
The Studio

Community Television Network

Community Television Network
2805 S. Industrial, Ste. 200 (near Eisenhower)
Ann Arbor, MI 48104

734-794-6150

www.a2gov.org/ctn

Revised 6/2013

Table of Contents

Introduction	1
Studio Production Step-By-Step	2
Lights	3
Equipment.....	3
Set-Up	6
Camera.....	10
Equipment.....	10
Set -Up	16
Audio	17
Equipment – In The Studio.....	17
Equipment – In The Control Room.....	22
Set-Up.....	32
Technical Directing.....	39
Equipment.....	39
Performing Transitions	51
Additional Sources.....	52
Record your program.....	53
Studio Strike.....	54

Introduction

Without some degree of teamwork, it would be impossible to complete a studio production. Cooperation, communication and planning are all needed to bring together the various elements involved in a successful production.

The Studio Production class is designed to provide you with an understanding of basic studio production, as well as provide you with the operational skills necessary to participate in a production. We will cover all of the crew positions and how they relate to each other. Even if you only plan to be a camera operator, it is important that you have some idea of what the other members of the crew are doing and how that relates to your position and the production as a whole. It is a team effort, and every player needs to know his or her role.

This training will be primarily of an operational nature with a quick sojourn into technique. You will not emerge from this class a polished and proven studio crew person, but you will know the care and feeding of CTN equipment, and have a foundation for the skills necessary to operate and communicate as a member of a studio crew. The best way for you to polish the techniques learned here would be to volunteer on as many productions as you are able. The class will in no way be of a technical nature and, as CTN Facilities personnel are always available during studio productions, they will handle any problems of a technical nature.

Studio Production Step-By-Step

Here is a list of the basic steps involved in producing a program utilizing the CTN studio and equipment:

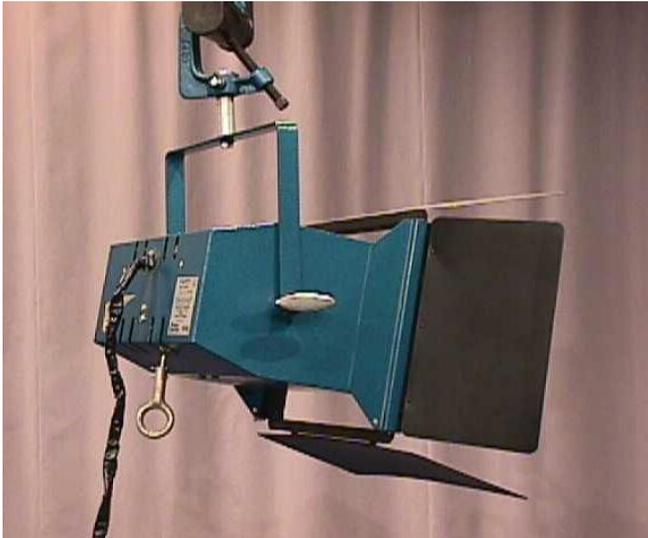
- 1)** Plan your production. Decide on the who, what, where, why, when and how.
- 2)** Fill out and submit a CTN Production Proposal Form.
- 3)** Decide when you want to do or begin your production work.
- 4)** Fill out and submit a CTN Studio Reservation Form.
- 5)** Call CTN the next day (at the earliest) to see if your reservation was approved.
- 6)** Arrange for crew. You can get a list of certified studio volunteers from CTN.
- 7)** Call CTN with the names of your volunteer crew at least the day before your production date.
- 8)** On the day of your reservation, arrive at the CTN studio on time.
- 9)** In the studio:
 - 10)** Set up your set.
 - 11)** Set up the lighting.
 - 12)** Set up the cameras.
 - 13)** Set up the microphones.
- 14)** In the control room:
 - 15)** Set up other audio sources.
 - 16)** Set up the audio mixer.
 - 17)** Set up the graphics.
 - 18)** Set up the switcher.
- 19)** Rehearse everything that can be rehearsed.
- 20)** Record your production.
- 21)** When you're done with recording, strike the set and equipment.
- 22)** Submit your finished program for playback.
- 23)** Begin planning your next production.

Lights

Equipment

Lights

Any lights hanging on the studio grid are available for use.



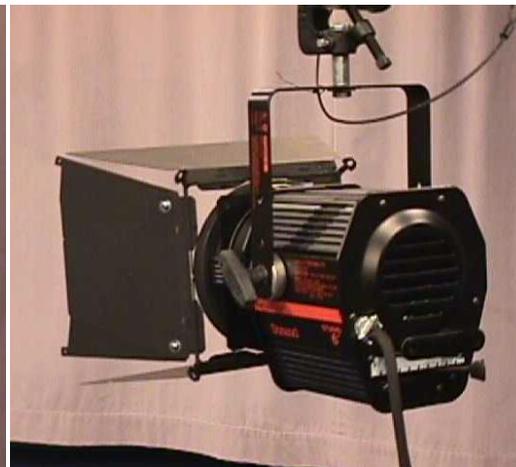
• Flood light



Mini Flood light



• Scoop light



Spot light

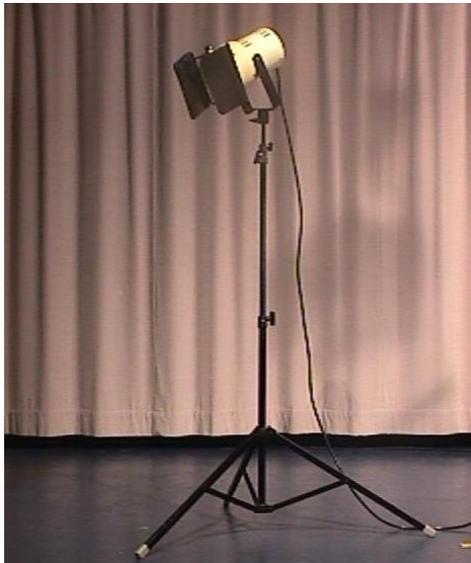
The Mini Flood lights and most of the Spotlights have power switches that are usually left in the On position.

The Spotlights also have a focus control located on the side or back of the unit.



• Spot light focus control dial or lever

Additional lighting is available with portable lights. In some cases, the portable lights are easier to manipulate than the grid lights and thus can be used more creatively. Care must be taken in choosing appropriate electrical outlets to power the lights.



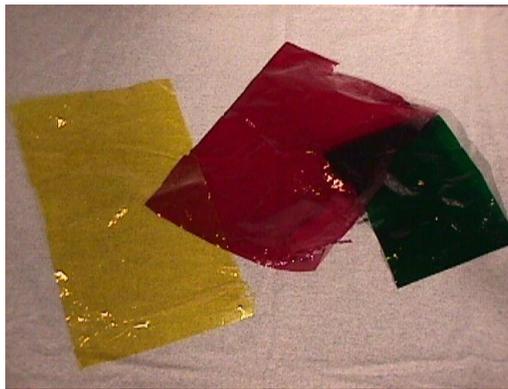
• Portable light

Scrim or diffusion material may be used to reduce or soften the intensity of a light. Scrim is a screen that mounts on the face of the light, behind the barn doors. Sheets of diffusion material can be clipped to the barn doors with clothespins or binder clips.



• Portable lights with diffusion

Gels can be used to alter the color of a light and create lighting effects. They too, may be clipped to the barn doors.



• Gels

Dimmer Board

Any light may be dimmed (faded up or down) by using the dimmer board. The dimmer board is divided into four sections: a row of 'X' faders, a row of 'Y' faders, the 'X' and 'Y' master faders, and the 'Grand Master' fader.



• Dimmer Board

X faders - with the Grand Master fader up, the X master fader up and the Y master fader down, you can then fade up any light being used by pushing up the fader in the X row for the circuit the light is connected to.

Y faders – operate the same as the X faders. The X and Y rows allow you to divide the lights being used into two groups that can be faded independently of each other.

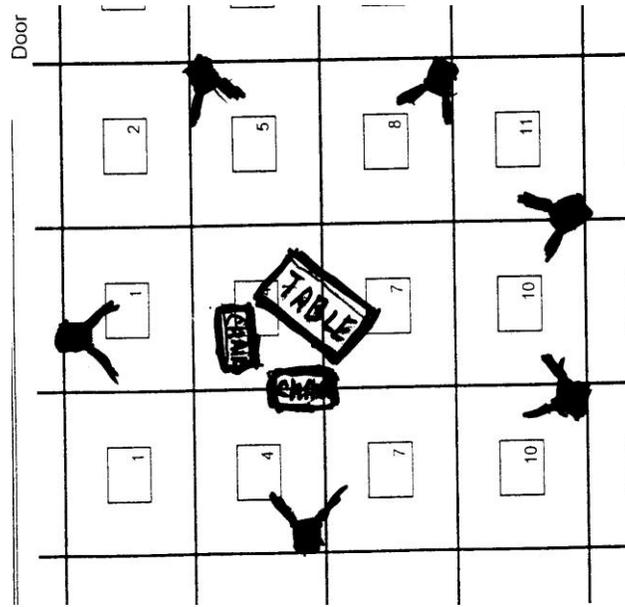
X master - will fade up or fade down all of the lights being used in the X row.

Y master - will fade up or fade down all of the lights being used in the Y row.

Grand Master - will fade up or down all of the lights being used.

Set-Up

- 1) First, figure out how many lights you need and where you will need them. Plotting your set with lights on a grid sheet can help.



