M/E* row bank assignments for all stripes on the surface match. So, for example, if the *Main Switcher* is showing *Bank 1*, all other stripes likewise display *Bank 1*. It possible, however, to lock individual stripes to specified *Banks*.
To do so, hold down the *ALT* and *CTRL* buttons on the surface together, which will cause the LCD displays to list *Banks 1, 2,* and *3* in the first three *Switcher* columns. Press the *KEY* row button above the display for the desired stripe to select the Bank it will present thereafter.
Stripes delegated to a particular *Bank* in this manner do not update when you press the *Bank (1-3)* buttons in the *Primary Command Group*. To restore normal behavior, hold down *ALT* and *CTRL* again, and notice that the *KEY* row button for the currently assigned bank lights. Press this button again to extinguish it, and the stripe will once again follow the primary *Bank* button assignment.

21.3.4 PREVIZ

This brings us to the control *PREVIZ* group which is reserved for possible future implementation.

21.3.5 UTILITY

MEM

When the *MEM* button is held down, the first 9 columns in the displays of all stripes update to list the names of *MEM*s for the busses delegated to the individual stripes. Punching a button in the

selection row below a *MEM* name recalls the corresponding preset for the bus assigned to the stripe.

Note: F*or multi-delegated stripes, only the first delegate is affected*

Holding *CTRL+MEM* then pressing and releasing a button in the *PGM/A* row beneath will store it into the corresponding MEM for the bus assigned to the stripe.

COMP

When the *COMP* button is held down, the first 16 columns in the displays of all stripes update to list the names of *COMPs* for the busses delegated to the individual stripes. Punching a button in the selection row below a *COMP* name applies the corresponding preset to the bus assigned to the stripe.

NOTE: In the case of multi-delegated stripes the COMP names displayed represent the first delegate only.

To store or update a *COMP*, hold down *CTRL + COMP*, then press a button in the selection row below the display for the desired stripe. To clear a *COMP*, hold down *ALT + COMP*, then press a button in the same selection row.

MACRO

To assign a macro to *any* button, first select the desired macro in the *Macro Configuration* pane in the user interface. Click a box in the *Triggers* control group at the bottom of the panel, to enable "Listen" mode, then hold down the *MACRO* button, punch the control surface button you want to use for the macro, and release the *MACRO* button. (See also Section 21.4.1, NUMBERPAD.)

When the *MACRO* button is held down, the names for any macros assigned to buttons in the (PGM/A/C) row immediately beneath the selection area displays are shown. Punching the button below a macro name triggers the corresponding macro.

Hint: To clear an assigned macro from a button, hold down Ctrl with the Macro button, the press the (lit) button you wish to clear.

SHIFT, CTRL, ALT
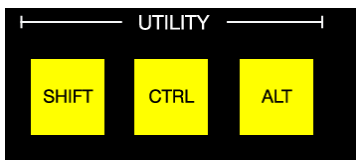
FIGURE 238

These buttons provide support for extended features and future expansion.

Note: Among other things, CTRL and SHIFT are used in connection with instant replays (see the Replay heading in Section 21.4.1) and Buffers (see 21.3).

21.3.6 LAYER SELECT (A/C, B/D)

Some Viz Vectar models let you configure M/Es with effects supporting up to four primary sources (along with KEY layers). The control surfaces, however, offers just *two* primary source selection rows, *PGM A/C* and *PREV B/D*.
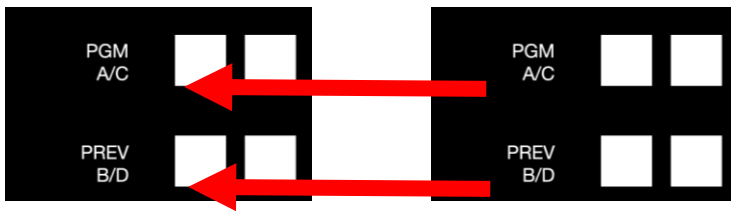
FIGURE 239

In cases where more than two selection rows are required for a given *M/E*, use the *LAYER SELECT* buttons to delegate the upper or lower selection rows to the layers you wish to control.

> *Hint: If you reduce the number of layers required by an M/E (by loading a different effect) the control surface will automatically revise the LAYER SELECT delegate state to match.*

21.4   Secondary Command Group

The *Command* control group in the second stripe (counting from the stripe nearest the operator) also has unique functions, which is why we will refer to it as the s*econdary Command group*. While discussing the *Primary Command Group* in 21.3, we reviewed the functions of the *KEY* delegates, and *LAYER SELECT* (A/C, B/D) buttons. Let's now consider the remaining items in this section.

21.4.1 NUMBERPAD

Unlike the *primary Command group*, the *secondary Command* group includes a numberpad. We'll discuss basic number input functions soon but, first, observe that certain buttons in the numberpads have labels below them identifying alternate functions.

FIGURE 240

NUM LOCK

This is why (in contrast to additional numberpads provided on the four stripe surface in particular), the 0 button in this numberpad is replaced by *NUM LOCK*. Not surprisingly, when *NUM LOCK* is lit all numberpad buttons perform simple numeric input. When *NUM LOCK* is off however (as it is by default) number buttons with alternate labels perform their secondary operation. Let's discuss these now.
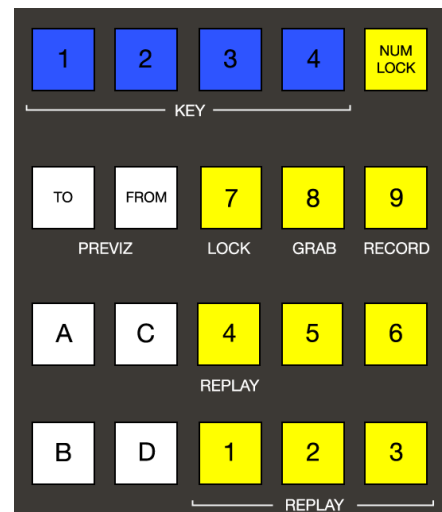
LOCK (7)

With *NUM LOCK* off, this button lets you lock or unlock other control surface buttons. Pressing *LOCK* lights all currently locked buttons. While the *LOCK* button is lit, pressing any other control surface button toggles its locked/unlocked state, preventing unintentional changes.

GRAB (8)

Pressing this button (with *NUM LOCK* off) triggers the software's main Dashboard *GRAB* button.

RECORD (9)

Pressing this button (with *NUM LOCK* off) triggers the main Dashboard *RECORD* function. You should be aware that, to prevent unintended interruptions in recordings, you must hold *SHIFT* while punching *RECORD* on the control surface to stop recording.

REPLAY (1, 2, 3, 4)
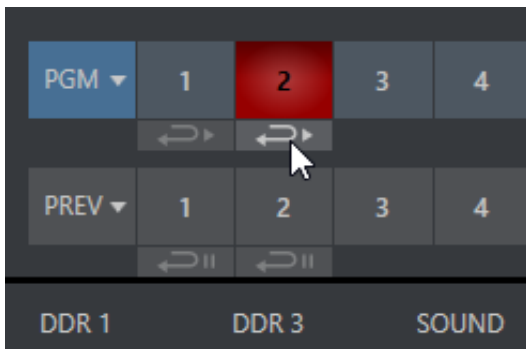
FIGURE 241

Recent editions of Viz Vectar Plus - Live Production software provide powerful instant replay workflow for any source with a recorder assigned to it.

When a Recorder is assigned to a source in its Input Configuration panel, and you also enable the associated Instant Replay switch, special replay buttons appear below the corresponding *Program* and *Preview* row buttons in the Live Desktop *Switcher.*

Viz Vectar control surfaces provide the same functionality as follows:

- To perform an instant replay from a Switcher source, hold down the CTRL button while punching the PGM A/C row button for the source. Double the length of the replay by holding down SHIFT along with CTRL.
- Or, defer playback of the instant replay as follows:
- Simply add the replay clip to the *DDR* playlist by clicking the source's *PREV B/D* row button (rather than the *PGM* row button) with *CTRL* (or *CTRL + SHIFT*) held down.
- Then, when you're ready to trigger the instant replay, press *CTRL + AUTO* to initiate the DDR's *Show On* operation.

This powerful workflow is ideal for replays from individual *Switcher* inputs. However, the four *MIX* outputs (which typically includes Program output as MIX 1) do not appear on the *Switcher* button rows – so another method is required in this case:

- Press a button numbered 1-4 in the Secondary Command Group (with NUM LOCK off) to trigger a replay from the corresponding (MIX 1-4) recorder.
- Hold down CTRL when doing the above to defer playback of the replay clip.
- Add SHIFT to either of the above to double the length of the replay clip.

NUMBERPAD (NUM LOCK ON)

Having covered the alternate (NUM LOCK off) numberpad button functions, let's consider the value of the *Numberpad* in connection with running macros.

Any macro can be triggered by pressing a three-digit number sequence on any of the *Numberpads* on the control surface. Simply open the *Macro Configuration* panel in Viz Vectar Plus - Live Production *Live Desktop*, and select a macro from the list; click a *Listen* box at the bottom of the panel, then type a three digit number, such as 123.
Each *Numberpad* on the control surface is treated independently. Thus, the very same numeric entry can trigger different macros from the *Numberpads* in different stripes.

> Hint: If you start to enter a number, then change your mind, simply press any button outside the number pad to cancel the entry.
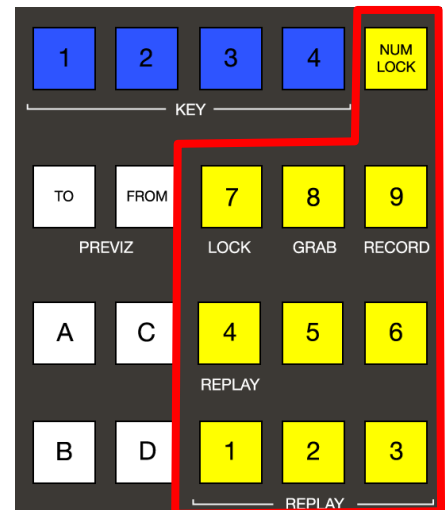
21.1   Layers & Effects

The controls in third column (all stripes) govern transitions and layer visibility for the various video busses.
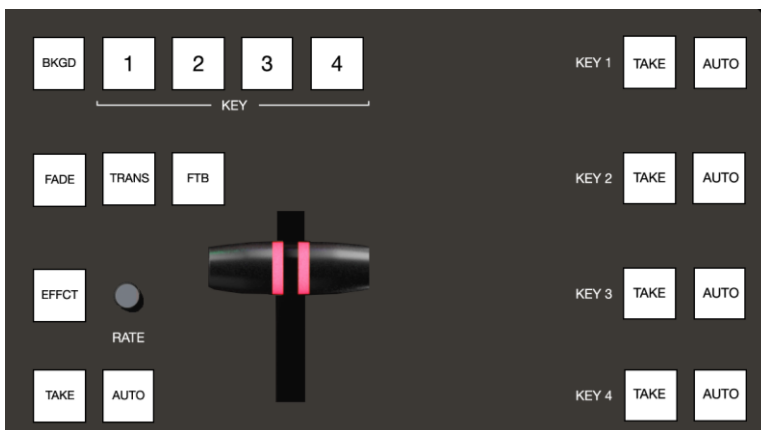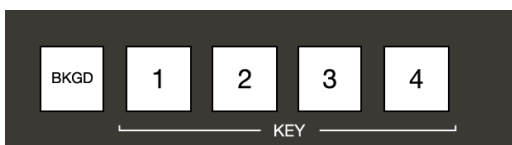
21.1.1 BKGD and KEY 1–4

These delegate buttons determine what video layers the main controls directly below (*TAKE*, *AUTO*, *T-Bar*, etc.) will affect. Multi-selection is supported, so, for example, if you select both *BKGD* (Background) and *KEY 1,* then press *AUTO* for a stripe delegated to the *Main Switcher*, a transition is applied to both the *Background* layer and *DSK 1.*

21.1.2 FADE & TRANS
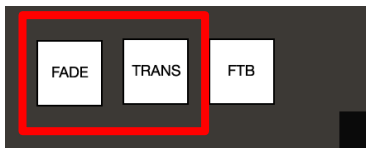
These two buttons provide a quick way to control the *Transition Bin* selection for the delegated switcher layer(s).

- Pushing FADE offers a quick and convenient way to select the standard Crossfade transition.
- Push the TRANS button to activate the last-used transition for a video layer (or layers).

Hint: For new sessions, TRANS jumps to the transition following Fade in the effect preset bin.

The *FADE* and *TRANS* (Transition) buttons are mutually exclusive; selecting either cancels the other, and only the currently active button remains lit.

21.1.3 FTB

To perform a *Fade to Black* operation, press *SHIFT* + the *FTB* button (the SHIFT button is required as a safety measure, since FTB is a somewhat dangerous operation). Revert to normal output by pressing *FTB* alone.

Hint: The duration of the transition to and from black is derived from the BKGD transition duration setting.

21.1.4 EFFCT (Effect)
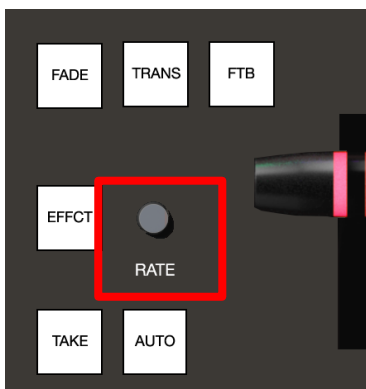
Hold down the *EFFCT* button to cause LED display columns at left to show the names of effects currently assigned to presets in effect bin for the currently delegated layer of the *Switcher* bus assigned to the stripe.

In the case of multi-delegated busses or layers, the display lists the content of the first effect preset bin only, and selection will only affect that delegated layer.

21.1.5 Rate

Rotate the nearby *RATE* knob to modify the transition timing for delegated layers. Or press the knob to cycle through the standard *Slow*, *Medium* and *Fast* presets.

21.1.6 TAKE & AUTO
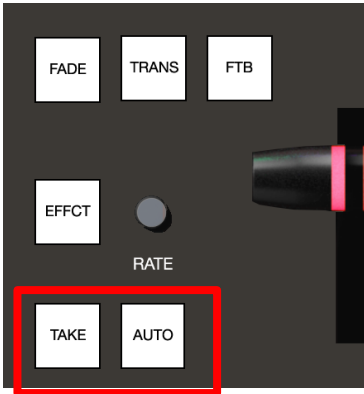
The *TAKE* and *AUTO* buttons perform a cut or transition respectively, affecting only the currently delegated video layers.

21.1.7 T-Bar

The T-Bar is perhaps the most recognizable component of a professional video control surface, and arguably one of the most important. Viz Vectar surfaces provide standard functionality by this means, along with exceptional system feedback. Obviously, you can pull the *T-Bar* to manually modify the progress of a transition between delegated video layers.

Illumination

The *T-Bar* employs colorful illumination to provide feedback and status updates based on your control surface selections and operations. The lighting schemes applied to *T-Bars* controlling both *M/Es* and *MAIN* video layers reinforce traditional button illumination in a way that soon becomes instinctive, and which provides unparalleled confidence in use. The following tables provide a color code for your convenience.

M/E Transitions

1. For an M/E with a transition assigned as the Background effect, control surface T-Bar illumination conforms to the color scheme of the M/E tabs on the Live Desktop.

M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8
Turquoise	Teal	Blush	Apricot	Sky Blue	Pink	Chartreuse	Hot Pink

2. If BKGD is delegated alone, the T-Bar color is as shown in the table above, identifying which M/E is delegated to the stripe. (When multiple M/Es are delegated, the first selected delegate determines the color.)
3. This color is at its brightest when the PGM/A source (effectively the Program row for a transition type effect) is fully displayed. As the T-Bar is moved (or AUTO is pressed) to begin a

transition, the color gradually dims until the effect is complete. At that point, it pops back to full brightness, just as the onscreen T-Bar returns to the top of its stroke.

4. In a mixed delegate situation (BKGD along with one or more KEY layers) the T-Bar is lit it medium blue, and conforms to the BKGD behavior described above.
5. If one or more KEY layers are delegated without BKGD, the T-Bar color is purple. When the KEY layer (or, for multi-KEY selections, the first KEY layer) is fully displayed, T-Bar lighting is at its brightest. Removing the layer dims the illumination.

Main Transitions

1. Just as you would expect, the T-Bar uses industry-standard red/green color coding for Program and Preview rows.
2. DSK-only operations result in the T-Bar being lit in purple, similar to M/Es.
3. Mixed mode (BKGD plus DSK delegates) result in blue illumination, after the fashion of T-Bar behavior previously described for M/Es.

This brings us to the fourth and final column of the Viz Vectar control surface – Joystick & Media control (see Section 2.2.2).

21.2   MEDIA PLAYERS

Let's explore the details of the *MEDIA PLAYER* control group (depending on your control surface model, there may be one or two such control groups).
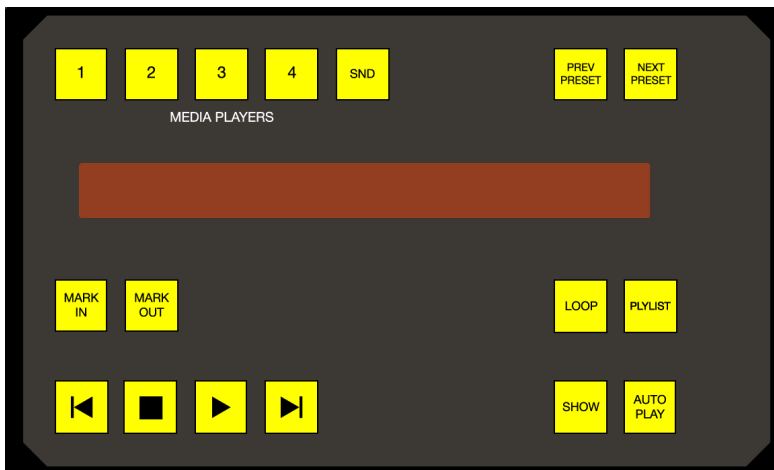
21.2.1 Delegates

The *MEDIA PLAYERS* buttons determine which players are governed by operations in this group. Multi-selection is supported.

21.2.2 PREV PRESET/NEXT PRESET
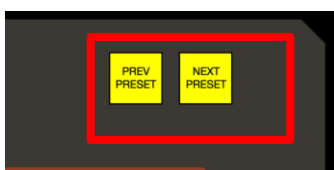
These two buttons let you cycle backwards or forwards respectively through existing presets for the delegated *Media Player.*

21.2.3 DISPLAY

The top line of the *Media Player* display shows the filename, countdown timer and if available, timecode for the current playlist selection. The lower line contains any comments you have attached to the file (using the clip context menu item, *Properties*).

