2016 Streaming Manual

1. ## Internet connection setup

    1.a. It is very important that there is a stable internet connection at each venue. The best option is to have a wired Ethernet connection from the facility. If a wired connection can not be obtained, there is a Verizon 4G/LTE modem built into each router. *Note: Please make your best effort to obtain a wired connection from the venue for stability and to save on cellular data overages.*

    1.b. The network is controlled by a Cradlepoint MBR-1400 Wi-Fi router, and it provides all network services for the devices on the network (MacBooks over Ethernet and iPads via Wi-Fi). *Note: Under no circumstances is any employee to use the Internet unless directed by a member of the IT staff or a show director. Any non-approved devices that are attached to network will be blocked by their MAC address and the violation will be reported to the show director and IT staff. Internet access is for transferring database synch information and streaming bandwidth only - NO EXCEPTIONS!*

    1.c. Please note the status indicators on the front of the MBR-1400:
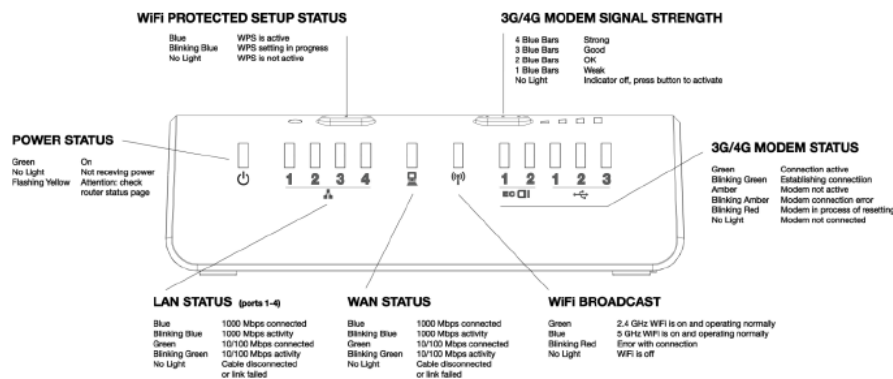
    1.d. If you have a wired either net connection from the venue, plug it into the blue Ethernet socket on the MBR-1400:


    1.e. Plug the MC MacBook into one of the orange Ethernet ports, along with the network switch for the other devices on the network.

1.f. Once you have determined if you have a wired connection or you need to rely on the 4G/LTE modem, you need to perform a speed test to see how much bandwidth you have available.

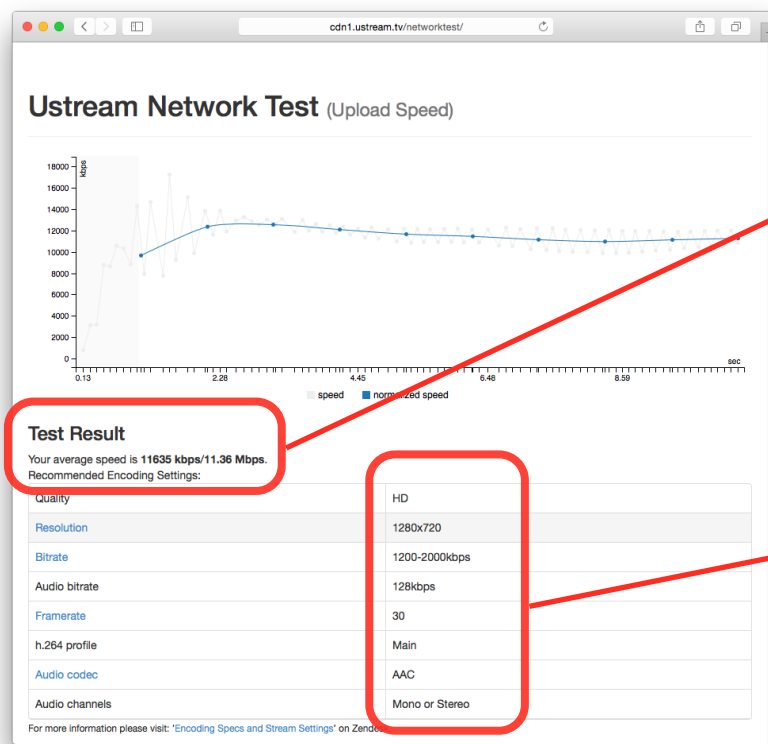Open Google Chrome form the Dock and go to http://cdn1.ustream.tv/networktest/.
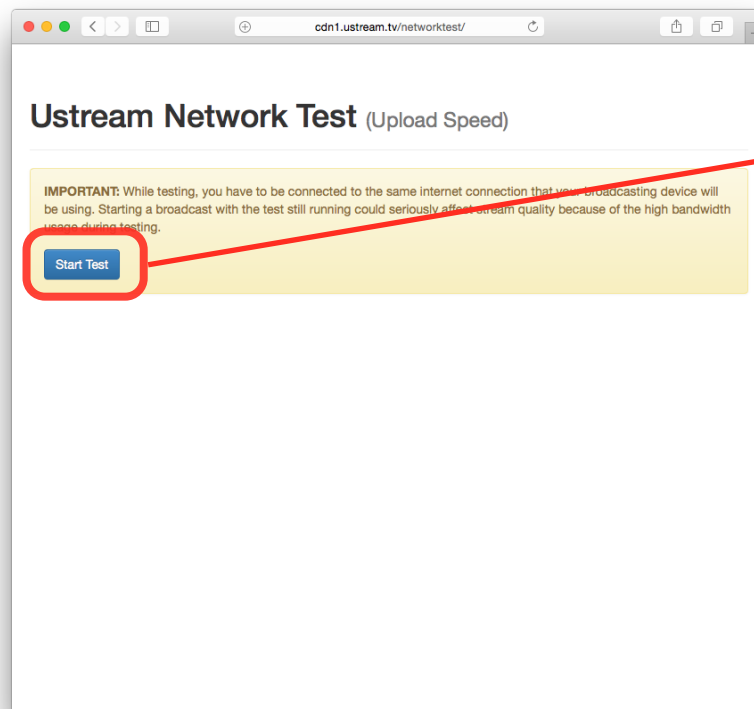
When you press 'Start Test' (1), the tool will analyze your upload speeds to Ustream's servers

