Addendum to *Audio/Video Guidelines for Assemblies and Conventions*

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Appendix

CO-160a-E Us

CHAPTER 1 INTRODUCTION

1. This addendum is designed to be used in conjunction with *Audio/Video Guidelines for Assemblies and Conventions* (CO-160). It contains direction that applies specifically to the United States branch territory, such as how to obtain assistance from the World Headquarters (WHQ) Broadcasting Department Help Desk and instructions on how to set up and operate specific audio/video (AV) equipment. All personnel involved with the Audio/Video Department should receive a copy of this document.

CHAPTER 2 TECHNICAL SUPPORT

1. To obtain assistance, please contact the WHQ Broadcasting Department Help Desk. See the contact information and hours of operation listed below. For events held at Assembly Halls, work with the technical contact at the facility before you contact the help desk.

- Telephone Numbers:
  - (718) 560-6433 (United States)
  - (876) 630-9002 (Jamaica)
  - +599 9 788 9990 (Curacao)
- Email: InboxBRDCST.US@jw.org
- Hours of Operation: Monday – Friday 8:00 a.m. to 5:00 p.m. (ET)

2. During convention season, the help desk provides extended hours:

- **Hours of Operation:**
  - Thursday 8:00 a.m. to 10:00 p.m. (ET)
  - Friday 7:00 a.m. to 10:00 p.m. (ET)
  - Saturday 8:00 a.m. to 10:00 p.m. (ET)
  - Sunday 8:00 a.m. to 10:00 p.m. (ET)

CHAPTER 3 AUDIO EQUIPMENT

AUDIO HEADEND

1. The audio headend provided to most locations by the WHQ Broadcasting Department includes primary and backup audio mixers, primary and backup digital signal processors

(DSP), an isolation transformer, and an audio meter. There are several versions of the audio headend.

- The Allen & Heath (A&H) audio system with included QSC amplifiers or Crown amplifiers.

QSC Variant

Crown Variant

Rear

- The A&H audio system for Alaska, Hawaii, and all United States branch territory islands, with and without FM transmitters.

With FM Transmitter

Without FM Transmitter

Rear

Rear

2. Refer to the provided bill of materials (BOM) to identify which audio headend is used at the venue.

ALLEN & HEATH AUDIO SYSTEM

3. Most rented venues will receive the A&H audio system. This system is made up of a number of components that work together to form a flexible and robust audio system. Each A&H audio system includes: two IP8 mixer control surfaces, one CC-10 audio meter, two AHM-32 audio matrix processor units, one audio configuration laptop, two audio cable spools, and several amplifiers.

4. **Allen & Heath IP8:** The A&H IP8 is a mixer control surface used to remotely control the AHM-32 processor. It is connected to the A&H audio system and is powered by one of the provided CAT6 cables. The IP8 can be deployed easily into the field of sound with a very small footprint.

5. **How to Set Up the Allen & Heath IP8:**

(1) Place the primary and backup IP8 control surfaces at the audio desk.

(2) Connect the provided CAT6 cables from the “NETWORK 1” port of the primary and backup audio headend panels to the RJ45 etherCON port on the rear of the corresponding IP8 control surfaces.

6. **Allen & Heath DX168 Stage Box:** The DX168 stage box is a 16-input, 8-output remote input/output (I/O) device that connects to the A&H audio system over a single CAT6 cable, providing input and outputs close to or on the stage. It communicates with the AHM-32 using the DX protocol, which does not require any additional configuration.

7. **How to Set Up the Allen & Heath DX168 Stage Box:** Follow these steps to set up the DX168 stage box:

(1) Two identical DX168 stage boxes are provided. Designate one as primary and one as backup. Place both stage boxes on the stage.

(2) Connect the provided CAT6 cables from the primary and backup “DX LINK 2” ports on the rear of the audio headend to the “DX A” ports on the side of the primary and

backup DX168 stage boxes. Refer to the section on Audio Cable Spools for more information.

(3) Connect the microphones on the stage to inputs 1-6 on the primary DX168 stage box.

(4) Connect the stage monitors to output 1 on the primary DX168 stage box.

(5) Plug in the provided power cables and connect them to power.

8. **Audio Cable Spools:** These two cable spools connect all the remote components of the A&H audio system. Each spool consists of four 150 ft CAT6 cables with RJ45 etherCON connectors on both ends. Each cable is also labeled and color-coded on each end. Once

deployed and connected, each cable spool should be located backstage near the audio headend, with the other ends positioned at the stage and audio desk, respectively.

9. **Set Up the Audio Cable Spools:** Follow these steps to set up the CAT6 cable spools.
   (1) Open the rolling crate lid and set it aside. Designate one spool for the audio desk and one for the stage. Lock the wheels in place and unlock the brake on the cable spool.
   (2) While leaving the spool at the audio headend, begin to carefully unspool the cable until it is long enough to reach the audio desk. Avoid walking paths when possible, and use cable protectors when needed.
   (3) Once the cabling is properly routed between the audio desk and the audio headend, make the following connections at the audio desk:
      - Connect cable “CH1” (blue) to the RJ45 etherCON port jack on the back of the primary IP8 control surface.
      - Connect cable “CH2” (green) to the RJ45 etherCON port on the back of the backup IP8 control surface.
      - Connect cable “CH3” (orange) to the CC-10 audio meter with the supplied RJ45 to etherCON adapter.
      - Cable “CH4” (yellow) is a spare and can be used during setup to connect to the audio laptop for configuration.
   (4) After the connections are made at the audio desk, unspool the 9 ft whip on the side of the cable spool and make the following connections at the audio headend:
      - Connect cable “CH1” (blue) to the RJ45 etherCON port labeled “NETWORK 1” under “PRIMARY CONNECTIONS.”
      - Connect cable “CH2” (green) to the RJ45 etherCON port labeled “NETWORK 1” under “BACKUP CONNECTIONS.”
      - Connect cable “CH3” (orange) to the RJ45 etherCON port labeled “NETWORK 2” under “PRIMARY CONNECTIONS.”

- When you use the laptop at the audio desk to configure the AHM-32, connect cable “CH4” (yellow) to “NETWORK 3” under “PRIMARY CONNECTIONS.”

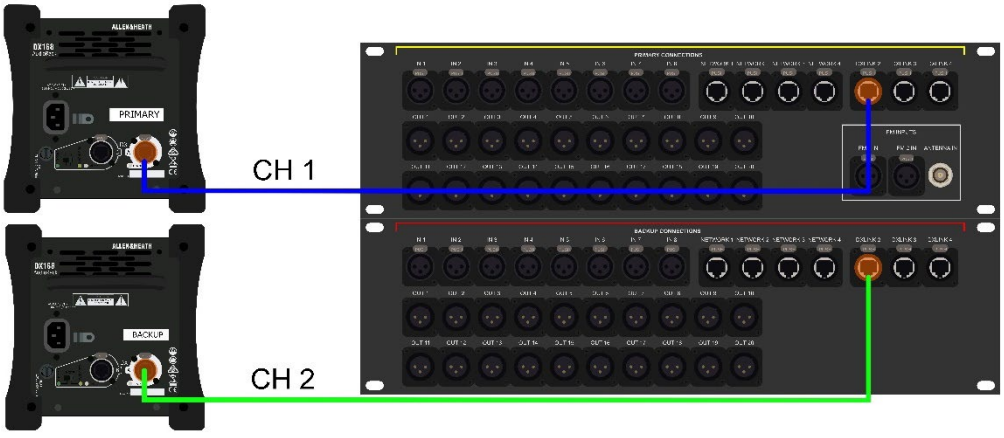
(5) While leaving the second spool at the audio headend with the wheels locked, begin to carefully unspool the cable on the way to the stage where the A&H stage boxes will be installed. Avoid walking paths when possible, and use cable protectors when needed.

(6) Once the cabling is properly routed between the stage boxes and the audio headend, make the following connections at the stage box:

- Connect cable “CH1” (blue) to the RJ45 etherCON port labeled “DX A” on the side of the primary stage box.
- Connect cable “CH2” (green) to the RJ45 etherCON port labeled “DX A” on the side of the backup stage box.

(7) After the connections are made at the stage boxes, unspool the 9 ft whip on the side of the cable spool and make the following connections at the audio headend:

- Connect cable “CH1” (blue) to the RJ45 etherCON port labeled “DXLINK 2” under “PRIMARY CONNECTIONS.”
- Connect cable “CH2” (green) to the RJ45 etherCON port labeled “DXLINK 2” under “BACKUP CONNECTIONS.”



(8) Using Velcro, secure the cables to the lacing bar on the back of the audio headend.

(9) After the program has concluded, disconnect all cables and neatly roll them onto the spool. Take care to wipe down the cable as it is rolled up. Use the provided Velcro and rubber twist tie to secure the cable spool and whip from unspooling.

10. **Allen & Heath CC-10 Audio Meter:** The A&H CC-10 is a 10 in. touchscreen tablet that features an output loudness monitor, pre-fader meters for microphones and media, and

active EQ information. It connects to the A&H audio system and is powered by one of the provided CAT6 cables. The CC-10 is located near the IP8 control surfaces at the audio desk.

11. **How to Set Up the Allen & Heath CC-10 Audio Meter:** Follow these steps to set up the CC-10 audio meter.

(1) Carefully remove the touchscreen from its equipment case.

(2) Place the CC-10 near the two IP8 control surfaces at the audio desk and adjust it so the mixer operator can clearly see the screen.

(3) Connect the provided “CH3” (orange) CAT6 cable from the primary “NETWORK 2” port on the audio headend to the Ethernet port on the bottom of the CC-10 using the provided etherCON to RJ45 adapter.

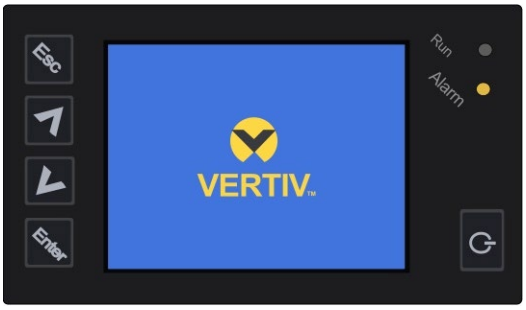
12. **Audio Configuration Laptop:** The audio configuration laptop is used to configure various audio equipment after everything is connected. The laptop comes preloaded with the software needed to connect and adjust the AHM-32 audio matrix processor. In the event that the CC-10 audio meter fails, the audio configuration laptop can be used in its place by running the Custom Control software, which comes pre-installed. It should not be used for any other purposes.

13. **How to Set Up the Audio Configuration Laptop:** The audio configuration laptop can be plugged into any “NETWORK” port on the rear of the audio headend to connect to the AHM-32. Plugging into the primary “NETWORK” ports will connect to the primary AHM-32, while connecting to the backup “NETWORK” ports will connect to the backup AHM-32.

14. **Vertiv GTX5 Uninterruptible Power Supply:** The uninterruptible power supply (UPS) included with the A&H audio system provides clean power to certain pieces of equipment in the audio headend. Its intended use is to increase the lifespan of the connected equipment, not to provide audio in the event of a power failure.

15. **How to Operate the Vertiv GTX5 Uninterruptible Power Supply (UPS):** The UPS in the audio headend needs to be powered on to operate the connected equipment. Follow these steps to turn on the UPS:

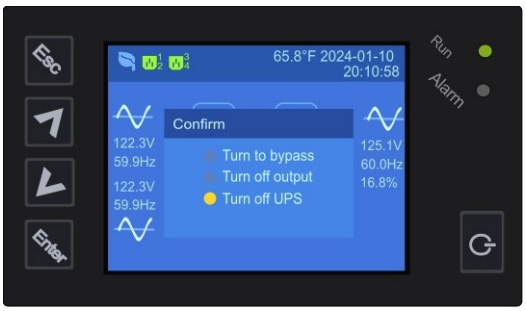
(1) Using the cable on the rear of the headend, connect the UPS to power. The UPS will give a long beep and display the boot screen.



(2) Once booted up, the UPS will ask if you want to see the alarm log. Using the arrow keys, navigate to “No” and press the Enter button.

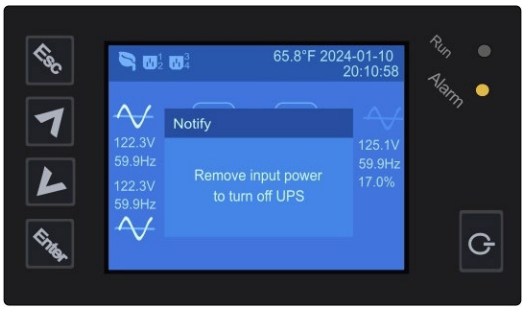
(3) Press and hold down the power button to the right of the screen. A screen will pop up asking if you would like to turn on the UPS. Navigate to “Yes” and press the Enter button.

(4) At the conclusion of the convention, turn off the UPS. Press and hold the power button to the right of the screen. A screen will pop up giving you three options. Navigate to “Turn off UPS” and press the Enter button.



(5) A screen will pop up asking you to confirm that you would like to turn off the UPS. Navigate to “Yes” and press the Enter button.

(6) A screen with pop up telling you to remove power input to turn off the UPS. Unplug the UPS from power.



(7) A screen will appear that says “Shutdown in progress.” The UPS will beep for a minute and then shut off.

16. **Allen & Heath AHM-32 Audio Matrix Processor:** The A&H AHM-32 is a 12-input, 12-output audio matrix processor. It performs all audio processing and sends signal to the power amplifiers. The AHM-32 is controlled using the IP8. Both the primary and backup AHM-32 processors are part of the audio headend.

17. **How to Set Up the Allen & Heath AHM-32 Audio Matrix Processor:** The WHQ Broadcasting Department provides a unique configuration file for each venue. The file will need to be downloaded from *JW Drive* and adjusted during setup. The required version of the AHM System Manager software comes pre-installed on the audio configuration laptop.

(1) Refer to the section Set Up the Audio Cable Spools to connect the pieces of the A&H audio system together.

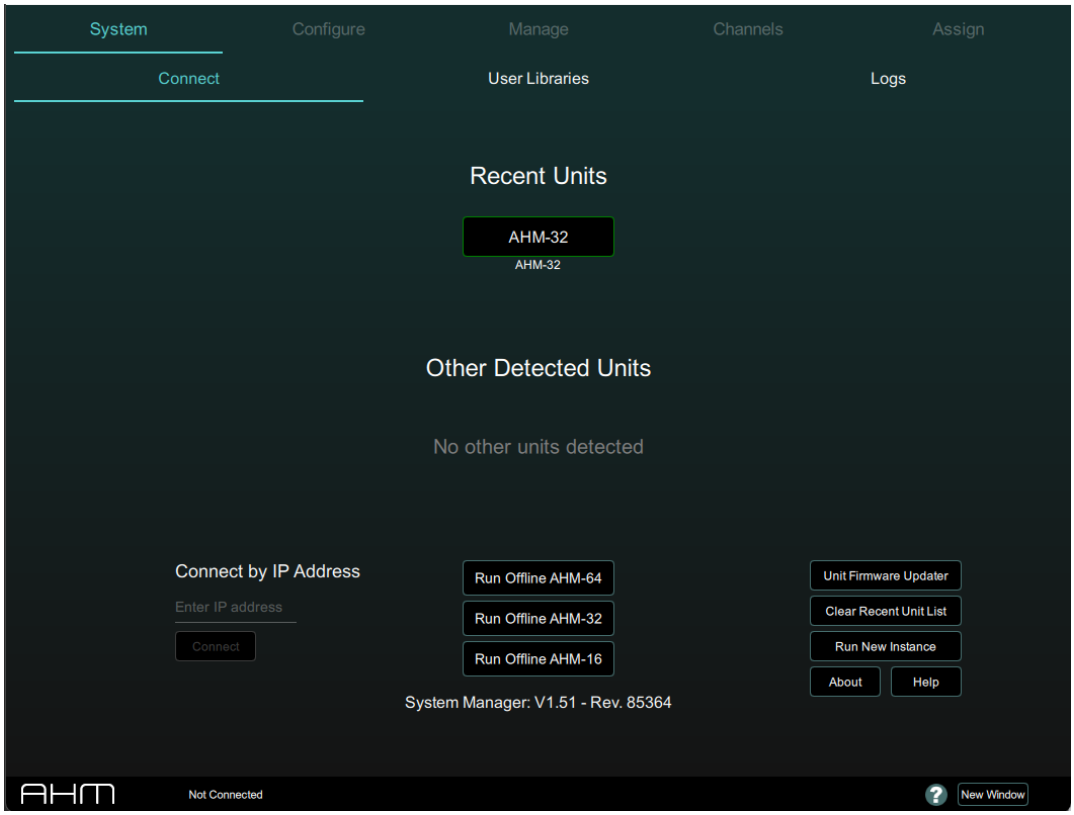
(2) Connect inputs and outputs to the back of the audio headend and the primary stage box according to the provided “Audio System Wiring Diagram” provided by the WHQ Broadcasting Department.

(3) Use the provided Ethernet cable to connect the audio configuration laptop loaded with the AHM System Manager software to the port labeled “NETWORK 4” on the back of the audio headend. The laptop will come pre-configured to connect to the A&H audio system. If there is an issue connecting to the AHM-32, check to make sure the laptop IPv4 settings match the following.

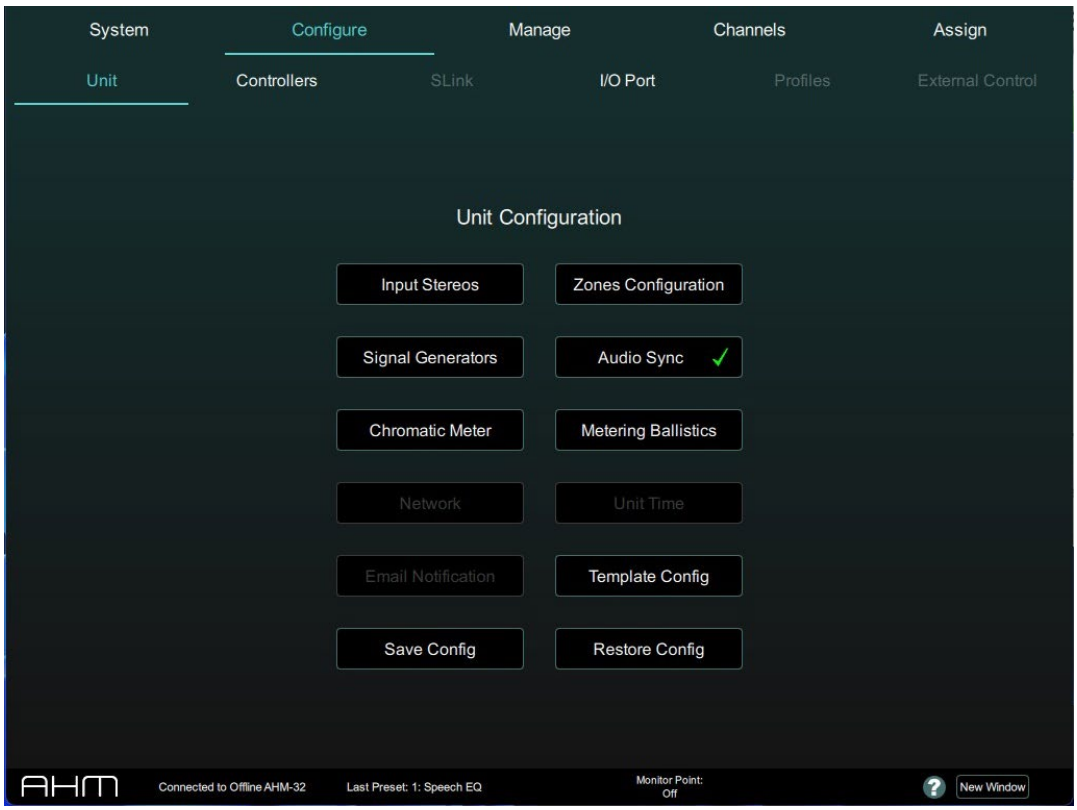
- **IP Address:** 192.168.1.100
- **Subnet Mask:** 255.255.255.0
- **Default Gateway:** 192.168.1.254
- **Preferred DNS:** 1.1.1.1

(4) Launch the AHM System Manager software.

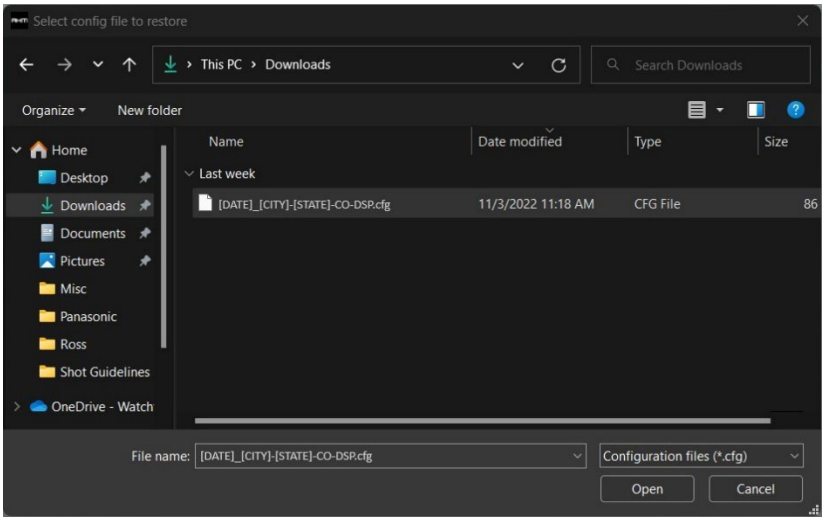
(5) The AHM-32 should appear under “Recent Units.” Click on it to connect. If the unit does not appear, enter the IP address 192.168.1.91 and click “Connect.” There is no password for the administrator account. Press “Enter” when prompted to enter a password. At times, a popup will appear that says “Unit time mismatch detected! Do you want to sync unit time?” Click “OK.”