21.2.4 MARK IN/OUT

Click these buttons to set the *In point* or *Out point* for the current playlist item in delegated players to the current frame.

> Hint: Press SHIFT with the button to reset the specified end point to its full limit.

21.2.5 LOOP and PLYLIST
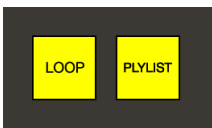
Click these buttons to toggle the *Loop* and *Playlist* modes for the delegated players.

21.2.6 Transport Control

- |◄ (Previous Item) – Press this button to go to the previous playlist entry in delegated Media Players. (The selection cycles to the last playlist entry when necessary.)
- ■ (Stop) – Push once to end playback for delegated Media Players; push a second time to return to the start position (this operation respects the Single setting for individual Media Players
- ► (Play) – Push to initiate playback for delegated Media Players.
- ►| (Next Item) – Push this button to go to the next playlist entry in delegated Media Players. (The selection cycles to the first playlist entry when necessary.)

21.2.7 SHOW and AUTOPLAY

The *SHOW* button triggers the matching *SHOW ON* feature in the footer of Viz Vectar Plus - Live Production *Media Players*. Likewise, the *AUTOPLAY* button toggles the eponymous *Media Player* option.
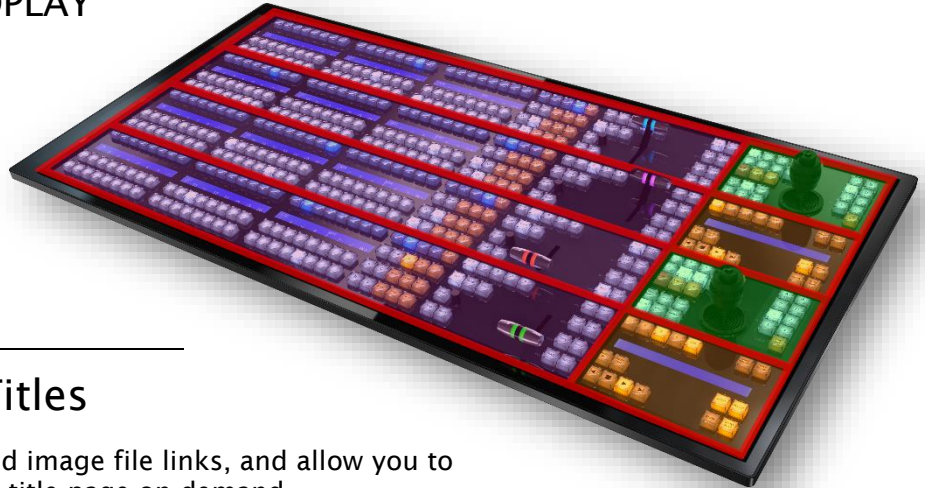
21.3   BUFFERS and Titles

Data Presets store text strings and image file links, and allow you to quickly update those aspects of a title page on demand.
To access these from your Viz Vectar control surface, you must first delegate a specific *Buffer* slot containing the target graphic you wish to control. To do so, hold down *SHIFT + MEM* and punch the button on the *PGM A/C* row at left corresponding to the desired *Buffer*.
Having delegated a *Buffer* as just described, hold down *SHIFT + MACRO* and punch the button on the *PGM A/C* row at left that corresponds to the *Data Preset* you wish to recall.

21.4   Joystick

The Viz Vectar control surface joystick provides a very versatile input mechanism.

In considering its applications it is important to realize that, unlike the *Layers and Effects* control groups at left, the *Joystick(s)* located in the surface's right-most column can optionally operate completely independently from the stripes at left.
Thus, while *T-Bar* operations (for example) are always directed to the video busses delegated to the stripe they are in, *Joystick* manipulations can affect any *M/E*, a *PTZ* (Pan, Tilt & Zoom) camera, or even a *Media Player*.
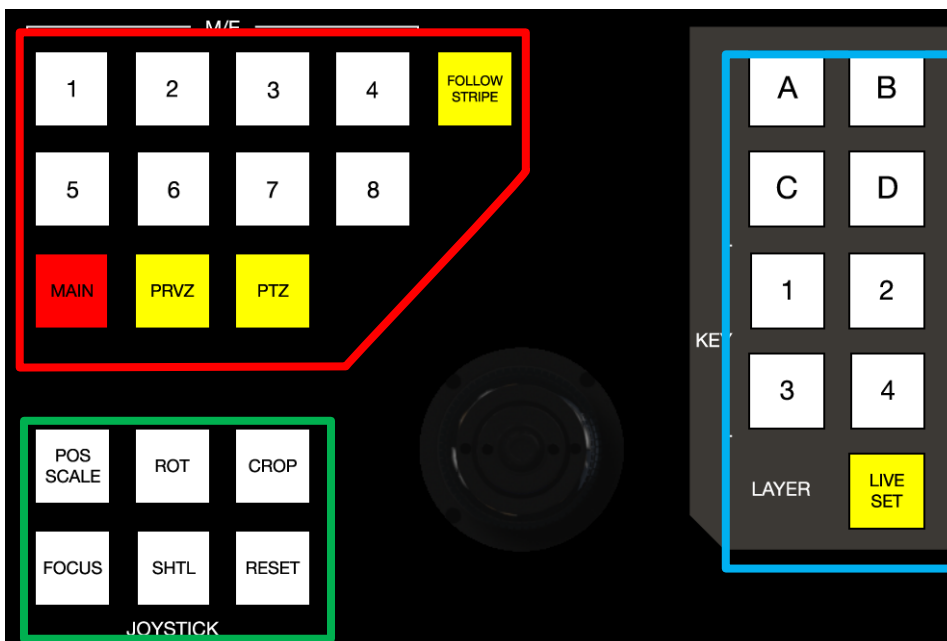
FIGURE 253

- The specific target of Joystick operations at any moment is determined by a set of Joystick delegate buttons, outlined in red above.
- As appropriate, this selection is further refined by buttons in the Layer group at right, outlined in blue above.
- Finally, the nature of the operation performed on the target is determined by a set of Control Mode buttons at lower left, outlined in green above.

Let's consider the primary *delegates* first.

21.4.1 Delegates

Follow Preview

Probably the most useful joystick delegate mode is *Follow Preview*. You will probably not be surprised to learn that, when enabled (as is the default in new sessions) the joystick assignment tracks your Main > Preview (*PREV*) row selection.

Since the *Live Desktop* normally displays a large *Preview monitor*, this makes setting up exactly the shot you want for the upcoming source queued on *Preview* the proverbial 'no-brainer'. Or, to quickly modify the framing of a bunch of PTZ cameras, or a series of M/Es, just select them one after another on the *PREV* row and adjust to taste.

> *Hint: To open the Input Configuration panel for the source currently selected on the Preview row to adjust its settings, simply tap the * (asterisk) key in the keyboard numberpad.*

Of course, the joystick has several other delegate modes, discussed next, but the default *Follow Preview* mode is very useful, and can be easily restored from any other mode by pressing the *PTZ* and *RESET* buttons together.

FOLLOW STRIPE

Pressing this *Joystick delegate* button restricts the behavior of the *Joystick* in a manner many are used to from using 'traditional' control surfaces. That is to say, *Joystick* operations will always be directed to the video bus(ses) assigned to the same stripe. As mentioned though, Viz Vectar surfaces offer greater versatility and control options. It's possible to quickly redirect control to any suitable target without interrupting *Switcher* operations on neighboring stripes.

M/E 1 – M/E 8

These buttons provide a quick and convenient way to delegate *Joystick* operations to one or more selected *M/Es* (the number of M/Es varies by Viz Vectar model).

MAIN

Punch *MAIN* to direct delegate *Joystick* operations to the *Main Switcher*.

PRVZ

PREVIZ controls are currently not in use.

PTZ

Source Select
PTZ (pan-tilt-zoom) style joystick operations are not limited to 'real' PTZ cameras. Static cameras, *Media Players*, and *Buffers* are among the different source types that may benefit from 'virtual PTZ'

functionality. And of course, M/Es have similar capabilities courtesy of *COMP* and *Positioner* features.

For this reason, you can delegate <u>any</u> source that is qualified for *Joystick* control on your system as follows: Hold down the *PTZ* button and press the desired *KEY* row button at left in the same stripe as the *Joystick.*

Press an M/E button (1-8), MAIN, or FOLLOW STRIPE to reset the Joystick to the corresponding operating mode.

Presets

In addition to manually controlling the PTZ camera with the *Joystick*, of course, you will often want to store and recall *PTZ presets*.

- ▪ To store a new preset for the currently delegated camera, or to update an existing preset, hold down the PTZ button and press a button numbered from 1-16 in the A/C row at left in the same stripe.
- ▪ To recall a preset, hold down the PTZ button and press a button numbered from 1-16 in the B/D row at left in the same stripe.

21.4.2 LAYER Delegates

As mentioned above, some *Joystick* delegate modes let you further refine the target for your manipulations. For example, when your primary delegate is *MAIN*, joystick operations can be applied to the *DSK 1, DSK 2, DSK 3* or *DSK 4* video layers. The *LAYER* delegate group determines which one will be affected.

Specifically, the *KEY* buttons labeled *1-4* direct joystick control to *DSK 1-4* when *MAIN* is selected as the primary delegate, or *KEY 1-4* for an *M/E.* Similarly, when an M/E with a compositing effect selected as the *Background* effect is delegated, the A, B, C and D buttons allow you to target the individual *Positioners* for the main M/E layers (A-D)"
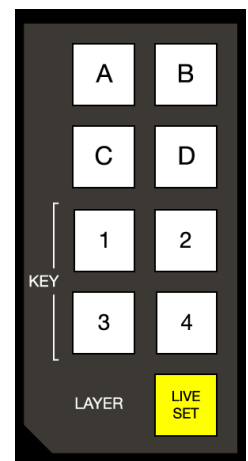
FIGURE 254

21.4.3 Control Mode

Let's turn now to buttons that govern the *Joystick* operating mode.
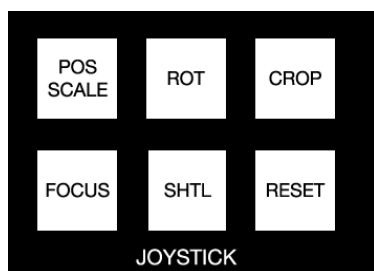
FIGURE 255

POS/SCALE

- ▪ Move the joystick horizontally, vertically or diagonally (as viewed from above) to move delegated video source(s) on its X and Y axes.
- ▪ Twist the joystick clockwise to scale delegated source(s) up, or counter-clockwise to scale down.

Hint: When multi-delegate selections are active for the Positioner, adjustments are generally relative to the current state for individual delegates, as opposed to absolute.

ROT (Rotate)

- Move the joystick horizontally (as viewed from above) to rotate delegated sources on the Y axis.
- Move the joystick vertically to rotate delegated sources on the X axis.
- Twist the joystick clockwise/counter-clockwise to rotate delegated sources on the Z axis.

CROP

- Twist the joystick clockwise (as viewed from above) to crop delegated sources inward on all four edges, maintaining the original aspect ratio.
- Twist the joystick counter-clockwise to reduce cropping of delegated sources on all 4 edges.
- Move the joystick horizontally to crop only the left edge of delegated sources.
- Move the joystick horizontally with the joystick button pressed to crop only the right edge of delegated sources.
- Move the joystick vertically to crop only the top edge of delegated sources.
- Move the joystick vertically with the joystick button pressed to crop only the bottom edge of delegated sources.

FOCUS

When the primary *Joystick Delegate* is *PTZ*, enable *FOCUS* to modify *Joystick* operations as follows:

- Pressing the Joystick button enables Autofocus.
- Rotate the joystick to adjust the camera's focus setting (which will naturally disable Autofocus).

SHTL (Shuttle)

Push *SHTL* (Shuttle) to delegate the *joystick* to shuttle the *Media Player(s)* currently selected in the *MEDIA PLAYERS > DELEGATE* group. (Again, the other joystick mode buttons cannot be multi-selected with SHTL.)

- To shuttle delegated Media Players, move the joystick horizontally (as viewed from above).

Note: You can zoom multiple LiveSets simultaneously when these are delegated together, just as you can also shuttle several delegated Media Players.

RESET

Despite its location, *RESET* is really an action button (not a *Joystick* mode). Press it to restore all position settings for currently delegated source(s) to their defaults. (This is also why *RESET* does not stay selected when pressed, nor does it change the current *Joystick mode*.

Hint: When SHUTTLE is delegated, delegated Media Players are reset to the starting point of the current item (or playlist). And when delegated to an M/E with LIVE SET enabled in the LAYERS group, the LiveSet is reset to its default positioning.

Appendix A: Viz Vectar Plus – Live Production Features

Viz Vectar Plus - Live Production Features is your 'backstage pass' to the latest power user tools and features from Vizrt's industry–leading developers. The benefits of Viz Vectar Plus - Live Production Features are already substantial and, best of all, will continue to accrue as further innovations are added to super-charge your workflow and take your productions to new heights of visual excellence

A.1 Introduction

Viz Vectar Plus - Live Production Features gives you unlimited access to a growing list of cutting-edge tools and technology. Let's consider them one by one beginning with one of the most exciting developments of all.

A.2 Live Call Connect

Conduct live video calls from virtually anywhere using Viz Vectar Plus - Live Production's *Live Call Connect* functionality. This capability enhances your productions with high-quality video and audio, allowing you to flexibly present remote conversations, interviews, reports, and more—regardless of the caller's device.

Supported Applications

Microsoft® Edge Chromium is pre-installed on your Viz Vectar Plus – Live Production system. However, if you prefer a different web browser, Google Chrome (or another Chromium™ based browser) can be installed. A number of popular video conferencing applications are also supported, such as Microsoft® Teams, VooV™ Meeting, Slack, Discord, and Zoom.

> *Note: Exit the Vecar software to download and install the supported applications you wish to use.*

Deployment Platforms

Viz Vectar Plus - Live Production is designed to take advantage of the hardware accelerated capabilities of the latest versions of Windows. Because of this, the *Live Call Connect* feature requires Windows Build 19041 or later. There are some cloud platforms like AWS on which this might not currently be available in the current default configurations although this is of course very likely to change over time. The customer can in most cases work around this; bringing their own Windows 10 version and deploy that manually in the cloud platform. This may have implications on cost, technical complexity and licensing agreements with Microsoft. To do this manual process is not something Vizrt can support installing, however, we do support our software.

Application Desktop Widget

A special *Live Call Connect* widget pins itself to the titlebar of your browser or conferencing app window when it has focus. The widget has the following components:

- The hamburger icon at left side collapses the widget to a tiny size, reducing the possibility of its obscuring any of the application's video sources.

- The *LIVE* button perfoms several tasks, including detecting the caller's video viewports, beginning video capture, auto maximizes the application screen, and locking the mouse out of the application to prevent it intruding. (As seen in Figure 256, the *LIVE* button is highlighted in orange when active.)

- The gear on the right side of the widget opens a menu listing (Figure 257) the following options:
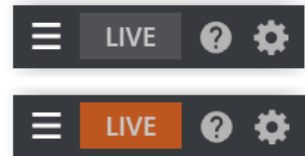
- Color Group – After choosing a color corresponding to a color group in Viz Vectar Plus – Live Production's Switcher, you can click a caller's video viewport in the conferencing application to assign that caller to the color-linked Switcher channel.

- Relearn caller positions – This selection triggers the relearn algorithm, including re-detecting the caller's screens (useful if things change unexpectedly in ways that can't be automatcially detected).

FIGURE 257

- Assign callers to inputs – Automatically assigns caller video output from an application to Switcher inputs 9-17

- Help – Opens a convenient Help applet to walk through the use of the feature.

Setting Up A Call

You need at least one secondary monitor to access the *Application Desktop* you assign to it using the *Workspaces* menu (as disccussed in the earlier section on *Workspaces*).

Once you have selected the App Desktop from the Workspaces menu, the Live Desktop will appear on your secondary monitor.

Your video conferencing application(s) and the system default browser will appear in your task bar. Click on your preferred app's icon, and join a meeting or display a web page in the usual manner for that application.

> Note: Viz Vectar Plus - Live Production does not support "High Contrast" mode within any video application.

In our example we are using Microsoft® Teams Application for a *Live Call Connect* walk-through. Notice the *widget* in the application's titlebar (highlighted in orange in Figure 258). You can either host or join a meeting.
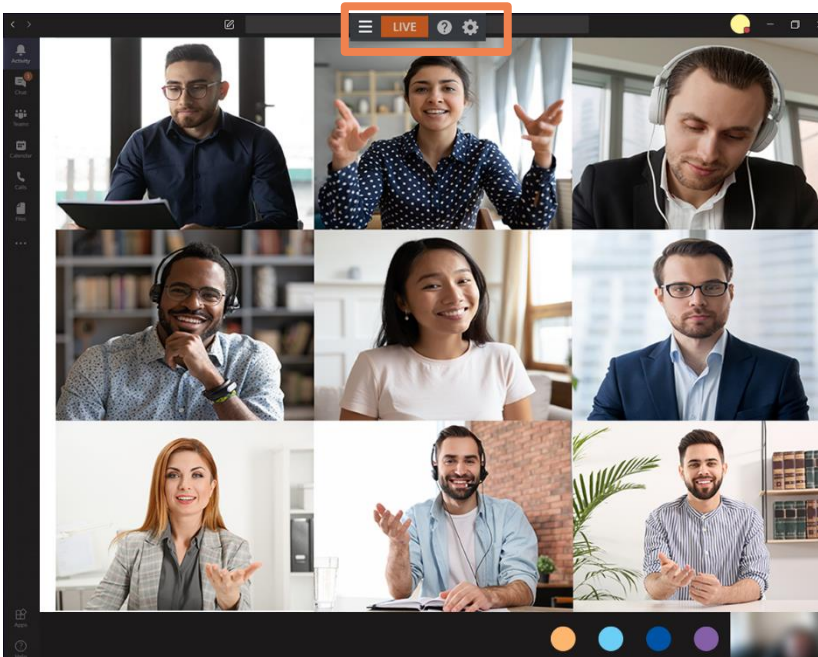
FIGURE 258

Once all callers have joined, you can use the "*Assign Callers to Inputs*" menu item (as shown in Figure 257) to automatically assign the number of inputs starting from input 9. Or you can manually assign the callers to Switcher inputs using Viz Vectar Plus - Live Production standard *Input Configuration* dialog (Figure 259) After that is complete, it's time to take it live (by pressing the LIVE button).