1.g. You will need to have a *minimum* of 768k upload speed to efficiently run the stream output form Wirecast. The higher your upload speed, the better quality stream you can provide the audience. The network test will show you information relevant to the connection at your location directly to Ustream.

Ideally, you would like to run a 1280x720/30fps stream to send the best quality to Ustream for broadcast, but changing network congestion will make sustaining that quality difficult over a 4G/LTE connection. If you have a broadband connection at the facility, it is almost always better than a wireless connection for stability reasons.

In the diagram below, check the test results (2) to see what your sustained speed is. The network test will give you recommendations for the stream level based on your location (3). Run this test at least 3 times to see if you get the same results. If you are on a 4G/LTE connection, keep in mind that as there are more people in the venue, the more traffic you will have to compete with because of other wireless network traffic.

Ustream Network Test (Upload Speed)

Test Result

Your average speed is **11635 kbps/11.36 Mbps**.
Recommended Encoding Settings:

Quality	HD
Resolution	1280x720
Bitrate	1200-2000kbps
Audio bitrate	128kbps
Framerate	30
h.264 profile	Main
Audio codec	AAC
Audio channels	Mono or Stereo

For more information please visit: 'Encoding Specs and Stream Settings' on Zende

2. **Streaming Setup:**

2.a. The streaming application that you will be using for broadcasting is Telestream's Wirecast 6 Pro. Launch it from the dock and it will open the main window. Please note some of the main feature locations below:

Preview — **Live Output** — **Layers** — **Shot**
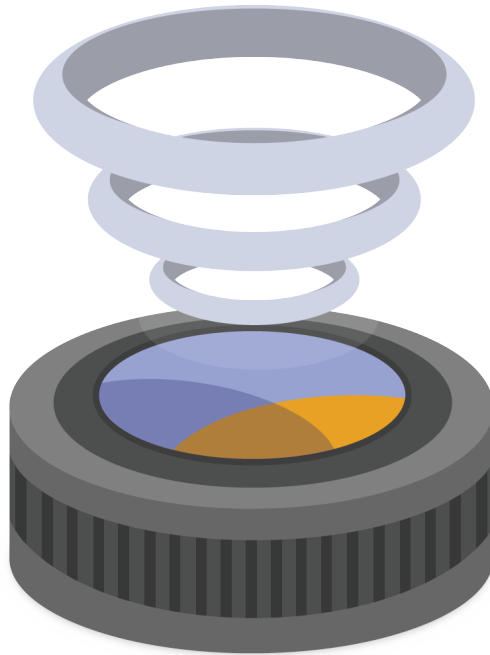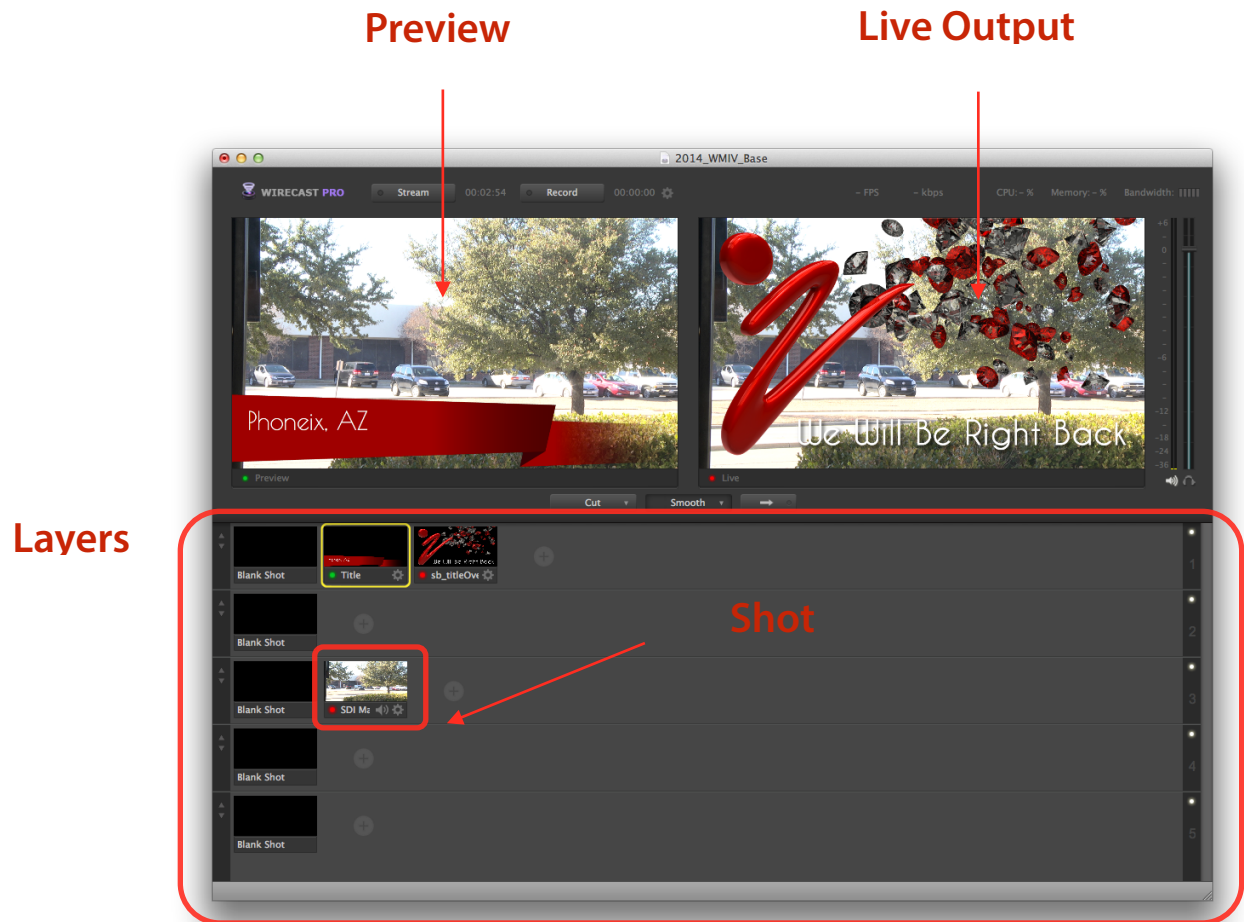
2.b. The first thing to do when Wirecast is launched is to check your source connections. Refer to the 2016 MC/Streaming Diagram as to how to connect the Ultrastudio Express Thunderbolt capture device and HD/SDI connection to the MacBook.

2.c. Wirecast is set to default to the last document opened, but in case the recent file was cleared, you can get to the base template in: */Users/MC/Documents/ 2016_WMIV_Base.wcst.* If you have damaged or overwritten the base file, a member of the IT staff will direct you to download a clean copy.