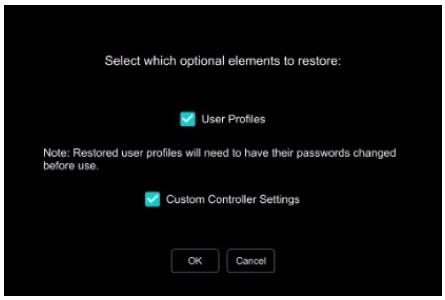
(6) Click on the “Configure” tab, then the “Unit” sub tab, and click on “Restore Config.”



(7) A file explorer window will open. Load the AHM file provided by the WHQ Broadcasting Department.



(8) Select the checkboxes to restore “User Profiles,” and “Custom Controller Settings.” Click “OK.”



(9) Once the file has been loaded, click on the “Channels” tab, then the “Zones” sub tab.

(10) Each zone listed on the left is an output to a zone of speakers and will be mostly preconfigured by the WHQ Broadcasting Department. Click the “GEQ/PEQ” box linked to Zone 1.

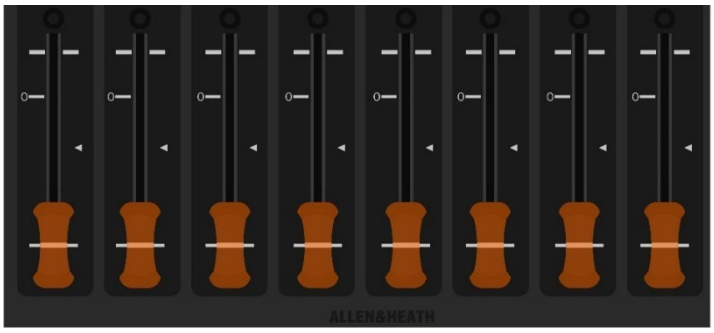
(11) Use the PEQ block to adjust the EQ of the audio system to accommodate the acoustics of the venue as well as notching frequencies that would cause feedback. Use this page and the direction in chapter 7 of *Sound Reinforcement for Christian Conventions* (CO-snd) for guidance on how to adjust this processing block. Repeat this process with all zones being used.

(12) When all the EQs have been set, return to the “Configure” tab and the “Unit” sub tab. Click “Save Config” to save a copy of the file to the laptop. Select the checkboxes to restore “User Profiles,” and “Custom Controller Settings.” Click “OK.”

(13) Follow steps 4-6 with the backup AHM-32 and load the adjusted file. Each AHM-32 will now run identical configuration files.

18. **How to Operate the Allen & Heath Audio System:** Once all equipment is set up, wired, powered on, and configured, the system can be operated from the IP8 panel located in front of the stage in the field of sound.

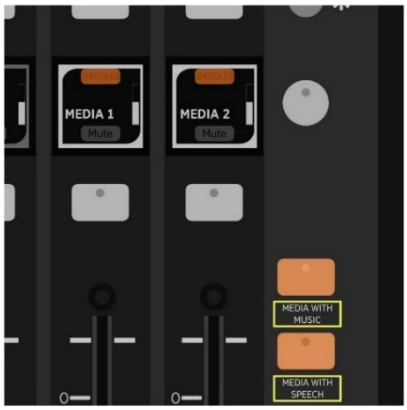
(1) Move the sliders up and down to adjust audio levels of the corresponding inputs.



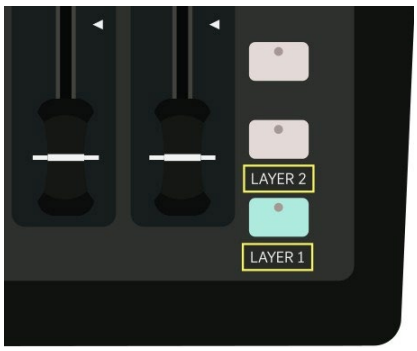
(2) Each slider has a small screen above it to show an audio meter, the input it controls, and whether the channel is muted. The media input screens also show whether the Media EQ is active or not.

(3) Directly above each slider is a soft key that mutes the channel shown on the screen above. When a channel is muted, the soft key will glow red, and the small “Mute” on the screen will go from grey to red.

(4) The two labeled soft keys on the upper right side of the IP8 are used to adjust the EQ on the media channels. The default is “Media with Music,” which is flat and used for media that is mostly music. The EQ labeled “Media with Speech” can be applied for media when the speech is lacking intelligibility.

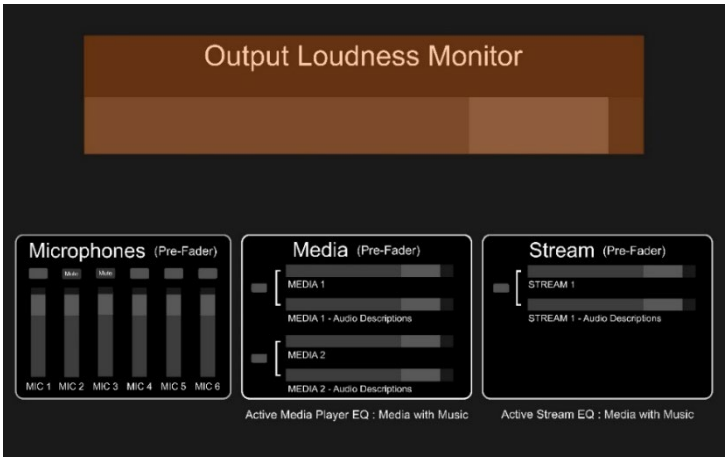


(5) The two labeled soft keys on the lower right side of the IP8 are used to switch between input layers. Layer 1 includes all six stage microphones, MEDIA 1 and MEDIA 2. Layer 2 replaces MIC 6 with the STREAM input and only needs to be used when receiving a streamed video feed from another site.

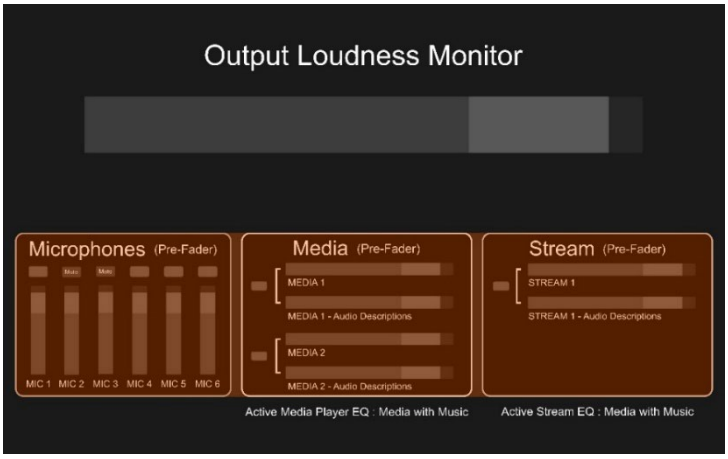


(6) Once the A&H audio system is correctly wired and powered up, the CC-10 will automatically connect and show the audio meters.

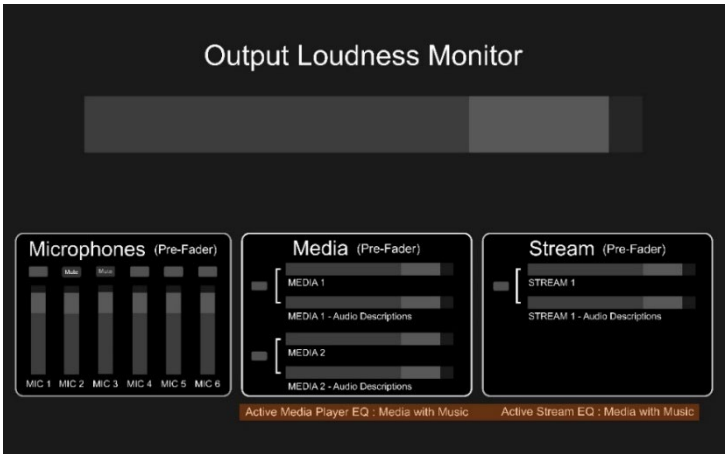
(7) The Output Loudness Monitor is used to monitor the overall output to the different speaker zones. The mixer operator will adjust each input on the mixer so that typically the yellow light on the bar is illuminated when an input is being used. The audio can go into the red briefly, but if the audio stays in this area for too long, distortion may be heard. Likewise, if the audio is below this level, the participants may not be heard by the audience. Since the mixer operator can experience “listener fatigue,” the Output Loudness Monitor assists the operator to keep the sound levels consistent. It does not replace the need for a critical ear.



(8) Use the microphone and media pre-fader meters to visually see if there is an audio signal coming from a device. These meters will move regardless of whether or not the corresponding slider is raised and do not reflect the audio heard by the audience.



(9) The “Active Media Player EQ” portion of the screen shows which media EQ is currently active. The two options are “Media with Music” and “Media with Speech.”



19. Each component of the A&H audio system includes a backup in case of a failure. The backup will be running redundantly with the primary. In the event of a failure, move the input and output connections from the primary stage box and headend I/O to the backup and continue normal operation.

20. **Allen & Heath Audio System for Alaska, Hawaii, and United States Branch Territory Islands:** This audio system consists of one 8-rack unit (RU) case, two 2RU cases and two handheld travel cases. While it may look different from the audio system used in the contiguous United States, most pieces of equipment operate the same as the A&H audio system, with the exceptions listed below.

21. One of the cases included with the audio system contains a UPS. This device is intended to be used only with the audio system. It is not designed to support any other equipment.

22. **Allen & Heath AR84 Stage Box:** The A&H AR84 stage box is an 8-input, 4-output remote I/O device that connects to the A&H audio system via a single CAT6 cable, providing inputs and outputs close to or on the stage. It communicates with the AHM-32 over the SLINK protocol, which does not require any additional configuration.

23. **How to Set Up the Allen & Heath AR84 Stage Box:** Follow these steps to set up the AR84 stage box.

(1) Place the case containing the primary and backup stage boxes on the stage.

(2) Plug the provided CAT6 cables from the primary and backup “SLINK” ports on the rear of the audio headend to the “EXPANDER” ports on the front of the primary and backup AR84 stage boxes.

(3) Connect the microphones on the stage to inputs 1-6 on the primary AR84 stage box.

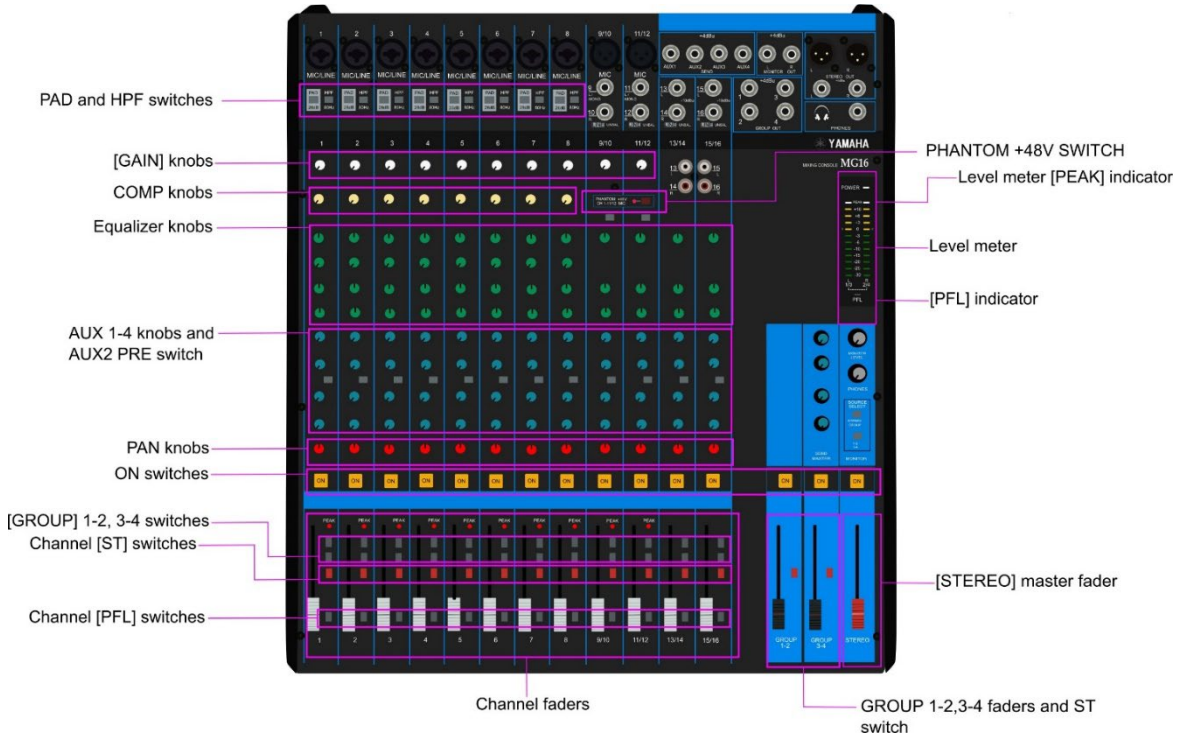
(4) Connect the units to power.

MICROPHONES

24. **Shure SM58:** The Shure SM58 is a dynamic microphone with a cardioid polar pick-up pattern. These microphones reproduce voices very well while rejecting unwanted noise from other directions. Proper microphone placement is crucial to use the cardioid polar pick-up pattern and avoid feedback. Stage monitors should be placed behind the microphones, starting at approximately 5 ft away, and adjusted as needed. Participants should speak into the microphone at a distance of 4 to 6 in. Refer to the section Stage Layout in Chapter 6 for more information on microphone placement.

AUDIO MIXERS

25. **Yamaha MG16:** The Yamaha MG16 is a 16-channel analog mixing console used to create separate, unique mixes for loud speakers and FM transmitters. Refer to the instructions below, along with the AV design provided by the WHQ Broadcasting Department, for setup and operating instructions.



26. **How to Operate the Yamaha MG16:**

(1) **PAD and HPF (High Pass Filter) switches:** The PAD switch attenuates the input by 26 dB. Turn this switch off if connecting low input level devices, such as microphones. Turn it on if connecting a line-level input, such as a media player. The HPF switch applies a high-pass filter that attenuates frequencies below 80 Hz in the signal by a slope of 12 dB/octave. *Turn the HPF switch on when connecting a microphone*.

(2) **Gain knob:** Adjusts the gain of the input signal. *Set gain as needed*.

(3) **COMP knob:** This knob adjusts the amount of compression applied to the input. As the knob is turned to the right the threshold, ratio, and output gain are adjusted simultaneously. *This knob should be set to 0*.

(4) **PHANTOM +48V switch:** This switch toggles +48V DC phantom power on and off for inputs 1-11/12. *Leave this switch off unless it is needed to phantom-power a condenser microphone*.

(5) **Equalizer ([HIGH]/[MID]/[LOW]) knobs:** These knobs shape the high, mid, and low audio frequencies. For microphones, these can be adjusted as needed to help with intelligibility, naturalness, and in reducing feedback. For media, these knobs should be left in the middle position (flat response).

(6) **AUX 1-4 knobs and AUX2 PRE switch:** The AUX knobs adjust the level of each signal sent to the respective AUX buses. *The AUX2 [PRE] switch should be left in the off position (post-fader)*. *Set AUX 1-4 levels as needed*.

(7) **PAN knob:** These knobs set the position of the sound image within the stereo field. Leave these knobs in the middle position unless otherwise instructed in the AV design provided by the WHQ Broadcasting Department.

(8) **ON switch:** Passes the input signal to the output(s). This switch should be turned on for any inputs used in the system.

(9) **[GROUP] 1-2, 3-4 switches:** These switches determine the bus(es) to which each input signal is sent. *Set the [GROUP] 1-2, [GROUP] 3-4, and ST (STEREO) switches to the on position*.

(10) **PFL switch:** The PFL (Pre-Fader Listen) switch sends the input channel to the MONITOR OUT and PHONES outputs for monitoring. If any PFL switch is on, the PFL indicator light flashes. *Leave the PFL switch off*.

(11) **Channel fader:** Channel faders are used to adjust the level of the input signal. To minimize noise, set the fader sliders for any unused channels all the way down.

(12) **SEND MASTER AUX1-4:** These knobs adjust the level of the signals output to the AUX1-4 jacks.

(13) **GROUP 1-2 fader and ST switch:** This fader adjusts the level of the signal output to the GROUP OUT 1, 2 jacks. The ST (STEREO) switch sends signals to the STEREO L/R bus via the GROUP 1-2 fader. *Set the ST switch to the off position*.

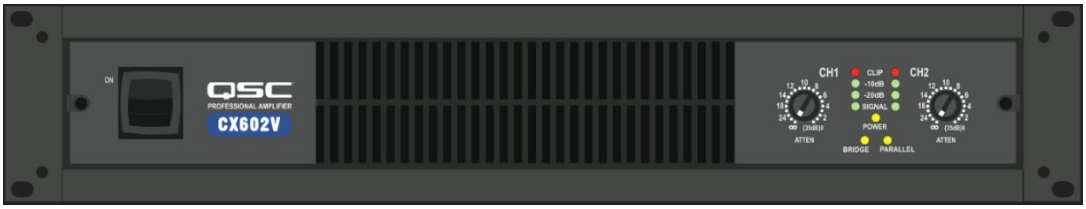
(14) **GROUP 3-4 fader and ST switch:** This fader adjusts the level of the signal output to the GROUP OUT 3, 4 jacks. The ST (STEREO) switch sends signals to the STEREO L/R bus via the GROUP 3-4 fader. *Set the ST switch to the off position*.

(15) **STEREO master fader:** This fader adjusts the level of the signal output to the STEREO OUT jacks.

(16) **Level meter:** The level meter shows the level of the signal in the STEREO L/R, GROUP 1-2, and GROUP 3-4 buses. The level meter PEAK indicator lights when output reaches the clipping level.

POWER AMPLIFIERS

27. **QSC CX602V:** The CX602V is a 2-channel, 600-watt power amplifier. Each amplifier comes either pre-installed in the audio headend rack or in its own shipping case.



28. **How to Set Up the QSC CX602V:** After all the connections have been made using the wiring diagrams provided WHQ Broadcasting Department, use the ON switch located on the front panel to power on each amplifier. The output level for each channel is adjusted using the potentiometer on the front right of the amplifier. Never lower the level below 14, as this could negatively affect the output. If levels below 14 are required, make the adjustments to the output of the DSP. Channels 1 and 2 are clearly marked.

29. **Crown CDI 2000:** The CDI 2000 is a two-channel, 800-watt power amplifier. Each amplifier comes either pre-installed in the audio headend rack or in its own shipping case.

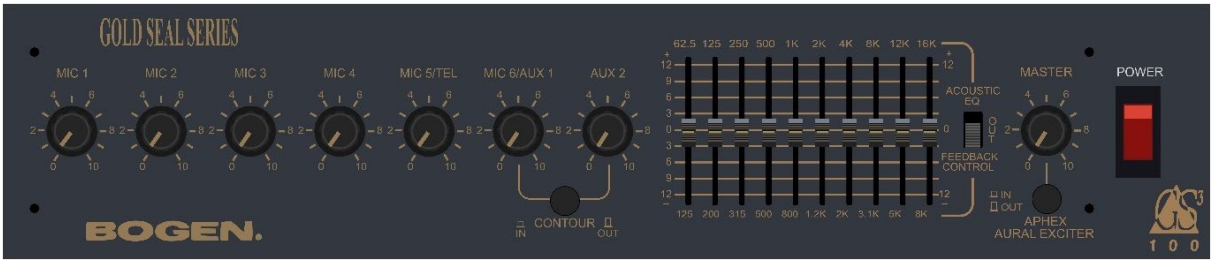
30. **How to Set Up the Crown CDI 2000:** After all the connections have been made using the wiring diagrams provided by the WHQ Broadcasting Department, use the POWER button located on the front panel to power on each amplifier. The output level for each channel is adjusted using the potentiometer on the front right of the amplifier.

31. If the front LCD screen does not display DUAL CH, contact the WHQ Broadcasting Department.

32. If, while adjusting the level on the amplifiers during setup the red “Clip” LEDs are constantly flashing, lower the potentiometer to reduce the load on the amplifiers.

33. When installed in the A&H audio system headend, the rear of the amplifiers is not directly accessible. Use the panel installed on the rear of the headend to make input and output connections to the amplifiers.

34. **Bogen GS3-100:** These mixers/amplifiers are often used for smaller breakout rooms.



35. **How to Set Up the Bogen GS3-100:** Follow the connections shown below. Use the POWER switch located on the front panel to turn it on.