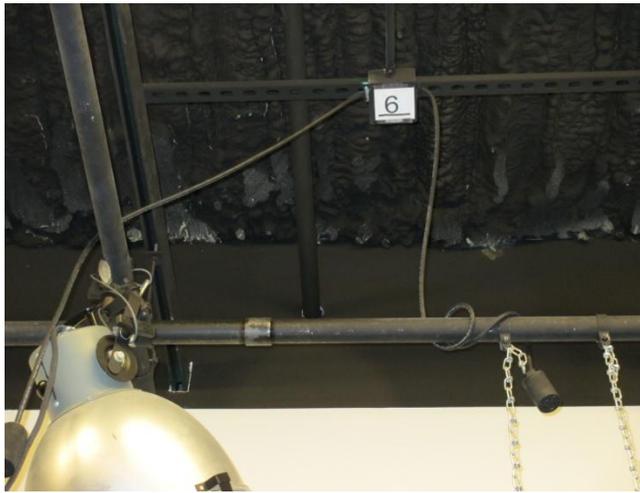
• Lighting Grid

- 2) Next, check to see if there are already lights in the positions you need, otherwise you will need to move them from elsewhere on the grid.
- 3) Before moving any lights, first make sure all the dimmers are powered down on the dimmer board in the control room.
- 4) Move lights into positions where you need them. This requires the loosening of the C-mount which holds the light on the grid and refastening it in its new location. Also remember to reattach the safety chain. Do Not Remove any lights from the grid and leave them on the floor, just move them to another spot on the grid if they are in the way.



• C-mount

- 5) Check to see which receptacle box each light is plugged in to. Each receptacle box is numbered according to the circuit it is connected to and there are two boxes for each circuit. For safety's sake, no more than two lights may be plugged in to one circuit.



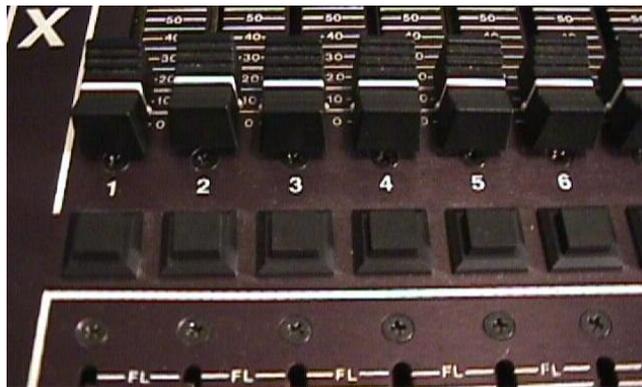
• Receptacle Box

- 6) Next, go into the control room and check that the dimmer board is on. (There is a green power on light near the upper left corner.)
- 7) Make sure the Grand Master fader is up, the X fader is up, and the Y fader is down. Then push up the fader with the same number as the receptacle box the light is plugged in to.

Note: It does not matter if you push up the fader in the X row or the Y row – you will get the same results.

- 8) You can also check the light with the ‘Instant On’ button, located just below each fader. This button will turn the light on without the fader being up but only for as long as you press the button.

Note: The Instant On is for testing purposes and not for use during a production.



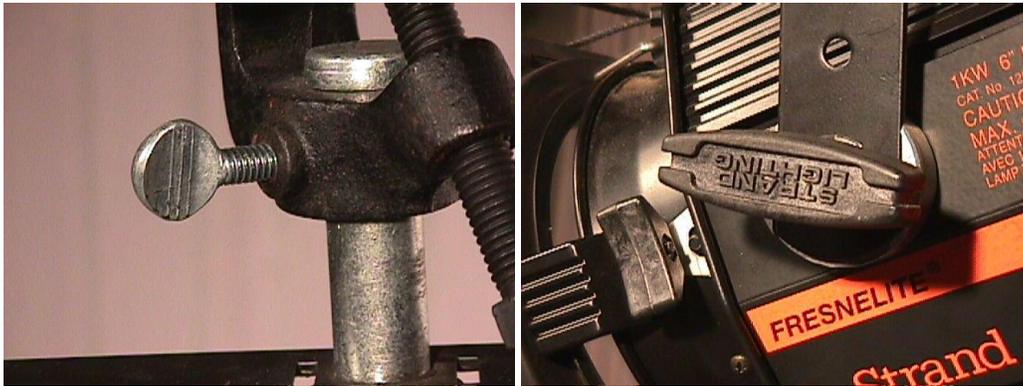
• Dimmer board Instant On buttons

- 9) Go back to the light you turned on and adjust the light until it is pointing in the direction you need. The heads of the lighting instruments may be moved left and right, up and down.

Note: Always wear gloves when making adjustments to a light that is on or was just turned off, as the instruments can become extremely hot.

To pan the light right or left, loosen the pan lock.

To tilt the head up or down, the tilt lock lever must be loosened and then re-tightened.



• Studio light pan lock

Studio light tilt lock

- 10)** For spotlights, adjust the focus control to make the light into as small a spot as it can be. This will allow you to be sure the light is aimed at the area you want it to light.
- 11)** Then adjust the intensity of light using the focus control. In the "spot" position, the light is more intense, has a sharper edge, and a narrower spill. Turn the focus control to flood the light out to cover the area needed.
- 12)** If necessary, adjust the barn doors on the face of the light to control the area of the light spill.
- 13)** Go back to the dimmer board and dim the light you were adjusting and then repeat these steps for each light you want to use.
- 14)** After adjusting all of the lights you want to use, turn them all on and check for shadows, dark areas or other distractions and make additional lighting adjustments as necessary.
- 15)** When you are satisfied with your lighting, fade the Grand Master down to dim all of the lights until you are ready to begin taping.

Note: The house light switches are located on the wall to the right when you first walk in to the studio and are typically turned off during a production.

Camera

Equipment



• Studio Camera

There are three (3) identical studio cameras available for any studio production. The cameras are composed of three main parts: the camera, the tripod, and the intercom.

Camera



• Studio camera

Because the cameras were designed to be used in a variety of situations, there are many more options, buttons, switches, etc. than you will need while using them in the studio. On the camera itself, there are only three (3) parts you need to deal with:

Lens Cap – remove when you're using the camera (if you want to see what you're pointing the camera at) and replace when done.



• Camera back

VTR Button (Video Tape Recorder) – push in to see in your viewfinder what the director has selected on the switcher’s Program bus (by the zoom control on the right handle).

Call Button – press to signal the control room when you can’t talk.

Intercom Switch – push up to the “on” position to turn on your headset mic. Push down to the “off” position to turn the mic off.

Intercom Level Dial - to adjust the level of what you hear through the headset.



• Viewfinder

Viewfinder – where you’ll see your camera’s images. It has several controls:

Angle Adjustment Knob – allows you to tilt the viewfinder up or down.

Brightness Dial – to adjust the brightness of the image in the viewfinder.

Contrast Dial – to adjust the contrast of the image in the viewfinder.

Note: The brightness and contrast controls will not affect the image being recorded.

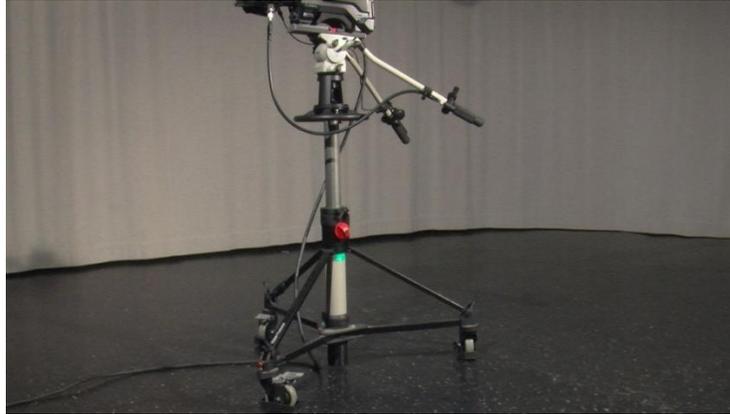
Prompter



• Camera 2 with Prompter

The Prompter is attached to camera two (2) and allows a person to look directly at the camera while reading from a script. The script can be typed into the Prompter software on the laptop computer located in the control room. The software also accepts documents written in Microsoft Word. When the software is activated, the script will appear in front of the camera lens, scrolling from bottom to top, allowing the person in front of camera two (2) to see and read the script while looking directly at the camera. The speed of the scroll can be adjusted while it is running.

Tripod



• Tripod and dolly



• Pan and tilt locks



• Pedestal locks



Wheel lock



• Focus and Zoom Controls

Tilt lock – when loose will allow you to tilt the camera up or down.

Pan lock – when loose will allow you to pan the camera right or left.

Pedestal lock – allows you to adjust the height of the camera.

Wheel lock(s) – allow you to lock the wheels to prevent the camera from moving.
 Make sure the wheels are unlocked and properly aligned and you have enough free cable if you will need to move.

Note: To avoid tripping over the camera cable when doing movements, swing the cable over your shoulder on the side you will be moving towards.



• Camera zoom and focus controls

Zoom control – By pressing this switch toward the tripod handle (left) you will zoom out and get a wide angle shot, pressing away from the tripod handle (right) you will zoom in to a telephoto shot. This switch is pressure sensitive – the harder

you press it, the faster the zoom. There is also a maximum speed (sp) adjustment dial just above the zoom switch.

Focus control – by turning this handle you can adjust the focus.

Set -Up

- 1) Take off the lens cap.
- 2) If an image does not appear in your viewfinder, check to see:
 - If the camera is "zoomed" in on a blank background.
 - If the image controls on the viewfinder are properly adjusted.
- 3) Loosen the Angle Adjustment Knob on the viewfinder and adjust it to an angle so you can comfortably see your camera shots.
- 4) Adjust the tripod arms by loosening the arm locks, rotating the arms to the desired position, and re-tightening the arm locks.



• Camera arm lock

- 5) Reposition the zoom and focus controls by loosening the control mount locks, rotating the controls around the tripod arms into the desired position.