2.d. Verify that your video input source shows up as **HD 1080p/PsF23.98** in the Black Magic Design Desktop Video settings in the *System Preferences > Blackmagic Desktop Video*. These settings should be consistent between reboots, but in case there were changes made, verify that your settings match the images below:
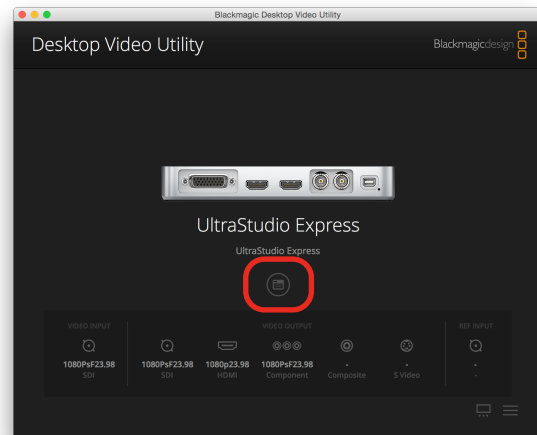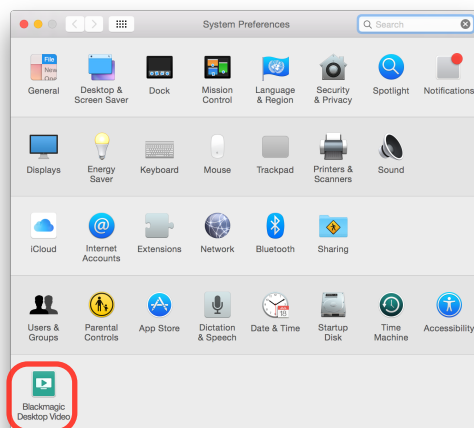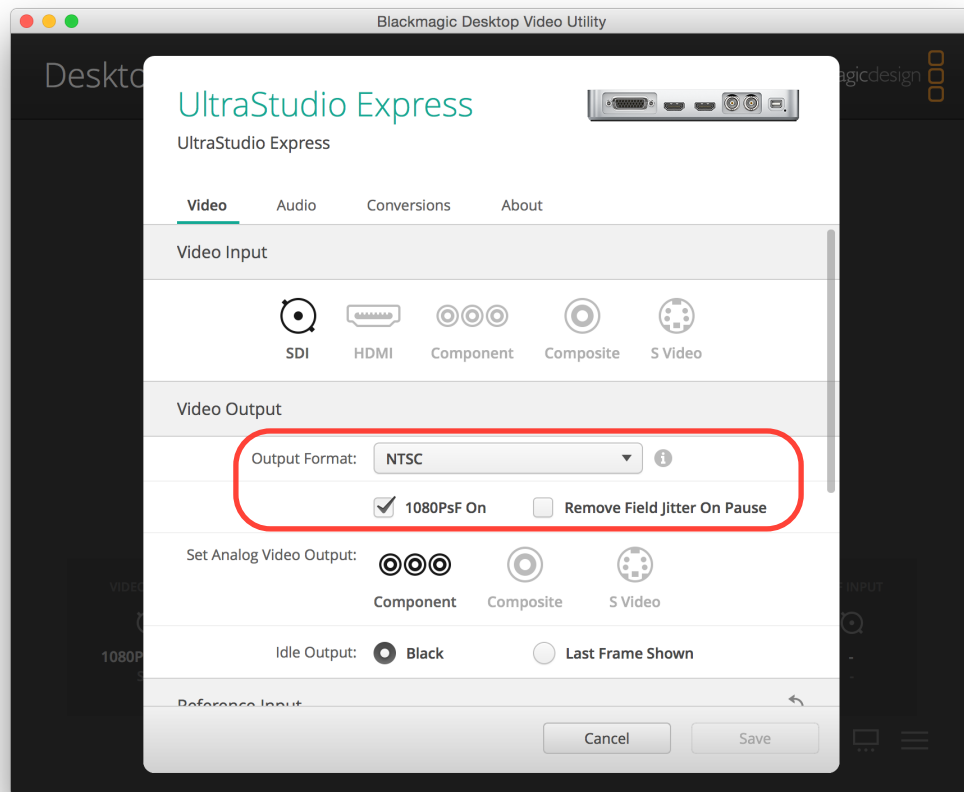
2.e. In Wirecast, go to the *Sources > Show Source Settings* (or press ⌘ ⌥S) and verify that your **Ultrastudio Express** input is set correctly to **HD 1080p23.98** as shown in the image below.
Note: This value will reset itself if you launch Wirecast without having the HD/SDI cable and an active camera output.
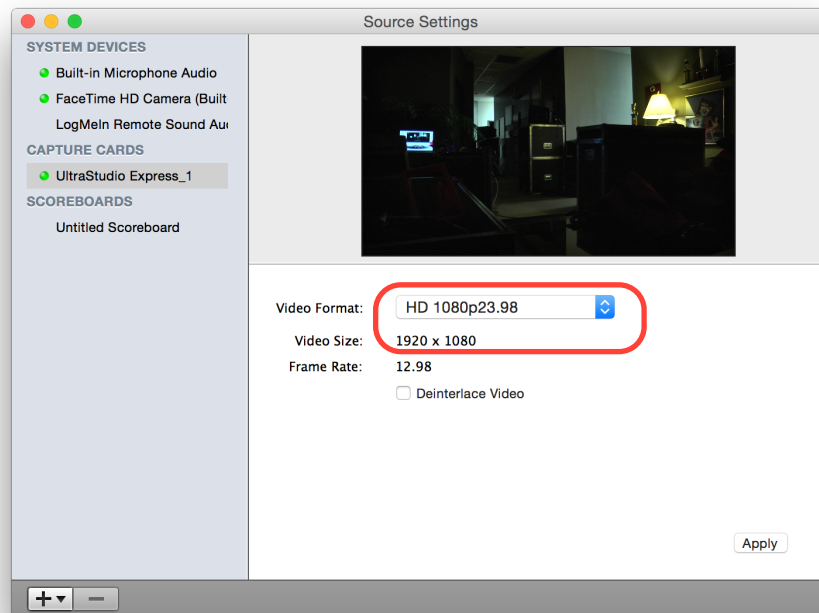
2.f. Once your source settings are verified, you can set up the encoding presets based on the value obtained in the speed test you performed earlier.