36. **How to Operate the Bogen GS3-100:** Make sure the master knob is turned up. Raise and lower the knob for the corresponding microphone or media input in order to send the audio over the loudspeakers.

SPEAKERS

37. There are a number of speaker systems that may be sent to a rented venue or Assembly Hall for events. Consult this document on how to safely set up and wire any speakers the WHQ Broadcasting Department provides.

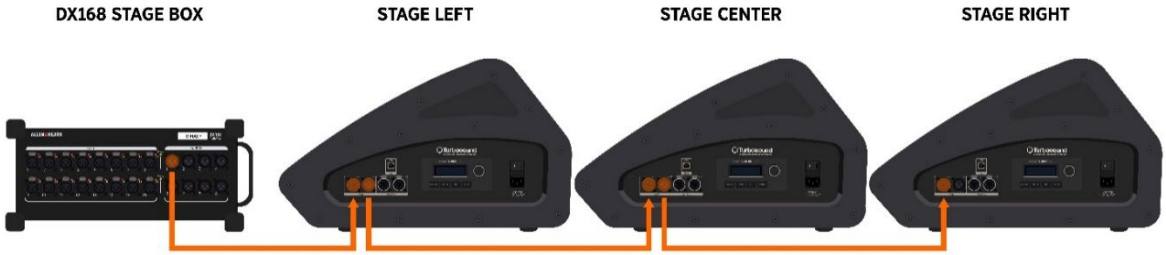
38. **Turbosound TFX122M-AN:** The TFX122M-AN is a powered coaxial 1100 W two-way 12 in. stage monitor with a built-in DSP. This speaker is used on stage to help participants hear themselves, as well as the videos and each other during demonstrations or interviews.

39. **How to Set Up the Turbosound TFX122M-AN:**

(1) Place the stage monitors on the stage. Plug in power with the provided IEC cables to the provided 25 ft tri-tap extension cord, then connect to the stage remote power box.

(2) Connect the provided XLR cable from the A&H DX168 stage box “OUTPUT 1” to the audio “INPUT” on the first stage monitor.

(3) To add the additional stage monitors, connect the provided XLR cable from the first stage monitor “LINK” to the audio “INPUT” of the next stage monitor in series.



(4) Audio levels for the stage monitors are controlled by the A&H AHM32. All controls on stage monitors are locked.

40. **Electro-Voice SX80T:** The SX80T is a 175-watt passive, compact, two-way speaker used for sound reinforcement in venues where the house sound is insufficient. It is a 70-volt speaker typically used to cover small seating areas and can be accompanied by tripods for mounting in the seating areas. These speakers are also used backstage to allow participants to hear the program.

41. **SHOW SPK08FT:** The SPK08FT is a similar form factor as the SX80T and can be used in place of it in designs. These speakers can be accompanied by tripods for mounting in seating areas and may be used backstage for participants.

42. **How to Set Up the Electro-Voice SX80T and SHOW SPK08FT:** Follow these instructions to set up the SX80T and SPK08FT speakers.

(1) Set up the tripod according to directions in the Speaker Lifts and Tripods section of this addendum.

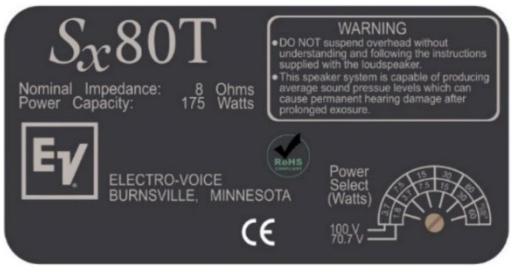
(2) Attach the mount to the top of the tripod using the provided thumb screw. Only hand-tighten the thumb screw to secure the mount.

(3) Loosen the nut on the vertical part of the L-bracket. Using the middle hole on the speaker bracket, attach the speaker to the mount.

(4) Securely tighten the nut to hold the speaker in place.

(5) If adding a second speaker, repeat the same process on the other side of the mount.

(6) Wire the speakers according to the drawings for the venue and tap the speaker to the specified wattage, ensuring to set the wattage according to the 70.7 V portion of the chart. It is recommended to use a #6 fork spade connector for these connections.



(7) Tilt and aim each speaker according to the drawing set provided by the WHQ Broadcasting Department. Adjust the way the speakers attach to the mount as needed. The images below show examples of some of the ways the speakers could be mounted and aimed.

(8) Use an inclinometer (or angle gauge) to set the speakers to the specified angle by loosening the vertical nut enough to tilt the speaker. Tighten the nut again to secure the angle in place. Aim the speakers in the direction specified on the drawing set.

(9) Raise the speakers to the specified height for optimal sound coverage and secure the wiring to the tripod.

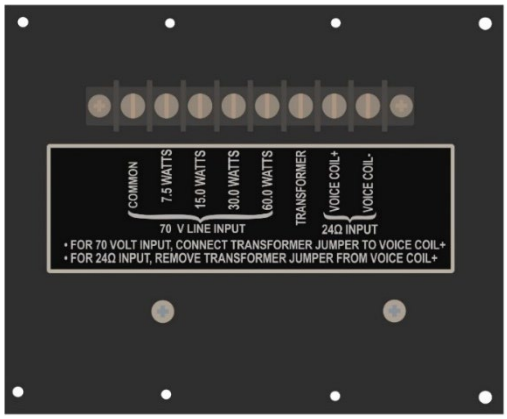
43. For details on mounting the SX80T on the same mount as the SX100+, refer to the section How to Set Up the Electro-Voice SX100+ and SX80T with the Quad Mount and Adapter.

44. **How to Set Up Speakers on Posts:** Occasionally, SX80T and SPK08FT speakers may need to be attached to posts to accommodate audio coverage in seating areas where tripods will not fit. Since every venue is different, these principles will help when constructing a means of mounting these speakers. Speakers should be safely mounted 8 ft above the floor. This may mean attaching and wiring the speakers while the mount is on the ground and using multiple people to lift and secure it into place. Avoid creating trip hazards for those attending, and make sure not to cause any damage to the venue.

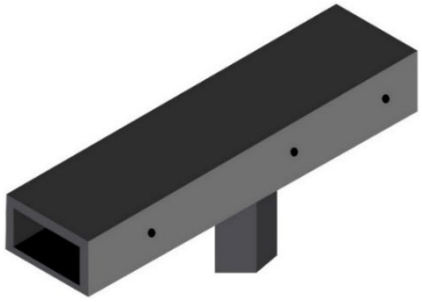
45. **Electro-Voice SX100+:** The SX100+ is a 200-watt, passive, two-way speaker used in venues where the house sound is not adequate. They are used to cover larger areas than the SX80T and are accompanied by a lift for mounting.

46. The SX100+ is an 8-ohm speaker and requires a separate transformer to be wired to the 70 V audio system provided. Connect the provided cables to the speaker and wire the

transformer according to the “Audio System Wiring Diagram” for your venue. Tap the speakers by connecting the wires to the correct transformer terminals.

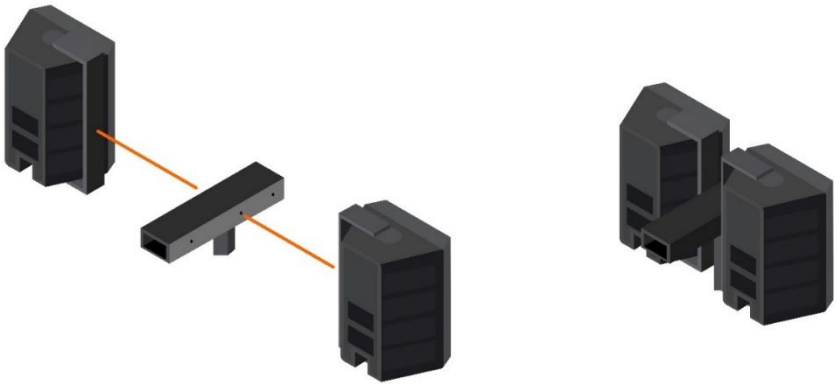


47. **How to Set Up the Electro-Voice SX100+ with the Quad Mount and Adapter:** Follow these instructions to set up two SX100+ speakers on the quad mount.

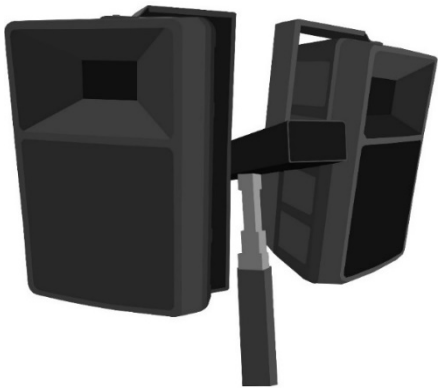


(1) Set up the appropriate equipment lift according to directions in the Speaker Lifts and Tripods section of this addendum.

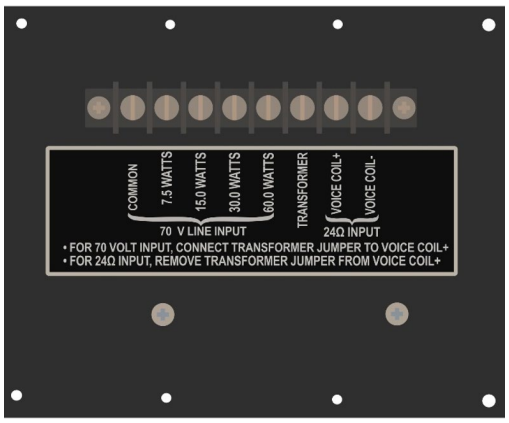
(2) SX100+ speakers must always be mounted in pairs for proper balance when using this style of mount. Using the middle hole on the SX100+ bracket, attach the speakers to the middle hole on the quad mount and securely tighten the bolt to hold the speakers in place.



(3) Carefully lift the mount with the attached speakers onto the top of the equipment lift.



(4) Wire the speakers with the provided transformer according to the drawings for the venue. Tap the speakers according to the drawing provided by connecting wires to the correct transformer terminals. It is recommended to use a #8 fork spade connector for these connections.



(5) Use an inclinometer (or angle gauge) to set the speakers to the specified angle by loosening the bolt enough to tilt the speaker. Tighten the bolt again to secure the angle in place. Aim the speaker in the direction specified on the drawing set.

(6) Following the instructions in the Speaker Lifts and Tripods section, raise the equipment lift to the appropriate height. It may be required to raise and lower the lift multiple times to ensure the speakers are aimed in the correct direction.

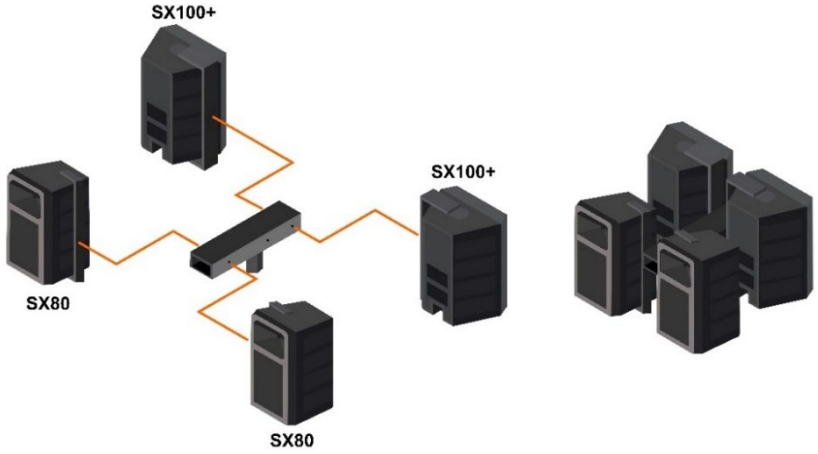
(7) For safety, install a barrier around the equipment lift base. Four panels can be constructed of 2 in. x 4 in. lumber and pegboard or similar material.

48. **How to Set Up the Electro-Voice SX100+ and SX80T with the Quad Mount and Adapter:** Follow the instructions below to set up two SX100+ speakers and two SX80T speakers on the quad mount.

(1) Set up the appropriate equipment lift according to directions in the Speaker Lifts and Tripods section of this addendum.

(2) SX100+ speakers must always be mounted in pairs for proper balance when using this style of mount. Using the middle hole on the SX100+ bracket, attach the speakers to the end hole on the quad mount and securely tighten the bolt to hold the speakers in place. SX80T speakers must also always be mounted in pairs for proper balance when using this style of mount. Using the middle hole on the SX80T bracket, attach

the speakers to the other end hole on the quad mount and securely tighten the bolt to hold the speakers in place.



(3) Carefully lift the mount with the attached speakers onto the top of the equipment lift.

(4) Wire the speakers according to the drawings for the venue.

(5) Use an inclinometer (or angle gauge) to set the speakers to the specified angle by loosening the bolt enough to tilt the speaker. Tighten the bolt again to secure the angle in place. Aim the speakers in the direction specified on the drawing set.

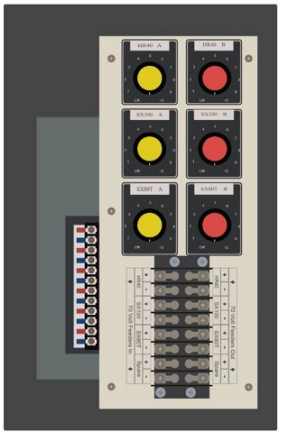
(6) Following the instructions in the Speaker Lifts and Tripods section, raise the equipment lift to the appropriate height. It may be required to raise and lower the lift multiple times to ensure the speakers are aimed in the correct direction.

(7) For safety, install a barrier around the equipment lift base. Four panels can be constructed of 2 in. x 4 in. lumber and pegboard or similar material.

49. **Electro-Voice HR40 Horn:** The HR40 horn is a lightweight, fiberglass, high-frequency horn. With the installed DH2T driver, it can be used in combination with other speakers to achieve full audio coverage in a venue. DSP outputs used to drive the HR40 horn will include crossover blocks to limit the frequency used by the horn. Only outputs configured for HR40 horns should be used.

50. **Crossbow System:** The Crossbow speaker system is a collection of equipment used for sound reinforcement when a house system is absent or inadequate. It is comprised of two SX100+ speakers, two SX80T speakers, two HR40 horns and drivers, all hanging hardware, and one wiring box. The equipment lift is used to suspend the speakers is included separately. Always attach all speakers to the equipment lift in pairs when using the Crossbow system, even if the speakers are not wired up in the design. Failing to use all speakers can result in the equipment lift being off balance and is a safety hazard.

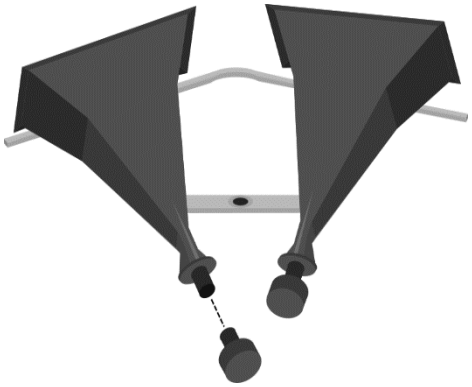
51. The wiring box included with the Crossbow system features rotary-select tapped transformers to independently set volume levels on each of the six speakers mounted to the equipment lift. Connectivity between the wiring box and speakers is provided via 20 ft cables, uniquely terminated so each speaker type is properly phased.



52. **How to Set Up the Crossbow System:**

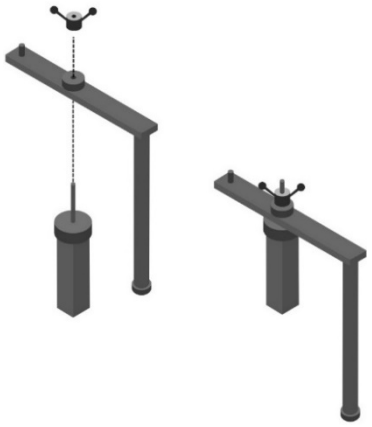
(1) Safely move the wooden crates containing the Crossbow system and equipment lift to the location shown on the provided drawings. Set up the equipment lift according to directions in the Speaker Lifts and Tripods section of this addendum.

(2) Locate the HR40 horns and drivers. Carefully screw the DH2T driver into the horn adapter. Use caution to avoid cross threading.



53. **Crossbow with SX80T:**

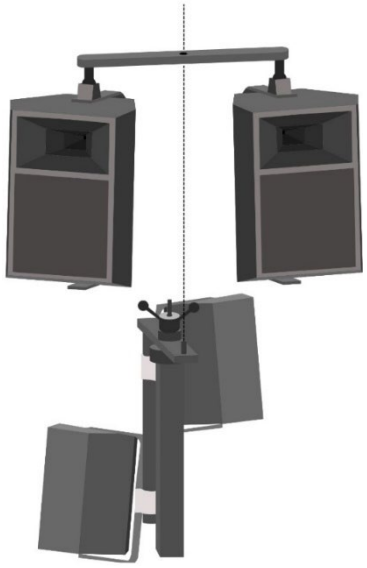
(1) Install the SX80T L-bracket onto the threaded portion at the top of the equipment lift. Temporarily replace the large wingnut on top and hand-tighten it to hold the L-bracket in place.



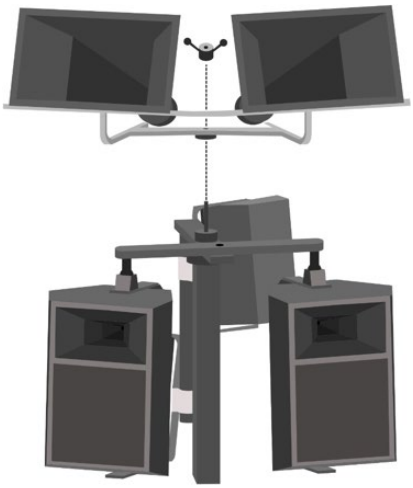
(2) Connect both SX80T speakers to the tube on the L-bracket using the attached C-clamps. Hand-tighten the clamps only.

(3) The yoke for the SX100+ will already have the speakers attached. Loosen the ball joint attached to the C-bracket for easier installation. Align the hole in the center of the yoke with the front alignment pin of the SX80T bracket and lower it into place.

(4) Use the attached cotter pin to secure the brackets together. Remove the large wingnut when speakers are secured to add the horn assembly.

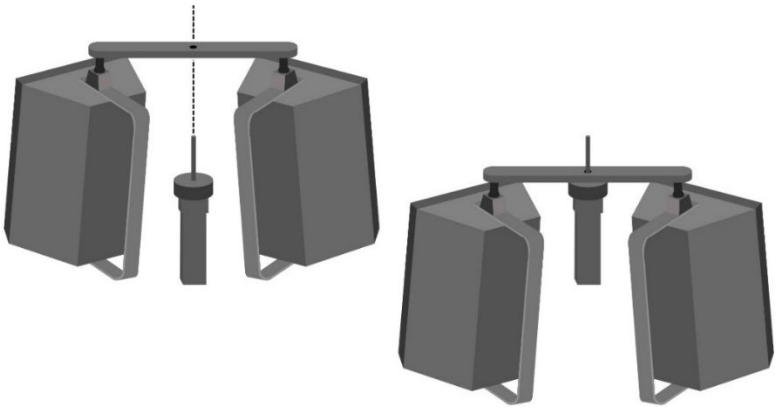


(5) Install the horn assembly onto the threaded portion of the tower adapter and lower it into place. Replace the large wingnut and hand-tighten it snugly.



54. **Crossbow without SX80Ts:**

(1) The yoke for the SX100+ will align with the threaded portion of the equipment lift adapter, as shown below.

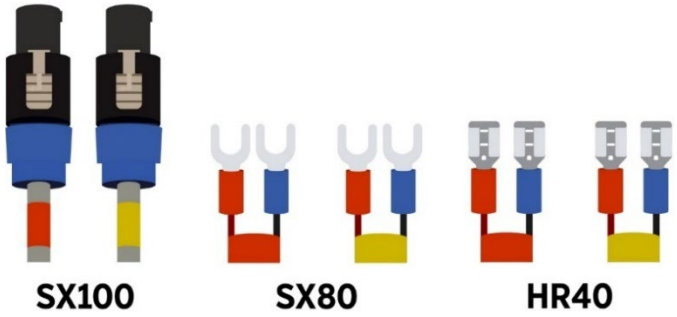


(2) Install the horn assembly onto the threaded portion of the equipment lift adapter and lower it into place. Replace the large wingnut and hand-tighten it snugly.

55. **Aiming and Wiring the Crossbow System:**

(1) Aim the horns and loudspeakers according to the drawings provided by the WHQ Broadcasting Department.

(2) Connect all cables from the wiring box to the speakers, observing the color codes and connectors on both cables and speakers.



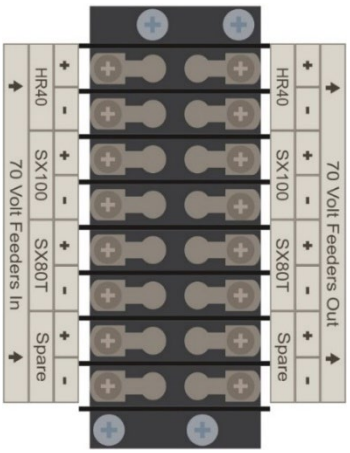
(3) Using Velcro or a zip tie, secure the wires only at the top of the equipment lift.