• Control mount locks

- 6) Unlock the wheel locks (if necessary) and move the camera to the position where you expect to use it.
- 7) If necessary, loosen the pedestal lock and adjust the camera height.
- 8) Loosen the pan and tilt locks so you can freely pan and tilt the camera.

Note: Never leave your camera without first tightening the tilt lock.

- 9) Put on the headset, turn on the intercom mic, and begin practicing camera shots with the director.

Note: Always turn off the mic before removing the headset.

Audio

Equipment – In The Studio

Microphones

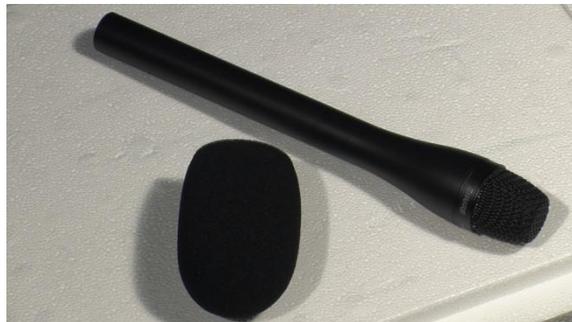
Because the studio is considered to be acoustically “live” (lots of echo), there are primarily three (3) types of microphones that are suitable for studio use:



• Cardioid Mics.



Shotgun Mics



Omni Mic



Lavalier Mic

Cardioid - useful for recording interviews and musical instruments. Generally, these mics are set up "on camera." Some cardioids have on/off switches.

Shotgun - useful anytime you wish the mic to be "off camera." These mics require one AA battery.

Lavalier (Lav) - good for news or talk show - type productions. In the studio, lavaliers don't require batteries. Some have on/off switches.

Microphone Stands

Mic Stands are used to position the cardioid or shotgun mics on or off the set.



• Tabletop Stand



Floor Stand



Boom Stand

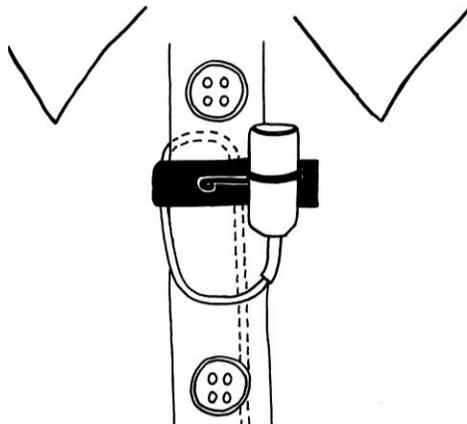
Tabletop stands – can be used to position mics “on camera” on a table or desk.

Floor stands - can also be used to position mics “on camera”.

Boom stands - can be used to position mics “off camera”, hanging overhead.

When using Lavaliers, the mics will be clipped to each person appearing on the program and there are several tips for attaching these mics to people:

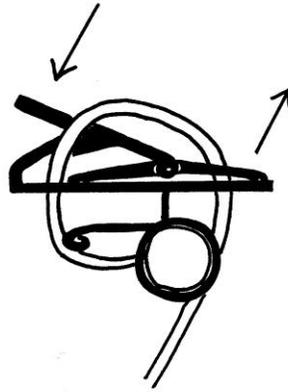
- **Clip 'em.** Make sure the clip is fastened to the clothing well enough to avoid moving or falling off during the production. When clipping a mic on a lapel or suit coat, place the mic on the side toward which the talent will be speaking most of the time.



• Hiding the Lavalier wire

- **Hide the wire.** When clipping lavs on button-down shirts and blouses, jerseys, sweaters, and T-shirts, run the mic wire up underneath the clothing. (Actually, have the talent do this herself unless you happen to be very good friends with her.) The mic should emerge from between the 2nd and 3rd buttons on a shirt or

blouse or from the collar on other types of tops. You can also hide the wire behind the talent's tie or sports coat.



• Looping the wire, top view

- **Loop the wire.** This helps to keep the wire hidden, even when the talent moves around a lot in his chair. Simply press the clip open, pull the wire into the clip, and pull the wire taut (see illustration).
- **Most Important.** Be sure that the microphone is pointing towards the talent's mouth, not tilting away from it. Also, a lavalier usually sounds best when placed about a fist's length below the talent's chin.

Connections

Non-Wireless microphone you use will need to be connected to the audio mixing board in the control room. You will do this by using mic cables and the junction boxes.



• Mic Cable



Junction Box (A)

Mic Cable - connects the audio signal from a microphone to the junction box. On each end of a mic cable, there is a three (3)-pin XLR connector (plug or jack). XLR connectors are "keyed" connectors, which means that they fit together in only one way. Do not twist the connectors in an attempt to fit the plug's pins into the jack's holes. This action may cause the pins to bend or break. Instead, examine the connectors carefully, and then plug them together. If they do not lock together at first, do not force the connection. Pull the connectors apart, reexamine the pin configuration, and try again.

Junction Box - connects your microphones to the control room mixing board. Each junction box has fourteen (14) microphone (mic) input jacks. One (A) is located on the far wall of the studio, and the other (B) is located to the left of the control room window.

Studio Speakers

There speakers in the studio that can be used to allow people on a program to hear some of the audio for the program (like the theme music at the beginning or end of a show, or the caller from the phone line). Any audio signal can be sent to the studio speakers and it will not effect how those signals get recorded - just whether or not the people in the studio can hear them.

Note: Don't send the signal from microphones being used in the studio out to the studio speaker because you'll get feedback - a loud, annoying, high-pitched whine.



• Studio speakers

Equipment – In the Control Room

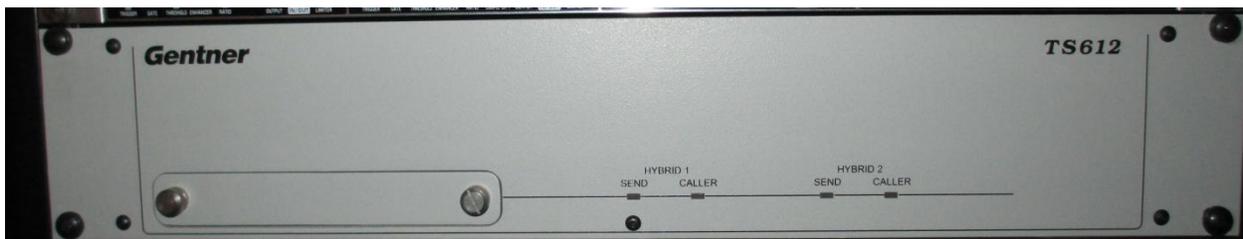
Audio Sources

In addition to the microphones used in the studio, there are several sources of audio available in the control room, including two (2) CD players, eight (8) wireless microphones and a telephone for call-in programs.



• Audio Rack

Telephone Interface - connects audio from the studio telephone lines to the mixing board thru Channel #19 (phone).



• Telephone Interface



• Studio telephone

Studio Telephone – used to answer calls to the studio phone lines and to select which line to put into your program. While it can accept twelve (12) phone lines, we only have two in the studio and on the phone they connect to line #1 and line #2. It operates like any phone though it does have some additional features and buttons, many of which are not used at this time.

MODE – used for technical set-up by staff.

AUX – not used.

FLSH – not used.

REC – not used.

SCRN – not used.

MUTE – will mute the on-air call. You can un-mute the call by pressing the MUTE button again.

CONF – turns conference mode on and off. In conference mode, you can have both phone lines on-air at the same time.

VIP – not used.

HOLD – places a line on hold. If you press HOLD while the handset is in its cradle, the on-air call will be placed on hold.

OFF – disconnects on-air calls. To disconnect calls from the handset that are not on-air, simply put the handset back in its cradle.

AIR – transfers a call to air. The next call to be transferred to air will cause the first to be disconnected, unless you are in conference mode.

NEXT – will select the line that has been on hold the longest. You can then place that line on-air (AIR) or disconnect it (OFF).

Compressor / Limiters – connected to mixer Channels #1 through #8, allow you to make adjustments to the signals from those channels and are often used with

musical instruments. There are three sections: the expander/gate, the compressor, and the peak limiter. The purpose of using an expander is to improve the separation between low-level signals and unavoidable noise by reducing the noise level. The gate works basically the same way, the major difference being that it reduces gain to a greater extent. Once the level drops below the threshold, the signal is muted. The purpose of the compressor is to adjust signal levels, to even out the loud and quiet parts, lowering the level if it gets too loud and raising it if it gets too quiet. The limiter is used to limit a signal to an adjustable level.



• Compressor / Limiters

Expander / Gate Section

TRIGGER – used to set a level or threshold below which expansion sets in and signals are reduced in gain. If the signal is below the level or threshold, the red LED (below the down arrow) lights up. If the signal is above the threshold, the green LED (up arrow) lights up.

RELEASE – used to select a short (switch out/light off) or long (switch in/light on) release time. The long release time is the best choice for slowly decaying or heavily reverberated signals.

GATE – used to toggle between the expander function (switch out/light off) and the gate function (switch in/light on). The gate function mutes signals below the threshold.

Compressor Section

THRESHOLD – used to adjust the compressor threshold.

CONTOUR LOW – activates (switch in/light on) a high-pass filter to avoid effects caused by high-energy bass frequencies.

ENHANCER – activates (switch in/light on) the dynamic enhancer which enhances the treble range.

RATIO – used to determine the ratio of input vs. output level with regard to all signals exceeding the threshold level by more than 10db.

INTERACT KNEE – used to change from a “hard knee” (switch out/light off) to a “soft knee” (switch in/light on) compression for signals exceeding threshold by up to 10db. This should be used when a subtle, inaudible musical compression is desired.

OUTPUT – used to raise or lower the output signal to make up for a gain loss by the compressor or limiter. The GAIN REDUCTION display reads the value adjusted.