Speet test upload value	Maximum Encoder Preset
1mbps	WMIV 240p 512k
2mbps	WMIV 360p 913k
4mbps	WMIV 480p 1278k

In the Wirecast menu go to **Output > Output Settings…**
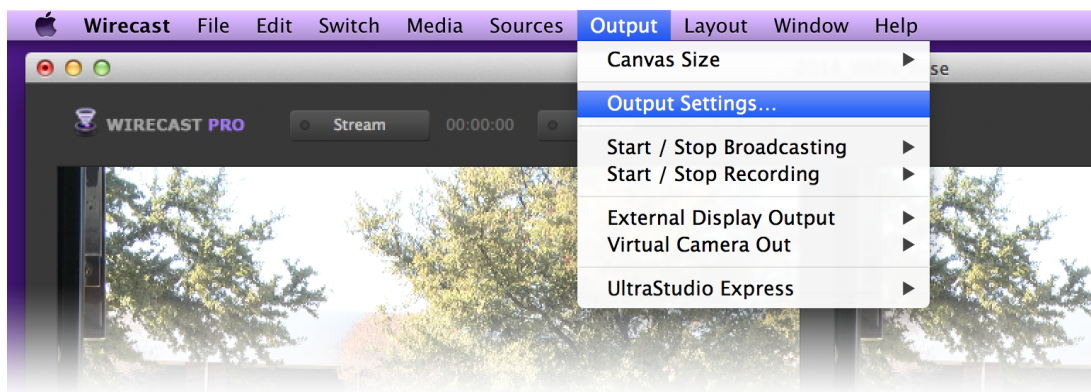
2.g. In the output settings dialog box, you will see multiple settings in the column on the left, each with a checkbox next to it:

2.h. These settings represent the bitrates that are optimized for the upstream bandwidth you have available. You will need to select the setting that most closely matches your upstream speed divided by 2. If you choose a bitrate that is more than 1/2 your upload speed, your audience will experience stutters and dropouts. It is better to have a stable lower quality stream than it is to have a higher quality one that drops often.
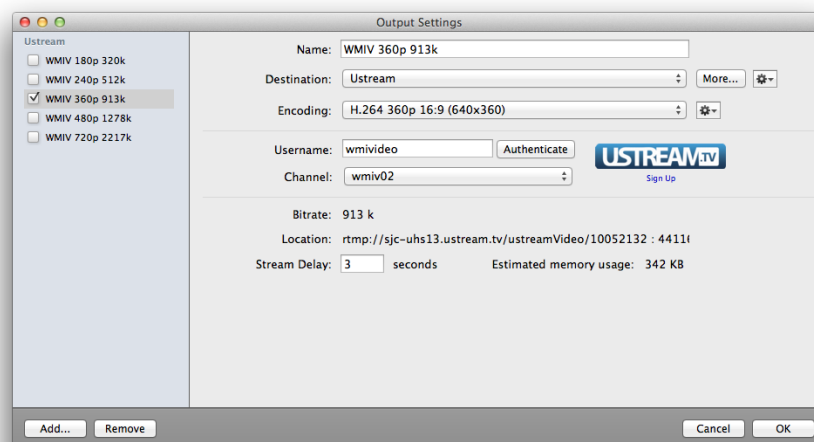
2.i. Once you determine the best bitrate for your connection (most commonly 360p/913k or lower), select the check box for that rate only, and ***uncheck all the other boxes*** (1). This ensures you are only sending one stream rate out at a time (Wirecast has the ability to transmit multiple bitrates simultaneously).
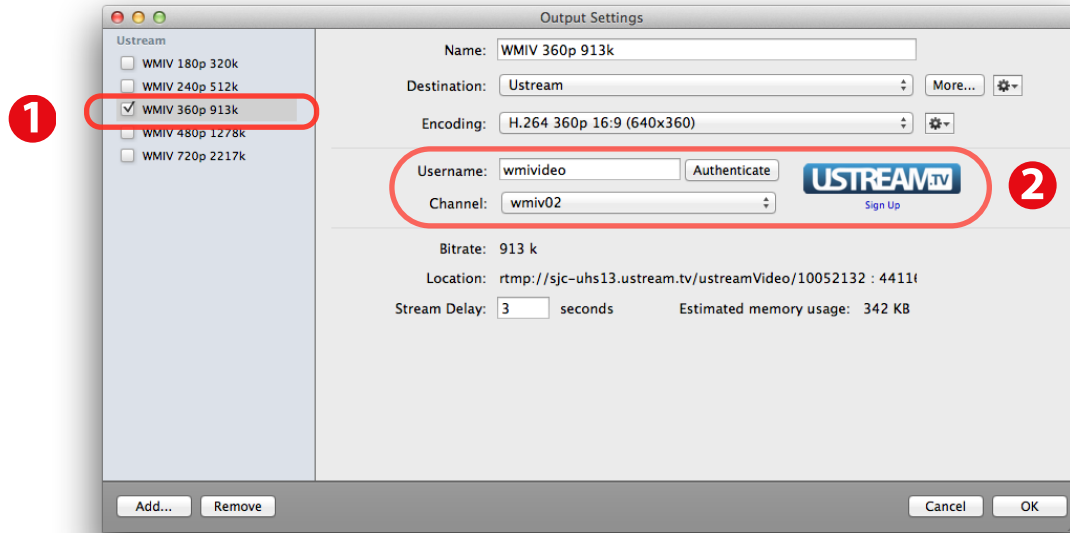