(4) Set all volume control knobs to “8” on the wiring box.

(5) Following the instructions in the Speaker Lifts and Tripods section, raise the tower to the appropriate height.

(6) Secure speaker wires at the base of the equipment lift with Velcro or a zip tie to ensure the cables are neat.

(7) Wire the Crossbow wiring box to the zones shown on the “Audio System Wiring Diagram” provided for your venue. It is recommended to use a #8 fork spade connector for these types of connections.



(8) Follow these steps in reverse to take down and pack the Crossbow system at the end of the convention. Refer to the instructions in the Speaker Lifts and Tripods section for lowering the equipment lift.

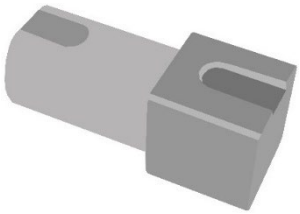
56. **TOA HX-7B Speaker Array:** The HX-7B speaker array is a compact two-way speaker mainly used at flat floor venues with no house coverage. These can either be supported from the ground with the provided equipment lift or suspended overhead with cabling. You must obtain approval from the WHQ Broadcasting Department before flying these speakers overhead. Refer to all documentation when you set up these speakers, as the angle at which they are connected together and the angle at which they are mounted can vary. For the

HX-7B array, WHQ Broadcasting Department will provide a special set of speaker equalization (EQ) settings in the premade DSP file.

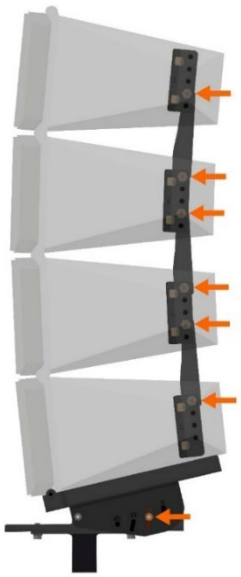
57. **How to Set Up the TOA HX-7B Speaker Array:** Follow these instructions to set up the speaker array.

(1) Safely move the wooden crates containing the speaker array and equipment lift to the location shown on the provided drawings. Set up the equipment lift according to directions in the Speaker Lifts and Tripods section of this addendum.

(2) Insert the metal adapter into the top of the lift and tighten snugly with an Allen wrench (hex key).



(3) Confirm the angle setting bolt and the rear bracket are set as depicted in the image below.



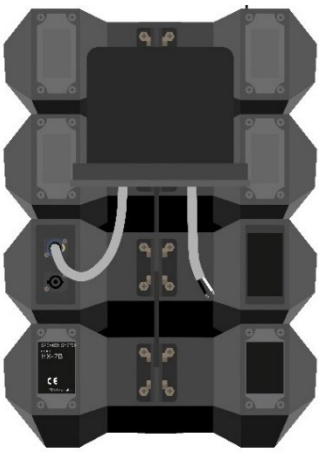
(4) Safely mount the speaker array onto the equipment lift and hand-tighten the wingnut. Be careful not to overtighten.

(5) Loosen, but do not remove, the angle setting bolt. Using an inclinometer (or angle gauge), set the angle of the top speaker according to the “Speaker Direction and

Mounting Angle Plan" drawing of the venue's drawing set. Tighten the angle setting bolt to secure the speaker array at the correct angle.

(6) Open the MT-200 transformer and tap to the wattage specified on the "Speaker Wiring Plan" drawing of the venue's drawing set.

(7) Mount the transformer to the mounting plate on the back of the speaker. Connect the speakON connector to one of the speakON ports on the rear of the speaker array. Using wire nuts, connect the speaker zone wires to the black and white cables coming from the transformer.



(8) Using Velcro or a zip tie, secure the wires only at the top of the equipment lift.

(9) Following the instructions in the Speaker Lifts and Tripods section, raise the tower to the height shown on the "Speaker Direction and Mounting Angle Plan" drawing of the venue's drawing set.

(10) Secure speaker wires at the base of the equipment lift with Velcro or a zip tie to ensure the cables are neat.

(11) Follow these steps in reverse to take down and pack the speaker array at the end of the convention. Refer to the instructions in the Speaker Lifts and Tripods section for lowering the equipment lift.

SPEAKER LIFTS AND TRIPODS

58. The United States branch convention fleet uses a variety of speaker lifts and tripods. Refer to the shipping information sent to each venue to determine which speaker lifts and tripods were received. Always use at least two people when setting up tripods and equipment lifts. Refrain from overtightening bolts and only use tools when necessary.

59. **Atlas SS-70X:** The SS-70X is a small form-factor speaker tripod with a 100 lb capacity. This tripod is used interchangeably with the Yiton 59300 speaker tripod. With the enclosed brackets, it is most commonly used in conjunction with SX80T and SPK08FT speakers.

Some locations will receive 10 lb sandbags provided by the WHQ Broadcasting Department. If this is the case, each tripod will receive three sandbags.

60. **How to Set Up the Atlas SS-70X:** Follow these instructions to deploy the SS-70X tripod.

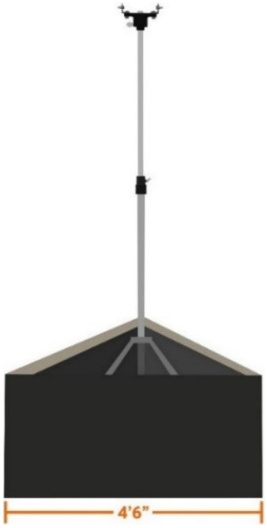
(1) Set up the tripod in its designated location. Extend the legs, ensuring they are evenly spread out. Hand-tighten the thumbscrew.

(2) Make sure each leg spreader is completely horizontal.

(3) Add a 10 lb sandbag to each leg spreader for stability.

(4) Once speakers are mounted to the tripod, extend the tripod to the specified height indicated on the drawing set.

(5) For safety, install a barrier around the tripod base. Three panels measuring 4 ft 6 in. long can be constructed of 2 in. x 4 in. lumber and pegboard or similar material.



61. **Yiton 59300:** The Yiton 59300 is a small form-factor speaker tripod with a 100 lb capacity. This tripod is used interchangeably with the Atlas SS-70X speaker tripod. With the enclosed brackets, it is most commonly used in conjunction with SX80T and SPK08FT speakers. Some locations will receive 10 lb sandbags provided by the WHQ Broadcasting Department. If this is the case, each tripod will receive three sandbags.

62. **How to Set Up the Yiton 59300:** Follow the instructions below to deploy the Yiton 59300 tripod.

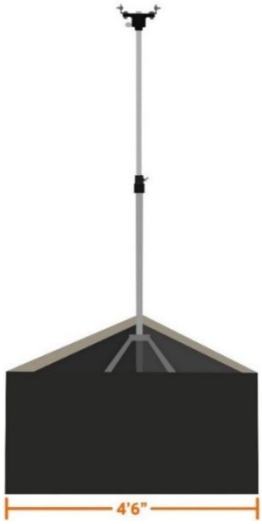
(1) Set up the tripod in its designated location by extending its legs and ensuring they are evenly spread out. Hand-tighten the thumbscrew.

(2) Make sure each leg spreader is completely horizontal.

(3) Add a 10 lb sandbag to each leg spreader for stability.

(4) Once speakers are mounted to the tripod, extend the tripod to the specified height indicated on the drawing set.

(5) For safety, install a barrier around the tripod base. Three panels measuring 4 ft 6 in. long can be constructed of 2 in. x 4 in. lumber and pegboard or similar material.



63. **Penn TE-064:** The TE-064 is a medium form factor equipment lift with a 250 lb capacity and a maximum height of 17.5 ft. These equipment lifts are used primarily to lift SX100+ speakers and TOA HX-7B speaker arrays.

64. **How to Set Up the Penn TE-064:** Follow these instructions to deploy the TE-064 equipment lift.

(1) Wheel the equipment lift to the location shown on the drawings provided by the WHQ Broadcasting Department.

(2) Pull out the legs and secure them to the base using the included pins.

(3) Use a torpedo level to ensure the vertical mast is perfectly vertical and the weight of the lift is spread equally between the legs. Use the crank at the end of each leg to assist with leveling. All four wheels of the lift should be slightly off the floor.

(4) For safety, install a barrier around the equipment lift base. Four panels that measure 5 ft 6 in. long can be constructed of 2 in. x 4 in. lumber and pegboard or similar material.

(5) Refer to the corresponding Speakers section for information on loading the lift.

65. **Raising the Lift:** Once the lift has been loaded properly, follow these instructions to raise the load.

(1) Make sure the safety catch located above the crank is moved out of the way. Turn the crank clockwise to raise the sections until the equipment lift is at the desired height.

(2) As the lift rises, make sure the cable winds smoothly on the drum to prevent kinks in the steel cable.

(3) Once the desired height is reached, turn the crank counterclockwise a small amount to release the tension on the steel cable.

66. **Lowering the Lift:** When it is time to lower the lift, follow these instructions.

(1) Turn the crank clockwise a small amount to create some tension on the steel cable. Failing to do so could result in injury.

(2) With tension on the crank, release and hold the lowest safety pin.

(3) Slowly turn the crank in a counterclockwise direction.

(4) When the next highest safety pin reaches its lowest point, and with tension still on the crank, release and hold the next safety pin. Repeat this process until the lift is fully lowered.

67. **Global Truss ST180:** The ST180 is a large form factor equipment lift with a 440 lb capacity and a maximum height of 18 ft. These equipment lifts are used interchangeably with the Penn TE-074 for supporting the Crossbow speaker system.

68. **How to Set Up the Global Truss ST180:** Follow the instructions below to deploy the ST180 equipment lift.

(1) Wheel the equipment lift to the location shown on the drawings provided by the WHQ Broadcasting Department.

(2) Remove the cotter pin and screw bolt from each leg and fully lower. Turn the screw jack counterclockwise to lessen the tension on the screw bolt. Then reinsert the screw bolt and cotter pin.

(3) Use a torpedo level to make sure the vertical mast is perfectly vertical and the weight of the lift is spread equally between the legs. All four wheels of the lift should be slightly off the floor.

(4) For safety, install a barrier around the equipment lift base. Four panels that measure 5 ft 6 in. long can be constructed of 2 in. x 4 in. lumber and pegboard or similar material.

(5) Refer to the corresponding Speakers section for information on loading the lift.

69. **Raising the Lift:** Once the lift has been loaded properly, follow these instructions to raise the load.

(1) With the lift fully lowered, loosen the black plastic stop screws.

(2) Release the highest safety pin by pulling and turning the ring.

(3) Turn the crank in a clockwise direction.

(4) Raise the first section to its full height (five holes will be visible), then lock the safety pin.

(5) Release the next highest safety pin and continue to use the crank to lift it to its full height. When the next five holes are visible, lock the safety pin.

(6) Release the third safety pin and raise the final section until two holes are fully visible. Lock the safety pin and rotate the crank counterclockwise a small amount to release tension on the steel cable.

70. **Lowering the Lift:** When it is time to lower the lift, follow these instructions.

(1) Turn the crank clockwise a small amount to create some tension on the steel cable. Failing to do so could result in injury.

(2) With tension on the crank, release the lowest safety pin. Slowly turn the crank in a counterclockwise direction.

(3) When the next safety pin reaches its lowest position, release and hold the safety pin while maintaining tension on the crank. Repeat this step until the equipment lift is fully lowered.

71. **Penn TE-074:** The TE-074 is a large form factor equipment lift with a 500 lb capacity and a maximum height of 17.5 ft. These equipment lifts are used interchangeably with the Global Truss ST180 to support the Crossbow speaker system.

72. **How to Set Up the Penn TE-074:** Follow these instructions to deploy the TE-074 equipment lift.

(1) Wheel the equipment lift to the location shown on the drawings provided by the WHQ Broadcasting Department.

(2) Pull out the legs and secure them to the base using the included pins.

(3) Use a torpedo level to make sure the vertical mast is perfectly vertical and the weight of the lift is spread equally between the legs. Use the crank at the end of each leg to assist with leveling. All four wheels of the lift should be slightly off the floor.

(4) For safety, install a barrier around the equipment lift base. Four panels that measure 5 ft 6 in. long can be constructed of 2 in. x 4 in. lumber and pegboard or similar material.

(5) Refer to the corresponding Speakers section for information on loading the lift.

73. **Raising the Lift:** Once the lift has been loaded properly, follow these instructions to raise the load.

(1) Make sure the safety catch located above the crank is out of the way. Turn the crank clockwise to raise the lift to the desired height.

(2) As the lift rises, make sure the cable winds smoothly on the drum to prevent kinks in the steel cable.

(3) At the desired height, turn the crank counterclockwise a small amount to release the tension on the steel cable.

74. **Lowering the Lift:** When it is time to lower the lift, follow these instructions.

(1) Turn the crank clockwise a small amount to create some tension on the steel cable. Failing to do so could result in injury.

(2) With tension on the crank, release and hold the lowest safety pin.

(3) Slowly turn the crank in a counterclockwise direction.

(4) When the next highest safety pin reaches its lowest point, and with tension still on the crank, release and hold the next safety pin. Repeat this process until the lift is fully lowered.

75. **Repackaging Equipment Lifts:** In most cases, pallet-sized crates are provided to ship equipment lifts. Remove all mounts from the top of the equipment lifts before loading them in the crates. Mounts are separate items on the WHQ Broadcasting Department packing list and may ship to another location other than where the equipment lifts are shipping to. The only exception to this is Crossbow equipment lifts, since their mounts are permanently attached to the lift with a sleeve pin and should not be removed. Each crate can hold up to four lifts. If possible, try to balance each pallet by loading an equal amount of lifts in each crate. Use the provided ramps to load the lifts into the crate safely. Use the straps attached to the crate to secure the lifts in the crate.

FM TRANSMITTER

76. **Decade MS-100:** The Decade MS-100 is an FM transmitter designed for individuals requiring assistive listening or for those who want to listen to the program on a portable receiver. This transmitter can broadcast on frequencies from 88 MHz to 108 MHz and operates at 250 microvolts. While operating on a clear FM channel, this can cover a radius of approximately 150 ft from the transmitter. This transmitter has a ¼ in. female unbalanced input that accepts line level. This transmitter complies with FCC Part 15. The transmitter's antenna is permanently attached and should be extended to the exact length specified in the manual based on the chosen frequency. The transmitter should be mounted as high as possible, typically on the top of a speaker tripod at many facilities.

77. **How to Set Up the Decade FM Transmitter:** Follow these instructions to set up the Decade FM transmitter.

(1) Place the transmitter in the middle of the section that needs to be covered.

(2) Set dip switches 1-8 on the back to choose the frequency the device will operate on. An open FM frequency, or one that has a distant broadcast on it, should be used.

(3) Rotate the attached antenna so that it is pointing straight up and extend the antenna to the recommended length based on the frequency being used.

(4) Mount the transmitter on a tripod or similar mount to get the transmitter as high as possible.

(5) Refer to the "Audio System Wiring Diagram" to connect the correct DSP output to the ¼ in. input on the back of the transmitter unit.

(6) Plug the power supply into the power connector on the back panel, then plug the power supply into an outlet. This will turn the transmitter on.

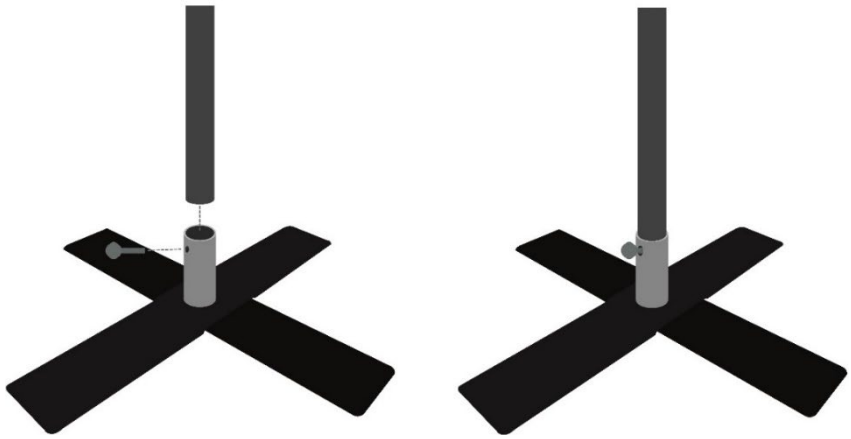
(7) Adjust the level input dial to increase the volume on the FM broadcast. If the overmodulation light is solidly on and not blinking, the level is too high.

78. **Listen FM LT-800-072-01:** The Listen FM LT-800-072-01 is an RF transmitter designed for individuals requiring assistive listening or for those who want to listen to the program on

a portable receiver. This transmitter can broadcast on frequencies from 72 MHz to 75 MHz and operates at 80,000 microvolts, which can cover a radius of approximately 1,000 ft from the transmitter. It has an XLR connector that can accept line level signal from the DSP. This transmitter complies with FCC Part 15. In order to make use of this style of FM transmitter, an FM receiver capable of tuning the 72-76 MHz range is needed. **NOTE:** Many FM receivers are not capable of tuning frequencies below 88 MHz. Models capable of tuning lower frequencies are often described as ADA radio band receivers.

79. **How to Set Up the Listen FM Transmitter:** Follow these instructions to set up the Listen FM transmitter.

(1) Assemble the telescoping pole and base plate according to the illustration below and place the antenna near the closest LED wall. The antenna should be located in the line of sight of the main viewing audience. Place sandbags on the floor mount to ensure the antenna is stable and will not fall over.



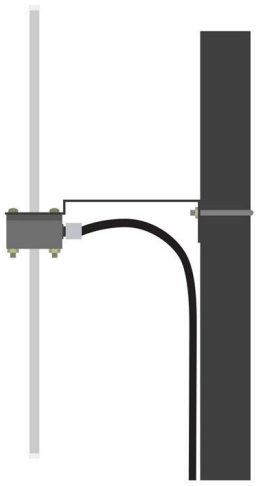
(2) Connect the antenna to the rear of the audio headend with the cable provided.

(3) Mount the antenna to the top of the telescoping pole vertically with the provided U-bolts. Make sure to orient the antenna according to the illustration below.

(4) Extend the antennas to their maximum length.

(5) Extend the telescoping pole so that the center of the antenna is approximately 8 ft off the floor. Use Velcro or a zip tie to secure the coaxial cable at the top of the

telescoping pole. Do not extend the telescoping pole past the indication marks located at the end of each pole section.



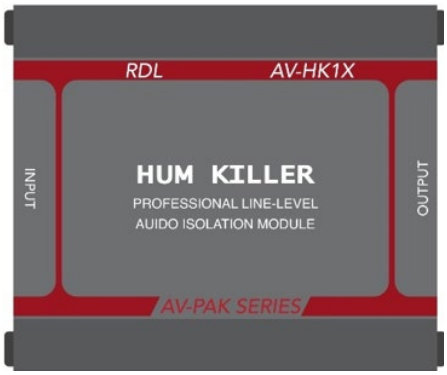
(6) Turn the power on by pressing the power button.

(7) Using the provided handheld FM receiver, search for an open FM frequency or one that has a distant broadcast on it.

(8) Set the transmitter to the channel corresponding to the selected frequency by pressing the CHANNEL SELECT up and down buttons. Set each FM transmitter to different frequencies using the image below.

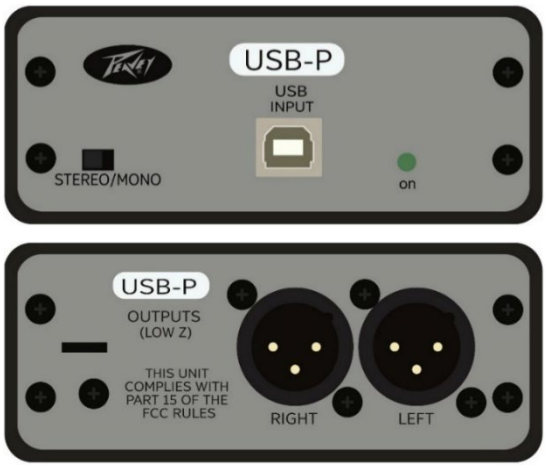
ISOLATION TRANSFORMER

80. **RDL Hum Killer:** Each audio headend includes an isolation transformer that is used any time WHQ Broadcasting Department equipment is connected to any house system. The RDL Hum Killer uses a 3-pin XLR connector on the input and output and should be used even if house inputs are isolated.



USB DIGITAL AUDIO CONVERTER

81. **Peavy USB-P:** Each media player kit includes two Peavy USB-P digital audio converters (DAC). This device takes audio from the computers USB port and converts it into a balanced stereo output. Refer to the “Video System Wiring Diagram” provided for your venue from the WHQ Broadcasting Department for connection instructions. The switch on the front of the device should be set to “STEREO” for proper operation.