I/O METER – selects whether the INPUT/OUTPUT LEVEL LEDs display the input signal (switch in/light on) or output signal (switch out/light off).

IN / OUT – activates (switch in/light on) the compressor/limiter and can be used for a comparison between the signal being unprocessed and being compressed/limited.

Peak Limiter Section

LIMITER – used to limit the signal to an adjustable level. The LIMIT LED lights up when the limiter is on.

Compact Disk (CD) Players – used to playback CDs. They are connected to the Audio Board thru Channels #9 and #10.



• CD Players

Wireless Mic Receivers - are used to receive the signals from the wireless mics. They are connected to the Audio Board thru Channels #11 to #18.

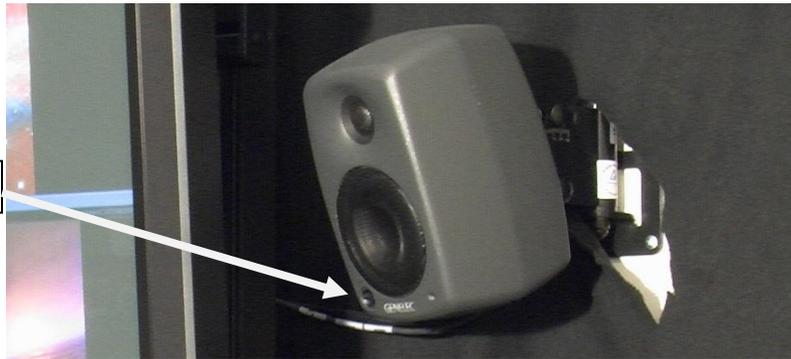


• Wireless Mic Receivers

Control Room Speakers

The audio being recorded for your program can be heard through the control room speakers. The speaker volume is controlled by the dial located on the bottom left side of each speaker. The Volume one (1) knob controls the left speaker and the Volume two (2) knob controls the right speaker.

Volume Dial



• Control Room Speakers

Audio Mixing Board

The Audio Mixing Board (Mixer) is composed of twenty-four (24) Input channels, four Submix channels, and the Main Mix (Left/Right) channel. Because the mixer was designed for a variety of uses, there are many buttons and dials you will never need to operate.



• Audio Mixer

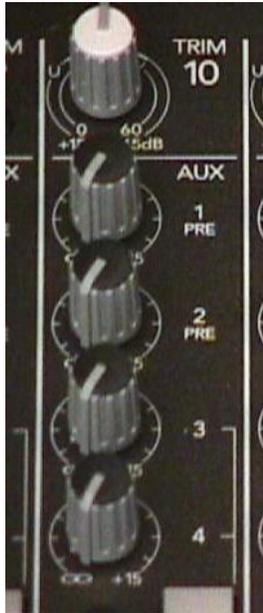
Input Channels

Each Input channel has the channel number at the top and bottom and there is an additional label if the channel that has been set to be used by audio sources other than the microphones in the studio. The standard set-up of the audio board is:

Channels 1 thru 8 - Microphones

Channel 9 & 10 - CD Players

Channel 11 thru 18 – Wireless Microphones
Channel 19 – Telephone Interface



Trim – is used to adjust the level of audio coming into a channel.

Aux 1 Pre – is used for sending audio from a channel to the studio speaker. The level of the audio sent to the studio speaker is based solely on the Aux one (1) dial and is independent of the fader level for that channel.

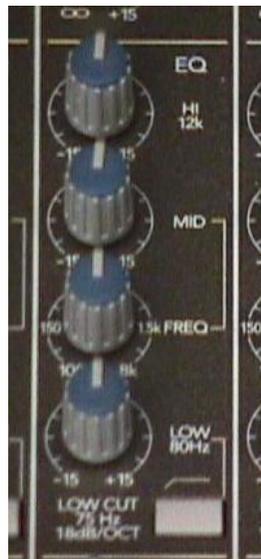
Aux 2 Pre – not used.

Aux 3 – is used to send audio from a channel to the studio speaker. The level of the audio sent to the studio speaker is based on the Aux 1 dial and the fader level for that channel.

Aux 4 – not used.

Pre – not used.

Aux 5 Post – not used.



Aux 6 Post – not used.

EQ Hi 12k – is used to add or reduce to sounds with high frequencies (cymbals). It can also help reduce hiss.

MD – is used with the FREQ knob and sets how much is added or reduced.

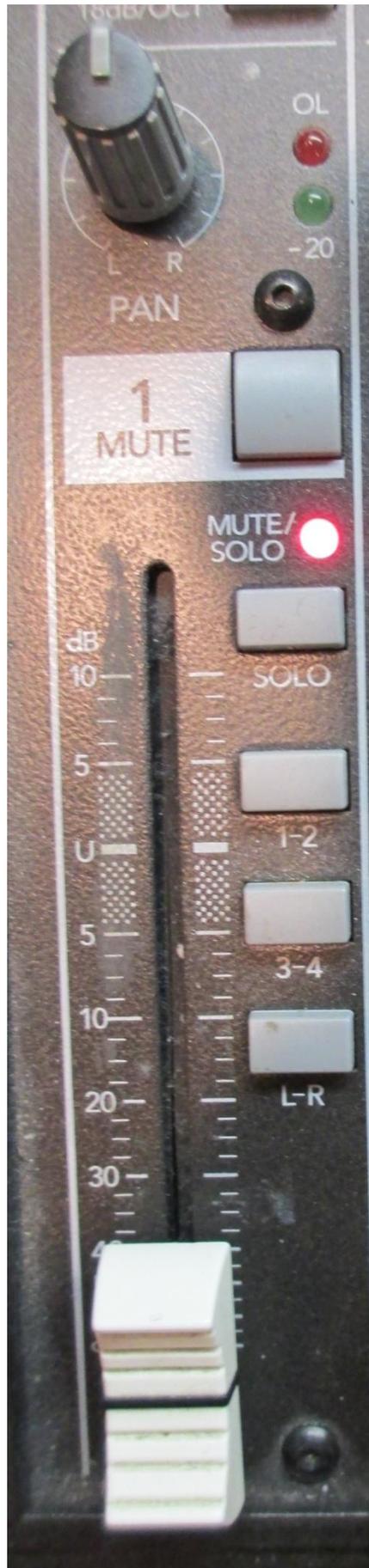
FREQ – is used with the MD knob to set the frequency being added to or reduced.

LOW 80hz – is used to add or reduce to sounds with low

frequencies (bass guitar).

LOW CUT 75Hz 18db/OCT – this switch helps prevent “muddy” mixes and should be on (pressed down) for all of the channels that receive microphone signals from the studio.

Note: The EQ knobs have no effect when set to the 12 o'clock position.



OL (red) light – lights up when the signal is too “hot”, a good indication that you need to lower the level for that channel.

-20 (green) light – also know as a “signal present” indicator, it confirms an adequate signal level.

PAN – adjusts the amount of the signal sent to the left or the right channel of the Main Mix.

MUTE – mutes the signal from the channel. When a channel is muted, the MUTE/SOLO light will be on solid.

MUTE/SOLO light – on steady when the channel is muted, flashes when SOLO is engaged.

SOLO – will isolate the channel from the rest of the board, send that channels signal to the LED Meters and the SOLO speaker.

1-2 – sends the channel signal to submix Channels one (1) and two (2).

3-4 – sends the channel signal to submix Channels three (3) and four (4).

L-R – sends the channel signal to the MAIN MIX.

Fader – controls the level for the channel. If the TRIM is set correctly, the fader will be somewhere between -20db and 0db (U). If the fader has to be pushed all the way up (10db), that’s a sign that the TRIM is set too low. If the fader is all the way down or below -20db , the TRIM is too high.

Submix Channels



AIR – will boost the 16kHz frequencies for the submix channel.

SOLO – will isolate the submix channel from the rest of the board, send that channels signal to the LED Meters and the SOLO speaker.

PAN – adjusts the amount of the signal sent to the left or the right channel of the Main Mix.

L/R ASSIGN – sends the submix channel signal to the MAIN MIX.

Fader – controls the level for the submix channel.

Main Mix Channel



TAPES RETURN TO PHONES/C-R – not used. Be sure this button is not pressed down or your main mix signal will not be sent to the Tricaster.

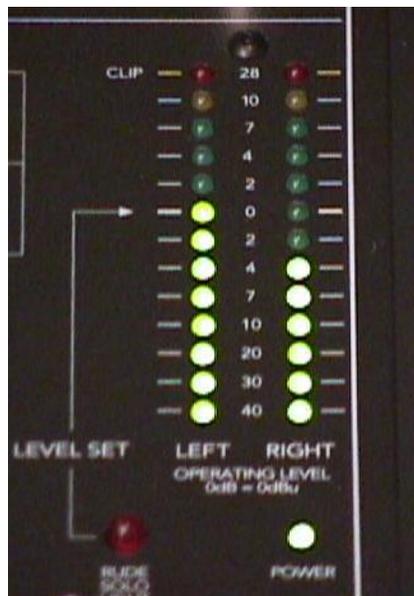
PHONES/C-R LEVEL – adjusts the volume level for the headphones connected to the mixing board.

TAPES RETURN TO MAIN MIX – not used. Be sure this button is not pressed down or your main mix signal will not be sent to the Tricaster.

MAIN MIX Fader – controls the level of the signals being sent to the Tricaster. Typically, this is set to unity, “U”, and left alone.

Meters

The mixer’s metering system is made up of two rows of LEDs ranging from -40dB to $+28\text{dBu}$ and will show the level for the main mix signal. However, when a SOLO button is on for any channel, the meters will show the level for that channel and the RUDE SOLO LIGHT will blink. Ideally for voices the LEDs should on average reach near zero (0). It’s okay if they go above zero (0), just as long as they’re not constantly going into the yellow or red section.