2.j. Note that in the settings for each preset, there is a Username and Channel for the Ustream service. These will be set in advance, but you will need to verify what channel you are broadcasting to for each show, as the audit laptop systems could change form venue to venue. Your show director will tell you in advance what channel you are going to steam to, so set that at this time (2) (1, 2, 3, 4, 5 or 6. ***DO NOT USE Channel M or you will override ALL streams with your broadcast when they go offline!***)

2.k. There are occasions that you may need to re-authenticate to Ustream as their stream keys will change from time to time, especially if you have a laggy/slow Internet connection. If you get an error message when attempting to stream, open the Output Settings panel and press the 'Authenticate' button and use the password ' **xxx** '. Press 'OK' and attempt to launch the stream again.

3. Content Settings

3.a. Once all the source and streaming presets and correct, check to make sure you have the following content in the main windows layers:

1. Layer one contains a Title/Sponsor Playlist (1) shot and a 'Be Right Back'/Playlist (2) image shot.

2. Layer 3 contains a 'SDI Main' shot (3) that is linked to the Ultrastudio Express input

3. *Please note that this content may be updated from time to time, and this is the minimum amount of shots to run an effective show.* ***ALWAYS make sure either (1) or (2) shots on Layer 1 are active, as these contain content from paying sponsors.***
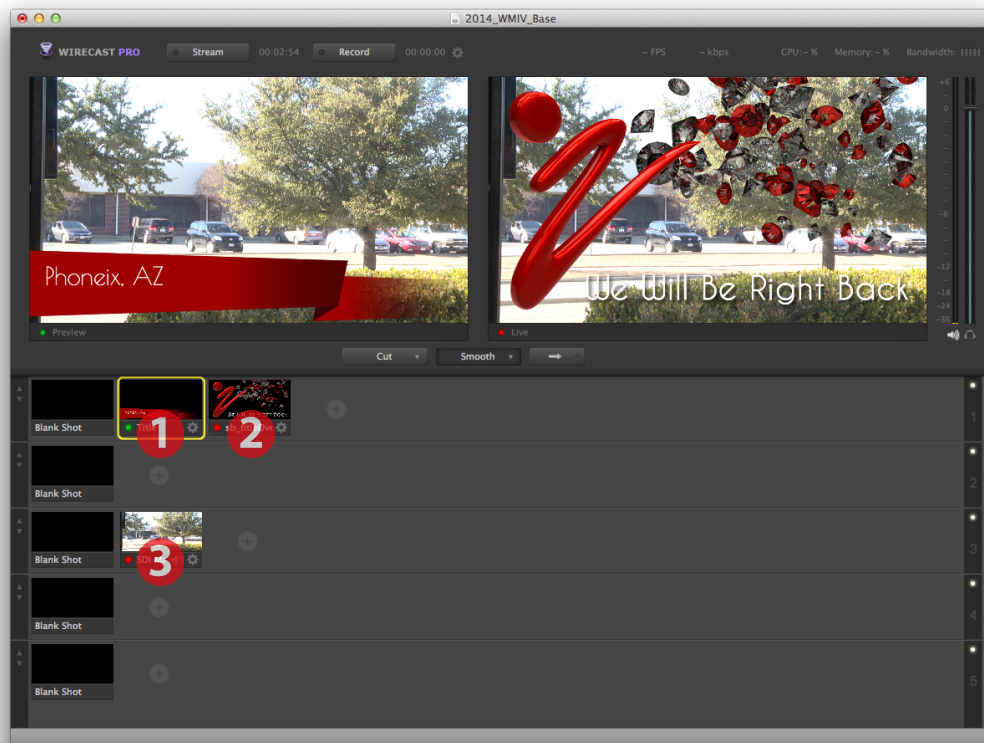