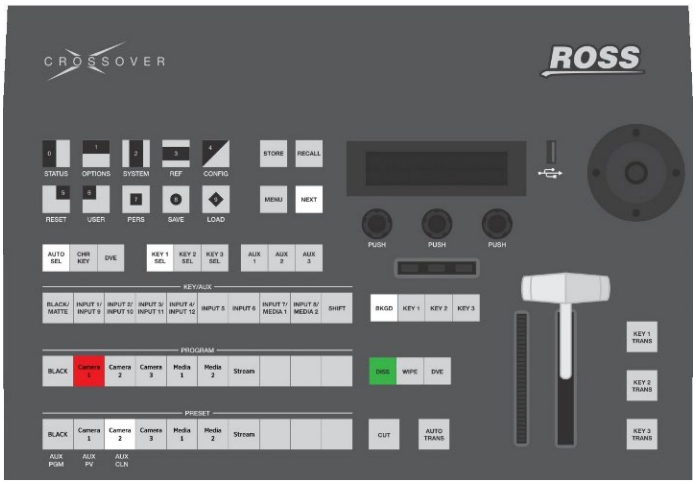
OTHER EQUIPMENT

82. All venues are different; therefore, some venues may receive equipment not included in this document. Consult any documentation included with these pieces of equipment, and contact the WHQ Broadcasting Department with any questions regarding the setup and operation of these pieces of equipment.

CHAPTER 4 VIDEO EQUIPMENT

VIDEO SWITCHERS

1. **Ross Crossover Solo:** The Ross Crossover Solo is a 12-input SDI video switcher most commonly used at events in the United States branch territory. It controls what is shown on the video displays in a venue.



2. The Ross Crossover Solo has four input frame synchronizer channels. By default, they will be assigned to inputs 4 (MEDIA 1), 5 (MEDIA 2), and 6 (STREAM).

3. **How to Set Up the Ross Crossover Video Switcher:**

(1) Remove the switcher from its case and place it on the video desk in front of the multiview monitor.

(2) Using the "Video System Wiring Diagram" provided for your venue from the WHQ Broadcasting Department, connect the inputs, outputs, and sync cables to the switcher.

(3) Connect one power brick to the PS1 port and the other power brick to the PS2 port on the rear of the switcher.

(4) Use the power switch located on the back of the switcher to turn it on. It will take approximately one minute to be fully usable. During this time, the screen may flicker or appear fuzzy. This is normal during start-up.

(5) After the switcher is fully powered on, press the DISS button so that it turns green. This selects dissolve as the type of fade that is applied when the AUTO TRANS button is pressed.

4. **Troubleshooting:** If you encounter problems with the Ross Crossover video switcher, reload the default settings.

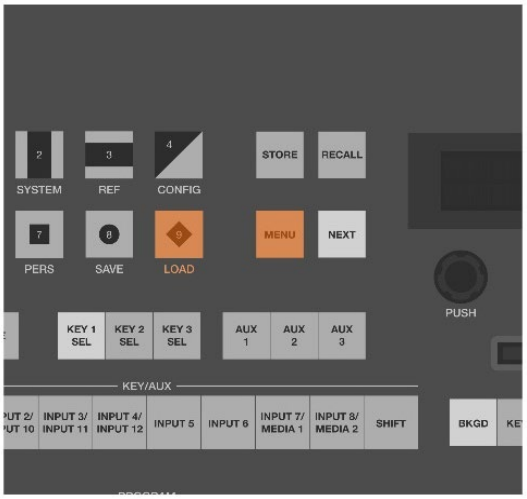
(1) Download and install the files contained in the *Ross_Crossover_Solo_Settings.zip* from *JW Hub*. Follow the instructions below to load the default settings file onto the switcher.

(2) Unzip the contents of the *Ross_Crossover_Solo_Settings.zip* file and copy them to a USB drive.

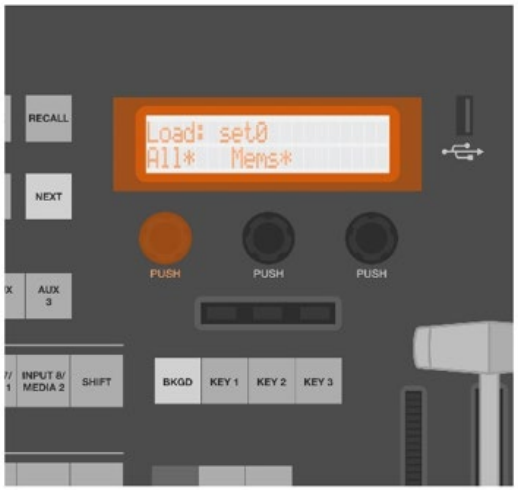
(3) The folder structure of the USB drive must match the diagram below for the switcher to recognize it.

(4) After the switcher is turned on, plug the USB drive into the slot located next to the LCD screen on the front of the switcher. Wait approximately 10 seconds for the switcher to read the USB drive.

(5) Press the “MENU” button, then press the “9 LOAD” button.

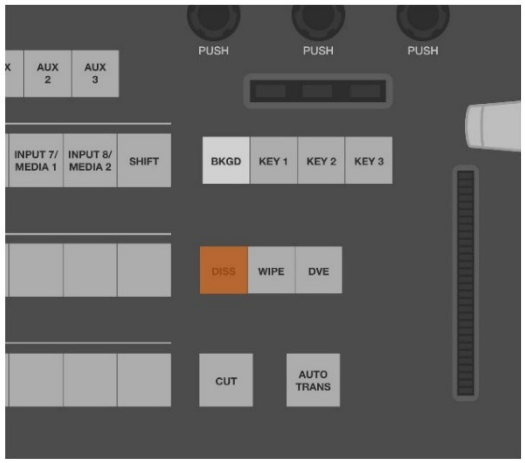


(6) Make sure the LCD screen reads as shown below, then press the left knob.



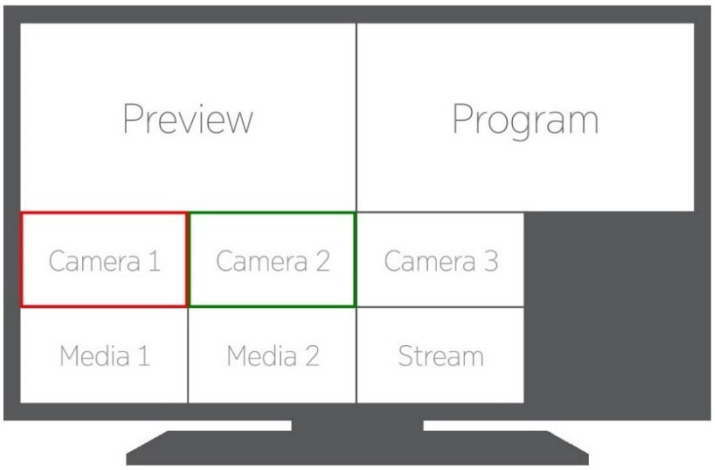
(7) The LCD will display “Load All from set0.” Press the left knob to confirm.

(8) Press the “DISS” button to return the switcher to normal function.

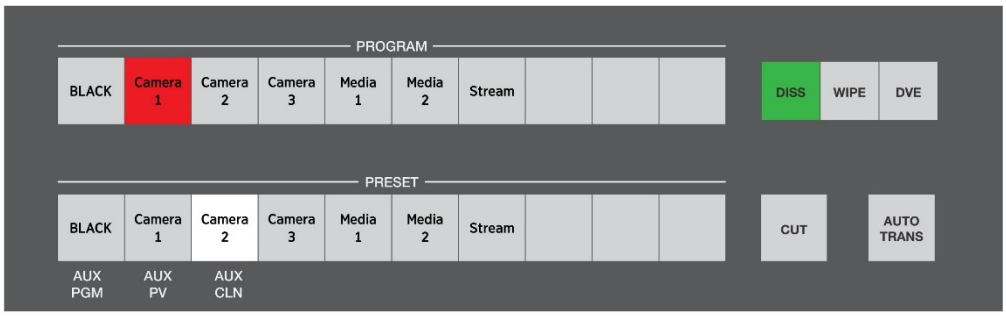


5. **Operating the Ross Crossover Solo:** Understanding the multiview is essential for operating the switcher. The multiview breaks up a single television into smaller displays that show the views from each camera and media source. This allows the operator to easily switch between various sources. Whatever source is shown in the large Program window

on the multiview is the source that the audience can see. Live shots are always represented as red.



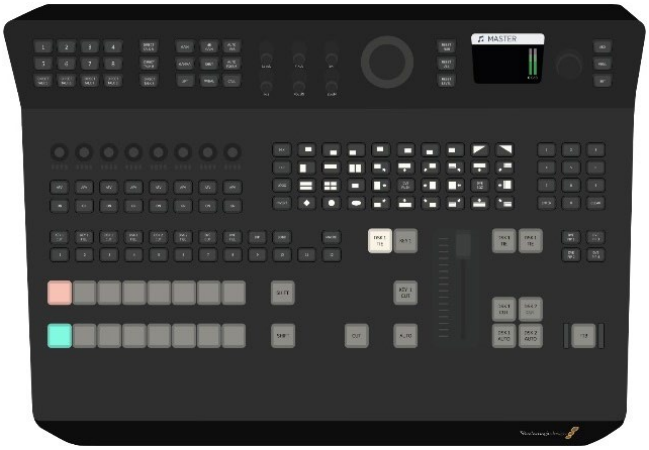
6. The Preview bus is the row of buttons labeled PRESET. The preview buttons cause the selected source to appear in the large preview window on the multiview. This makes it easier to see where camera adjustments are needed. Use the Preview bus at any time to closely examine a shot without it going live.



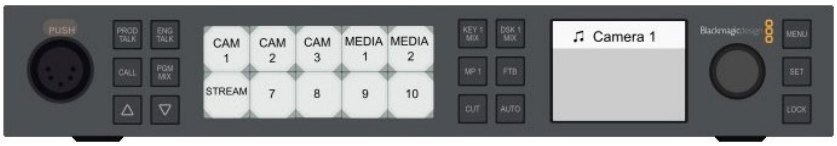
7. The CUT and AUTO TRANS buttons are to the right of the Preview bus. The “CUT” button immediately replaces the live shot with whatever shot is being previewed. No fade effect is applied. The “AUTO TRANS” button stands for automatic transition. This button fades, or transitions slowly, between the shot that is live and the shot being previewed. “CUT” and “AUTO TRANS,” when used in conjunction with the Preview bus, provide a safe way to select the next source needed in a program.

8. **Blackmagic ATEM Television Studio Pro HD/4K:** The Blackmagic ATEM Television Studio Pro 4K is an 8-input SDI video switcher commonly used at events held in the United States branch territory. It controls what is shown on the video displays in a venue. The

Blackmagic ATEM Television Studio Pro HD is a 4-input SDI and 4-input HDMI video switcher and is also used at events held in the United States branch territory.



9. **Blackmagic ATEM Constellation HD:** The Blackmagic ATEM Constellation HD is a 10-input SDI video switcher and is used primarily at events held in Alaska, Hawaii, and the United States branch territory islands.



10. **How to Set Up the Blackmagic ATEM Video Switcher:** Follow these instructions to set up all Blackmagic ATEM video switcher models.

(1) Remove the video switcher from its case and place it on the video desk in front of the multiview monitor.

(2) Using the “Video System Wiring Diagram” provided for your venue from the WHQ Broadcasting Department, connect the inputs and outputs to the switcher.

(3) Connect the power cord to the AC power port on the rear of the switcher.

(4) The switcher will turn on automatically. It will take approximately one minute to be fully usable. This is normal during startup.

(5) **[ATEM Television Studio Pro HD/4K only]** After the switcher is fully powered on, press the “MIX” button so that it turns green. This selects dissolve as the type of fade that is applied when the “AUTO TRANS” button is pressed.

(6) If you encounter problems with the Blackmagic ATEM video switcher, reload the default settings. Download and install the settings files from JW Hub. Follow the instructions below to load the default settings file into the switcher.

(7) Unzip the contents of the settings files and copy them to a USB drive.

(8) Connect the switcher and a computer to the same network switch.

(9) Plug the USB drive into the computer.

(10) Download the ATEM Software Control software from the Blackmagic website. Contact the WHQ Broadcasting Department to determine the correct version needed to proceed with the reloading of the configuration.

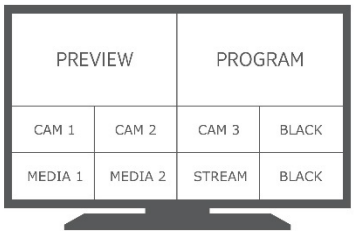
(11) Open ATEM Setup software on the computer.

(12) Go to the menu bar in ATEM Software Control software and select File > Restore. A window will open asking for the file you want to open. Navigate to the file on the USB drive and click Open. You will now see a window containing active checkboxes for your saved settings on each block of your ATEM switcher.

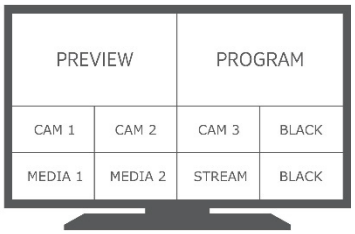
(13) Click Restore.

11. **Operating the Blackmagic ATEM Switcher:** Understanding the multiview is essential for operating the switcher. The multiview breaks up a single television into smaller displays that show the views from each camera and media source. This allows the operator to easily switch between various sources. Whatever source is shown in the large PROGRAM window on the multiview is the source that the audience sees. Live shots are always represented as red.

ATEM Television Studio Pro HD



ATEM Television Studio Pro 4K

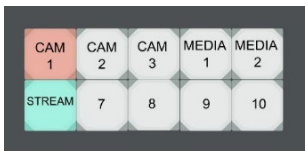


ATEM Constellation HD

12. The Preview bus is the bottom row of buttons. The preview buttons cause the selected source to appear in the large preview window on the multiview. This makes it easier to see where camera adjustments are needed. Use the Preview bus at any time to closely examine a shot without it going live.

ATEM Television Studio Pro 4K

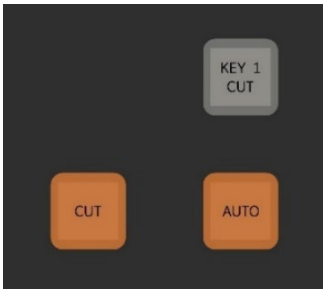
ATEM Television Studio Pro HD



ATEM Constellation HD

13. The AUTO and CUT buttons are to the right of the Preview bus. The CUT button immediately replaces the live shot with the shot that is being previewed. No fade effect is applied. The AUTO button stands for automatic transition. This button fades, or transitions slowly, between the shot that is live and the shot being previewed. AUTO and CUT, when used in

conjunction with the Preview bus, provides a safe way to select the next source needed in a program.

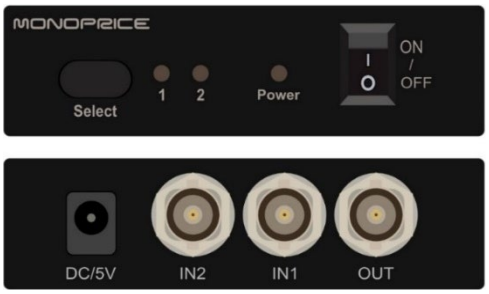


ATEM Television Studio Pro HD/4K

ATEM Constellation HD

14. **[ATEM Television Studio Pro HD/4K only]:** The output to the confidence monitor can be changed by using macros on the switcher. Pressing the “MACRO” button and then pressing number “11” will show the “Preview” window on the confidence monitor. Pressing the “MACRO” button and then pressing number “12” will show the “Program” window on the confidence monitor.

15. **Monoprice A/B Switch:** This A/B switch is used to switch the view of the onstage confidence monitor between program output and multiview. Use the Select button to send multiview to the confidence monitor during walk-throughs, and switch it back to use during the program. Refer to the “Video System Wiring Diagram” provided to set up the A/B switch.



LIVE BROADCAST LAPTOP

16. **HP Laptop:** A laptop with two SDI to USB video capture cards and four USB cables (a combination of USB-A and USB-C ends) are provided to stream the convention program to homebound publishers. The second video capture card serves as a backup.

17. **How to Set Up the Live Broadcast Laptop:** Follow these instructions and refer to the "Video System Wiring Diagram" provided to set up the live broadcast laptop.

(1) Place the laptop on a desk near the video desk and plug the power adapter into the HP laptop and then into a power outlet.

(2) Connect an SDI cable carrying the convention program, along with embedded audio into the USB capture card.

(3) Connect one of the provided USB cables into the video capture card.

(4) Connect the other end of the USB cable into the laptop.

(5) Turn on the laptop. Confirm the video capture card is receiving signal and power by checking the LED status lights on the device.

(6) Confirm the laptop is connected to the internet, preferably using a wired connection.

MEDIA PLAYERS

18. **HP Laptop:** Media is played using HP laptops running *JW Library*. Two identical laptops are provided for redundant operation. In the event that *JW Library* does not function properly on both laptops, use the pre-installed backup media playback software VLC Media Player.

19. **How to Set Up the HP Laptops:** Follow these instructions and refer to the "Video System Wiring Diagram" provided to set up the HP laptops.

(1) Place the media player laptop on the video desk and plug the power adapter into the HP laptop and then into a power outlet.

(2) Connect the HDMI video cable to the HDMI ports on the converter and the laptop.

(3) Connect the USB-micro B power cable to the USB power port on the converter. Then connect the cable to the USB port next to the HDMI port on the laptop.

(4) Use an SDI cable to connect the micro converter to the video switcher, typically inputs 4 and 5.

(5) Connect the Peavey USB-P to the laptop using the USB-A to USB-B cable.

(6) Ensure the stereo/mono switch on the USB-P is set to STEREO.

(7) Use the left and right XLR outputs to connect the USB-P to the audio headend.

(8) Turn on the computer. It will log in automatically and run a script that will apply the correct system settings.

(9) When the computer is on, confirm that all devices are receiving power. A white light will illuminate next to the USB power port on the micro converter and a green "On" light will illuminate on the USB-P.

20. **Live Stream Event:** For the regional convention venues that have been specifically invited to tie-in to view the live or recorded event from a special or international location, follow the instructions below.

(1) Confirm the laptop is connected to the internet, preferably using a wired connection.

(2) Open the Microsoft Edge browser.

(3) In the browser's address bar, type "https://hub.jw.org" and press the Enter key.

(4) Click the link for JW Stream.

(5) Access the live or delayed event on *JW Stream*.

VIDEO CABLE SPOOLS

21. Not all sites will receive cable spools. Three cable spools will be provided to make all the needed connections from each camera to the video system. Each spool contains a 150 ft bundle and consists of two SDI, one network, and one XLR cable. Each cable is labeled and color-coded on each end. All video cable spools should be located backstage near the video switcher system and the audio headend, with the other ends going to each camera at the front of the stage.

22. **Set Up the Video Cable Spools.** Follow these steps to set up the video cable spools.

(1) Open the rolling crate lid and set it aside. Designate each spool for the three cameras in front of the stage. Lock the wheels in place and unlock the brake on the cable spool.

(2) While leaving the spool near the video switcher system, begin to carefully unspool the cable until it is long enough to reach the designated camera. Avoid walking paths when possible, and make use of cable protectors when needed.

(3) Make the connections at each camera. Connect cable “CH1” (blue) to the SDI connector on the back of the camera labeled “SDI Out”; cable “CH2” (green) to the SDI connector on the back of the camera labeled “Genlock In” or “G/L In.” If you received a manned camera, connect “CH3” (orange) to the Telex belt pack. If you received a PTZ camera, connect “CH4” (yellow) to the RJ45 jack on the back of the camera labeled RS-422.

(4) Unspool the 9 ft whip on the side of the cable spool. On the back of the video switcher, connect the stage right camera “CH1” (blue) to the “SDI IN 1” connection; the center camera or PTZ “CH1” (blue) to the “SDI IN 2” connection; the stage left camera “CH1” (blue) to the “SDI IN 3” connection. Connect all of the “CH2” (green) cables to the “REF OUT” 1-3. For any manned cameras, connect the “CH3” (orange) XLR cable to any of the intercom XLR connections on the back of the audio headend. For any PTZ cameras, connect the “CH4” (yellow) RJ45 connector to the back of the PTZ controller labeled “To Pan/Tilt Head” jacks 1-3.

(5) After the program has concluded, disconnect all cables and neatly roll them onto the spool. Take care to wipe down the cable as it is rolled up. Use the provided Velcro and rubber twist tie to secure the cable spool and whip from unspooling.

CAMERAS AND CONTROLLERS

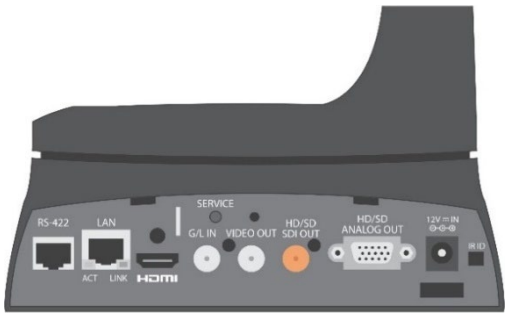
23. Three types of cameras are primarily used in the United States branch territory: the Panasonic AW-HE120 pan/tilt/zoom (PTZ) camera with Panasonic AW-RP50 controller, the Panasonic HPX-250 manned camera, and the VHD V60CL PTZ camera with Bolin KBD-1010-RNV controller. Cameras are typically set up on Manfrotto 536 tripods with Manfrotto 509HD video heads.

24. **Panasonic AW-HE120:** The Panasonic AW-HE120 is a PTZ camera that is controlled by the Panasonic AW-RP50 PTZ controller. At spoken language events, typically one of these cameras will be sent as the main camera for talks. At sign-language events, three of these cameras will be used and the PTZ controller controls all three.