Live Call Connect attempts to maintain callers at the Switcher input you assign them to, but should the need arise you can turn off LIVE and apply the *Relearn Caller Layout menu option.*

Live Call Connect crops out static application tools and borders, and supplies the callers' video to Viz Vectar Plus - Live Production *Switcher* as potential sources.

Input Configuration
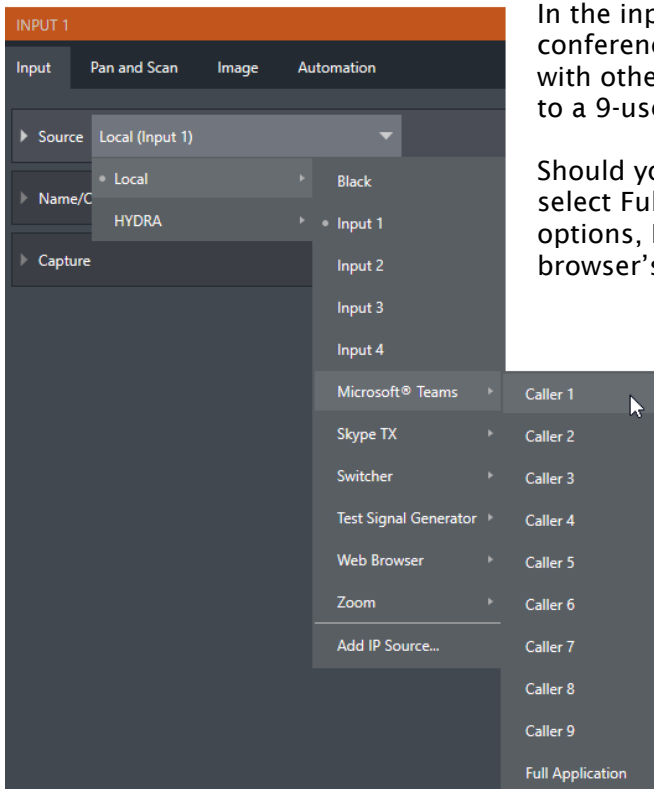
In the input configuration panel, (Figure 259) the conferencing or browser applications will appear along with other local sources. Each application will support up to a 9-user configuration in each applications layout.

Should you wish to capture the entire application interface, select Full Application. Web browsers offer just two options, Full Application and Page Area (which crops the browser's toolbar at the top.

Audio Configuration
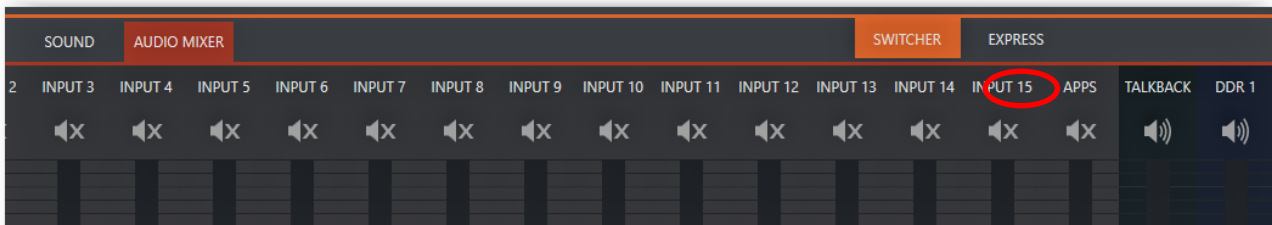
Viz Vectar Plus - Live Production takes the system audio output for the supported applications and makes it available as an input in Viz Vectar's *Audio Mixer* (labeled APPS, by default - Figure 260). You will find *System Audio* listed as an optional selection in the Mixer's *Input Configuration* Panel's *Connection* options.

A/V Return to Caller

Viz Vectar Plus – Live Production main video Mix 1 output is returned to the conferencing application, and thus passed to remote callers so those calling into the meeting can see it. The audio return to conferencing apps is a special mix minus signal comprised of the Master audio mix with System Audio removed.

Green Room Method

Zoom permits the meeting host to create "Breakout Rooms" to split your Zoom meeting into separate sessions. This feature, supported by *Live Call Connect*, provides a path to "*Green Room*" functionality. A few examples where this feature can be conducive are; helping to prepare callers before a live show, split the participants of a large class or meetings. Steps to use Zoom's "Breakout Rooms" as a "Green Room" with your Viz Vectar Plus - Live Production are below, but first be sure to enable the Breakout Room setting, in the account, group or user settings.

Setup

1. External meeting host system (e.g., laptop):
   a. Launch NDI Webcam Input
      i. Select Viz Vectar Plus – Live Production Mix 1 as the NDI source
      ii. Set Webcam Input's Audio Level to +20dB
   b. Zoom Preparations
      i. Set Zoom's camera and microphone to "NewTek NDI Video" and "Line (NewTek NDI Audio)"
      ii. Start your meeting
      iii. Name the local Host connection "Program", and "Spotlight" the connection (this is your show)
      iv. Open a breakout room and name it "Green Room"
2. Viz Vectar Plus – Live Production:
   a. Launch Zoom on the App Desktop
   b. Connect to the meeting
3. Zoom configuration (meeting host system, i.e., laptop):
   a. Give the Viz Vectar Plus – Live Production connection a suitable Zoom name (e.g., "Operator")
   b. Make "Operator" a co-host (provides the ability to to mute/unmute callers in the "Green Room"
   c. Assign program participants and "Operator" to the "Green Room" (using the Breakout Room option that moves them automatically)

Different Rooms for Different Purposes

- Callers in the main meeting see Viz Vectar Plus – Live Production program (Mix 1) from Webcam Input.
- Callers in the "Green Room" see and hear a) each other and b) Program output.
- As a co-host, the "Operator" can selectively mute/unmute any caller in the "Green Room."

Note: Zoom has a "pre-approved consent to be unmuted" feature (Meeting Options>Request permission to unmute participants). When enabled, callers are prompted to let the host mute/unmute them. Permission persists for any future meeting with the same ID, and is particularly useful for callers in the "Green Room."

Displaying a Caller in Your Show

- Either the Host or Viz Vectar Plus – Live Production "Operator" can assign program participants to the "Green Room".
- The "Operator" can selectively mute/unmute callers in the "Green Room", and use TalkBack to address them *without disrupting program audio*.
- The "Operator" assigns callers in the "Green Room" to Viz Vectar Plus - Live Production Switcher inputs.
- And can display them in the program, and mix "Green Room" caller sound into the show.

A.2.1   Live Story Creator

This powerful Plus Feature delivers numerous and powerful benefits. At the lowest level, you might use it simply as a very convenient and useful teleprompter for your show's talent. Coupled with the NDI Studio Monitor included in the free NDI Tools bundle, this is a great feature. There's a great deal more to Live Story Creator, however: Live Story is first and foremost a powerful natural language automation system.

Overview

When you first open the new *Automation* tab, located at right below the main *Switcher* (near *Buffers*), you'll see the empty script pane and some (rather lonely looking) controls at right (Figure 261)
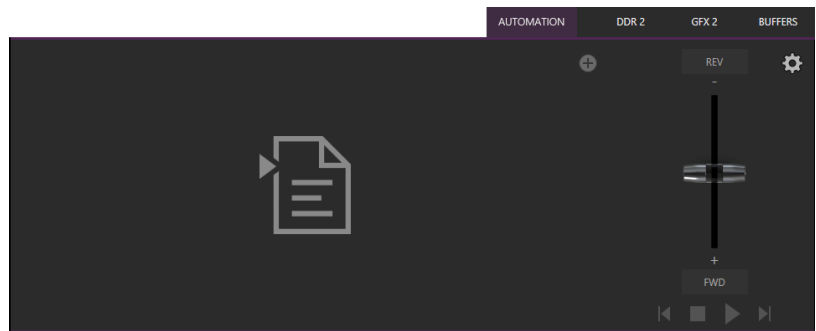
FIGURE 261

Click or tap the (+) plus sign gadget below and to the right of the tab to open a *File Explorer*. Here you can navigate to a location where you have previously stored a .docx file such as those created in Microsoft Word (or compatible software with similar features). Figure 262 illustrates the result. Let's discuss a few of the Live Story interface controls and features before continuing.
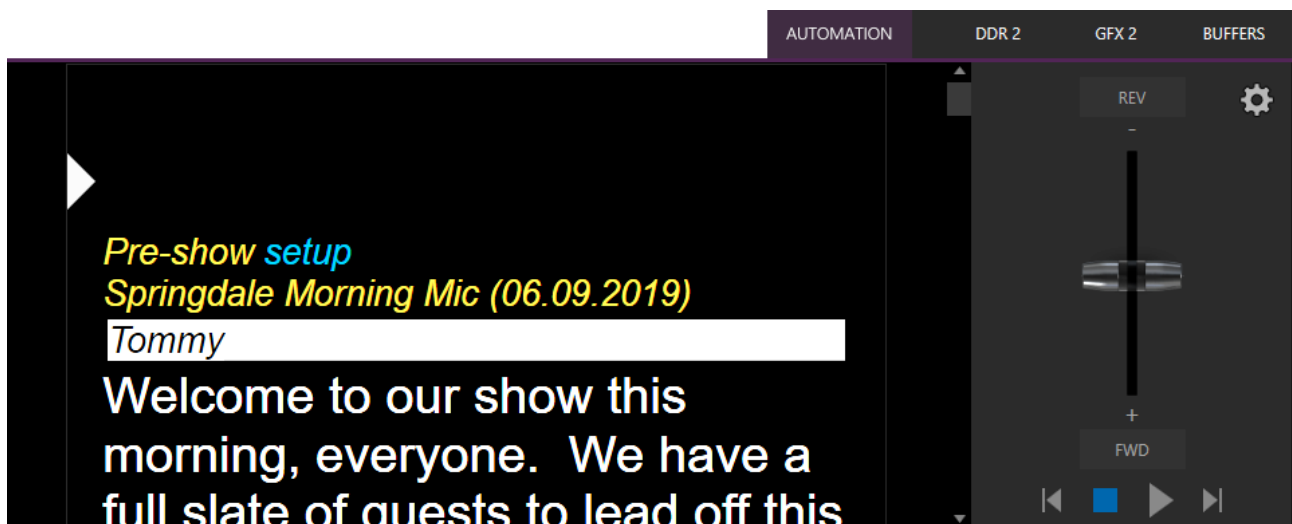
FIGURE 262

Examining the tabbed Live Story panel from left to right, you'll see:

- An (x) gadget at upper-left. Click this to unload the current script (.docx file).
- The eyeline control is a white caret (triangle) control that can be dragged up and down to adjust the position of the similar eyeline indicator on a teleprompter display.

- The script pane, or canvas, displays the content of the .docx document, as interpreted by Live Story.
  - Colors and font styles have special meaning:
    - Generally, text shown as yellow and italicized is not meant to be read aloud.

For example, in the image above, the first line ("Pre-show setup") is used to issue a command to TC2 to place Black on output before the show begins. The line has Word's Subtitle style applied to it, indicating it is not intended to be read aloud. Live Story shows this in yellow italics.

You'll notice, though that the word "setup" is blue in the script pane, despite also being in Subtitle style in the document. This is because the command we inserted to cause black to be shown on output is in a comment applied to this word in the document.

Blue identifies commented text in the document, and comments can be used to issue commands (we'll discuss all of this in more depth shortly).

Hint: Move the mouse pointer over blue text in the script pane to see a tooltip showing how Live Story Creator has interpreted your comment.

Notice that the show's title ("Springdale Morning Mic") is displayed in yellow, too. Live Story recognized this is as the SHOW TITLE because the *Title* style is applied to this text it in the document.

- Document styles can trigger corresponding actions, too. For example, the *Title* style can automatically display a specially prepared LiveGraphic™ animation to introduce your show – all without any manual intervention.

Note: The SHOW TITLE animations require the latest LiveGraphics content to be installed. The Broadcast templates in the updated content include a special Show Open preset specially prepared for this purpose.
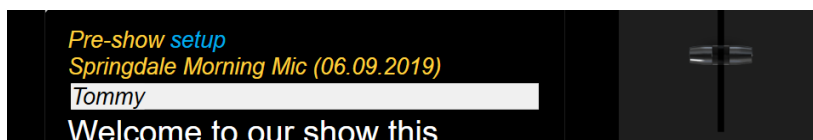
FIGURE 263

- In similar fashion, the document style *Heading 3* denotes a CUE, used to introduce someone who will be speaking next. CUEs are show in inverted color, black text on a white background (Figure 263).

Like the *Title Style*, CUEs can also automatically trigger TC2 operations. For example, if a *Switcher* input name matches a name in the CUE, that source will be placed on output, and a title identifying the newly introduced talent will be shown. (After a few moments, the title is automatically removed.)

- Text meant to be read aloud is shown in a large white typeface.

- Live Story's operating controls are located in a small panel just right of the script pane (Figure 264).

This *Control Panel* is dominated by a vertical *Speed* control. You can modify the scroll rate during playback or traverse the script backward or forward by dragging the *Speed* bar up or down.

Transport controls below the *Speed* bar include *Stop* and *Play*, as well as *Previous* and *Next Segment* buttons.

> Hint: Divide your show into different segments identified by applying the Heading 2 style to lines in your .docx file.

- Click the familiar gear gadget in the upper-right corner of the *Control Panel* to open Live Story's configuration panel (Figure 265).

FIGURE 264
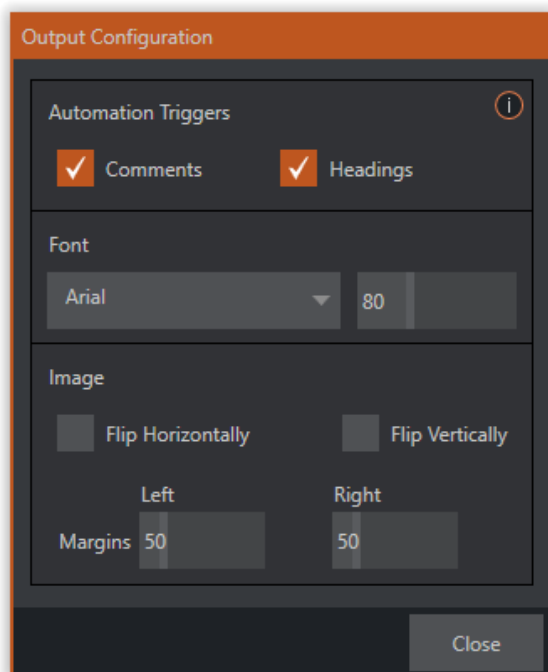
FIGURE 265

- The two switches in the *Automation Triggers* toggle automation in response to *Comments* or *Headings* (styles) applied in the .docx document.

- When both switches are off, Live Story does not process automation commands, and is operates as a simple teleprompter.

- Font controls let you adjust text display for legibility when you are using an external teleprompter device.

- The *Flip* switches in the *Image* group likewise allow you to conform the teleprompter output to match your local devices, while the margin sliders let you move text confine teleprompter output to best suit your preference.

Style-based Operations

As discussed earlier, various styles applied in the .docx document serve different purposes in the Live Story Creator context, and some styles can even trigger automatic operation.

Document Style	Applies to	Displayed on output	Description	Sets value for DataLink key	DataLink Key Description
Title	Show Title	No	e.g., "State of the Union Address"	%SCRIPT_ShowTitle%	Main show title
Heading 1	Show Descriptor	No	Sets value for a DataLink key	%SCRIPT_ShowDescription%	Main show descriptor
Heading 2	Segment	No	e.g., "Intro Package", "Welcome Monologue"	%SCRIPT_ShowSegment%	Current show segment
Heading 3	Cue	Yes (inverse)	e.g., talent name: "Billy Bob"	%SCRIPT_CueName%	Name of speaker
Subtitle	Information text	Yes (yellow, italics)	Displayed but not meant to be read (e.g., "walk behind desk")	%SCRIPT_Info%	Current/Last information text
Normal	Body text	Yes (white)	Text to be read by on-air talent.	n/a	n/a

The following styles automatically trigger TC2 operations when the *Headings* switch is enabled:

- ▪ **Title** – triggers automatic display of a *LiveGraphics* show opening title animation. This title uses the text from the *Title-style* line to populate the first line of the animated title, and takes (hidden) text from a line entered using the *Heading 1* style for its second line (when used).

Heading 3 – identifies a *CUE*. When the *Headings* switch is enabled, a lower-third title is automatically displayed for a short duration when the eyeline reaches a CUE for the first time in a *segment*. The first line of the title shows the full *Switcher* input name set in *Input Configuration* for that source. The second line of the title is drawn from the (Input Configuration) *Comment* entry for the source.

> *Hint: Titles as discussed above default to a pre-selected LiveGraphics title, and transition in and out automatically. To display a different title page, preload the desired title into Buffer 1 beforehand. This can be done using a command entered as a Comment in the docx file. You can also use Comments to change the title's transition effect, display duration, and so on.)*

Comment-based Commands

While heading styles provide some useful automation possibilities, the use of *Comments* in the .docx file provide much more powerful and detailed options.
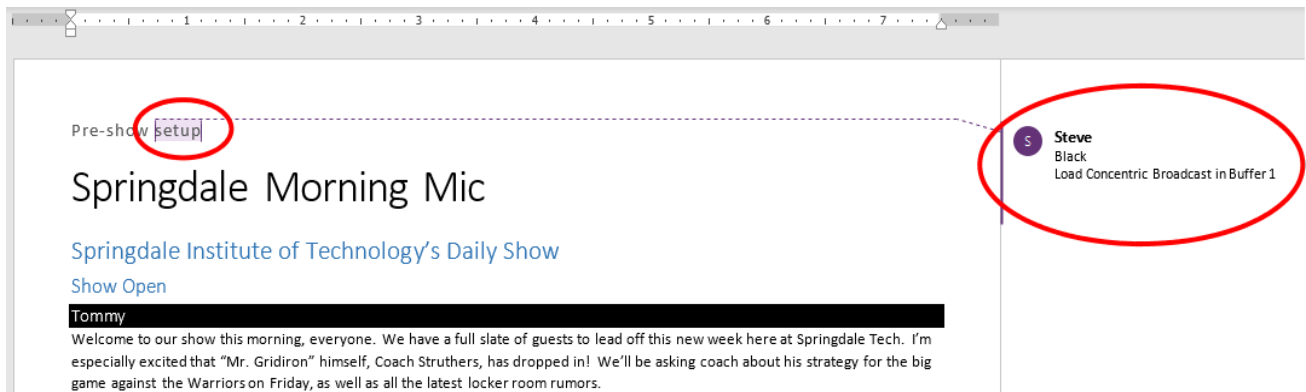
Note the *Comment* inserted into the text in Figure 266. You'll see that it has two lines. The first is simply "Black", which tells TC2 to select the input named "Black" on its *Program* row.