• Meters

Talkback

There is a microphone connected to the audio mixer that can be used to speak to anyone in the studio. The AUX one-two (1-2) button will turn the mic on and send it's signal out to the studio speaker and the LEVEL dial will adjust the level for the mic. The MAIN MIX button will send the talkback mic's signal into the main mix.



• Talkback controls

Set-Up

Let's go over how you would set up the audio equipment and the mixing board for some common situations.

Microphones

- 1) Decide how many and which kind of mics you want to use and request them from the staff person on duty.
- 2) Make sure you get enough mic cables for each mic and any mic stands you may need.
- 3) Position the mics on the set where they will be used.
- 4) When necessary, turn on each mic, insert batteries, etc.
- 5) Connect each mic to a mic cable.
- 6) Connect each mic cable to a microphone input on the nearest junction box. When doing this, you should always try to hook up the mics in order from left to right when facing the set. In other words, the left most mic on the set gets hooked to Input #1, the next mic to Input #2, and so on. This will make it easier for the person operating the mixing board to look at a cover shot of the set and match up input channels with people.
- 7) Inform the person that will operate the mixing board where the mics are connected and be ready to talk into each mic for testing.

CD Players

The CD Players operate very simply and require little to be done in the way of set-up.

- 1) Insert the CD into the player.
- 2) Search through the CD to find the track you want to use and pause or cue the CD.
- 3) After getting the appropriate channel set-up on the mixing board, play the CD to test the levels.
- 4) Re-cue the CD so that it will be ready to play during your production.

Telephone

The telephone itself requires no set-up but you will need to set-up the input channel for the phone on the audio board just like you do for microphones which is described in the next section. You will also want to send the signal from the phone input channel to the studio speaker and this is described in the Studio Speaker section.

There are some things you should know about using the phone, which has two (2) lines. These lines are linked so if someone calls line one (1) when it is busy, the call will roll over to line two (2) and vice versa. Therefore, we generally just give out 734-794-6155 to audience. Also, the phone does not ring, at least not audibly, when a call comes in the line button will flash until you answer it.

Mixer Input Channels

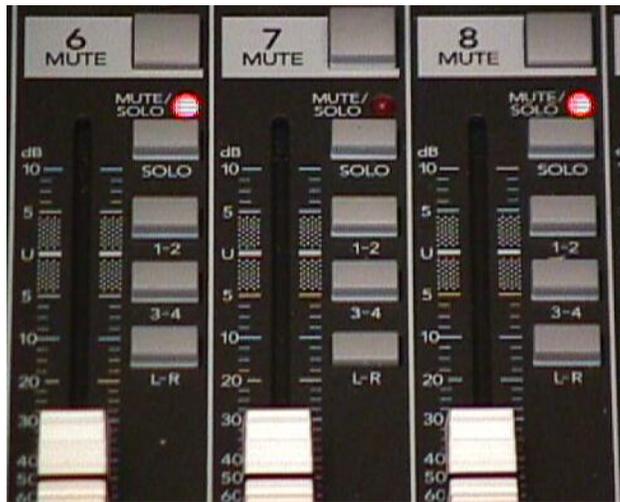
The set-up of the input channels is the same regardless of the source (mic, CD, etc.).

- 1) Set the MAIN MIX fader to U (unity), the shaded area between the fives (5's). This will rarely need adjusting.
- 2) First activate the channel by pressing the MUTE button to un-mute the channel. The MUTE/SOLO light will go off.



• Input Channel 7, un-muted

- 3) Next, choose how to send the signal to the MAIN MIX channel. Most often you'll just send it directly by pressing the ASSIGN button marked L-R. The other ASSIGN buttons are used for submixing and we'll go over those later.



• Channel 7 Assign button L-R pressed in

- 4) Then by sliding up the FADER you can raise the signal to an appropriate level. The Fader actually controls the level of the signal being sent to the MAIN MIX channel.



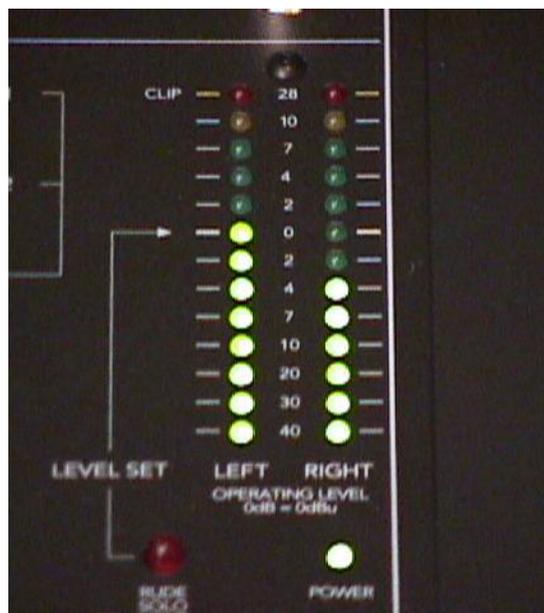
• Channel 7 Fader raised

- 5) Another way to adjust the signal level is by using the TRIM knob to adjust the level of the signal coming into the channel. If the signal is too strong, the OL light will come on and you can use the TRIM knob to reduce it.



- Channel 7 Trim knob set to 12 o'clock position

- 6) To determine if you have a good level, look at the LED meters at the far right labeled Left and Right. These will be registering the level of the audio for the MAIN MIX or total program. Always check the meters.



- LED Meters

Studio Speakers

- 1) For each channel you want sent to the studio speakers, turn the AUX 3 knob clockwise, at least to the twelve o'clock position.
- 2) Play the audio source for that channel and raise it's fader to a good level.
- 3) Go out to the studio and decide if the level of audio from the studio speakers is acceptable. If not, go back and adjust the AUX three (3) knob.
- 4) One last thing to note, there is a master AUX three (3) knob that is located in the top right area above the submix one (1) channel. If this is not turned up (at least to the twelve o'clock position) no sound will be heard from the studio speaker.



• Aux Knobs

Submixing

The Submix channels allow you to control several input channels with one fader. This comes in handy when you need to fade up the signals from several channels at the same time. A good example is when there are several microphones that need to be faded in at the beginning of a show. Instead of trying to slide up multiple faders at the same time, submixing would allow you to fade in all the microphones at once by sliding up one fader.

- 1) To submix several sources (like microphones), first activate each channel as was explained earlier.
- 2) Instead of selecting the L-R button, choose one of the ASSIGN buttons marked one-two (1-2) or three-four (3-4) depending on which submix channel you want to use. You should choose the same ASSIGN button for all of your microphones if you wish to be able to control them all together.
- 3) Then raise up the faders for each microphone to a good recording level and, if you've done everything correctly, you should not hear anything.
- 4) Next, push down the L/R Assign button located just above the submix fader for the submix channel you want to use.

- 5) Then slide up the submix fader to Unity (U) and you should be able to hear all of your microphones. If you want to raise or lower all of the microphones, you can do this with the submix fader, however you can still adjust the level for individual microphones by adjusting the fader for each microphone.



• Submix Channels

Equalizer

Each input channel on the mixer has Equalizer (blue) knobs that allows you to make tonal adjustments that sometimes make the signal sound “clearer”. They are often used during live, call-in productions to make the callers' voice easier to understand.



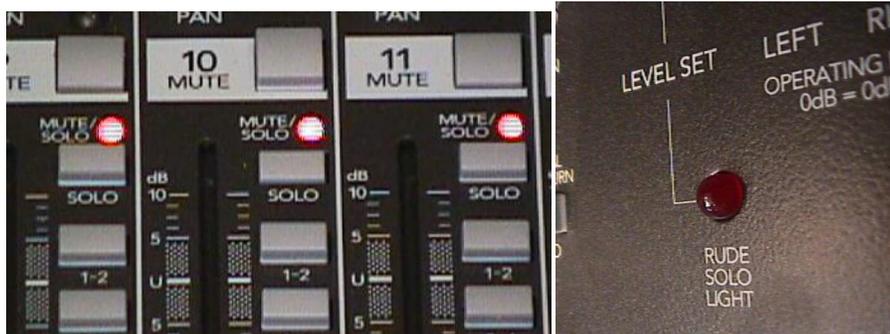
• Equalizer Knobs

- 1) For each channel you want “tweak” with the equalizers, begin by playing the audio source for that channel and raise it’s fader to a good recording level.
- 2) Then adjust the equalizer knobs, one at a time, while listening to the audio as you turn the knob.

- 3) When the audio has been “tweaked” in a manner that satisfies you, stop playing that audio source and move on to the next channel you want to adjust.

Solo/Preview

- 1) Press in the **SOLO** button for the channel you wish to preview. A red MUTE/SOLO light should come on and flash. Over to the right, you will also see the **RUDE SOLO LIGHT** flashing. This is a reminder that the meters will now display the level for the channel(s) where you’ve engaged the SOLO button.



- Channel 10 Solo button pressed in Rude Solo Light.

- 2) Push up the fader for the channel you are trying to preview.
- 3) Then turn up the audio monitor or headphones and you should hear the sound coming from the channel you've chosen to preview.