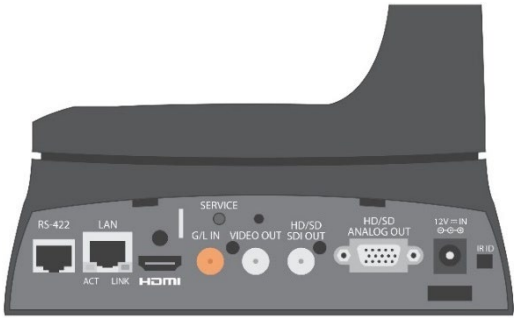
25. **Setting Up the Panasonic AW-HE120:** Carefully remove the camera from its case and mount it on the tripod provided. Follow the instructions below and the provided “Video System Wiring Diagram” to set up the camera(s).

(1) Mount the camera on the tripod by sliding the attached plate on the bottom of the camera into the matching grooves on top of the tripod head until it clicks into place. Tighten the locking knob to secure the camera. The location of each camera is noted in the section Stage Layout.

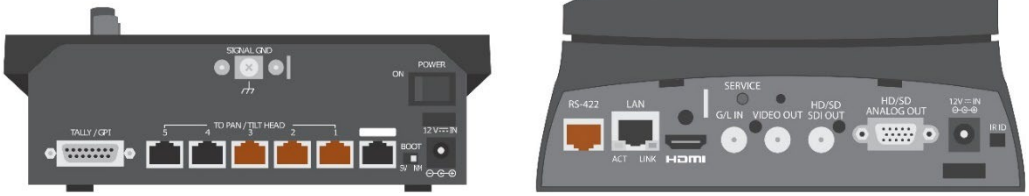
(2) Connect an SDI cable from the HD/SD SDI OUT port on the rear of the camera to the video switcher.



(3) Connect an SDI cable from the Ross switcher “REF OUT2” to the G/L IN port on the rear of the camera.



(4) Connect a CAT5e cable from the RS-422 port on the camera to the camera controller starting with Port 1 for one camera, and Port 1 through Port 3 for three cameras.



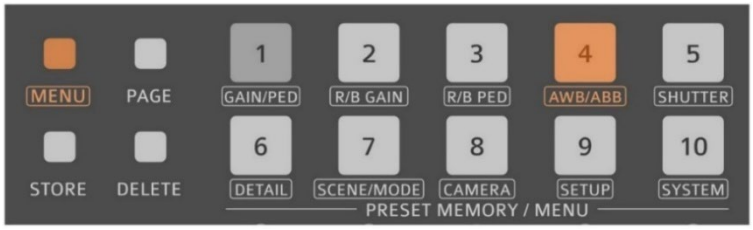
(5) Connect the DC power brick to the 12V IN port on the rear of the camera.

26. **Panasonic AW-RP50:** The Panasonic AW-RP50 is a PTZ camera controller capable of controlling multiple Panasonic PTZ cameras remotely. It allows control of all the functions required to operate the camera from the video desk location.

27. **Setting Up the Panasonic AW-RP50:** Remove the camera controller and place it on the video desk so that the operator can clearly see the multiview monitor in order to adjust the cameras. Plug the controller in according to the provided “Video System Wiring Diagram” for your venue.

28. **Panasonic AW-HE120 White Balance:** The Panasonic PTZ needs to be manually calibrated due to variation in lighting at each venue. Make sure the CAT5e cable is connected before you power up the camera and controller as well as ensure the camera is connected to the switcher. Refer to the section Collapsible White-Balance for information on using the white-balancing panel before proceeding. Follow these instructions to calibrate the white balance.

(1) Press the MENU button, and then press the 4 AWB/ABB button.



(2) Turn the F1 knob until AWB MOD: AWB A is displayed on the LCD, and then push the F1 knob. Turn F2 until SET: AWB is displayed on the LCD, and then push the F2 knob.

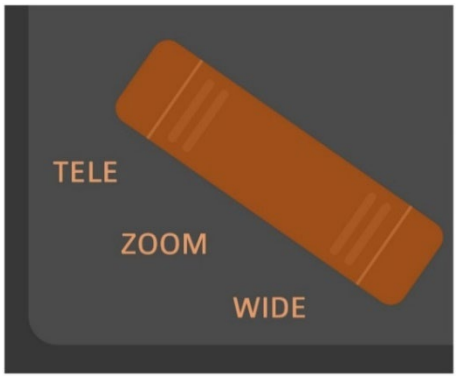
(3) Press the “MENU” button to exit.

29. If absolutely necessary, auto white balance (AWB) can be used at outdoor venues, as the color temperature may shift throughout the day. However, manual white balance is recommended.

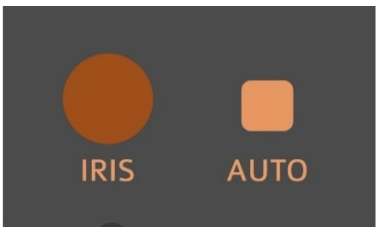
30. **Operating the Panasonic AW-HE120 and AW-RP50:** Only one person is needed to control any of the Panasonic PTZ cameras. The normal functions used are pan and tilt using the joystick, zoom using the rocker, and iris using the knob. Presets can be saved and recalled using the controller. The cameras will also be white-balanced using the controller. Use the “CAMERA SELECTION/STATUS” buttons to select which camera to control when multiple cameras are used.

31. **Joystick:** Use the joystick to move the camera shot. The joystick is pressure sensitive, so the farther it is pushed in a certain direction, the faster the camera will move. For greater control over pan and tilt speed, a dial to the left of the joystick will control the top speed of the camera.

32. **Zoom:** To zoom in and out with the camera, press the rocker switch on the bottom left of the controller. Pressing the rocker to the left, marked “TELE,” makes the camera zoom in closer. Pressing the rocker to the right, marked “WIDE,” makes the camera zoom out to a wider shot.

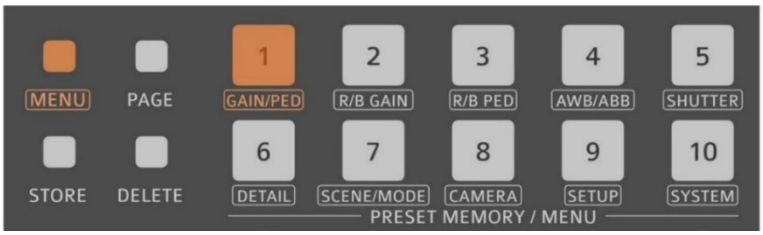


33. **Iris:** Set the iris control to manual mode. To do this, press the “AUTO” button until the light is off. To adjust the iris manually, turn the dial located above the zoom rocker labeled “IRIS.”



34. **Gain:** In some venues, there may not be enough light on the stage to get a bright enough picture, even with the iris all the way open. In this scenario, raise the gain on the camera until it is bright enough to provide a clear picture. However, because gain adds noise to the picture, it is recommended to keep it as low as possible.

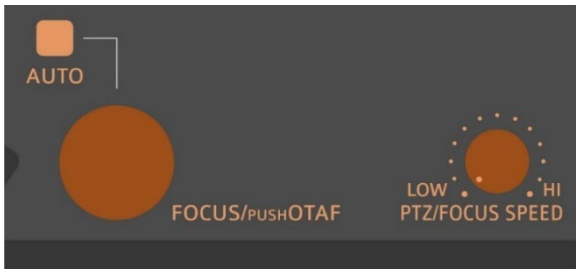
(1) To adjust the gain, press the “MENU” button and then the “1 GAIN/PED” button.



(2) Turn the F1 knob on the PTZ controller to increase the gain.

(3) Press the “MENU” button to exit.

35. **Focus:** Set the camera to auto focus by pressing the “AUTO” button. In most locations, there will be no need to adjust the focus manually. However, if you notice the camera is not finding the correct focus or if it is continually adjusting during the program, you should switch to manual focus for that portion of the program. To adjust the focus manually, press the “AUTO” button so it is off and turn the dial located to the bottom right of the zoom rocker.



36. **Using Presets:** The PTZ Controller can be programmed with preset shots. The reference presets can be used to quickly set the initial framing, which can then be fine-tuned before going live.

37. To program a shot as a preset, follow these steps.

(1) Press the “STORE” button. It will light up in orange.

(2) Use the joystick to move the camera to get the desired shot.

(3) Adjust the iris so the shot is properly exposed.

(4) Hold down one of the numbered preset buttons until the LED screen reads “STORE COMPLETE.” The preset is then saved.

(5) Press the “STORE” button again to leave the setup mode. Repeat this process for as many presets as needed. Illuminated buttons have saved presets.

38. To delete a preset, follow these steps:

(1) Press the “DELETE” button. It will light up in orange.

(2) Press and hold the preset number you wish to delete until you see the message “Delete complete.”

(3) Press the “DELETE” button again to exit the delete menu.

39. **Panasonic HPX-250:** The Panasonic HPX-250 is a fixed-lens, manned camera. Two of these cameras accompany the HE-120 PTZ camera. The camera ships in a case containing most of the cabling needed for setup, an external monitor, and an adjustable Noga arm. Focus/iris and zoom controllers come already attached to the tripod arms.

40. **How to Set Up the Panasonic HPX-250:**

(1) Mount the camera on the tripod by sliding the attached plate on the bottom of the camera into the matching grooves on top of the tripod head until it clicks into place. Tighten the locking knob to secure the camera.

(2) Attach the Noga arm by screwing it into the middle-threaded hole located on top of the camera, then attach the monitor to the other end of the Noga arm.

(3) Connect the monitor power brick to the DC 12V IN port on the back of the monitor.

(4) Plug the included HDMI cable into the HDMI-IN port on the rear of the monitor, and connect it to the HDMI port on the rear of the camera.

(5) Connect the zoom and iris/focus controllers that attach to the tripod arms to the camera using the “CAM REMOTE FOCUS IRIS” and “CAM REMOTE ZOOM S/S” ports located on the back of the camera.

(6) Connect the camera power brick to the camera by inserting the connector into the battery compartment and sliding it down.

(7) Connect an SDI cable from the SDI OUT port to the video switcher. Refer to the provided “Video System Wiring Diagram” for more details.

(8) Connect an SDI cable from the Ross switcher “REF OUT1” and “REF OUT3” to the “GENLOCK IN” port on the rear of the cameras. Gently secure all cabling.

(9) Remove the camera lens cap.

(10) Check that the camera switches are all set to the positions shown below.

41. **Gain:** In some venues, there is not enough light on the stage to get a bright enough picture, even with the iris all the way open. In this scenario, raise the gain on the camera until it is bright enough to provide a clear picture. However, because gain adds noise to the picture, it is recommended to keep it as low as possible.

42. To adjust the gain, toggle the “GAIN” switch on the side of the camera.

43. **ProHD Monitor:** Each camera ships with an external monitor so that camera operators can better capture each shot.

44. **White Balance:** To manually set the white balance on the camera, flip the toggle switch on the side of the camera under WHITE BAL to A.

(1) Point the camera at the provided white-balance panel according to the instructions found in the section Collapsible White-Balance Panel.

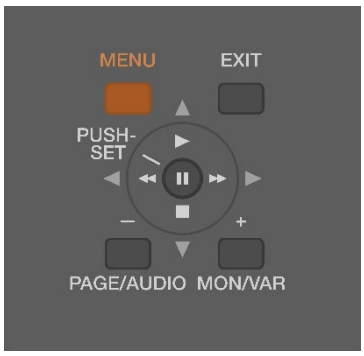
(2) Press the “AWB” button located under the lens on the front of the camera.

(3) The screen will display AWB A ACTIVE. Once the white balance is set, it will show “AWB A OK” with a numerical value.

45. If absolutely necessary, auto white balance (AWB) can be used at outdoor venues, as the color temperature may shift throughout the day. However, manual white balance is recommended.

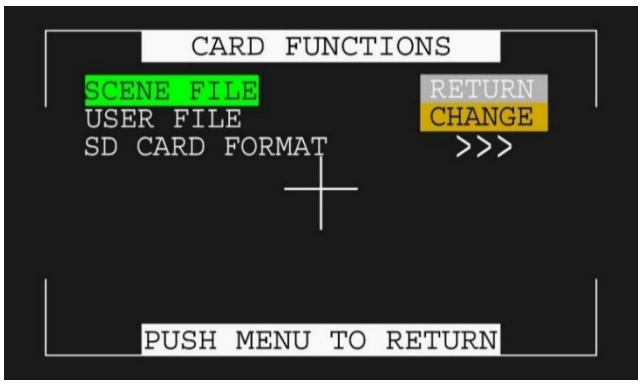
46. **Troubleshooting:** If the camera image does not look correct, try to reload the scene file. There is an SD card provided by the WHQ Broadcasting Department already inside the camera with the correct scene file on it. Do not remove this card from the camera, nor reformat this card. To reload the scene file, follow the directions below.

(1) Press the “MENU” button on the left side of the camera.

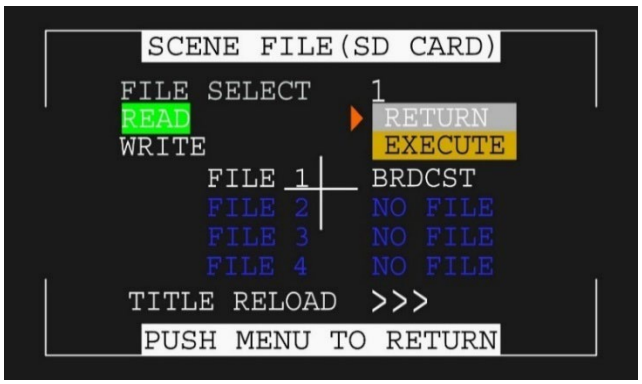


(2) Navigate to the option “9. CARD FUNCTIONS.” Select it by pushing in the joystick. Do not reload the scene file from the option “SCENE FILE” in the menu. This will load the settings from the internal camera memory. Always reload from the scene file on the SD card.

(3) Select SCENE FILE, then CHANGE.

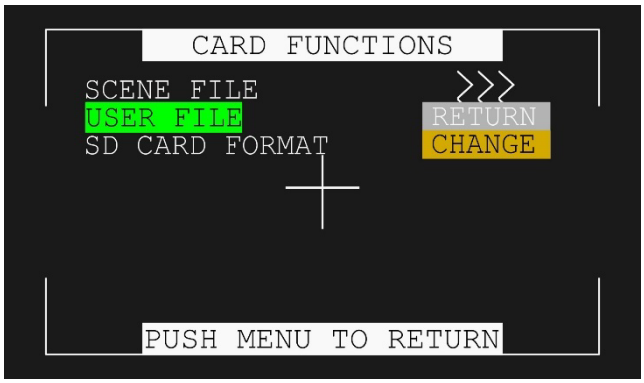


(4) Select READ, then EXECUTE.

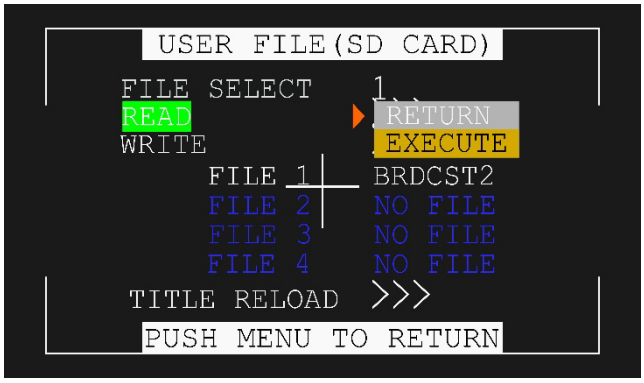


(5) Once complete, it will display the message READ OK. Press the MENU button twice to return to the option CARD FUNCTIONS.

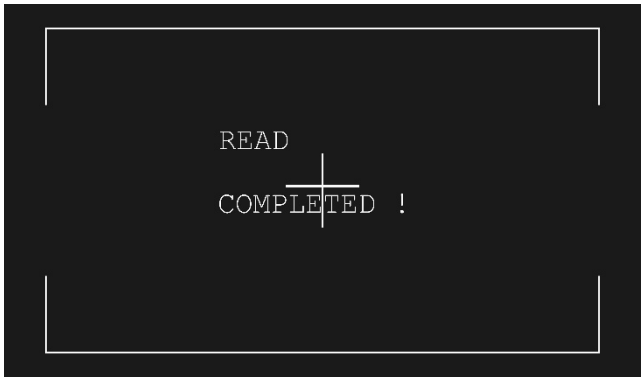
(6) Select USER FILE, then CHANGE.



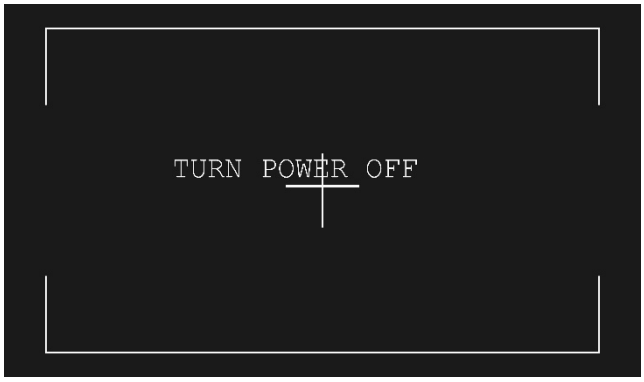
(7) Select READ, then EXECUTE.



(8) Once complete, it will display the message READ COMPLETED!



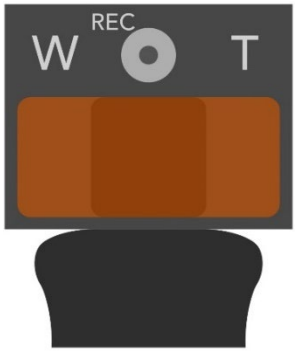
(9) Thereafter, it will display the message TURN POWER OFF. At this point, power cycle the camera for the scene file to be applied.



47. **Operating the Panasonic HPX-250:**

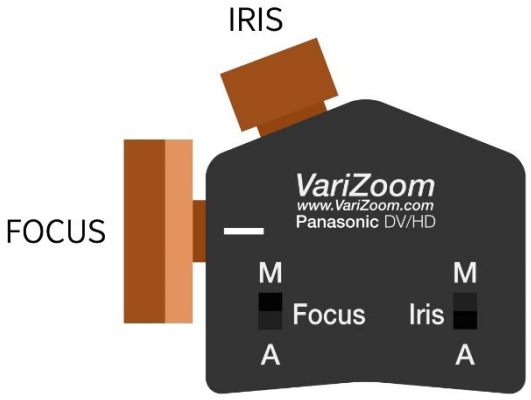
(1) Power on the camera by turning the switch on the right side of the camera to ON.

(2) On the right arm of the tripod is a zoom controller. To zoom in closer, press the right side (T). To back out to a wider shot, press the left side (W). The “REC” button is not used.



(3) On the left arm there are controls for the iris and focus. Set the focus to A (automatic) and the iris to M (manual). To adjust the iris, turn the small knob on top of the controller. If the technical director requests that you adjust the focus manually, switch the

focus to M and turn the large knob on the left. Make the adjustments very slowly if the shot is live, so that changes are less noticeable.



48. **VHD V60CL:** The VHD V60CL is a PTZ camera controlled by the Bolin KBD-1010-RNV PTZ controller. At events where these are needed, three of these cameras are used and the PTZ controller controls all three.

49. **How to Set Up the VHD V60CL:** Safely remove the cameras from their cases and attach them to the provided tripods in the location noted on the drawings provided by the WHQ Broadcasting Department. Follow the steps below to set up the cameras.

(1) Connect an SDI cable from the 3G-SDI BNC output on the rear of the camera to an input on the video switcher.

(2) Plug in the CAT5e or higher cable from the provided network switch to the LAN port on the camera. This will enable the camera controller to remotely operate this camera. It will also provide power to the camera over Power over Ethernet (PoE).

(3) Once all connections are made, turn the camera on via the power switch located on the back.

(4) When the cameras are all powered on, verify they can all be viewed on the multiview of the video switcher.

50. **Bolin KBD-1010-RNV:** The Bolin camera controller is capable of controlling multiple VHD PTZ cameras. The controller uses a LAN network to control multiple cameras. The provided network switch has been configured for this purpose.

51. Only one person is needed to control all three VHD PTZ cameras. The functions used are pan and tilt using the joystick, and zoom using the rocker. Presets can be saved and recalled using the number keys on the controller. The cameras will also be white balanced using the controller.

52. **How to Set Up the Bolin KBD-1010-RNV:** This camera controller will be configured by the WHQ Broadcasting Department prior to shipping. If an issue arises with the controller configuration, contact the WHQ Broadcasting Department. Follow these steps to set up the camera controller.

(1) Remove the unit from the shipping container and place it on the video desk.

(2) Connect the CAT5e cable from the LAN/PoE port on the controller to the PoE network switch.

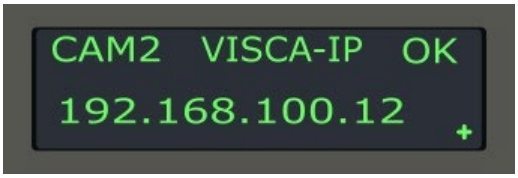
(3) Connect the unit to electrical power using the included power supply.

(4) Ensure all cameras are connected to the PoE network switch and powered on.