Fuzzy Logic

Interestingly, the very same thing would occur if the command entered in the *Comment* had instead said "Show black", "Put black on program", "Send Black to Program", or "Output black". Live Story uses "fuzzy logic" to try to find the best match to your entry.

> Note: Extraneous text is typically ignored so, for example, you could instead write "Put black on program while I have lunch" and still be successful (assuming your lunch was satisfactory).

We mentioned earlier that you can move the mouse pointer over blue text in the script pane to see a tooltip showing how Live Story interprets your comment. It's helpful to know that Live Story determines the probability that the interpretation is correct. If the wording of a *Comment* entry is ambiguous, and could be interpreted differently, the text color in the script pane is red rather than blue.

> Hint: If a comment has multiple lines in it, Live Story adds an asterisk to any ambiguous lines in the tooltip. The entry "Output black" would trigger this behavior, even though it is correctly interpreted, with the result that black is shown on output.

Live Story Creator VS. Macros

Let's pause at this point to consider how Live Story commands differ from the somewhat similar shortcuts used by macros.
Like Live Story commands, a macro shortcut is entered on a single line, and may support arguments, or parameters. Macro shortcuts, however, require you to use very specific syntax. By contrast, though, Live Story commands are entered using 'natural language' – the way you might normally speak or write. A macro shortcut will generally fail with an error if your syntax isn't perfect, while, as mentioned previously, Live Story uses fuzzy logic to try to find the best match for your command, and only fails 'reluctantly'.

> Hint: Live Story documents are evaluated on loading. When Live Story determines its evaluation of a specific command in a Comment could be incorrect, it posts a message to TC2's Notification panel to note the ambiguity, in addition to marking the commented text in red in the script pane.

Additionally, a single *Comment command* can do things that would otherwise require multiple commands entered on separate lines in a macro. Consider for example, when Live Story encounters the simple *Comment* entry "fade tom slow", it results in the following steps:

1. Select an input named "Tom" (or "tom", or with a similar string, such as "Tommy" in the input Comment box) on the Switcher's *Preview* row.
2. Set the Switcher's *Background* transition effect to Fade
3. Set the effect speed to *Slow*
4. Perform an *Auto*

To do something similar using a macro, you'd need to enter four separate lines, getting the syntax correct for each macro shortcut – and since macro commands require an input index parameter rather than a name, you'd need to know in advance which camera would be pointed at Tom. If Tom was moved to a different chair on your set at the last minute, the macro would need to be modified. Using Live Story Creator, you could simply rename the camera.

Better yet, continuing with the example above, if – rather than naming an input "Tom", you prepared a PTZ preset (or Pan and Scan preset, for a non-PTZ source) and named it "Tom", TC2 would automatically select that preset at step 1 above.

Hint: Imagine what this means if you are using a few PTZ cameras to cover a city council meeting, with PTZ presets prepared for different participants. If two people change seats at the last minute, all you need to do is update the PTZ presets and Live Story Creator will take care of everything else for you!

So, not only are Live Story Comment commands easier to write, often performing multiple operations with a single entry, but they are 'smarter', and easier to maintain and update. Which brings us to another key feature.

Live Updates

As clever as Live Story is, at times you will want to experiment, or need to tweak your wording to bring about the result you intend. As we mentioned, you don't even need to press *Play* to test modifications, you can simply reload the .docx file and hover the mouse over commented text to see the way the embedded commands have been evaluated.
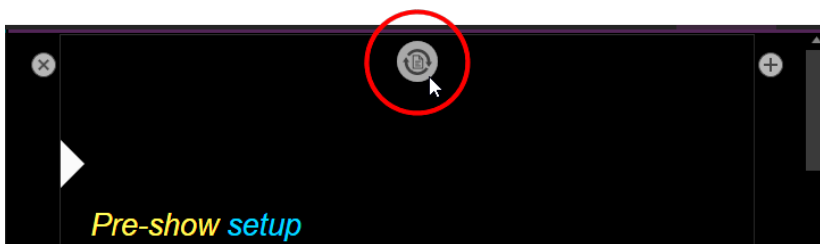
FIGURE 267

Making this exercise even better, Live Story Creator has a built-in *Update* feature, and monitors changes to the script file you loaded. Suppose you are using a laptop to edit your script in Microsoft Word. You might opt to save the file across a network connection to (for example) the shared Public\Documents folder on your TC2.
Then, when you modify the document and save it (which typically requires just a quick keyboard operation to perform - CTRL + s) Live Story will immediately show an *Update* icon at the top of the script pane (Figure 267). Click this to reload the .docx file with the changes you made.

Note: This will reset Live Story's eyeline indicator to the top of the script, so don't do update when your talent is reading from the teleprompter you are quite confident that they will miss you with whatever they throw!

Default Behaviors

We mentioned that Live Story's *Comment commands* can perform compound operations, and are simpler to use than macros. Actually, they are designed to provide a useful result even when you don't supply complete information. Let's look at an example.

FIGURE 268

FIGURE 269

Figure 268 above illustrates the result of the *Comment command* "Fade Football Star on in PiP" (the simpler entry "PiP football star" would have produced the same result). We didn't supply much detail about our intentions, so Live Story produced a 'default' picture in picture effect, as shown.

But perhaps you want to make some changes. In Figure 269, we have edited the Comment command to read "PiP Football Star large top right". Since we defined the position of the overlay, and specified a size, we achieved a more pleasing result.

The *Comment command* "title" provides another example of default operation. Add the simple entry "title brackets lower third" to a comment.   Live Story evaluates the comment when the *eyeline* indicator reaches it, and the predetermined defaults are used so you may not even need to add any more detail. The designated title page (Brackets Lower Third) is automatically i) loaded into a Buffer, ii) assigned to a DSK, iii) faded on, iv) held briefly, and then v) faded off).

In this example, you might kick things up just a bit by changing the effect used to introduce the title page. The *Comment command* "Show Title brackets lower third Edge LtoR(H)" works quite nicely for this purpose.

> *Hint: You might want a title to remain in view longer than the default time.   To do this, add the word "hold" to the command you use to display the title. Then insert a new comment into your script at the point where you want to remove the title from view and enter the command "title off".*

Try different things – you can change effect speed (Fast, Medium, Slow), specify the DSK to use, and so on.

More Comment Commands

We can't provide an exhaustive listing of every possible command and combination of options, but we'll identify the main Viz Vectar Plus - Live Production features Live Story currently supports and give some examples and a few alternatives that work just as well. The best way to learn is to just try typing in what you want to happen!

Audio Mixer

- "Set input 2 Volume to -5"; "volume input 2 5dB"; "input 2 9dB"; " Set volume for input 2 to -20"
- "volume master 5dB"; "Set Saster Volume to 5"; "set volume to 5"
- "mute"; "mute on" – mute master output
- "unmute"; "mute off" – unmute master output
- "mute out 2"; "mute out 2"; "mute aux 2"; "mute aux 2 on"; "aux 2 mute on" – mute named output
- "aux 2 mute on"; (etc.)
- "mute input 3"; "mute input 3 on" – mute the named input
- "mute input 3 off"
- "solo input 6"; "solo input 6 on" – solo the named input
- "solo input 6 off"
- "unsolo input 6"; "solo input 6 off" – disable solo for the named input
- "follow input 6"; "follow input 6 on" – solo the named input
- "follow input 6 off"
- "input 4 eq"; "input 4 eq on"; "input 4 enable equalizer"
- "input 4 eq off"; "input 4 disable equalizer"; (etc.)
- "input 5 compressor on"; "input 5 enable compressor"
- "input 5 compressor off"; " input 5 disable compressor"; (etc.)
- "AudioMemName"; "select AudioMemName"; "recall AudioMemName"; "mixer AudioMemName"; "audio AudioMemName"; audio select AudioMemName"; "audio recall AudioMemName"
- "audio select MEM 3"; "audio select 3"; "audio recall 3"; "audio recall mem 3"; "mixer select 3"; "mixer select mem 3"; "mixer recall 3"; "mixer recall mem 3"

Comps

- "load MyComp"; "select MyComp"; "myComp" – loads the named main Switcher *Comp*.
- "comp 3"; "load Comp 3"; "select comp 3"; "go to comp 3"
- "m/e 1 comp 2"; "me1 comp 2"; "select comp 2"; "load main comp 2"; "go to myMEname myCompName"; (etc.) – loads the designated *Comp* into the main *Switcher* (default) or named *M/E*.
- "myComp medium"; ""myComp normal"; "myComp 1.0"; "go to myComp slow"; (etc.) – loads a Comp using the designated speed.

Media Players

- "play lion"; "play lion on main"; "="take lion on me1"; "cut to lion on m/e 1"; (etc.) – locates, loads and plays a clip named "lion" on the main Switcher (default) or named M/E; performs an auto or take when playback ends. The scrolling of the script pauses until playback is complete.
- "circle(h) lion" works as above but uses a Circle wipe to display and remove the clip.
- "play lion ddr2" forces the operation to use DDR 2 (rather than selecting a default DDR)
- "add lion to ddr 2; "load lion ddr 2" – adds the clip without displaying it
- "play lion at 9 db";
- "play lion voiceover"; play lion vo" – the script continues to scroll during playback
- "play lion at 5 db"; "play lion 5db"; "lion 5 db"

- "DDR 1 stop"
- "DDR 1 Next"; "DDR 1 Previous"

DSKs

- "Toggle DSK 1"
- "toggle DSK 1 slow"
- "auto on dsk 2 slow"; "auto on M/E 2 key 2 slow"; "Fade M/E 2 keyer 1 slow";
- "fast auto off dsk3"
- "Set main dsk 1 as input 1"; "Set input 1 on main dsk 1"; "set DSK 1 to GFX 1"; "set M/E 1 Keyer 1 to GFX 1"; "assign GFX 1 to Me2 key 2"; (etc.)
- "Play lion in dsk2"; "Play lion on dsk2"; "Show lion in dsk2" – plays a clip named lion in DSK2, fading on and holding the last frame.
- "Play lion on key 2 in M/E 1 with slow circle(h)" – as above but uses a slow Circle wipe in M/E 1.
- "Show lion on dsk 3 with fast auto"; "Show lion on dsk 3 with take"
- "set main DSK 3 transition to circle(h)"; set circle(h) Me2 key 1"; "change transition on me4 for key 2 to circle(h)"; (etc.)
- (etc.)

See also dedicated PiP (Picture in Picture) commands)

Buffers

- "Add globe to buffer 6"; "buffer 6 load globe" – loads the Globe *Frame Buffer Animation* effect to the target buffer
- "Add Hexagon lower third to buffer 6" – loads the named static title page into the target buffer
- "buffer 3 load Hexagon Broadcast" - loads the named LiveGraphic into the target buffer
- "Buffer 1 set speed medium"
- "Buffer 1 speed 2"; "Buffer 1 set speed 2x"; "Buffer 6 globe 200%" – set speed to 2x the default (Medium).
- "set buffer 1 to layer preset 2"; "set buffer 1 to index 2"; "set buffer 1 to preset 2"; "buffer 1 select preset 2"; "buffer 1 preset 2"; select buffer 1 index 2 (etc.) – select the designated *Layer Preset* for a LiveGraphics title page loaded in the buffer slot specified.
- "set buffer 1 to data preset 2"; etc.– select the designated *Data Preset* for a LiveGraphics title page loaded in the buffer slot specified.

Macros

Of course, at times you may want to run a more complex macro from within a script, using a *Comment command.* The commands below will let you do that.

- "*macro_name*"; "macro *macro_name*"; "run *macro_name*"; "play macro *macro_name*"; etc.
- "stop *macro_name*"; "stop macro *macro_name*"; macro *macro_name* halt"; *macro_name* end"; etc.
- "stop all macros"; "stop macros"; "halt macros"; etc.
- "Continue Paused Macro"

PiP (Picture in Picture)

- "Input 5 pip"; "pip input 5"; "ots input 5" – assign input 5 to a default DSK and display it using default options
- "pip globe" – show the matching file (in the example, a Framebuffer Animation) using default PiP settings
- "pip globe center large"; "pip globe middle large"
- "pip me1 key 2 globe small bottom right"
- "pip input 5 large center" – assign input 5 to an unused DSK and display it large size at center screen
- "pip main dsk 3 input 5" – assign input 5 to DSK3 and display it using default options
- "pip me1 dsk 1 input 2" – assign input 2 to DSK1 in M/E 1, and display it using default options
- "pip input 5 fly in L" - – assign input 5 to an unused DSK and fly it in from left
- "fade pip off"; "ots off" – remove the default PiP from output using a fade effect
- "pip main dsk 2 off"– remove the PiP in DSK 2 from output
- "pip *myPtzPreset*" – recall the named PTZ preset and show that source in a PiP
- "pip dsk1 *myPtzPreset* "; "pip me1 key1 *myPtzPreset*"; "take pip *myPtzPreset* "; (etc.)

PTZ

- "*myPtzPreset* "; " *myPtzPreset* on program"; "put *myPtzPreset* on program"; "take *myPtzPreset* on program"; "select *myPtzPreset* on program"; "take to *myPtzPreset* "; (etc.) – locate a PTZ preset named "myPtzPreset" and display it on Program output.
- "put *myPtzPreset* on preview"; "select *myPtzPreset* on preview"; etc.
- " *myPtzPreset* on M/E 1 b row"; "me1 put *myPtzPreset* on b row"; "me1 select *myPtzPreset* on b row"; "set me1 b row to *myPtzPreset*"
- See also PiP-related PTZ preset commands.

Record, Grab

- "record"; "record on"; "recording on"; "start record"; "begin record"; "start recording"; etc.
- "record off"; "recording off"; "stop recording"; "end recording"; etc.
- "Grab still"

Stream

- "stream"; "stream on"; "streaming on"; "start stream"; "begin streaming"; etc.
- "stream off"; "streaming off"; "stop streaming"; "end stream"; etc.

Switcher

- "auto"; "transition" – perform a *Background* transition on the main *Switcher*
- "take"; "cut"
- "fade"; "crossfade"; fade slow; etc.
- "input 4"; "input 4 on program"; "put input 4 on program"
- "bob"; "take to Bob"; "take Bob on program"; "fade to Bob"– perform a *Background* (Take or Fade, respectively) transition to show a source (or PTZ preset) named "Bob" on the main *Switcher.*

- "input 4 on preview"; "put input 4 on preview"; "set preview to input4"; "input 4 on b row"; "set layer b to input 4"; etc.
- "me1 put input 4 on preview"; "set M/E 1 preview to input 4"; etc.
- "set M/E 1 b row to input 6"; "set me1 layer b to input 6"; "input 6 on me1 b row"; etc.
- "auto to input 4"; "transition to input 4" etc.
- "fast auto to input 4"; etc.
- "auto to input 4"; "transition to input 4" etc.
- "M/E 3 bob"; me3 auto to input 4"; "transition me3 to input 4"; etc.
- "ftb"; "fade to black"; "ftb off"; etc.

DSK

- "DSK1 Auto"; "dsk 1 perform auto"; etc.
- "dsk2 take"; etc.

DataLink

- "set datalink key myVar to I'm a Yankee Doodle Dandy"
- "datalink key myVar equals 12";" set datalink key myVar to value 12"; "set datalink myVar to 12"; "set myVar to 12"; "myVar equals 12"

Titles

- "Aero Broadcast"; "Title Aero Broadcast" – for a LiveGraphic title, sets the default layer preset (10), then transitions the designated title in a default buffer assigned to a default DSK, removing it after 8 seconds;
- "Aero Broadcast hold"; "title Aero Broadcast hold" – as above but does not automatically removed the title
- "title Aero Broadcast Fly In L medium"; etc. – as above using the designated transition and speed
- See also title-related commands listed in the Buffers subheading.

Aliases and Comments

- You can use these *comment commands* to eliminate the need to pre-configure Switcher source names. Instead, you can set them right in the .docx script. This also allows you to change the metadata associated with a Switcher inputs at various points in your show as you wish.
- "Sam Smith is on input 4"; "assign input 4 to Sam Smith"; "set input 4 to Sam Smith" - set an alias for the designated input's name value

Hint: You'll likely want to use the full name here, for use in connection with titling.
- "input 4's description is CEO of Megadyne Inc."; "Input 4 memo is CEO of Megadyne Inc."; etc. – sets the descriptor for the input, which is used as the value for the second line of default lower third titles

Teleprompter Output

Even apart from all of the foregoing (for example, if you disabled both the Comments and Headings support), Live Story Creator would still be very useful as a native teleprompter. Coupled with file watcher functionality to easily update your script right up to 'air-time', this feature saves a setup time, expense, and provides exceptional output flexibility.

FIGURE 270

Control

We discussed Live Story's onscreen teleprompter controls earlier in this section, but these primarily serve for use during setup.
For live use, most prefer a dedicated physical controller device, whether for use by the talent or another teleprompter operator in the studio. Live Story natively supports the ShuttleXpress USB controller by Contour Design Inc. (Figure 271).

FIGURE 271

You will find this device provides common teleprompter controls in an easy to use and affordable manner.

Output

In order to support a wide array of external teleprompter hardware, Live Story assigns the scrolling text output to the highest numbered Switcher output by default. You can then assign this signal to a video Mix output supplying a physical video output connector to feed an external device.

Of course, in an NDI˚ environment, you have other powerful options. Viz Vectar Plus - Live Production automatically supplies the teleprompter output to your network as an NDI stream, offering many display options. (For example, the Studio Monitor application included with the free NDI Tools bundle (found here ndi.tv/tools/ can be used to display your teleprompter output on Windows˚ and OS X˚ platforms.

A.2.2 Format Independent Production
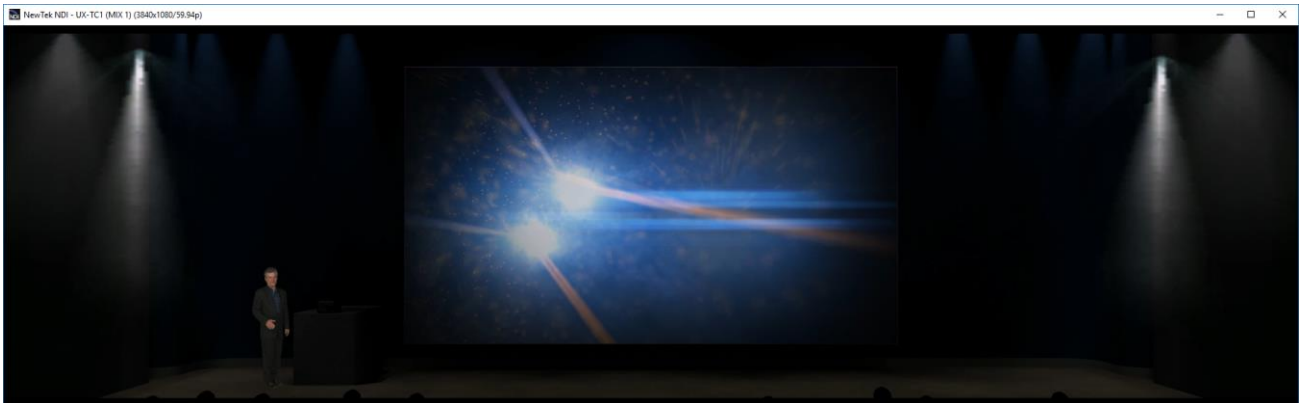
Did you ever need to compose a double-wide, vertical or square scene to fulfill projection systems, signage or social media requirements?