Technical Directing

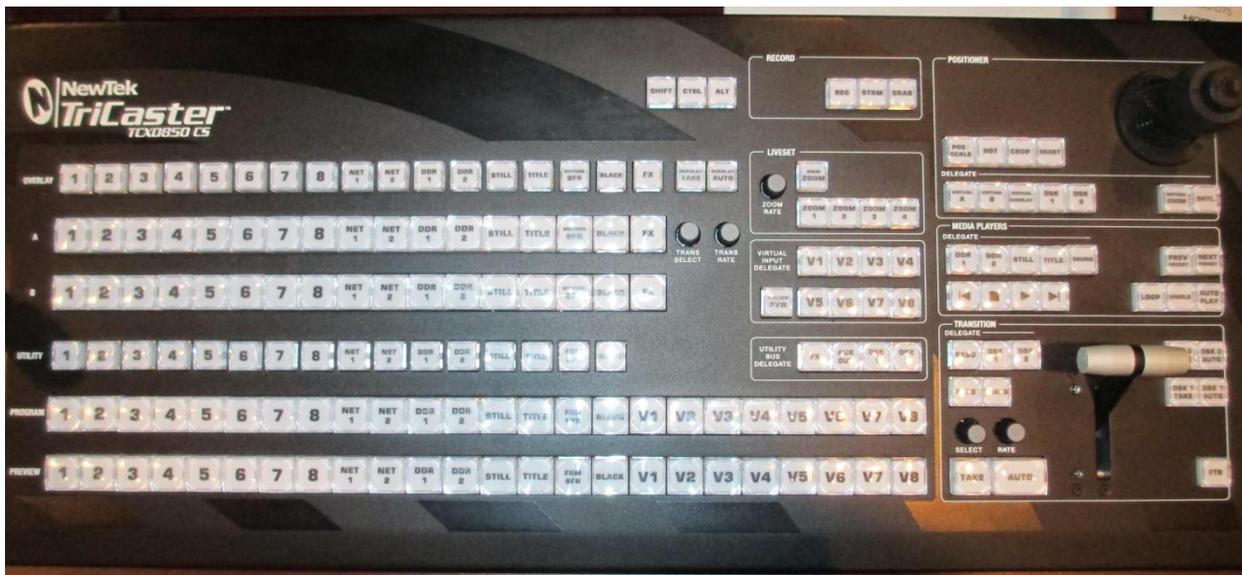
The Technical Director (TD) operates the Tricaster, bringing up the visual sources in the manner requested by the Director (dissolve, fade, wipe, etc.). He/she also supervises control room clean-up ("strike") at the end of the production. At CTN, the Director is often also the TD.

Equipment

Video Switcher (Tricaster)

The Video Switcher controls all of the visual elements of your program and will allow you to manipulate video images in the following manner:

- Fade in from black or out to black
- Replace one image with another (Cut, Wipe or Mix)
- Combine one image with another (Mix, Wipe or Key)
- Dissolve from one image to another (Mix)
- Superimpose graphics (keys) over a camera or video images (Key)



• The Switcher

The Switcher is divided into several groups of controls, based on the jobs they perform.

Live Desktop



Monitoring

- **All Monitors** - all live inputs and internal sources (such as DDRs, etc.)
- **External Monitors** - Camera monitors
- **Internal Monitors** - Media Players and Network sources
- **Scopes** - source monitor along with Waveform and Vectorscope
- Look Ahead Preview and Program output monitors

Live Control

- **Switcher rows** - Utility, Program and Preview, with Delegate buttons
- **Transition controls** - Delegate buttons, T-bar, video layer configuration and control

Tabbed Modules

- External Audio
- Virtual Inputs
- Audio Mixers
- Media Players & Titles
- Sound
- DDR1 & DDR2

Primary Buses

The Primary Buses consist of two (2) identical rows of pushbuttons, each representing a specific video source. These two (2) busses are parallel - the same button in each row selects Camera One, the same button in each row selects Title, etc. When you press in one of the buttons in any row it will light up and stay lit until you press another button in the same row.

Busses



• Live Desktop busses

PREVIEW Bus - selects the video to be recorded after the next transition.

PROGRAM Bus - selects the video and media to be recorded.

UTILITY (formerly Effects)- A source currently assigned to a utility delegate.

1 – selects the video from camera one.

2 – selects the video from camera two.

3 – selects the video from camera three.

4-8 – not used.

Net 1 & 2 – outside sources (PowerPoint or graphics)

DDR 1 & 2 – video sources

Still – images

Title – graphics

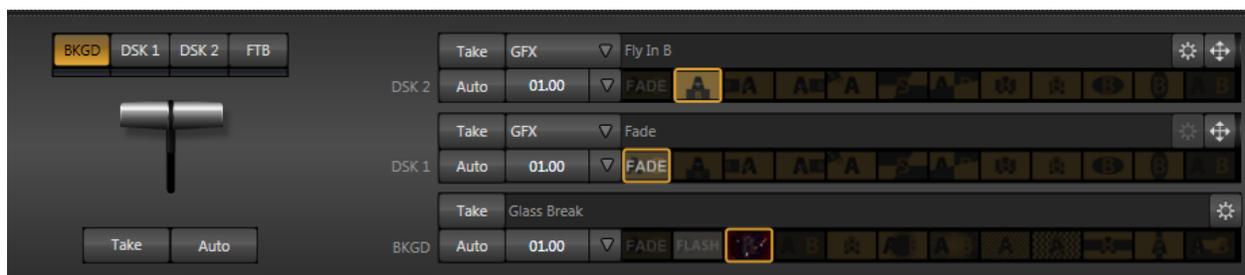
FRM BFR (FRAME BUFFER)? – not used

Black – black slate

V1-V8 – virtual sets

Transition Controls

The Transition Controls perform a variety of transitions between the Program bus and Preview bus; from mixes to wipes.



- Transition Controls (live desktop)

SELECT – cycles through twelve (12) different transition styles which are indicated in the display. Note: Gear icon allows you to select more transition types.

- Take 1 - fade
- Take 2 - flash
- Take 3 - clouds
- Take 4 - noise
- Take 5 - circle
- Take 6 - twirl
- Take 7 - streaks
- Take 8 - diamonds
- Take 9 - checkerboard

- Take 10 - edge split (horizontal)
- Take 11 - edge split (vertical)
- Take 12 - sleep

RATE – displays the Auto rate in seconds and frames. Use the knob or the mouse to adjust the rate.

FTB – Transition used at beginning and end of show. Fades audio and video.

DSK 1 & DSK 2 – Allows you to set up transitions for delegated overlays.

TAKE – Cut transition

AUTO – Mix transition

DSK

The DownStream Keyer section is used to fade utilities delegates in and out.



• Downstream Keyer Section

DSK 1 TAKE – cuts in and out DSK 1

DSK 1 AUTO – fades in and out DSK 1

DSK 2 TAKE – cuts in and out DSK 2

DSK 2 AUTO – fades in and out DSK 1

FTB – fades everything to black

NOTE: DSK's can be set in Utility row & Utility Bus Delegates.

Media Player

The Media Player plays any video or graphic sources.



• Media Player controls

DDR 1 – controls playback for a video source from DDR 1

DDR 2 – controls playback for a video source from DDR 2

STILL – controls playback from a picture source

TITLE – controls playback from a graphic source

SOUND – controls playback from a sound source

◀ (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.)

LOOP- sets the current playback source to play in a continuous loop

SINGLE- playback automatically stops after the end of the current clip

AUTO PLAY- plays automatically when you select the source.

Positioner

The *Positioner* section allows you to adjust position attributes for different overlays or virtual sets and video layers using the *Joystick*.

The *DELEGATE* group includes seven buttons. In some cases, the scope of application for a *DELEGATE* selection is further modified by button selections in other sections of the control surface.



• Positioner controls

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.

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 4 edges, maintaining the original aspect ratio. Twist the *joystick* counter-clockwise to reduce cropping of delegated sources on all 4 edges. Move the *joystick* horizontally to crop only the left edge of delegated sources. Move the *joystick* horizontally with the *joystick button* pressed to crop only the right edge of delegated sources. Move the *joystick* vertically to crop only the top edge of delegated sources. Move the *joystick* vertically with the *joystick button* pressed to crop only the bottom edge of delegated sources.

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*.

Record



- Record controls

REC- Pressing this button enables TriCaster's *Record* feature. As a safety measure, pressing the *REC* button when recording is underway does not stop recording. Instead, the *CTRL* button flashes to remind you that you must hold the *CTRL* button down while pushing *REC* to end recording.

STRM- Push to enable or disable TriCaster's live streaming feature.

GRAB- Push to store a snapshot of Program output using TriCaster's *Grab* feature.

Qualifier Buttons



- Qualifier buttons

The *SHIFT*, *CTRL* and *ALT* buttons provided on the control surface support extended features and future expansion.

LiveSet

LiveSet allows you to achieve the look of a big budget set via overlays of a virtual set against a green screen.



• Liveset controls

ZOOM RATE – The duration of animated zooms is determined by the *ZOOM RATE* setting. Rotate the knob to modify the duration of the effect, or push it to jump to a preset duration (Slow, Medium or Fast).

ANIM (ANIMATE) ZOOM – When *ANIM ZOOM* is enabled, pressing an unselected *zoom preset button* initiates a smooth zoom from the current level to the new level. Preset selection applies directly to all delegated *Virtual Inputs*.

ZOOM 1 thru ZOOM 4 – The buttons labeled *ZOOM 1-4* selects the active *Zoom Preset* for the currently delegated *Virtual Inputs*. The *ANIM ZOOM* button corresponds to the *Animate Zoom* switch in *Virtual Input* tabs on the *Live Desktop*.

Virtual Input Delegates



- Virtual Input Delegate controls

FOLLOW PVW- Enabling the *FOLLOW PVW* button forces the *DELEGATE* selection to track the Switcher's *PVW* row selection. This can be very valuable, as it automatically ensures that adjustments you make to settings will affect the *Virtual Input* that you plan to display next.

V1 THRU V8- which *Virtual Input(s)* are affect by operations.

Utility Bus Delegates



- Utility Bus Delegate controls

FX- The *FX* channel selection provides an auxiliary video stream which can serve in a variety of ways. For example, it could supply the background scene in a *Virtual Input*, or be assigned to an *Overlay* or *DSK* channel.