(5) Power on the controller using the power button located on the back next to the DC connector.

(6) The camera controller will power on and connect to the cameras on the network. To verify that the cameras are connected, press the F1-F3 buttons. This should display each camera on the built-in display along with their respective IP addresses. (**NOTE:** If there is a valid connection to the camera, the upper-right corner of the built-in display will show the OK status. However, if there is no connection, then the display will show the NO status.)

(7) The display located at the top of the controller will show which camera is being controlled as well as which preset is being stored or recalled. It is best to refer to this readout often.

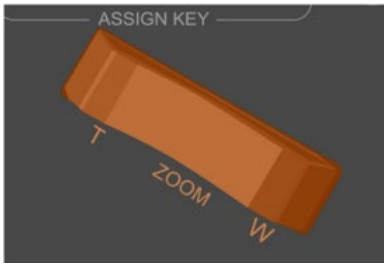


53. **Operating the VHD V60CL and Bolin KBD-1010-RNV:** Only one person is needed to control any of the VHD PTZ cameras. The normal functions that will be used are pan and tilt using the joystick, zoom using the rocker, and iris using the knob. Presets can be saved and

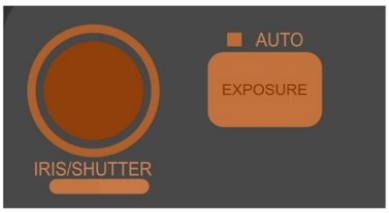
recalled using the controller. The cameras will also be white balanced using the controller. Use the ASSIGN KEY buttons F1, F2, and F3 to select camera 1, 2, and 3, respectively.

54. **Joystick:** The joystick is used to pan and tilt the camera. The speed at which the camera moves can be adjusted with the “P/T SPEED” knob.

55. **Zoom:** The ZOOM rocker is used to zoom out the selected camera by pressing the side marked W and zoom in by pressing the side marked T. The speed at which the camera zooms can be adjusted with the ZOOM SPEED knob.



56. **Iris:** Use the IRIS/SHUTTER knob to adjust the iris of the selected camera. Ensure the iris is not set to “AUTO.”



57. **To Save a Preset:**

(1) Frame the shot appropriately by using the PTZ functions of the controller.

(2) Hold down the “PRESET” button until it illuminates.

(3) Press the number on the keypad that the preset will be saved to.

58. **To Recall a Preset:**

(1) Select the camera that you will use.

(2) Hold down the “CALL” button until it illuminates.

(3) Select the number on the keypad that corresponds to the preset you want to recall.

59. **To White Balance the Cameras:**

(1) Select the camera to be white-balanced.

(2) Point the camera at the provided white-balance panel according to the instructions found in the section Collapsible White-Balance Panel.

(3) Press the “ONE PUSH WB” button.

(4) Auto white-balance should not be enabled for any of the cameras.

(5) The iris of each camera can be adjusted using the “IRIS/SHUTTER” knob at the top left of the controller. The exposure should not be set to auto for any of the cameras.

(6) Focus should be set to auto which is toggled by pressing the “AUTO MANUAL” button next to the focus knob.

COLLAPSIBLE WHITE-BALANCE PANEL

60. A collapsible white-balance panel is included in the camera tripod case that can be used to white-balance each of the cameras.

61. **How to Use the Collapsible White-Balance Panel:** Follow these instructions to use the white-balance panel to adjust the cameras.

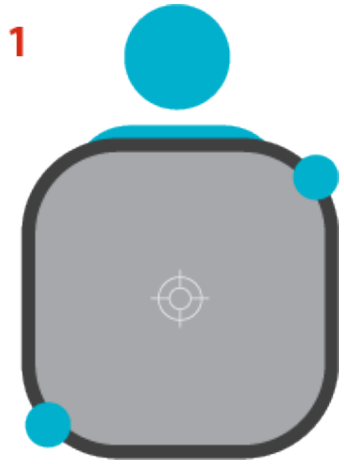
(1) Fully assemble each camera on its tripod and ensure the lighting is at the level it will be for the entire program.

(2) Standing at the lectern, hold the white panel in the approximate position of a speaker's head. Point the camera at the white-balance panel and zoom in until it fills the screen.

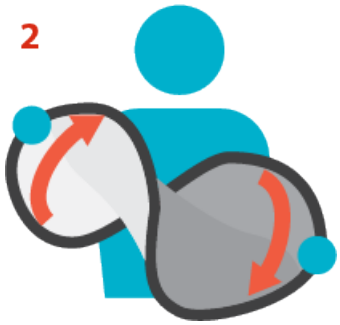
(3) Follow the white-balance directions provided in the appropriate section for each camera provided by the WHQ Broadcasting Department.

62. **How to Store the Collapsible White-Balance Panel:** Follow these steps to collapse the white-balance panel.

(1) Hold the panel on opposite sides.



(2) Twist into a figure-eight.



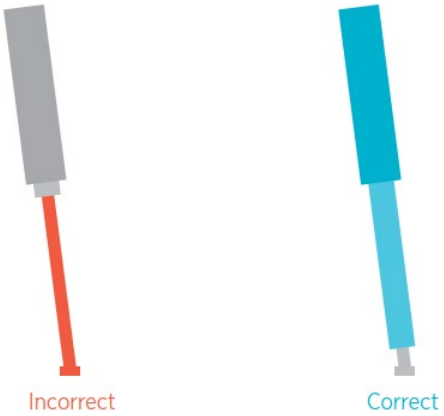
(3) Continue twisting while pushing the two sides toward each other.

(4) Push the two sides together so that one passes in front of the other and they align. Place the collapsed panel in the storage pouch.

TRIPODS

63. **Manfrotto 536 Tripod:** The camera tripods used at conventions are the Manfrotto 536 tripods with Manfrotto 504HD heads.

64. **Setting Up the Tripod:** The tripod legs have three sections. During setup, it is important to extend the thicker sections of the leg on the top and middle, rather than the thinner section at the bottom. The thinner section is more fragile and less stable.



65. It is important to note that only the PTZ tripod should be set to its maximum height, with all three leg sections extended. For the safety of the operator, the manned cameras should not be operated from a height greater than the top two sections of the legs. Camera angles from this height are acceptable.

66. Refer to Chapter 6, Stage and Audio/Video Control Areas for more information on setting up the cameras in relation to the stage.

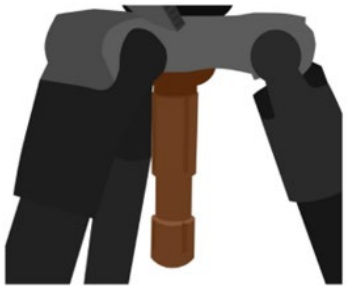
67. **Adjusting and Balancing the Tripod Head with the Panasonic HPX-250:** When a camera is properly balanced on the tripod, it will be easier to operate. To balance, slide the camera all the way forward on the tripod head. This will offset the weight of the arms and cables on the back of the tripod.

68. Adjustments can be made to the resistance for pan and tilt. Tighten each knob so that there is enough resistance to facilitate smooth and precise movements, but do not over-tighten them. The drag knobs are not intended to hold the camera steady if the operator removes his hands from the tripod arms.

69. The tripod head sits in an adjustable bowl and should be level. A lever for adjusting the bowl is found directly under the tripod head. Use the level on the tripod head as you make

your adjustments. The bubble in the level should be directly in the center of the circle on the level.

70. Bowl adjustment.



71. There are two levers for locking the tripod head in place. These must be loosened before adjusting the resistance.

72. The tripod is equipped with a counterbalance system. This helps keep the camera level. Adjust the counterbalance dial to 3.

73. Counterbalance knob.

74. You can adjust the resistance by turning these knobs.

(1) Pan drag knob.

(2) Tilt drag knob.

75. **Adjusting the Tripod Arms:** Adjust the angle of the arms on the tripod to a level comfortable for the operator. The operator's arms should be bent at 90-degree angles.

76. To adjust the tripod arms, unscrew the knob where the arms attach to the head and carefully move the arm to the correct angle. Unscrew the arm enough so that the fine teeth do not touch when the arm is turned.

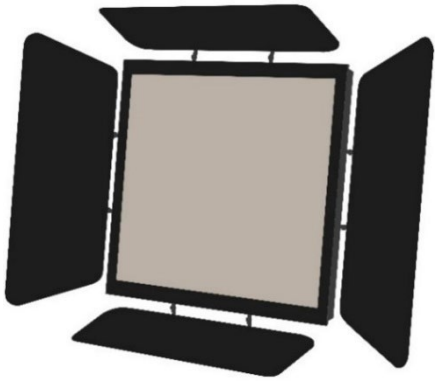
77. **Adjust the Monitor:** Loosen the lever in the center of the Noga arm to adjust the angle of the external monitor. Do not grab the monitor by the front.

LIGHTING

78. The convention lighting kit used in the United States branch consists of six LED light panels, one DMX controller, one DMX terminator, two equipment lifts, and two lighting bars.

79. **Elation TVL2000 LED Light Panel:** The Elation TVL2000 is a bi-color LED panel used in venues where the house lights are not sufficient for video capture. The LED panels are

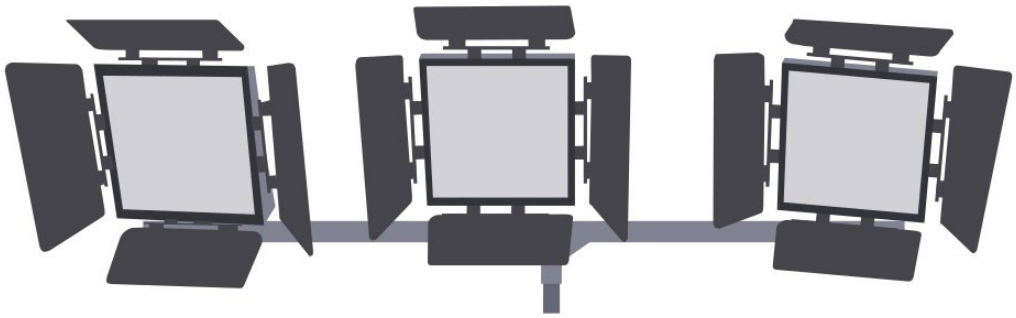
controlled over the DMX protocol and all six can be daisy-chained together for control. Three lights can be daisy-chained together for power.



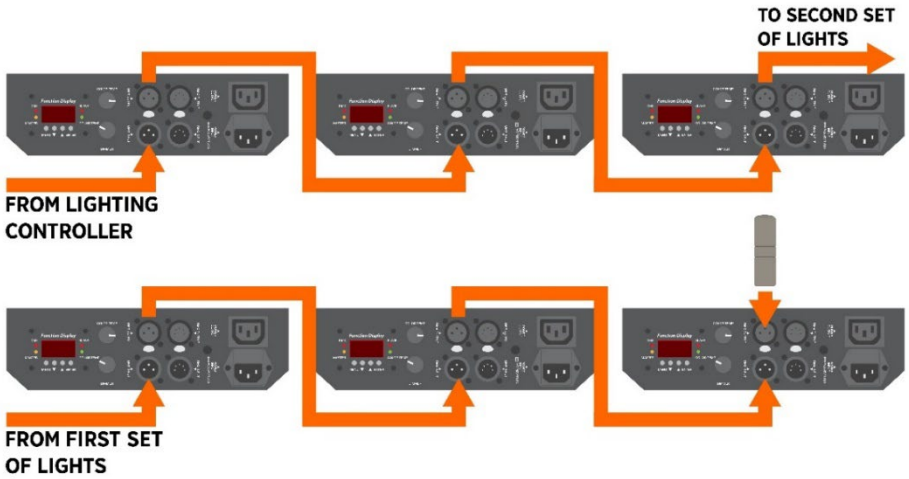
80. **How to Set Up the Elation TVL2000 LED Light Panel:** Follow these steps to set up the LED light panels.

(1) Follow the instructions in the Penn TL-132-187 Equipment Lift section of this document to set up the equipment lift and lighting bar.

(2) Remove the lights from the case and mount them to the lighting bar as shown below. The middle light will need to be offset in order to properly connect to the lighting bar.



(3) Once the lights are mounted, connect them together as shown with the provided DMX cabling. Place the DMX terminator in the DMX Out port of the last light in the chain.



(4) Wires should be loosely secured with Velcro. Keep in mind that the lights still need to be aimed and may need to be adjusted. Secure each light with the provided safety cable.

(5) As illustrated in the drawing below, each main area of the stage will be illuminated by the lights. To aim the lights, first raise the lift fully by referring to the Penn TL-132-187 Equipment Lift section. Once the lift is fully raised, observe the position of the lights.

Lower the lift to make necessary adjustments to the light angles. This process may need to be repeated several times to achieve the desired light positioning.

(6) Once the lights are aimed, the wires can be secured and all the clamps and bolts can be tightened. Raise the equipment lift to its full operating height.

81. **DMX Operator:** The DMX Operator is a DMX controller capable of controlling all connected lights remotely.

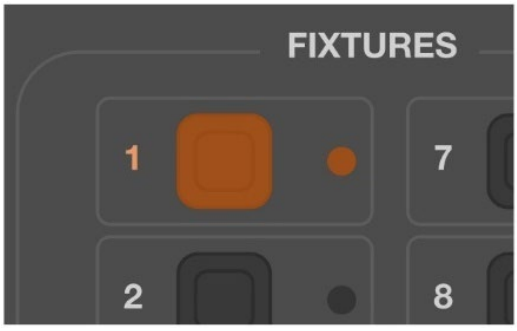
82. **How to Set Up the DMX Operator:** Follow these steps to set up the DMX Operator lighting controller.

(1) Remove the lighting controller from the shipping container and place it in a safe location backstage.

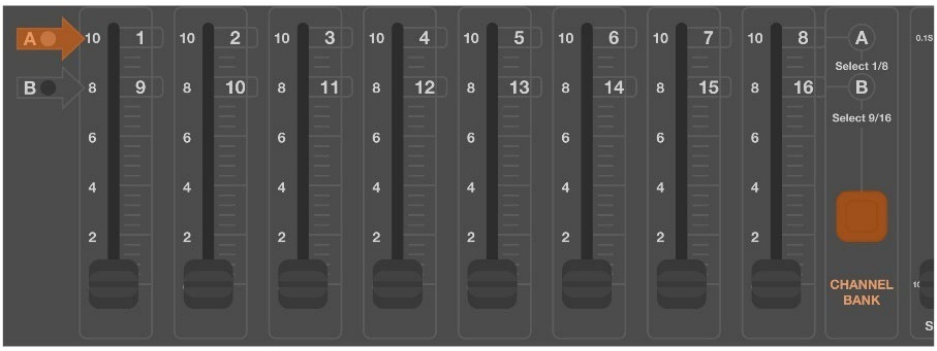
(2) Connect the DMX cable from the first light to the DMX OUT port on the rear of the lighting controller.

(3) Connect the lighting controller to power. It will turn on automatically.

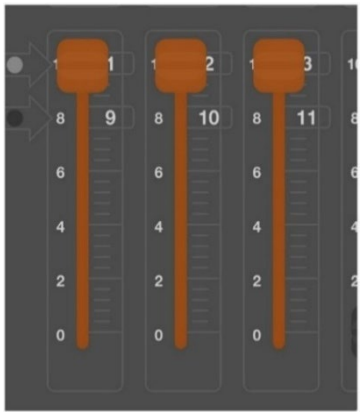
(4) The LED next to the “1” button in the “FIXTURES” section should be illuminated. If it is not, press the “1” button.



(5) The “A” LED to the left of the sliders, should be illuminated. If “B” is illuminated, press the “CHANNEL BANK” button to change it to “A.”



(6) Raise the first three sliders.



(7) If there is a small round light flashing next to the “Blackout” label, press the “Blackout” button on the bottom right of the lighting controller.

83. **Operating the DMX Operator:** Use the DMX Operator lighting controller to adjust the intensity of the lights. Once a setting has been decided on, the lights should remain untouched. Do not adjust the lights for every part on the program. Follow these steps to operate the DMX Operator lighting controller.

(1) Control the lights using the first three sliders on the board. Sliders 1 and 2 control the color of the lights and should be raised all the way up to ensure the lights are white. The third slider is used to control the intensity of the lights. Adjust the third slider to provide an adequate amount of light for the cameras to capture facial expressions

and gestures. Adjust the lights with a person standing on stage to achieve the best lighting possible.

(2) In most cases, the lights will not need to be used at full intensity, and too much light from above can create unwanted harsh shadows under the chin, eyes, and nose. Too much light can also cause light to be reflected from the forehead, glasses, or convention badges, creating problems for the cameras.

84. **Penn TL-132-187 Equipment Lift:** The Penn TL-132-187 lighting equipment lift is used to elevate the stage lights to illuminate the participants on stage.

85. **How to Set Up the Penn TL-132-187 Lighting Equipment Lift:** Follow these instructions to set up the lighting equipment lift.

(1) Move the equipment lift to the corners of the stage on the floor of the venue as shown in the Stage Layout section in Chapter 6.

(2) Pull out the legs and secure them with the attached wingnut.

(3) Use a torpedo level to make sure the lift is perfectly vertical and the weight of the lift is spread equally between the legs. Add one 10 lb sandbag to each leg spreader.

(4) Mount and secure the included lighting bar to the adapter at the top of the equipment lift.

86. **Raising the Lift:** Once the lift has been loaded properly, follow these instructions to raise the load.

(1) Loosen the tension knob on the top mast.

(2) While pulling the top safety spring-loaded pin, turn the crank clockwise to raise the top section of the equipment lift. When the top mast has reached its maximum height, release the safety pin into the hole on the mast. Re-tighten the top tension knob.

(3) Loosen the tension knob on the bottom mast.

(4) While pulling the bottom safety spring-loaded pin, turn the crank clockwise to raise the bottom section of the equipment lift. When the bottom mast has reached its maximum height, release the safety pin into the hole on the mast. Re-tighten the bottom tension knob.

(5) Once the full height has been reached and the safety pins on both masts are secured in their holes, turn the crank handle counterclockwise to release tension from the cable.

87. **Lowering the Lift:** When it is time to lower the lift, follow these instructions.

(1) Turn the crank clockwise a small amount to create some tension on the steel cable. Failing to do so could result in injury.

(2) Loosen the tension knob on the bottom mast.

(3) With tension on the crank, release and hold the bottom safety pin.

(4) Slowly turn the crank in a counterclockwise direction.

(5) When the top safety pin reaches its lowest point, and with tension still on the crank, loosen the top tension knob and release and hold the top safety pin.

(6) Continue to lower the equipment lift until it is at its lowest position.

LED VIDEO WALLS

88. The LED video walls used in the United States branch territory are Absen PL3.9 XL, Dicolor M1-481, Dicolor M-481 Plus, Mozu X4, Mozu X6, and Leyard VSS4-O walls. Refer to the BOM provided by the WHQ Broadcasting Department to determine which walls you received.

89. **Absen PL3.9 XL:** The Absen video wall is a 9.8 ft x 16.4 ft (3 m x 5 m) display with a 0.15 in. (3.9 mm) pixel pitch. It is made up of thirty 39.4 in. x 19.7 in. (1.0 m x 0.5 m) panels. It is used at indoor venues and built on a frame. Each video wall is shipped with all hardware needed to assemble the frame and attach the panels, cabling for power and data, video signal processor, and power distribution unit.

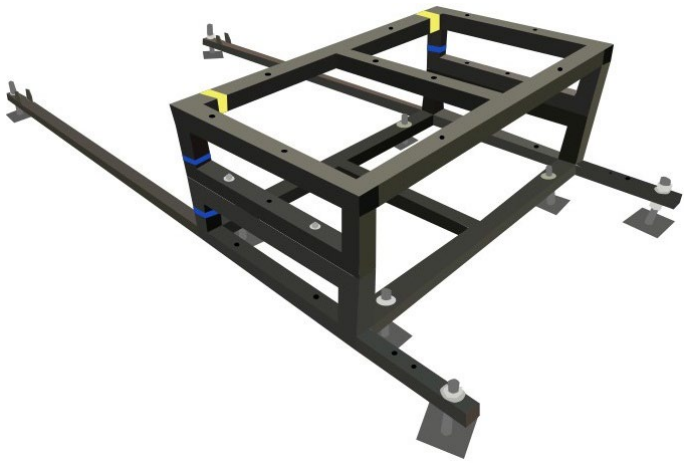
90. Each panel is labeled with an ID number that refers to a specific screen. The panels should be installed and stored by this ID number.

91. The following tools are included: Allen wrench set including 3 mm, 6 mm, and 8 mm Allen wrenches, a 17 mm combination open-end box wrench, and a 32 mm open wrench.

92. A digital scale is recommended for packaging the hardware kit. The weights of each bin are given in grams on the packing guide attached to the hardware kit.