- Select from numerous non-traditional frame formats to work in when creating a session, including double-wide and many more

- Flip, rotate, scale and crop individual inputs

- Flip, rotate, and choose the resolution for individual outputs You can even send left/right or quarter screen segments, and optionally enable automatically blended Overlap

FIGURE 272

Session Options

You'll first encounter these powerful features on the *Home* page of the *Launch screen*. Here you will notice a new group of buttons labeled *Aspect*, which allow you to choose between landscape (horizontal), square, or portrait (vertical) aspect modes.
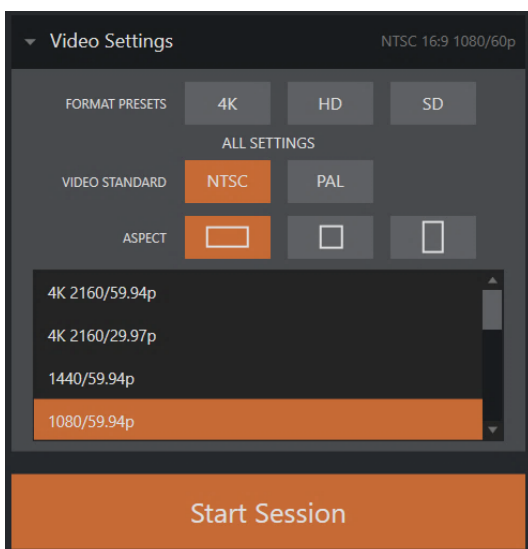
FIGURE 273

In the resolution selector below, you will find that traditional video formats have been complemented by appropriate non-standard options including, for example, portrait aspect 1080x1920 and 1080x3840 options, and so on.

Input Rotation
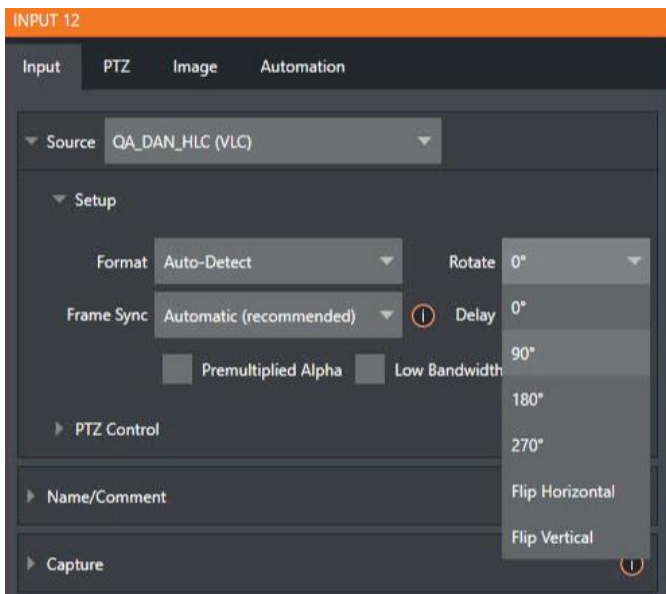
FIGURE 274

To complement non-traditional sessions and handle unusual *Switcher* sources (e.g., non-landscape mobile device output) each input now features a new *Rotate* menu, which also includes *Flip* options.

Output Rotation

Extending these capabilities even further, all *Mix* outputs now support independent resolution selection, rotation and flip control, as well as *Section* options as seen in (Figure 276).
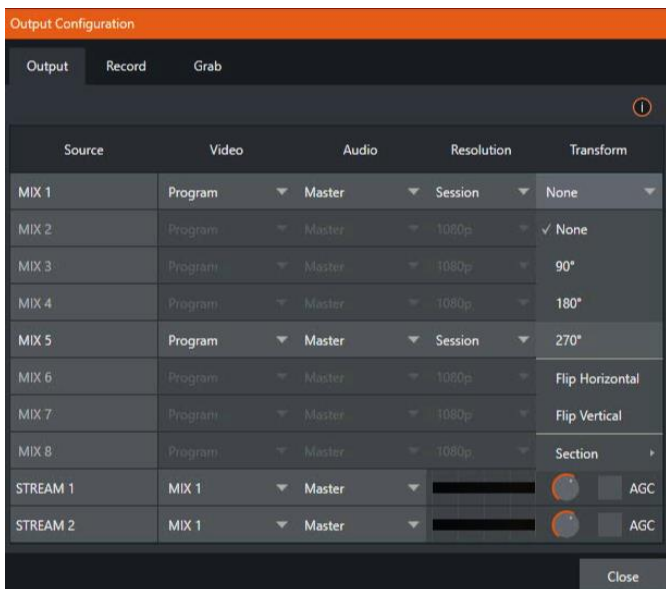
FIGURE 275
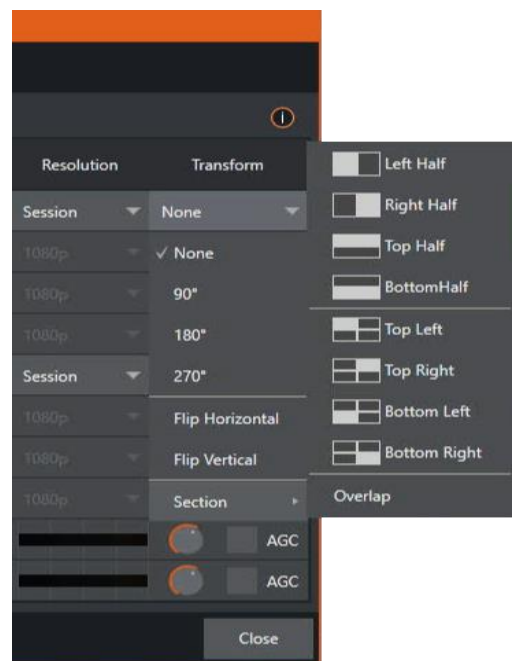
FIGURE 276

A.2.3 LiveGraphics

LiveGraphics® represents a revolutionary approach to title and CG page creation, combining the power of the most complete production systems on the planet and the world's leading creative platform—Adobe® Creative Cloud®. Of all the Viz Vectar Plus - Live Production Features benefits, LiveGraphics is the one of those most likely to dramatically elevate your productions in ways that grab the attention of your viewers.

FIGURE 277

LiveGraphics comprises several key elements: It includes an extensive set of professionally prepared animated title templates and the interface to control and update these in your Viz live production system, but this is just the beginning.

Imagine designing animated titles, motion graphics, and looping effects using popular Adobe® Creative Cloud® tools— then importing them directly into your Viz Vectar Plus - Live Production live production system, which will then allow you to both animate and update them dynamically.

With the LiveGraphics Creator plugin to simplify authoring in After Effects CC for users of all experience levels, enhanced real-time system functionality allowing powerful customization, playback, and even automation options, LiveGraphics lets you produce and present spectacular live graphics faster and easier than ever before.
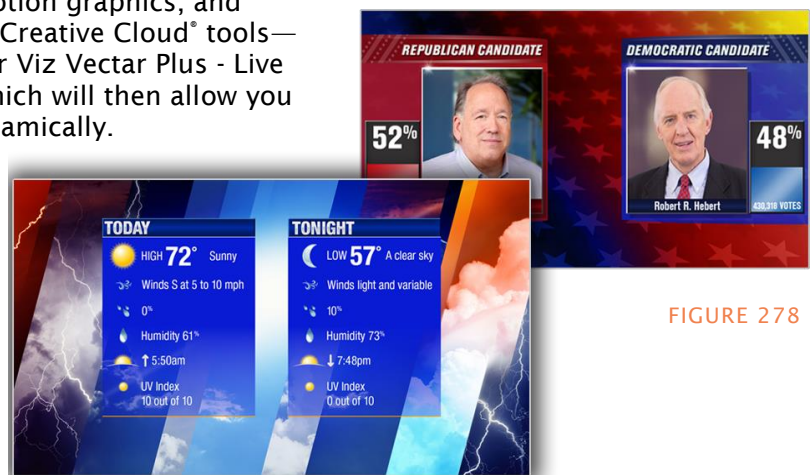
FIGURE 278

Use Layered PSD Files

Create individual graphics or an entire package in Adobe Photoshop CC, then bring the PSD files directly into your Viz Vectar Plus - Live Production live production system.

LiveGraphics recognizes the layers automatically, allowing you to manage elements independently and store up 16 macro-ready variations per system buffer.

Animate in After Effects

Animate graphics faster and easier than ever before with the included LiveGraphics Creator plugin for Adobe® After Effects CC.
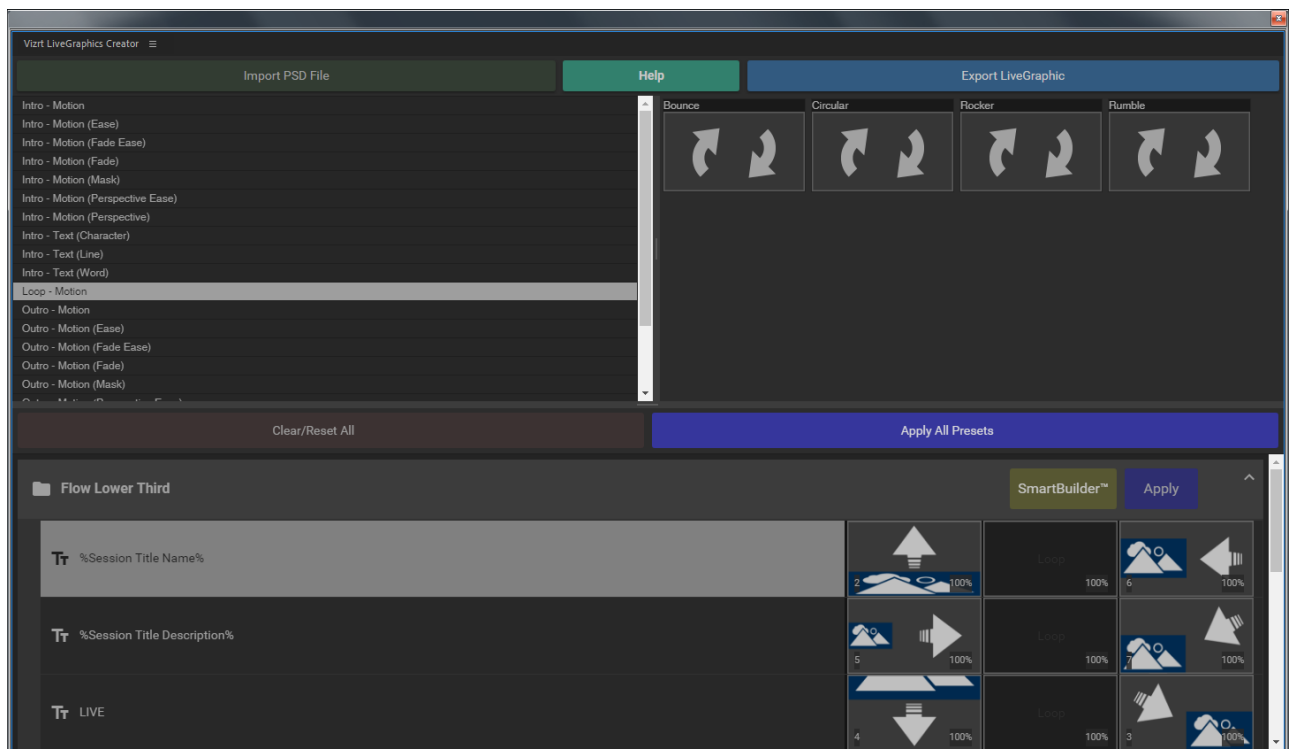
With LiveGraphics Creator, AE novices can simply import a layered Photoshop® PSD file, drag and drop presets to apply motion to its different layers, then export the result ready for live use.

Or use the included SmartBuilder™ to have LiveGraphics analyze your content and add animations for you with a single click! Of course, more advanced users can refine their creations using standard methods right in After Effects.

> Hint: The use of Viz Vectar Plus - Live Production LiveGraphics Creator is documented in its own manual, installed with the plugin.

Using LiveGraphics

Of course, you can also simply load any of the 100+ production-ready LiveGraphics templates supplied with Plus Features into your system's Buffer slots and get started right away.

The *Title Editor* lets you change text and images on the title pages, and hide or show layers using the *Layers* menu (Figure 280). Layers animate into place as you do so. Then, store the results as presets – display the *Layer* preset bin by clicking the *Preset* button at upper right (Figure 280).
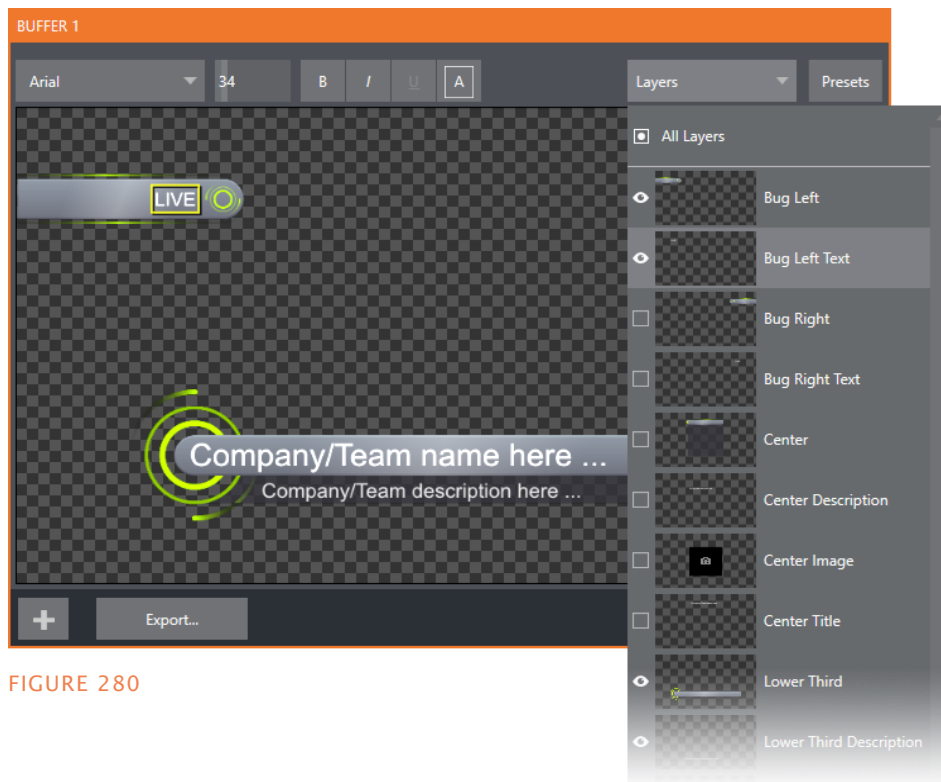
To preserve the *Layer* and *Data* presets you generate for your LiveGraphics pages outside of the current live session, you can use the *Export* button at left in the *Title Editor*'s footer. Afterward, load your creation into a *Buffer* slot, and use its preset bin to animate from one state to another at will – see Section 12.3.7, Buffer Presets for more detail.

LiveGraphics and DataLink

Naturally, LiveGraphics supports Viz Vectar Plus - Live Production DataLink™ system for dynamically updating title page details even during live display (information about DataLink appears in a number of places in this manual, but you might start your exploration at 12.2.4).

DataLink technology lets you use external hardware scoreboards, spreadsheets, and other remote data sources to populate and update your graphics automatically.

LiveGraphics templates even support text and images direct from the Web when with combined with the *DataLink Web Browser extension*.

In addition, the next *Plus Feature* we will discuss (LivePanel™) provides several powerful ways to update *DataLink* key value (such as its integrated *Scoreboard* control pages for various sports). And thanks to the included *Builder* web app, you can
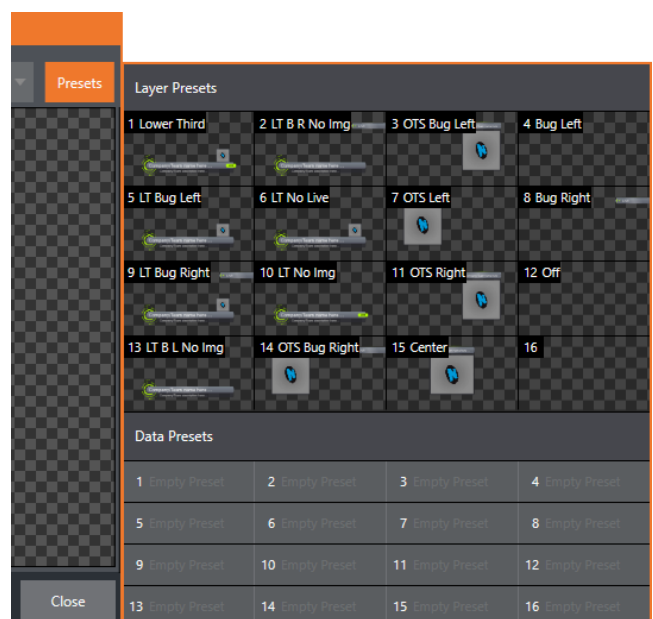
even build custom control pages capable of driving your motion graphics from any device on your network with a web browser.