AUX OUT- Selecting the *AUX OUT* delegate allows direct selection of the *Auxiliary Output* video stream, without requiring you to open *Output Configuration*.

DSK1 & DSK2- Selecting a *DSK* (1 or 2) delegate allows direct selection of the associated *DSK* source.

Overlay

Overlay, Input A & Input B buses



1 thru 8- cameras

NET 1 & NET 2- outside sources

DDR 1 & DDR 2- video sources

STILL- pictures

TITLE- titles

VIRTUAL BFR (VIRTUAL BUFFER)?-

BLACK- black slate

FX- auxiliary video?

TRANS SELECT- Rotate the *TRANS SELECT* knob to cycle the transition bin selection through transitions currently available in the (*Overlay*) *Transition Bin* in the user interface.

TRANS RATE- Rotate the *TRANS RATE* knob to modify the transition duration. Press the knob to cycle through the standard Slow, Medium and Fast presets.

Monitors

The Monitors make up an important part of the equipment associated with the function of mixing the video sources for your program and they consist of:

Program Monitor - shows what video is being recorded and is associated directly with the Program Bus.

Preview Monitor - can show any of the available video sources and effects in advance of the Director selecting them for the program. It is associated with the Preview Bus and/or the Insert Bus.

Camera Monitors - show what each camera is viewing and provide the basis for selection of shots for the Director.

DDR Monitors - show what is playing in each DDR 1 & DDR 2.

Still - pictures

Title - graphics

Net 1 & Net 2 – outside sources



• Control Room Monitors

"On-Air" Monitor - is connected to cable, so you can monitor a "live" show as it is seen in the homes of your viewers.



• On-Air Monitor

Intercom

The Intercom system provides the Director with two-way communications with any or all personnel in the studio (crew, talent, and audience). On the Intercom Main Station, there are several switches that the Director can use to speak or listen to anyone wearing an intercom headset or out in the studio space.



• Intercom Main Station

Volume – adjusts the headset volume.

Headset – activates the headset mic.

Panel Mic – activates the panel mic.

Mic Kill – turns off microphones on any intercom stations.

PA – lets the director speak over the studio speakers.

All Talk – used to talk to everyone on both channels.

Listen – turns on the headset or speaker to listen to anyone on intercom channel 1.

Call – not used.

Talk – turns on the headset or panel mic to talk to anyone on mic for intercom channel 1.

Listen – turns on the headset or speaker to listen to anyone on intercom channel 2.

Call – not used.

Talk – turns on the headset or panel mic to talk to anyone on mic for intercom channel 2.

Volume - adjusts the intercom main station speaker volume.

Performing Transitions

Fade To Black (FTB)

Note that *FTB* (Fade to Black), although not located beside the other delegates as it is in the user interface, is a delegate button – not an action button – and works exactly the same manner as its *Live Desktop* twin. Note that *FTB* has no dedicated transition controls; its fade in/out duration is derived from the *BKGD* transition setting.

Take (Cuts)

The quickest, least obtrusive way of changing from one video source to another is by performing a cut. There are two ways to perform cuts.

Using the TAKE Button

- 1) Select a source in the Program Bus (ex. CAM 1).
- 2) Select the source you want to cut to in the Preview Bus (ex. CAM 2).
- 3) Press the TAKE button. The two busses will immediately swap their selected sources.

Without Using the CUT Button

- 1) Select a source in the Program Bus (ex. CAM 1).
- 2) Press the button in the Program Bus for the source you want to cut to (ex. CAM 2). The source in the Program Bus will immediately change.

Auto

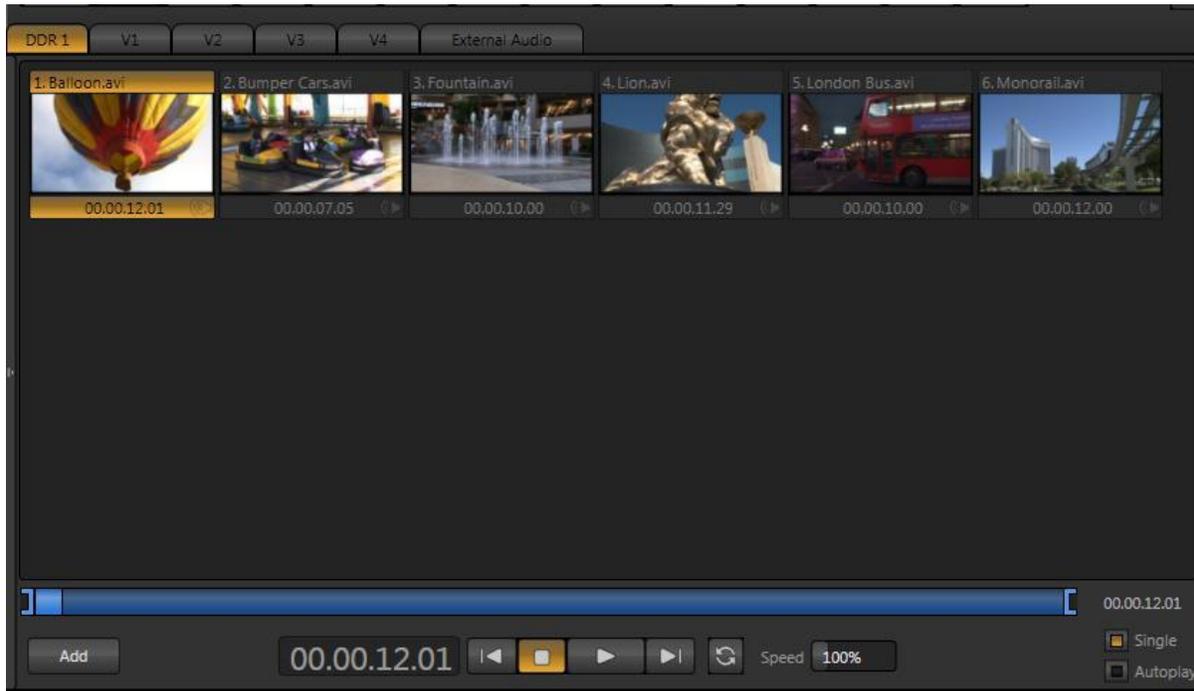
The procedure to do auto (dissolves) is similar to doing cuts with the TAKE button.

- 1) Select a source in the Program Bus (ex. CAM 1).
- 2) Select the source you want to mix to in the Preview Bus (ex. CAM 2).
- 3) Use the SELECT button to select fade or other wipes.
- 4) Then, either pull down the FADER BAR or press the AUTO button. You'll notice when the mix is completed the lighted buttons in the Program Bus and the Preview Bus will have switched. The Program Bus will always show (light up) which source is being recorded.

Additional Sources

There are several additional sources for videos, images, or audio that can be used during a production.

DDRs (Digital Disk Recorder)



• DDR bin

DDR 1 & DDR 2 – video sources

STILL – image sources

TITLE – text or graphics sources

SOUND – audio sources

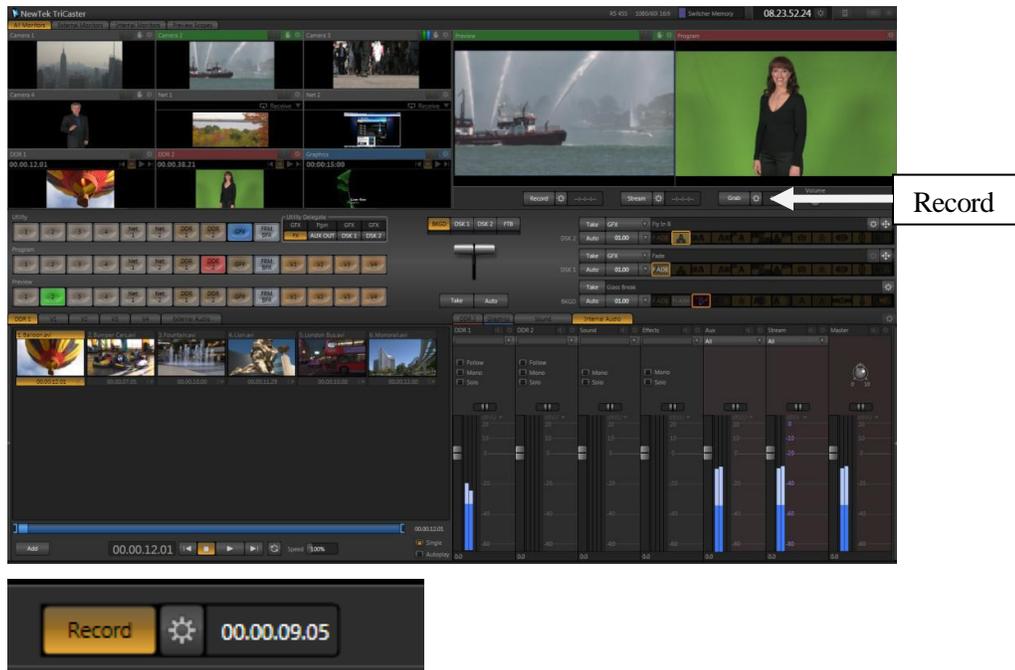
AUDIO MIXER –

V1 - V8 –

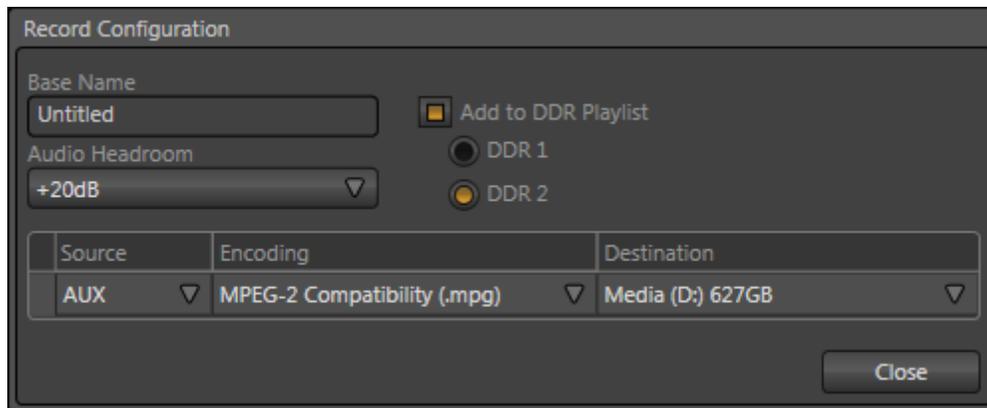
EXTERNAL AUDIO –

Record Your Program

- 1) Press the Configuration button (gear shaped) next to the Record button and make sure all the settings are as you require them.
- 2) Press Record.
- 3) Start your production.
- 4) When your production is over, press Record again to stop recording.