3.b. For each shot there is a small gear icon so you can adjust it's settings. The only one you will need to adjust is the settings for the Title layer(s). Click on the gear to edit the shots settings.
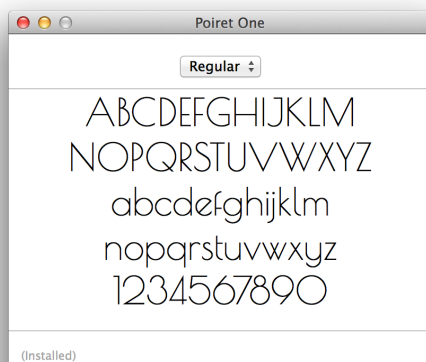
Shot Settings

3.c. You will need to edit the Title shot to reflect the city you are in. In the 'Editing Title' window you will want to click the small 'T' icon (1) in the row of Attributes under the shot. Type the name of the city in the 'Line 1' text field (2). If you have a long name you may need to adjust the font size - do so by pressing the '**Aa**' button to the right of the text field. Do not edit the font name, weight, color or other font attributes.
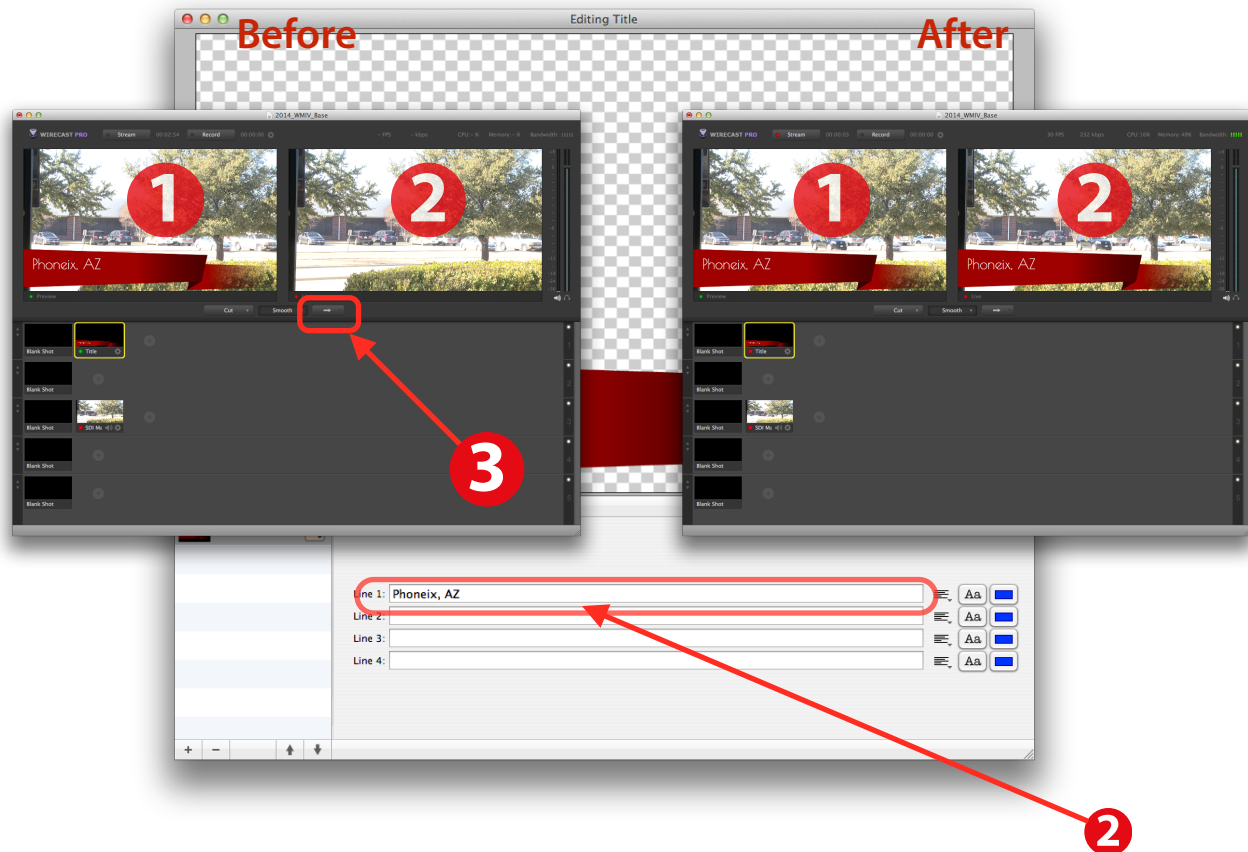