A.2.4　　　LivePanel
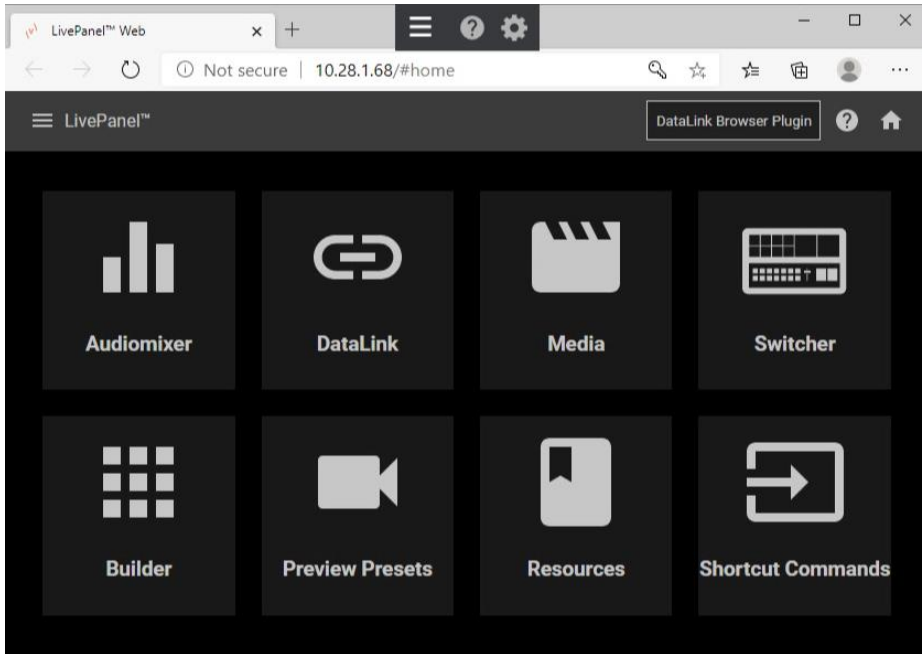
LivePanel™, included with your Viz Vectar Plus - Live Production Features, provides potent tools to extend your production workflow, and is also available for separate purchase.

Among other features, LivePanel lets you create custom control panels for your Viz live production system accessible in web browser of a device on your network. LivePanel also provides several production-ready tools for remote video mixing, media playback, audio mixing, and macro automation.

Network Access to LivePanel

To access LivePanel, click the *Notification icon* (see 7.3) at upper-right on your Viz Vectar Plus - Live Production live production system's *Live Desktop*, to open the Notification Panel.

Note the URL shown beside the *Web Browser* button at left in the footer of the *Notification Panel*. Enter this into the address bar of a web browser on another device on the same network.

Note: You may be asked for a username and password to access LivePanel – see 4.1.
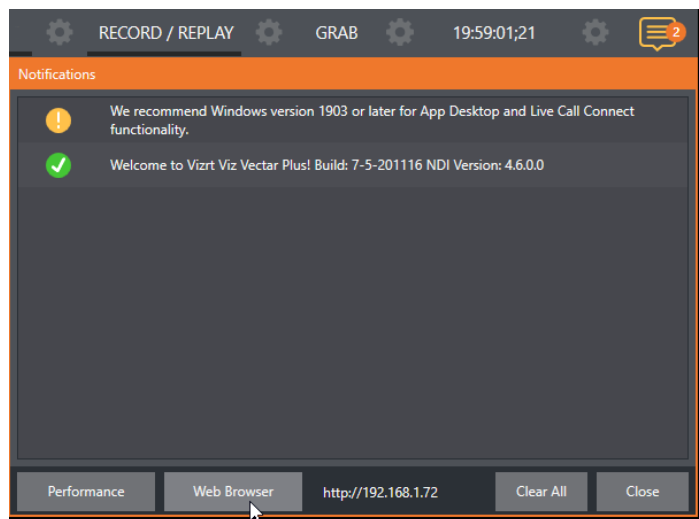
Home Page

After entering security credentials (if necessary), Live Panel's *Home* page is displayed in your web browser.

> *Note: We recommend using a modern web browser (such as Chrome or Firefox) available for your platform for best results when using LivePanel.*

All of the existing LivePanel tools can be accessed from the Home page, either by using the 'hamburger' menu at left in the titlebar, or by clicking the large icons on the page.

> *Hint: Need information quickly? Click the (?) icon at right in the titlebar to view information about LivePanel tools on the current page.*

Audio Mixer

LivePanel's prepared web applets are easy to use. In many cases the controls mimic similar items in the main interface for your system. This can be seen in Figure 284, which shows LivePanel's *Audio Mixer* applet.
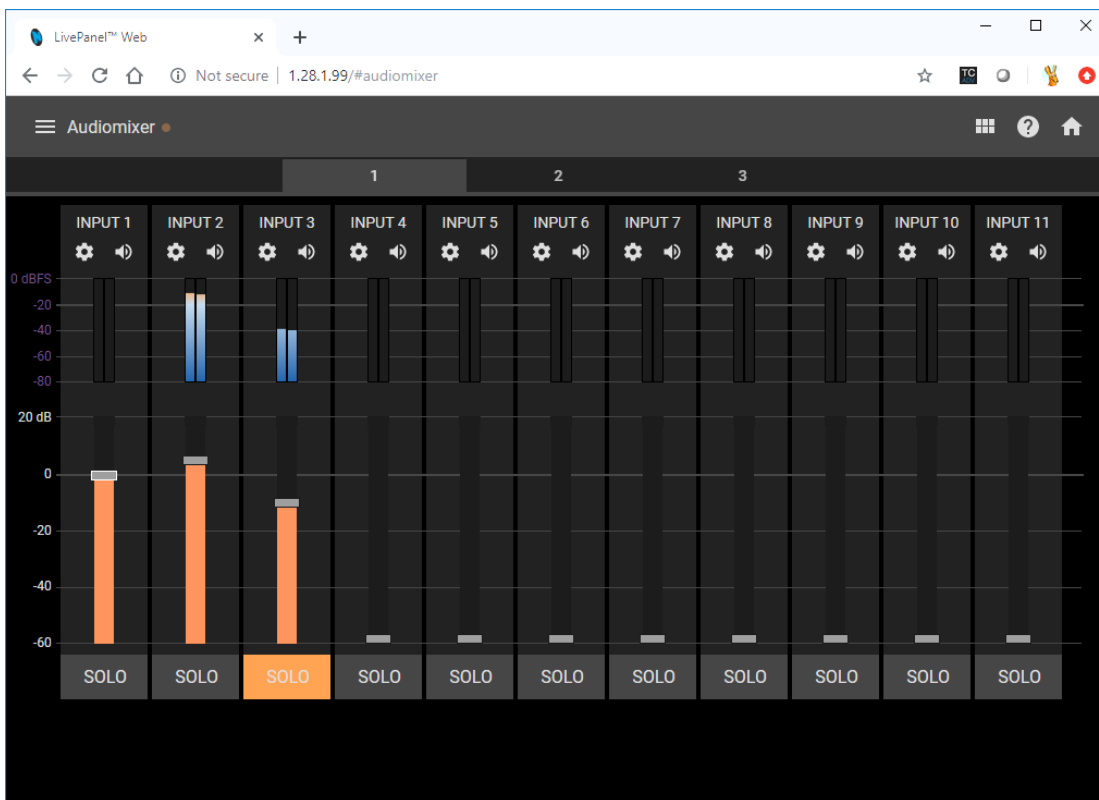
FIGURE 284

DataLink
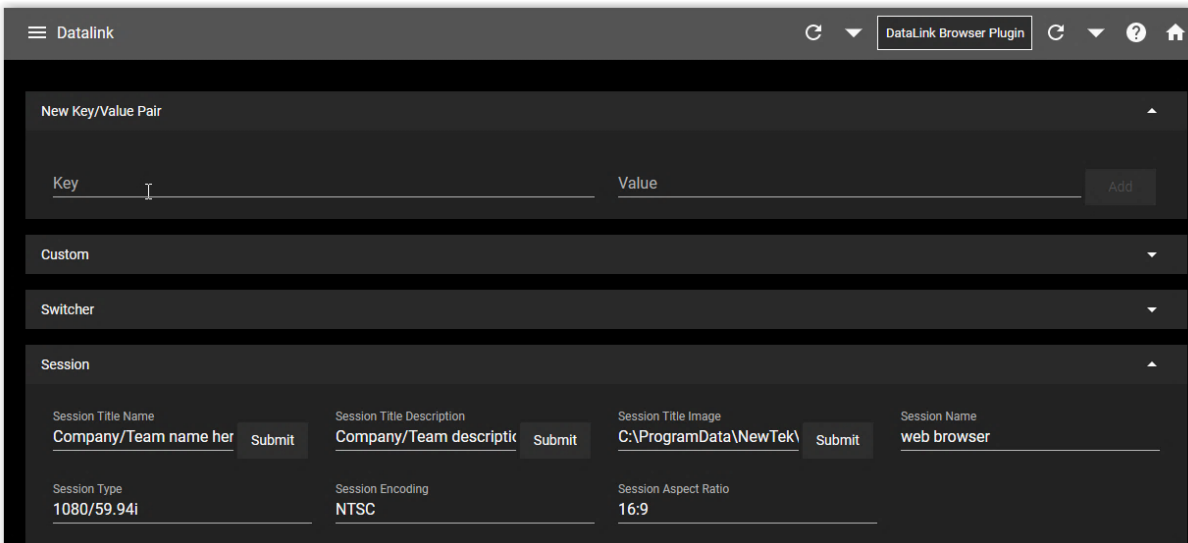
FIGURE 285

The DataLink page lets you selectively review the values for all current DataLink keys, edit these, and even generate entirely new key-value pairs.

Media

Likewise, LivePanel's *Media* page provides you with remote access to the system's *Media Players*, allowing you play, trim, add and remove media files in the playlist.

Toggle the Media Player's *Autoplay* and *List/Single* playback modes, and trigger the *Show On* feature to push *Media Player* output to display on *Program* output or in a designated *M/E*.

You can even upload images from a local host device (such as a tablet or smart phone) to the playlist on your Viz Vectar Plus - Live Production live production system.

Switcher

The LivePanel Switch applet is designed to make it easy to switch less demanding productions without a complex interface. Simply tap a viewport for a video input to *Take* it to Program output, or swipe it horizontally to do so with a transition.
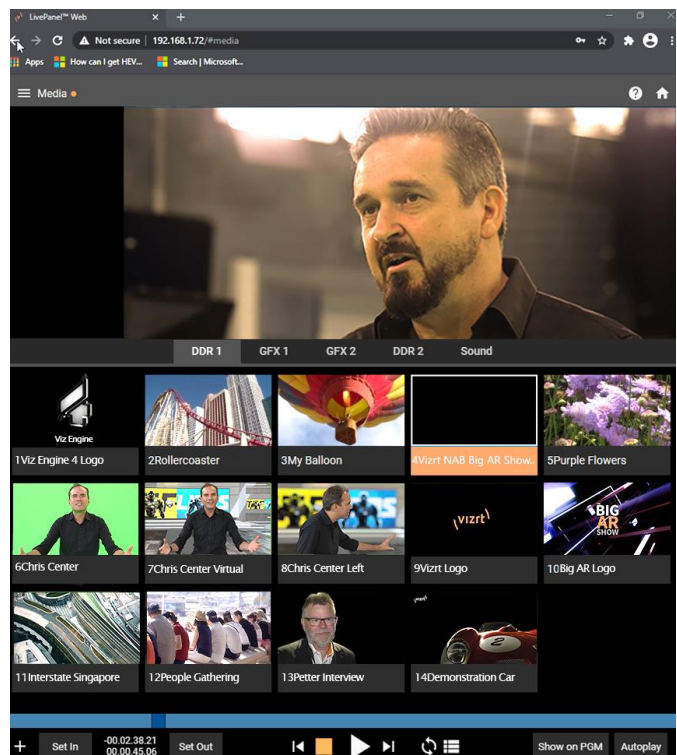
FIGURE 286

Select transition effects for the *Switcher*, an *M/E, DSK*, or *KEY* layer, and – most powerful of all – select a *Comp* to change your composition entirely with a single tap.
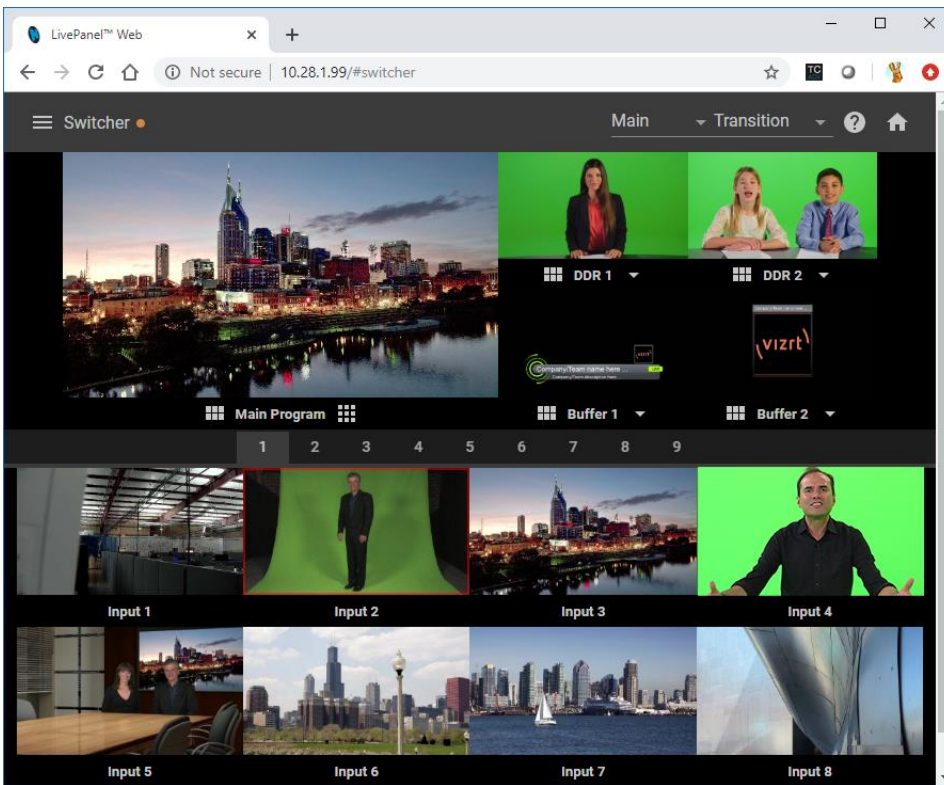
FIGURE 287

Builder

Unquestionably the icing on the LivePanel cake, the Builder Applet allows you to easily create custom control panels to meet a virtually limitless number of needs.
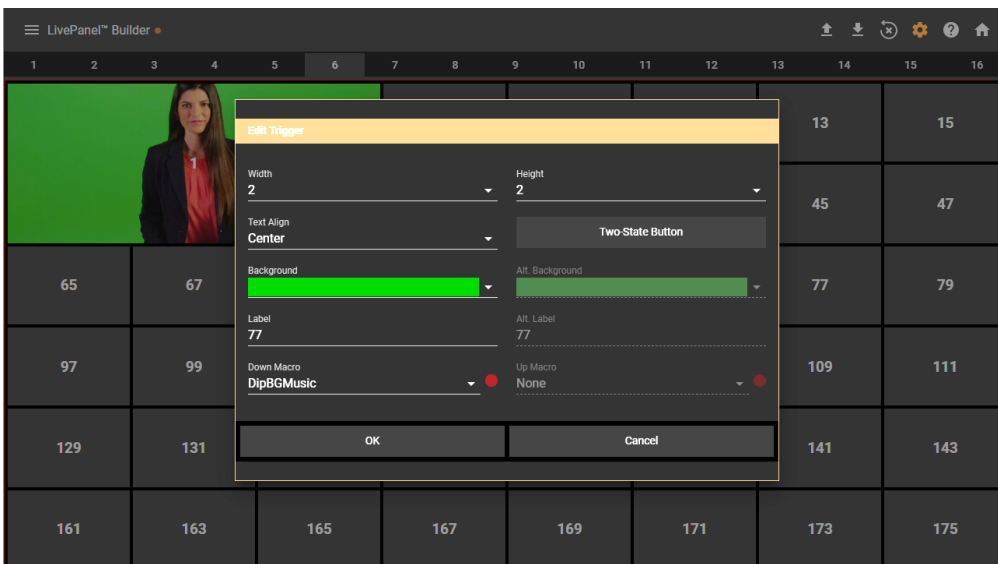
FIGURE 288

Flexibly assign a macro to a button, or perhaps two – one to operate when the button is pressed, and another to be applied when you click it a second time. Give the button a color, or fill it with a still image of your choice.

The Builder applet lets you gang buttons together to give them more prominence, and you can even assign moving video from an external *Switcher* input, *Media Player*, or output to a button (effectively turning it into a monitor), and creating your own custom *Switcher* interface.

Scoreboard

As discussed elsewhere, DataLink can be directly connected to a number of popular scoreboard systems.

With the new *Scoreboard* applet included in LivePanel, however, you can be your own scorekeeper using the web browser in virtually any laptop or tablet. Better yet, Viz Vectar Plus - Live Production Features includes full motion *LiveGraphics* scoreboard title pages already configured to work with the *Scoreboard* applet.
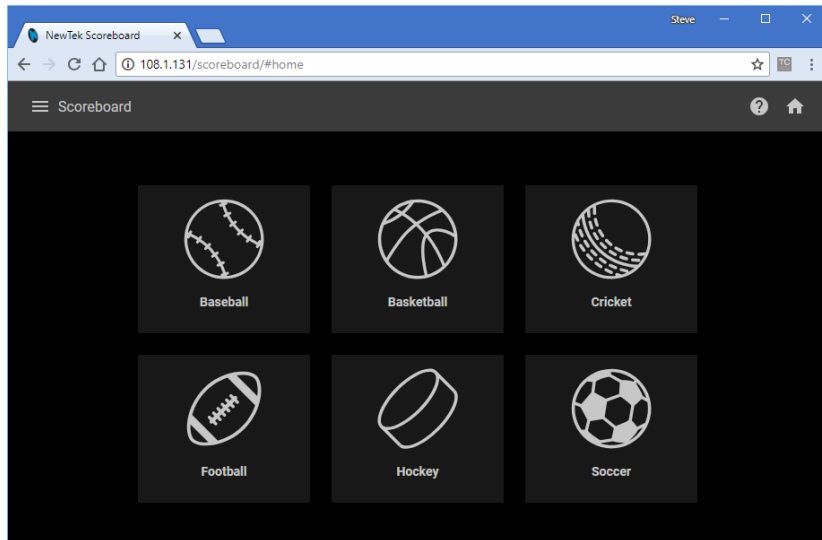
FIGURE 289

Having chosen the *Scoreboard* for your sport, and a matching scoreboard title page, the applet lets you set the team names, supply individual team logos, and track goals, penalties, and more as play proceeds.