- Record and Configuration buttons and timecode



- Record Configuration window.

Studio Strike

Note: ALL power switches are to be left ON.

Studio

- 1) All sets and props need to be struck and stored or removed (if producer property).
- 2) All cameras need to be shutdown as follows:
 - Lens cap on.
 - Tripod locked down (tilt, pan and column) and parked with the cable coiled underneath.
- 3) All lights are to be faded down on the dimmer board. Additional floor lights are to be struck and put back in their case and returned to staff.
- 4) All equipment issued to the crew (mics, cables, etc.) is to be returned to staff in the condition in which it was received.
- 5) All debris is to be removed and the studio floor/furniture vacuumed if necessary.
- 6) Talent, guests and crew need to be out of the studio by the scheduled time.

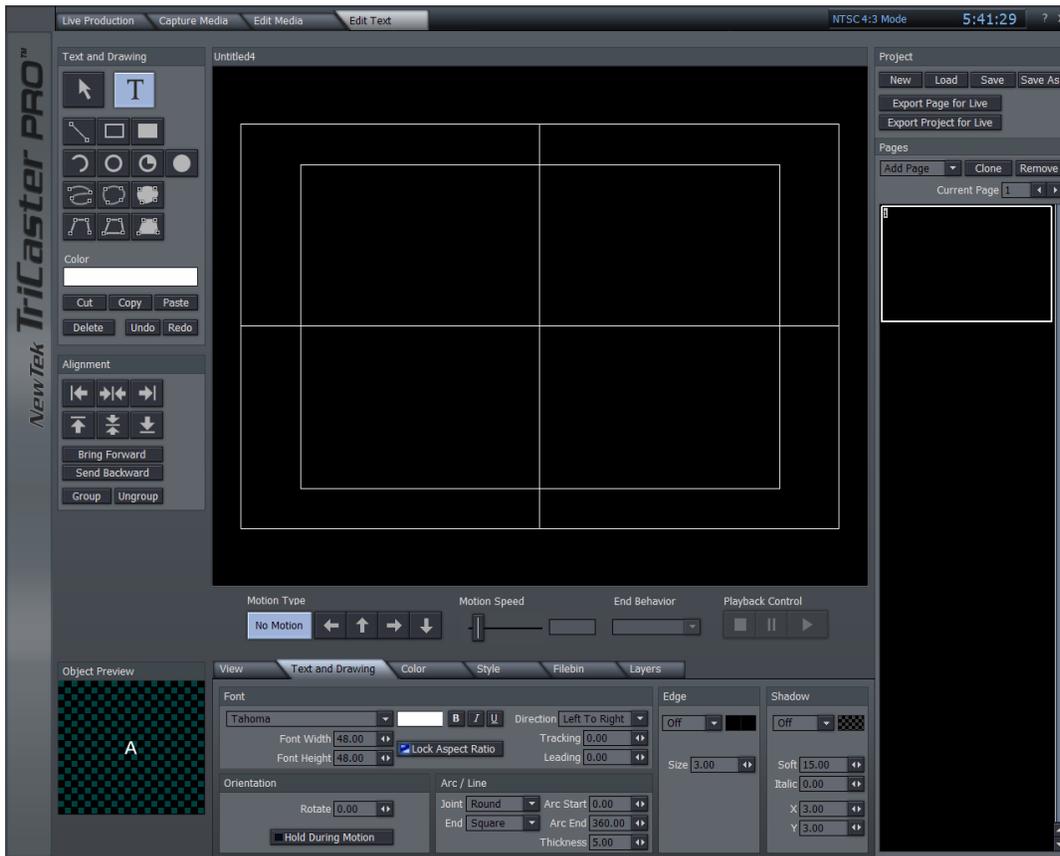
Control Room

- 1) All power should be left on.
- 2) All Channels on the audio mixer should be muted, Assign buttons up, Equalizers should be turned to 12 o'clock, Aux dials turned to the left, and Faders down to zero.
- 3) All CD's should be removed from the players.
- 4) Any papers or personal belongings and the crew need to be out by the scheduled time.

Note: Notify staff immediately of any problems with equipment and the equipment in question should be turned over to staff.

Editing Text with Live Text:

Once in Live Text the following screen appears:



Creating a new Project:

- Click the NEW button . Note that if the Edit Text tab is already open to a new project, you will not see anything happen. If you are prompted to save the current project, click “Discard.”
- Click the Save As button immediately, to help ensure that you save your project to the proper folder. A dialog box will open.
- Navigate to the desired folder location Enter the Project name in the File Name field:
- Choose “*.cg” in the File Type field (if it does not already appear):
- Click the Save button .

Opening an Existing Project:

- Click the Load button
- A dialog box will open
- Navigate to the folder that contains the desired Project
- Double-click the icon for the desired Project

Saving a Project:

- Click the Save button in the Project section of the screen. This will save any change(s) made to any Pages in the Project

Adding a Page to a Project:

Method 1 (Creating a new blank page):

NOTE: This method works only if you currently have fewer than 6 pages in your project. If your project already contains 6 or more pages, use Method 3 below)

- Click anywhere in the blank (bottom) area of the Pages list. A new blank Page will be created at the bottom of the list.
- NOTE: This method will not work if the Project contains 6 or more pages, because the pages list will not have any empty space in which to click
- This does not mean that you cannot add additional pages. It just means that you need to use either of the other methods for adding a page.

Method 2 (Copying an existing page):

- See the directions for Copying (Cloning) a Page for directions on copying an existing Page

Method 3 (Choose a pre-set layout from the available choices):

- NOTE: This method can also be used to create new blank Still, Crawl, and Scroll titles, in addition to pre-formatted titles.
- Click the Add drop-down box in the Pages section of the screen. A list of available formats appears. Note that this list is scrollable, so you can use the scroll wheel on the mouse, or the scroll bar on the right side of the list to scroll through the list. The scroll bar on the right side of the list may look like it is the scroll bar for the list of pages, but it is actually a scroll bar for the list of formats. Don't be afraid to try it! You might otherwise miss the perfect preset format for your title ☺
- The top three choices (starting with the word "New") create a blank page (no pre-set formatting) of the specified type (ex: a blank Crawl), similar to using Method 1
- The remaining choices are pre-formatted.
- Select the desired page type from the list
- Note: When you hold the cursor over any of the choices other than those starting with "New," you will see a sample of the formatting applied to that page type
- Click the desired page type. You will see an icon for the new page appear in the Pages list on the right side of the screen. The newly-created page will now appear in the main work screen, ready to be edited

Navigating Among the Pages in a Project:

After you add several Pages to your Project, you may find that you cannot see the icons for every page in the Pages list. To navigate between the pages, use one or more of the following methods:

- If the desired Page is visible in the Pages list:
 - Click the icon for the Page. This Page will open in the editor
- If the desired Page is not visible in the Pages list:
 - Click the arrows next to the Current Page indicator to change the currently-displayed Page
 - The Pages list will scroll automatically to show the selected Page
 - The selected Page will appear in the editor
- (OR)

- Click inside the number field next to the Current Page indicator
- Enter the number of the desired Page
- Hit the Enter key. The Pages list will scroll automatically to show the selected Page, and the selected Page will appear in the editor

Copying a Page (Cloning):

- The Clone function allows you to copy an existing page. To Clone a Page:
- Select the desired Page in the Pages list
- Click the Clone button . The new copy will appear directly below the copied (source) Page.

Moving a Page:

- Occasionally (particularly after using the Clone function), you may find that a Page is not located where you would like in the Pages list. To move a Page:
- Click the desired Page in the Pages list, and keep the left mouse button depressed
- Drag the cursor up or down. As you drag the cursor, a symbol appear at the border between the two Pages underneath the cursor. When you have reached the location between the two Pages where you would like the moved Page to appear, release the left mouse button. The Page will be inserted between the desired Pages.

Removing (Deleting) a Page:

- To Remove (Delete) a Page:
- Select the desired page in the Pages panel (see “Navigating Among the Pages in a Project” section for details)
- Click the Remove button in the Pages panel. The page will be deleted

Saving a Page as a Custom Template:

- After you have created a style that you like for your titles, you can save your settings as a preset (known as a Custom Template), which you can use on future Pages. To save a Page as a Custom Template:
- Navigate to the desired page in the Pages List (use the scroll wheel on the mouse, or the scroll bar on the list if you cannot see the page)
- Click the Add Page button
- Scroll to the bottom of the list
- Click the choice labeled “Add Page to Templates List”
- The Custom Template will appear at the bottom of the Add Page list, just above the “Add Page to Templates List” choice, with the name similar to “Untitled”