3.d. Showbiz and PrimeTime will have their own fonts, colors, graphics and images that will be set with the base file. Please keep these elements consistent to promote a professional appearance to the audience. In case you click onto a different font, here are the base font names for SB and PT:

Showbiz: Poiret One
PrimeTIme: FredokaOne

4. Streaming Competition Workflow

4.a. Now that all shots are set you are ready to stream the show, change shots and go to breaks. You do this by setting your shot in the preview (1) window and pressing the transition button to make it live (2). When you transition (3) the preview shot(s), the shot you setup in the preview window will become the active output to Ustream. This gives you the ability to setup shots and synchronize them with your announcing duties at the show.

4.b. To clear a shot on a layer, select the 'Blank Shot' that is a non-removable part of each layer. Set this in your Preview, and when you transition it to live, it will clear the layer. You will always want to keep Layer 3 active, as it is the base shot for the show (camera and audio input).

4.c. To stream the content of the live window, press the stream button in the upper right hand of the main window (1). Whatever you set as the Encoding Preset earlier will then be sent to Ustream for Broadcast. As long as the small red light stays lit on the stream button you are live. If you see the light flashing that means you are having connection issues (see the bandwidth meeter at the far top right of the main window(2)). If this goes into the red, you are trying to stream at a higher bitrate than your Internet connection can handle.
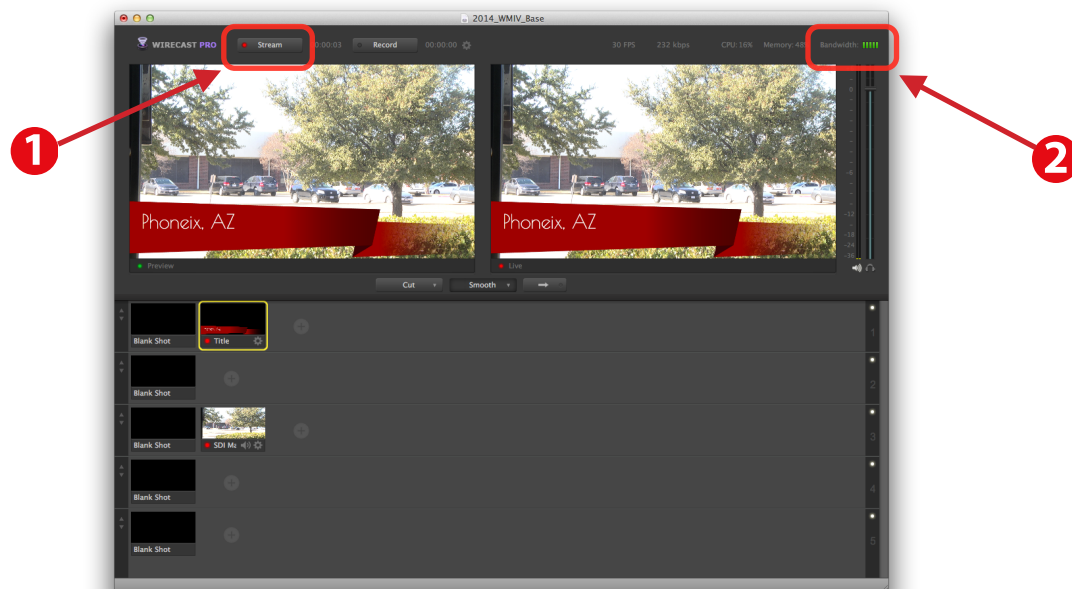
4.d. You may show or hide the title banner as often as you like, but make sure that when going to a break you display the 'We will be right back message' on Layer 1 and when returning from break, display the Title shot until the next act comes on stage. Attempt to allow as much of the routine that is on stage to be visible - if the lower titles conflict with the framing of the show, please removed them.

4.e. Since you are controlling the local sound as well as the stream broadcast, you can much more easily synchronize the tiles and what is happening on stage. Make sure that any microphones are muted before you go to a break, but allow the house audio to play while you are on break.

4.f. On the mixing board, the audio output for the stream as well as the Same Day Productions videographer levels are controlled by Group 1/2. Leave this level set to 0dB unless you have a very loud or weak signal. You can see the levels in Wirecast in the audio meter on the right, and as a rule of thumb it will be left at its default settings. Experiment until you get the best balance on the mixing board first before you adjust audio settings in Wirecast or on the actual cameras. The videographers will also alert you to the audio levels if they are weak/strong.