FIGURE 290

A.2.5   Advanced Audio I/O
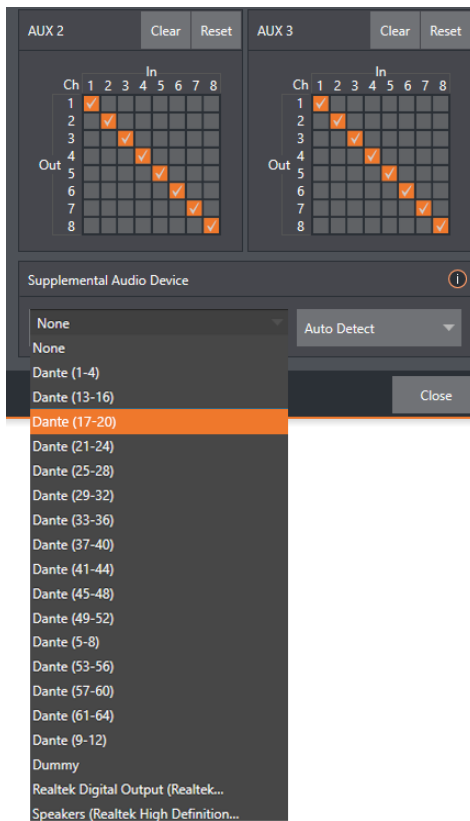
Viz Vectar Plus - Live Production Features software provides our most complete support for audio solutions such as Audinate's Dante and AES-67 implementations (with required third-party drivers).

Viz Vectar Plus - Live Production *Advanced Audio* support for ASIO drivers allows you to easily transmit or receive audio using these popular 'audio over IP' protocols.

Send selected channels from any *Mixer* input, *Media Player* or output bus and channels you wish to send and match these to the transmit channels provided by your third-party driver.

You can, for example, send your *Media Player* output to an external hardware mixer supporting the same protocol, and route that mixer's out back into your Viz system for output with your video.

Hint: Advanced Viz Vectar Plus - Live Production also provide independent per input delays for both audio and video, for a perfect match every time.

A.2.6   NDI® KVM

As exciting as all of the foregoing is, the NDI KVM feature may change your life even more.

To enable this feature, go to the Launch screen's Home page, and use the titlebar *NDI KVM* menu (Figure 292) to select which operating mode you wish to apply, choosing between *Monitor Only* or *Full Control* (which passes mouse and keyboard operations to the remote system).

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

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

You can select to view or control the User Interface or another *Multiview*, or both with multiple instances of *Studio Monitor* (Figure 293**Error! Reference source not found.**) open on the receiving unit.
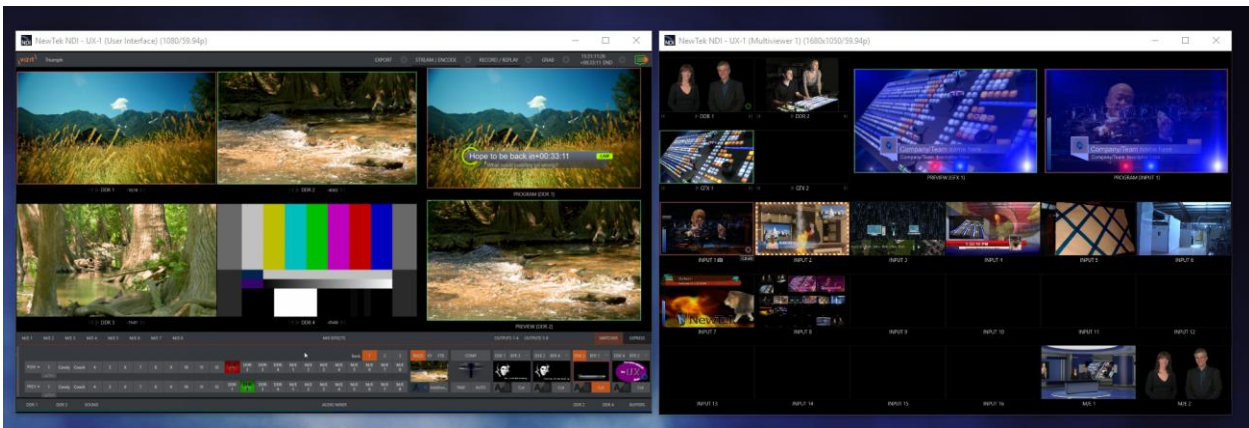
Note, too, that this feature gives you a great way to multiple your *Multiviews* around your studio or campus. You can even use these displays as video sources for another NDI-enabled system. System audio will also pass to the receiver, and you can even copy and paste text between the two systems. With the User Interface running full-screen in *Studio Monitor* on a receiving system, it's really hard to remember that you're actually controlling a remote system. Even touch is supported, meaning you can run the User Interface output on a Microsoft Surface™ system for portable touch control over your entire live production system.

 (Actually, many of the interface screengrabs shown in this manual – including those in this section – were grabbed from *NDI Studio Monitor* while controlling the remote system in the manner described above.)

A.2.7   Virtual PTZ

Virtual PTZ, also referred to as "pan and scan", is a unique *Switcher* input feature applied to 'standard' video sources, i.e., those which are not actually connected to physical PTZ (Pan, Tilt, Zoom) cameras.

Naturally, the latter (real PTZ cameras), when connected and configured, show *Pan*, *Tilt*, and *Zoom* controls in their *Input* tab of the corresponding *Input Configuration* panels.

The *Virtual PTZ* feature adds similar controls to all *Switcher* sources (except M/Es, which already have similar capabilities thanks to *Comps*). This even includes *Media Players* and *Buffers*.

Since the *Virtual PTZ* implementation includes *Presets* and *Speed* controls, this means is that you can zoom in/out and pan around within the frame supplied by any source.

Of course this is a particularly attractive feature ion the context of UHD video sources, but can also be used to mimic the so-called "Ken Burns effect" (a.k.a., 'pan and scan') when applied to imagery in *Media Players* (Figure 294).
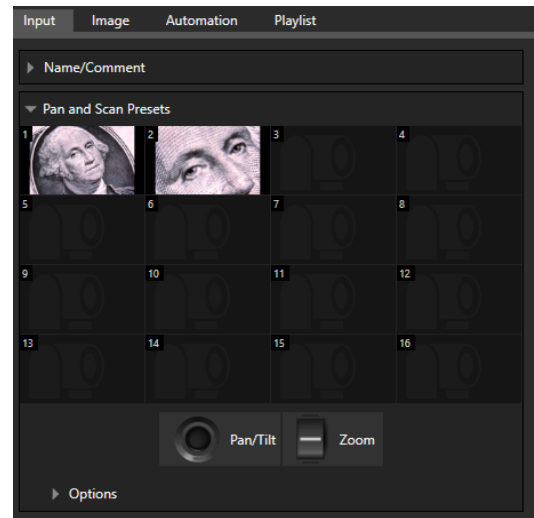
A.2.8   Virtual Set Library

Viz Vectar Plus - Live Production Features also provide you with the use of the entire collection of LiveSet™ virtual sets, covering an array of useful broadcast, business, and industrial applications. A small sampling from this collection is shown below.
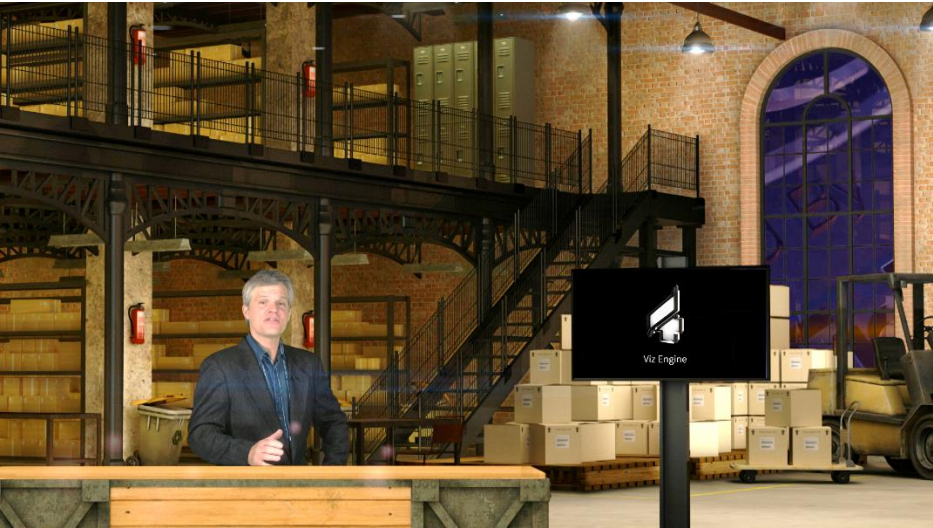
At the time of writing, the collection includes thirteen professionally designed multi-camera virtual set environments ready-to-use for your productions.

A.2.9　Sound and Music

This 100-track bundle of songs includes a variety of license-free, full-length audio tracks to engage your audience and give you plenty of soundtrack options. The multiple musical genres in this bundle allow you to develop a theme or evoke specific emotions with background music for live content or edit these unlimited-use music clips into pre- and post-production content.

Appendix B: Skype and Skype TX

Skype™ and SkypeTX™ may sound alike, but they are not really the same thing. Each delivers specific capabilities, and their connection and configuration details differ as well. This chapter will help you understand these distinctions, so you can take full advantage of these important connection options.

Literally hundreds of millions of people use Microsoft Skype™, so it's very likely that you are already acquainted with its use on mobile and desktop platforms. It's hard to imagine a better technology to extend your productions to remote participants, whether around the corner or in far-flung corners of the world.

Viz Vectar Plus - Live Production provides optional approaches to working with Skype, the app desktop and the related feature. Live Call Connect, support running a Skype client directly within live environment. Here, though, we will discuss two other approaches, the first using Microsoft's professional level Skype TX™ platform first, and then another method of using a standard Skype client. Until recently, however, there were 'missing links' in the i/o chain between Skype and the video broadcast realm. Microsoft introduced its Skype TX platform, comprising purposed-designed hardware, software, and control room tools, to link the two worlds.

B.1.1   Skype TX Controller

A vital part of the Skype TX™ platform is the call-center application referred to as Skype TX Controller (available here for free). You might think of Skype TX Controller as the 'switchboard' for your calls.
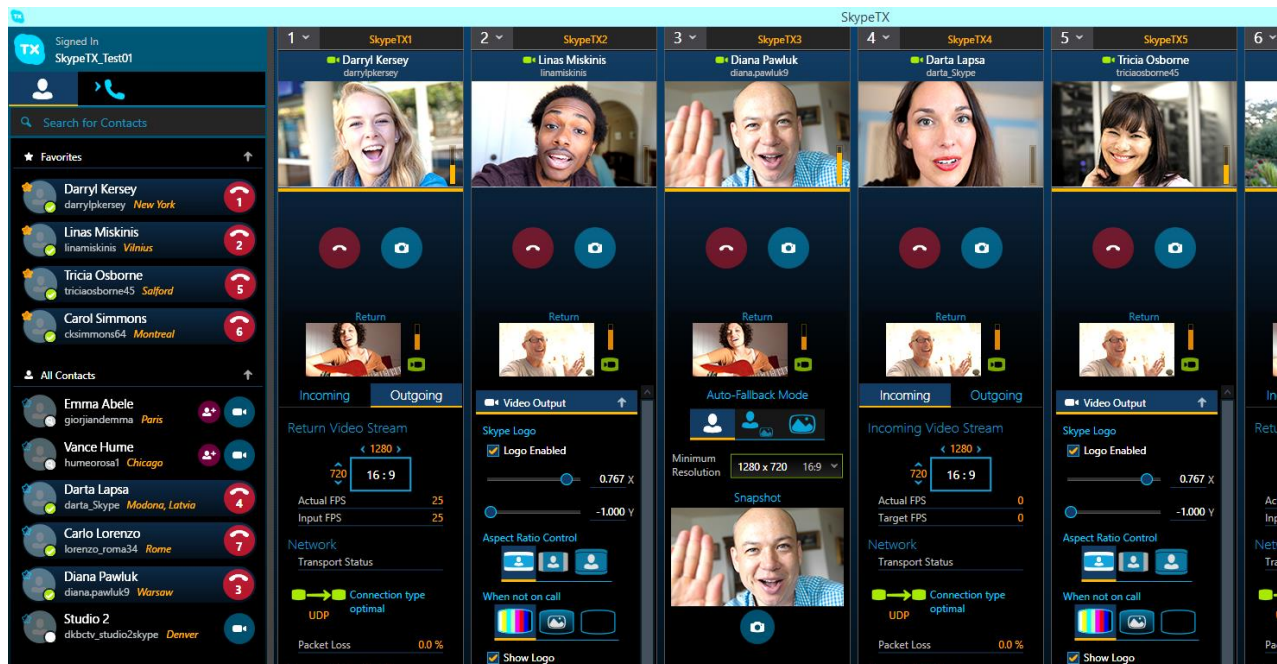
The operator can initiate outgoing calls, answer incoming calls, and more.
The Skype TX Controller console provides numerous professional conveniences, including contact and call management tools, auto-answer, detailed call quality metrics, and fallback images to be displayed automatically should network conditions for a remote caller fall below designated minimums.

B.1.2   Skype TX Caller

Viz Vectar Plus - Live Production also features native Skype TX capabilities. This unique support lets you directly connect Skype™ calls from anywhere in the world to either of two special *Switcher* inputs by leveraging the Skype TX Controller.

All you need to use this feature is a network connection between your Viz Vectar Plus – Live Production system and the computer running the (free) Skype TX Controller application that provides call management.

FIGURE 296

Audio and Video Connections

Section 8.1.1 explains how to assign a Skype TX Caller to a selected video Switcher input.
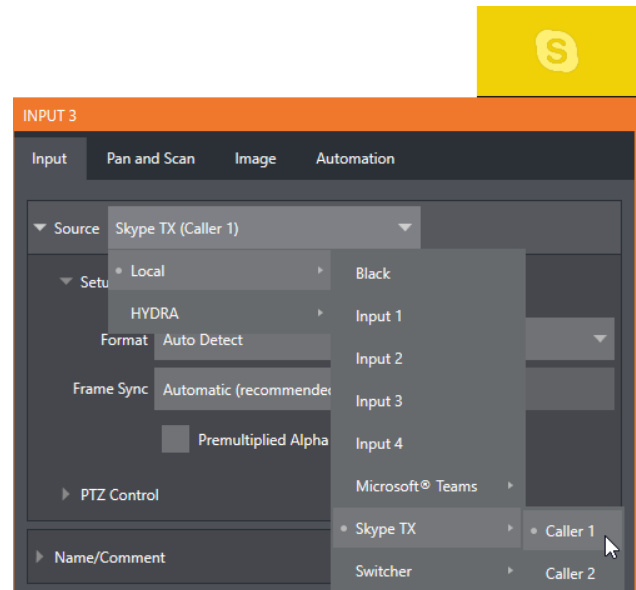
It is not necessary to manually create a special mix minus audio return feed to send to the remote caller(s). You will find details on the special 'mix minus' that is automatically supplied in 16.5.

In addition, you will find it worth reading the section on the TalkBack feature provided in the Audio Mixer to let the production system operator talk 'offline' with selected callers, without fear of the conversation being overheard on program audio output.

> *Hint: The return video sent to remote Skype callers can show a tally overlay. The overlay image is named SkypeTally.png, and is located in the file folder at one of the locations below, by model:*
>
> *   C:\ProgramData\Vizrt\VectarPlus\Configuration\Skype\ or …*
>
> *This image can be deleted to disable the feature, or replaced to modify it.*

B.1.3   Skype for Content Creators

Microsoft offers several variants of Skype. The Desktop version of Skype provides new possibilities for Skype users including broadcasters, streamers, and vloggers. including output using NDI® protocol. This support for NDI provides yet another way to bring Skype calls into NDI–enabled software and systems, including Viz Vectar Plus - Live Production.

Input setup for Skype a/v output is similar to connecting any other NDI source. The Skype client does not directly support NDI input from you to remote callers, but you can use the NDI Webcam Input application (included with the free NDI Tools pack) to connect program video output and a mix minus audio return feed prepared as discussed in the sub-heading Sub-Mixes and 'Mix Minus' in Section 16.11.2 of this manual.

Appendix C: Performance Considerations

In this section, we'll consider the most common questions you may have (and of course we'll provide the answer, too). Answers are intentionally brief – perhaps just a reminder of one or two steps required to perform some operation. For this reason, we'll also point you to explanatory information elsewhere in this manual whenever that would be useful.

C.1.1 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.

C.1.2 IMAG and Latency

What's IMAG? It's a compression of the expression "Image MAGnification." Typically, in modern IMAG applications, video cameras supply live imagery to projection systems, magnifying speakers and performers so that audience members further back in large venues can still see what's going on.

IMAG is a very tricky task at the best of times, one that calls for excellent planning, and where possible, testing. Those designing an IMAG installation have, not just one, but *two* inter-related broadcasts to consider – in the form of the audio and video streams.

Relativity and the Speed of Light

Wouldn't it be nice if audio and video travelled from their respective broadcast devices at the same speed? Then, wherever you were seated in the audience, the sound from hypothetically perfect speakers and the video image from huge video displays co-located at the front of the auditorium would reach your ears and your retinas at precisely the same moment!

This is not the case, however. Sound travels quite slowly – so slow, in fact, that even in relatively small venues it reaches those in the rear of the audience noticeably later than those in the front.

In loose terms, for a mid-size auditorium 600 feet long, it takes around a half-second for the audio to reach those in the back. For this reason, audio engineers often position speakers throughout the 'house', then introduce carefully considered delays by electronic means – to ensure 'late sound' from front speakers does not arrive after sound from the nearest speaker to those further back.

Light, on the other hand, travels so much faster that for all intents transmission can be considered instantaneous in the same setting. So, a person in the rear will see the image on a screen at the front long before sound from a *co-located* speaker arrives.

If transmission of the video signal from the camera lens right through to the projection screen were instantaneous (it's not, mind you), we'd likely need to *find* a way to delay it. Viewed in this light, a certain amount of latency is actually "A Good Thing!"

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.

Latency and Your Viz Vectar Plus – Live Production

Viz systems excel at IMAG, but inevitably constitute just one (albeit critical) link in a chain of devices.
It is common for each device to contribute a little to the combined total latency for the system.
Your Vizrt system portion of the total latency is well within acceptable standards for devices of this sort – roughly between 1 and 2.5 frames (the actual amount can vary slightly within this range, depending on several factors).

> *For example, suppose a 'video frame' supplied by a camera arrives at an input one millisecond after a different frame has been sent to the output. Obviously, the new arrival must wait its turn; it can't be transmitted until the correct duration for its predecessor has elapsed. Thus, the newly arrived frame must 'wait' almost one entire frame, until its turn comes.*

> *Hint: You can actually assess the latency of your pipeline fairly easily. Run timecode directly to 1) a monitor and at the same time 2) through the switcher to a second (identical) monitor. Take a photograph that encompasses both monitors, and compare the timecode shown.*

Other Sources of Latency

More often than not, significant latency is added by other devices in the IMAG chain that come *after* the switcher. Projectors are a common contributor, but at times the cameras themselves are a factor.

Here are some helpful points to consider when designing and connecting your system:

- If you use Multiview output from the switcher to the projector – if at all possible, match the resolution sent from the switcher to the native resolution of the projector. (On some projectors

this allows the unit to avoid using its own internal scaling, which is often a significant factor in unwanted latency.)

- When possible, try supplying the projector with analog video. This can eliminate a lot of the complexity from the process (of course, this is not always possible.)

- Certain projectors provide a 'low latency mode' to disable features of the unit that carry a heavy toll in latency. Enabling this mode can make positioning the projector slightly more challenging (as you may sacrifice some ability to position and scale the image using projector menu functions) – but the latency reduction can be very worthwhile.

- Some cameras include features that add more latency than you would expect. For instance, image stabilization (by definition) adds one field of latency and sometimes more. Disable anything of that sort that you can.

Appendix D: Video Calibration

An oft-heard expression is "Don't worry – we'll fix it in post". Post-production techniques are invaluable, but they do not invalidate another often repeated axiom – "Garbage in, garbage out." And, in the case of live production, the results are immediately obvious to your audience … for good or for bad.

For these reasons and many more, it's important to control the visual quality of your work all the way through the production pipeline. Adequate lighting, good cameras, and high-quality connections are critical, but there are other things to consider.

Human vision is remarkably adaptable. In one study, participants equipped with inverting lenses initially saw everything upside-down. After a few days, people reported that things appeared right-side-up again.

Even when things are dramatically wrong our brains compensate to a remarkable degree. Have you ever looked at a television in a store without noticing anything untoward, and then realized that the colors on another unit nearby looked much better?

This built-in tolerance makes it difficult for us to judge whether the blacks in our video productions are really black –or just dark gray; whether reds are purple or tinged with a slight greenish caste, and so on. What we really need is a reference for comparison – just as we find it easier to pick the best-looking display from a row of television sets on a store shelf.

D.1.1   What (And Where) to Calibrate?

Tip one – forget 'point and shoot'. Lighting, set design, and countless other factors have an impact on the video attributes our cameras 'see'.

As a first step, cameras need to be properly calibrated. *Ideally, this is done right at the camera*. Corrective measures taken downstream never fully compensate for problems at the first link in the chain. Most cameras, even inexpensive consumer models, provide adequate controls for this purpose. Some other video sources do not offer much if anything in the way of adjustment, however. You may need to adjust the *Proc Amp* settings to improve previously recorded video played from a DVD player, or a networked 'video chat' system.

In both cases above, the *Waveform* and *Vectorscope* monitors will help. We also need to give consideration to *downstream* devices, though.

Computer displays are inherently different than television sets. Therefore, the video you see on your computer interface can vary quite a bit from what your viewers see on their televisions. Too, you will want to be able to correctly judge colors when preparing titles and graphics. It will help you a great deal if your downstream video monitors are properly set up to allow you to make these judgments.

D.1.2   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.

Setting Black and White

Naturally, the color range available for transmission and recording is bounded at the upper level by white and at the lower level by black. Anything else falls somewhere in-between.

Consider what happens if you gradually raise the brightness control on your television. Beyond a certain point (and unlike claims made for laundry detergent) your whites do not become whiter. They can't – the upper limit (white) is firmly fixed. Instead, parts of the image that are nearly white are boosted, eventually also becoming white. Meanwhile, black portions of the picture are tending towards gray. Since white cannot become whiter, and black has become gray, we could say that the dynamic range of the image has been narrowed. The net result is a less vibrant image.

The same thing is true for video from your cameras. If the black and white levels from the camera are incorrect, you are effectively losing either shadow or highlight detail. For this reason, the first thing many do is calibrate their camera for correct levels.

Waveform Monitor

From days of old, for video engineering purposes the scale between black and white was defined in IRE units (IRE being an acronym for "Institute of Radio Engineers"). White was pegged at 100 IRE.   For PAL (and NTSC-J) countries, black was defined as 0 IRE. For NTSC lands, black properly sat at 7.5 IRE.

Thankfully, the day of strict adherence to these analog video concepts has virtually disappeared. Today, confirming that the black and white levels your camera is sending are correct is as simple as sending first black, and then white (or the brightest past of your scene, and reading values from the scale alongside the *Waveform* scope.

> Hint: Your system automatically compensates for the traditional 7.5 IRE black (also known as "setup" and "pedestal") in SD format NTSC sessions.

Connect your camera to the correct input, block the lens so it receives no illumination, and check the level shown in the *Waveform* monitor. Generally, it should be 16 on the 8bit scale.

To check white, use either the brightest part of your scene or a white card, ensuring that it is evenly illuminated with the same lighting your main subject will receive. Move in or zoom to fill the viewfinder with this, and confirm that the Waveform monitor is showing 235 on the same scale. Otherwise, you might try using your camera's Auto White Balance feature with the white card – your camera manual will provide instructions. Afterwards, check the black level again.

Some more professional cameras offer full manual controls for white balance and/or black level. Use these as instructed to ensure your camera is providing the correct white and black levels.

If you cannot make source adjustments, or can't get it quite right by these means alone, you can use the Brightness and Contrast controls in the *Proc Amp* for that input to tweak black and white levels. (Of course it is always best to perform adjustments at the source if possible.)

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 the *Vectorscope*, and perform an initial test of the camera's color balance.

A vectorscope can be likened to the familiar 'color wheel' 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.
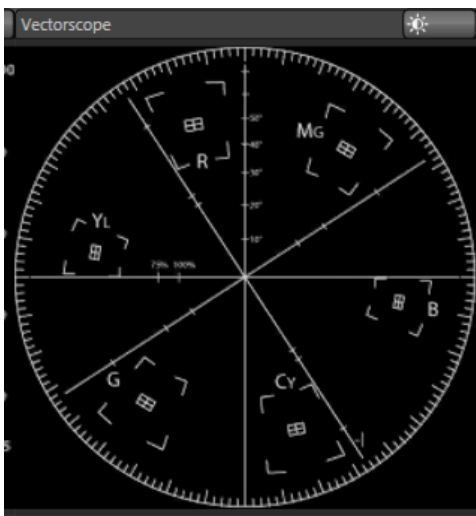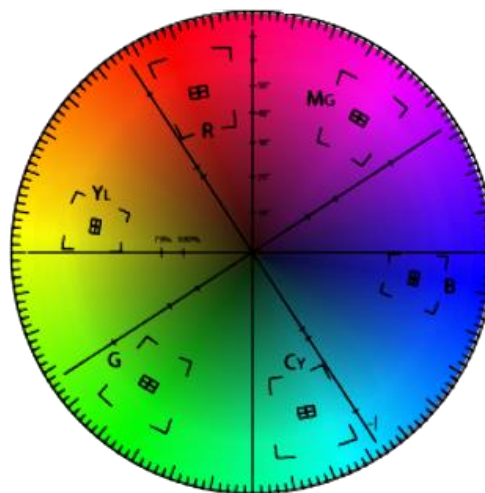
As it happens, from the vectorscope point of view, neither black nor white properly have any color saturation. Thus, with the lens cap on (or with a white card filling the viewfinder), the vectorscope should show only a small fuzzy trace at its center. If the fuzzy dot is off-center horizontally or vertically, 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 Proc Amp's *U Offset* and *V Offset* controls to do so (as always, source controls are best). Adjustments to *U Offset* move the trace left or right, while *V Offset* changes adjust its vertical position.

Let's move on to a slightly more rigorous testing.

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 299 (NTSC) is an example of the color bars used in NTSC countries, while Figure 300 (PAL) is a PAL example, common throughout European nations.

FIGURE 299 (NTSC)
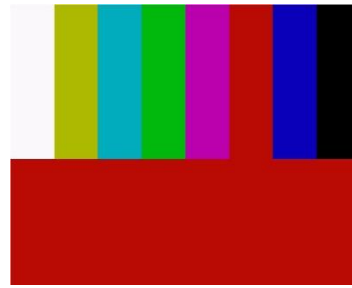
FIGURE 300 (PAL)

You can use color bars in conjunction with *Waveform* and *Vectorscopes* to make sure the video supplied to is consistent, accurate and broadcast legal. Most video cameras are capable of displaying color bars – check your camera manual to see how to display these (given a choice, use 75% bars). Then look at the *Vectorscope* to see how it traces the individual colors comprising the image.

The *Vectorscope* graticule has six distinct rectangular *targets*, one each for Yellow, Red, Magenta, Cyan, Blue, and Green. The targets are small rectangles with a cross-hair superimposed on them. When a source is properly calibrated, the trace from the different colored segments of the color bars displayed will fall right inside their individual targets.
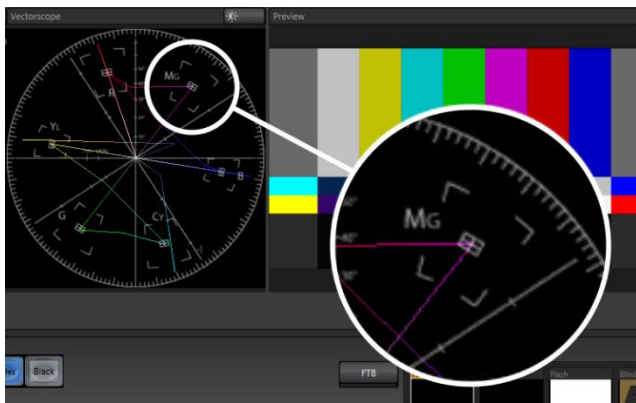
FIGURE 301

If the trace vectors do not line up as they should even after performing a white balance at the camera, you can use *Proc Amp* controls to tweak the signal.

Adjust the *Hue* control to rotate the vectors around the center point to line them up correctly on their respective targets. Increasing *Saturation* will move the trace further out towards the edge of the scope. Decreasing Saturation lowers color intensity, bringing the trace back closer to the center.

> Hint: Naturally, you should repeat the steps above for each connected source, to ensure a perfect match when switching from camera to camera during your live productions.

At this point, your video signal should be reasonably accurate, and broadcast legal. Naturally, there are other devices between that signal, you, and your viewers. Let's discuss ways to calibrate downstream video monitors to ensure that you see your video at its best.

D.1.3   Calibrating Your Monitors

In most cases, you will use a computer monitor of one type or another to display your system's controls – the user interface. Even though the television monitors you likely use for final program output may look somewhat similar to your computer monitor, they do differ in a number of important respects. For this reason, we will approach their calibration separately.

Computer Monitor

This is a subject that could (and does) easily fill multiple volumes, but which we will sadly give short shrift. It may not be *quite* as important to achieve 'spot-on' color calibration for the monitor used for the user interface. Not surprisingly, video output color is best judged on larger downstream video monitors.

Nevertheless, you may find a trip to one of any number of websites providing test imagery and calibration hints useful.   A search for "computer monitor calibration" will yield an endless list, along with some commercial utilities for those who feel the need. Here are links to several such sites:

https://www.epaperpress.com/monitorcal/
http://www.lagom.nl/lcd-test/
https://www.photofriday.com/info/calibrate
https://www.onecomputerguy.com/windows7/windows7_calibrate_color.htm

Program Output Monitor

Again, a search of the Internet for "video monitor calibration" will yield a large number of resources, both free and commercial. If you have television monitors connected to your outputs, though, you can make further use of the color bars. The approach is somewhat similar to what we did for our video sources, in that the first adjustments are to ensure that black and white levels are correct. Color calibration is performed afterward.

First, warm up your monitor for at least 10 minutes (some sources recommend a half-hour), to stabilize its output. Dim room lights and window light, to eliminate light sources that might skew your color perception. Pass the color bars from your camera through to program output (or use a color bars image in one of the *Media Players* for this purpose.

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 302

2. If the monitor lacks a "Blue-gun only" feature, you can obtain a colored filter such as a Kodak Wratten #47B gel, and hold that between your eyes and the monitor for a similar result.

3. Tweak the *Color* (or *Saturation*) knob until the small rectangular patches at very bottom of the tall upper bars on the extreme right and left of your screen merge with the tall bars above.

4. Tweak the monitor's *Hue* control until the small rectangles beneath the third and fifth tall upper bars likewise blend into bar above.

5. You may need to redo the last two steps several times, balancing the adjustments of these two controls until all four of the lighter bars evenly match the smaller rectangles just beneath them. (Note that a perfect match simply may not be possible on some monitors.

6. Check your results with some familiar imagery, and make any further tweaks you feel are required.

PAL

1. If your monitor has a "Blue-gun only" setting, enable it. Raise the *Color* or *Saturation* setting until the three right hand bars all appear to be the same shade.
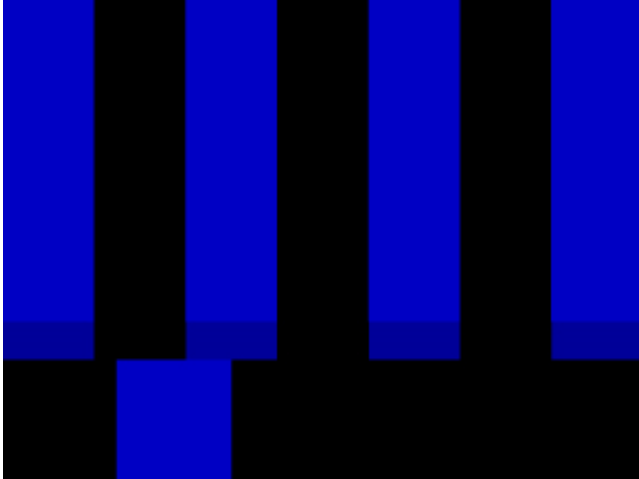
2. If the monitor lacks a "Blue-gun only" feature, you can obtain a colored filter such as a Kodak Wratten #47B gel, and hold that between your eyes and the monitor for a similar result.

3. Turn off the "Blue-gun only" feature (or dispense with the filter if you used one), and examine the red bar. It should appear not be so vivid that it bleeds onto the nearby bars

4. Check your results with some known familiar imagery, and make any further tweaks you feel are required.

Appendix E: Keystroke Shortcuts

E.1.1   Switcher…

Program Row, Inputs 1 to 24	F1 – F12 plus [Shift + F1-12]
Preview Row, Inputs 1 to 24	1 – 0, -, =, and [Shift + 1-0, -, =,]
Transition Delegate – select BKGD	[key (left square bracket)
Transition Delegate – multi-select BKGD	Shift + [
Transition Delegate – select DSK 1	] key (right square bracket)
Transition Delegate – multi-select DSK 1	Shift +]
Transition Delegate – select DSK 2	\ key (backslash)
Transition Delegate – multi-select DSK 2	Shift + \
Transition Delegate – select DSK 3	Backspace
Transition Delegate – multi-select DSK 3	Shift + Backspace
Transition Delegate – select DSK 4	Insert
Transition Delegate – multi-select DSK 4	Shift + Insert
Transition Delegate – select FTB	b
Transition Delegate – multi-select FTB	Shift + b
Select FTB Delegate and perform Fade	Ctrl + b
Auto DSK 1 On/Off	a
Auto DSK 2 On/Off	s
Auto DSK 3 On/Off	d
Auto DSK 4 On/Off	f
Take DSK 1 On/Off	Shift + a
Take DSK 2 On/Off	Shift + s
Take DSK 3 On/Off	Shift + d
Take DSK 4 On/Off	Shift + f
Select Transition (prev/next)	, and . (comma and period)
Select Fade Transition	Ctrl + f
Restore Last Transition	Shift + Ctrl + f
Transition – Slow … Medium … Fast	z…x… c
Transition – Increase Speed	Shift + c

Transition – Decrease Speed	Shift + z
Toggle Reverse Transition On/Off	e
Ping Pong Transition (off/on)	Alt + e

E.1.2 T–Bar

Take	Return Key
Take T-bar Back to Top	Shift + Return
Transition … Go/Pause	Spacebar
Auto Reverse	Shift + Spacebar
Adjust T-bar… Down/Up	t / Shift + t (faster add Ctrl)
Halfway T-bar… Take	h

E.1.3 Record, Grab, and Stream

Record on/off	r/ Shift + r
Grab (still image)	p
Stream Start	Ctrl + /
Stream Stop	Ctrl + Alt + /

E.1.4 Tabs

Show (DDR, PTZ, Mixer, etc.) tab	Ctrl + (F1 to Fn)
Select M/E 1- 8	Ctrl + Shift + F1-F8
Show M/E pane	Ctrl + m
Hide M/E pane	Alt + m
Toggle M/E pane	m

E.1.5 Workspace

Show Interface A	Alt + Numpad 0
Show Interface B	Alt + Numpad 1

Show Interface C	Alt + Numpad 2
Show Interface D	Alt + Numpad 3
Show Multiview A	Ctrl + Numpad 0
Show Multiview B	Ctrl + Numpad 1
Show Multiview C	Ctrl + Numpad 2
Show Multiview D	Ctrl + Numpad 3

E.1.6   Media Players

Stop	k
Play	l (lower case L)
Go to previous playlist item	j
Go to next playlist item	; (semi colon)
Autoplay On/Off	u
Loop On/Off	' (apostrophe)
Single On/Off	q
Navigate through Playlist items	Up/Down/Left/Right Arrows
Set In Point for current Playlist Item (Clip or Audio file)	i
Set Out Point for current Playlist Item (Clip or Audio file)	o
Split clip at current frame	/
Reset In and Out Point to the file's first and last frame	g

E.1.7   General

Edit Title Pane

Save the current title page	Ctrl + Shift+ s
Save the current title page, and duplicate it in the playlist	Ctrl + Shift+ s
Save the page and move to the previous playlist item	Page Up
Save the page and move to the next playlist item	Page Down

Selection and Navigation

Select All	Ctrl + a
First/Last Item	Home/End
Navigate through Playlist items	Up/Down/Left/Right Arrows
Select All Previous/Following Items	Shift + Home/End
Playlist - select to Top/Bottom	Shift + Home/End
Playlist – add to selection (Up/Down)	Shift + Up/Down arrow

Misc.

Cut	Ctrl + x
Copy	Ctrl + c
Paste	Ctrl + v
Delete	Delete Key
Show version	Alt + b

Appendix G: Third Party License

G.1.1 Third Party Licenses:

This product uses a number of third-party software libraries under license. Related license requirements are defined in documentation installed on the product. To view these licenses, please click the Additional Licenses link provided in the Help menu on the Startup>Home page shown upon launching the product.