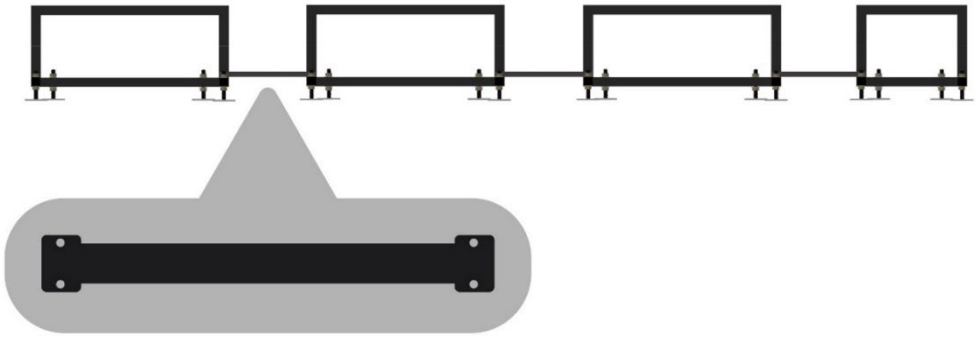
93. **How to Set Up the Absen LED Video Wall:** While assembling the frame, bolts can simply be hand-tightened unless otherwise noted below. Once the frame is assembled and the LED panels are mounted, snug the bolts with hand tools. Take care to not overtighten the bolts. Do not use power tools. Use two flat washers with every bolt and nut: one under the head of the bolt and the other between the frame and nut.

(1) Start by assembling the four frame base sections. Each frame base section is comprised of six parts: two short base extensions with feet, two long base extensions with feet, one lower base section, and one upper base section. The lower base section will need to have the feet attached. Connect the six pieces as shown in the picture below. Use M10-120 mm bolts for the frame base sections. Note that only four of these bolts are needed to connect the upper and lower base sections. A bolt is not needed in the middle hole of each side. Use M10-80 mm bolts for the base extensions. Repeat this process for the three long frame base sections and the one short frame base section.

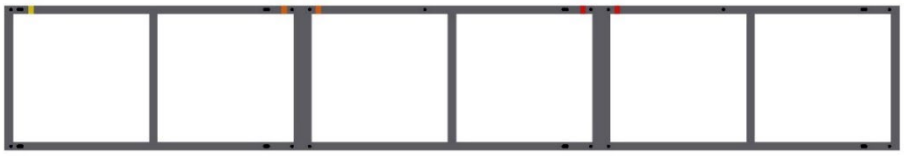


(2) Use the six spacer bars shown below to connect the four frame base sections. These bars are not bolted to the frame, but merely placed in the holes as a spacing guide.

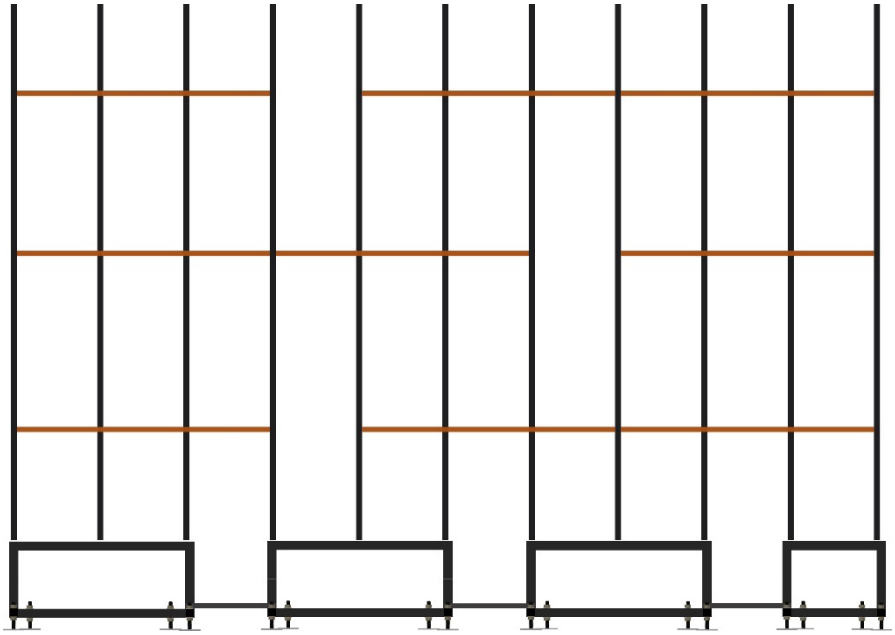
Use a level and the adjustable feet to ensure that each of the four frame base sections are completely level.



(3) Three rectangular supports combine to make eleven vertical supports. Use M10-80 mm bolts to connect the three rectangular supports to each other. Snug the bolts with hand tools. Make sure to match the colors on each end of the rectangular supports as shown below.

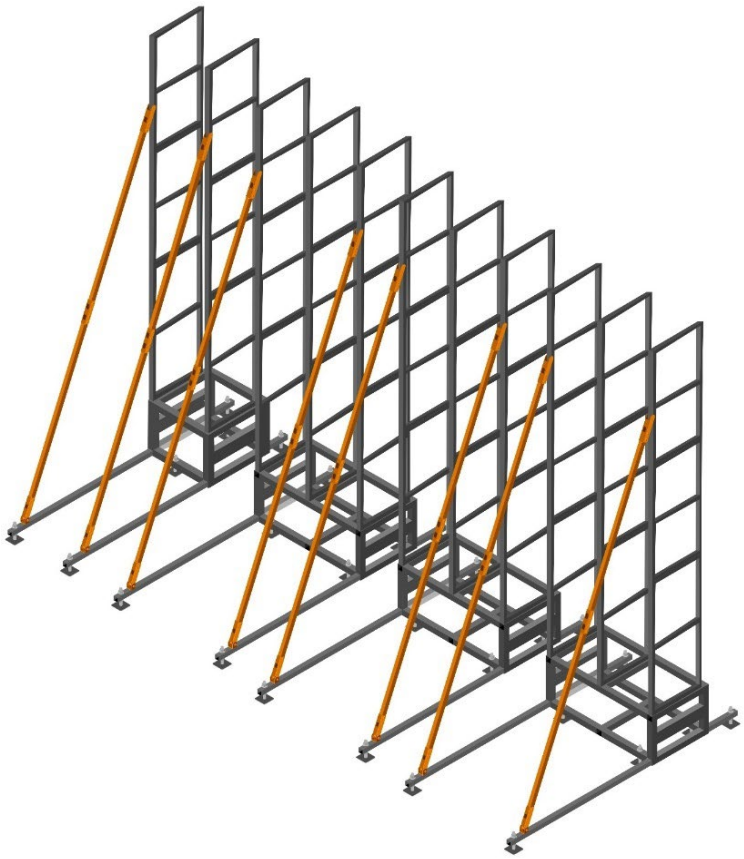


(4) Mount the eleven vertical supports to the four frame base sections. Use M10-120 mm bolts. Make sure the side with colored stripes is mounted on the back of the frame base sections. The vertical supports are held together with horizontal braces; secure them using M10-80 mm bolts. The braces are highlighted below as seen from the front of the video wall frame. Alternate securing the horizontal braces on the front holes of the vertical supports and the back holes where they overlap.

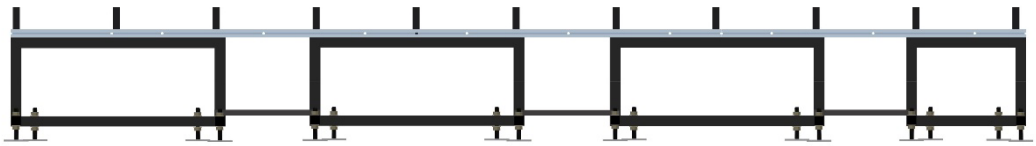


(5) Connect the diagonal braces together as shown below. Each diagonal brace consists of a diagonal brace with one connector and a diagonal brace with two connectors. Pair the pieces together with the matching colors meeting in the middle. Attach them with M10-50 mm bolts. Snug the bolts with hand tools.

(6) Use M10-50 mm bolts to connect the diagonal braces to the vertical supports and M10-80 mm bolts to connect them to the long base extensions. Snug the bolts with hand tools. There is a total of eight braces to be attached.



(7) Mount the four pedestal bars on the front of the frame bases as shown below when facing the front of the video wall frame. Place the three long ones first from right to left, followed by the one short section. Connect the four pedestal bars together by inserting the square bar into the channel of the adjacent section and inserting the removable pin into the first aligning hole on the side of each section. Align the holes on the flat part of the pedestal bar with the holes on the frame bases. Use M8-90 mm bolts with washers to bolt them to the frame bases.



(8) Using the string-line method, make sure the pedestal bar is completely level at all four base sections by adjusting the feet. If it is not leveled, the LED panels will not easily latch together. Refer to Appendix C for information on the string-line method of straightening.

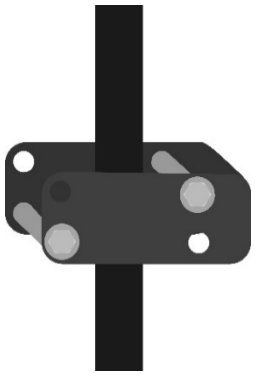
(9) Before mounting the LED panels, they must be tested. Refer to Chapter 5, Electrical Distribution Equipment for instructions on setting up the power distribution unit and the video wall remote power box. For locations receiving a Geist power unit, have a competent electrician connect it for the video wall. Using the provided video wall power cables with connectors, connect each panel to the video wall remote power box. Alternatively, use the panel testing cable with inline switch to connect panels to a standard outlet. Make sure to use the inline switch or the corresponding breaker to de-energize the output before connecting or disconnecting the cables each time.

(10) Locate the “TEST” button on the rear of the LED panel near the center. Press the button once. All the LEDs on the front of the panel will turn red. Every subsequent press will cycle the colors on the front. While performing this test, look for sections of LEDs that do not light up or appear different and set these panels aside. If only single LEDs appear to not light up, this is still acceptable for installation. Repeat this process with all thirty panels, remembering to turn the breaker or the inline switch to the OFF position before removing and installing the connector. If there are any major issues with the LED panels, contact the WHQ Broadcasting Department for direction.

(11) While testing panels, inspect the two angle latches on every panel. Ensure that each one is set and locked at zero.

(12) When all panels are tested, the frame is constructed, and the pedestal is leveled, the LED panels can be mounted to the frame. Each wall is ten panels across and three panels high.

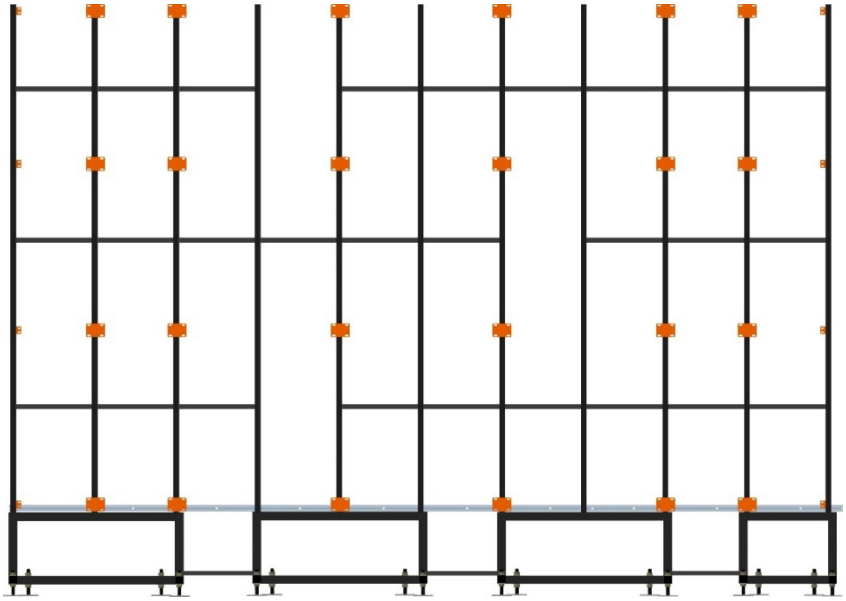
(13) Use the panel mounting brackets between the LED panels and the frame as shown below. Slide the bracket over the vertical section of the frame and use M8-60 mm bolts with washers to secure the LED panels to the bracket.



(14) For the edges of the frame, use the end bracket as shown below. Use M10-50 mm bolts to attach the bracket to the frame and M8-15 mm bolts to attach to the panels.

(15) For the bottom section of the LED panels, where they rest on the pedestal bar, adjust the position of the panel mounting bracket so it is flush with the bottom of the frame.

(16) Panel mounting brackets will not be installed at every corner of each LED panel. Please see the front view diagram below for the locations.

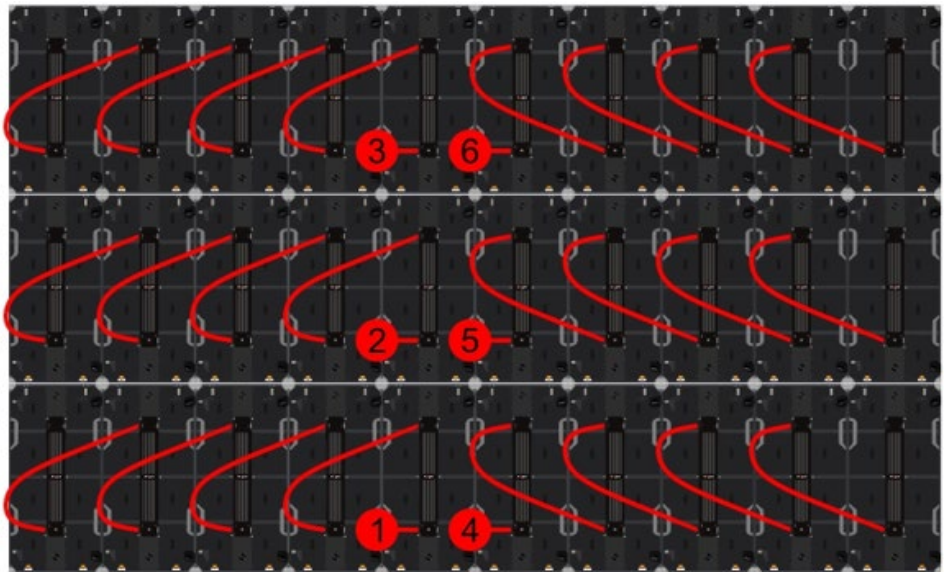


(17) As the LED panels are installed on the frame, use the two latches on the rear left side of each panel to secure the panels to each other. Make sure the top and bottom of the two panels being latched are completely flush in the front. The latch handle will lay down and need to be pushed in and turned up to lock it. Once the first row is completed, make sure to center the row on the frame. With each row added above, make sure the panel faces are also flush and use the latches on the top of each panel to secure the panels to the ones above. This latch handle will lay to the left and needs

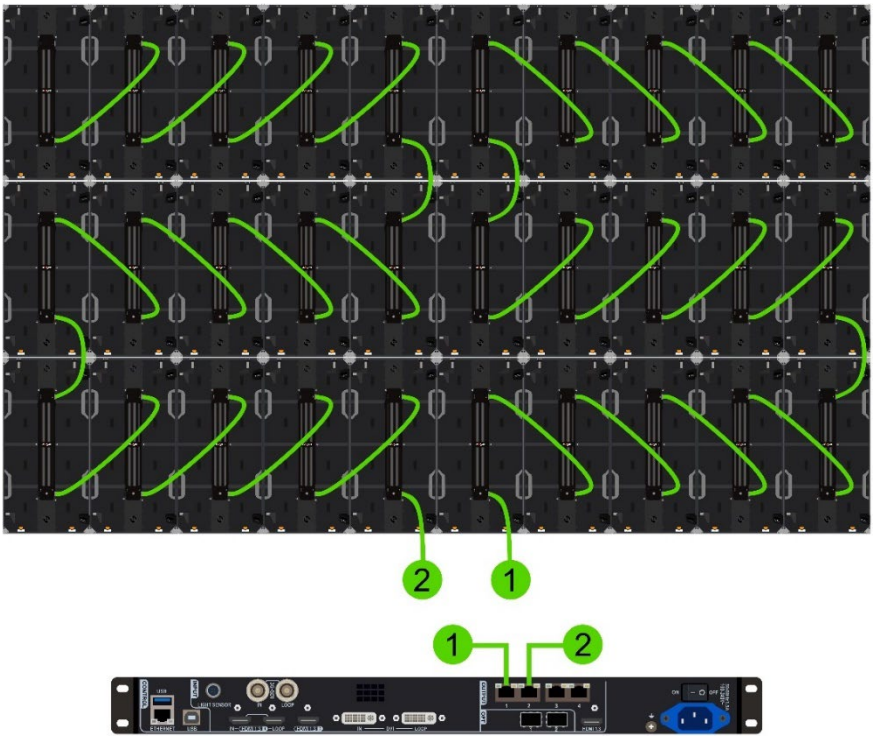
to be pushed up and turned to the right to lock it. To release this latch, push the orange lever before unlocking.

94. **Wiring the LED Video Wall:** Follow these instructions to wire the Absen LED video wall.

(1) Locate the (24) power cables. Connect them as shown below. Power connectors should be pushed in, twisted, and locked into place.



(2) Locate the (28) data cables. Connect them as shown below.



(3) Connect the two long data cables to the two outputs on the NovaStar video processor.

(4) Connect all six power cables to the video wall remote power box or Geist unit.

(5) When all the power and data cables are installed and checked, power the LED wall by turning on all six switches on the video wall remote power box or by using the Geist disconnect switch. The green indicator lights on the back of each LED panel should be illuminated. If there is a connection to the video processor, the green indicator light should blink once per second.

95. **DiColor M1-481 and M-481 Plus:** The DiColor video wall is a 9.8 ft x 16.4 ft (3 m x 5 m) display with 0.18 in. (4.8 mm) pixel pitch. It is made up of thirty 39.4 in. x 19.7 in. (1 m x 0.5 m) panels. It is used at indoor venues and built on a frame. Each video wall is shipped with all hardware needed to assemble the frame and attach the panels, cabling for power and data, video signal processor, and power distribution unit.

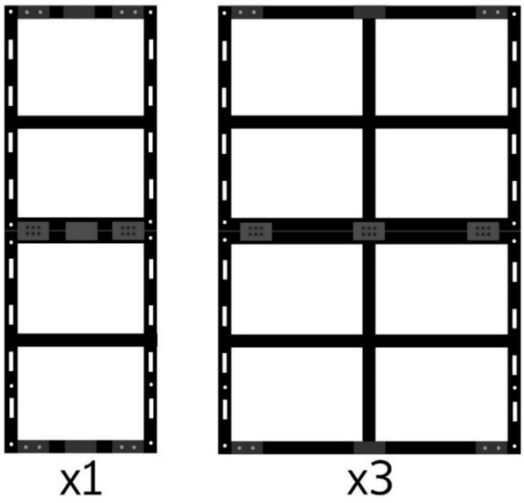
96. Each panel is labeled with an ID number that refers to a specific screen. The panels should be installed and stored by this ID number.

97. The following tool is included: 8 mm T-handle Allen wrench.

98. The following tools are needed: 6 mm, 8 mm, and 10 mm Allen wrenches, and 13 mm, 17 mm, and 19 mm open-end or box wrenches.

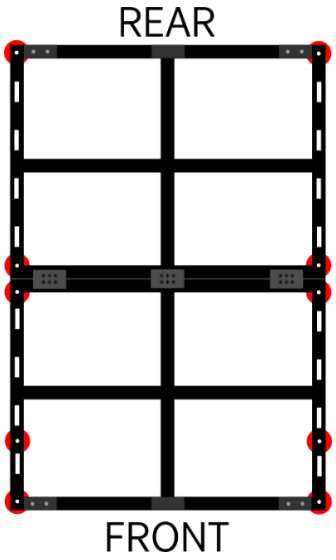
99. **How to Set Up the DiColor LED Video Wall:** While assembling the frame, bolts can simply be hand-tightened unless otherwise noted below. Once the frame is assembled and the LED panels are mounted, snug the bolts with hand tools. Take care not to overtighten the bolts. Do not use power tools. Use two flat washers with every bolt and nut: one under the head of the bolt and the other between the frame and nut.

(1) Each wall comes with one half-sized and three full-sized hinged base assemblies. Remove them and place them upside down on a level working surface. The metal feet will point towards the ceiling.



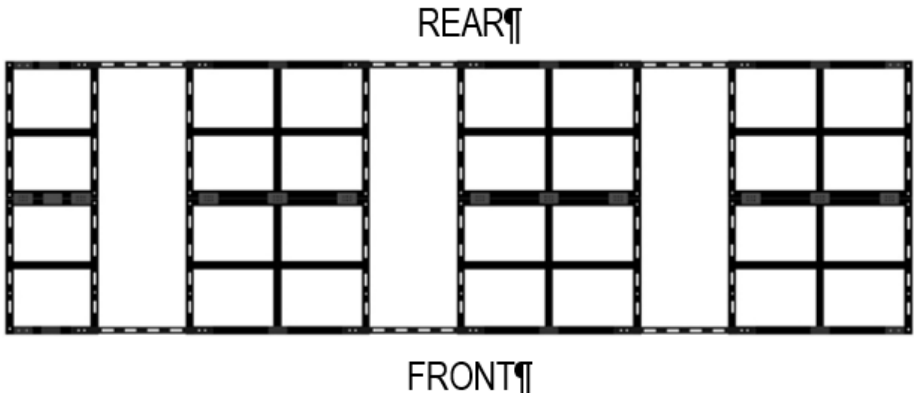
(2) Use M10-20 mm bolts to attach a stiffener plate at the hinge of each base assembly where there are threaded screw holes. Each full-sized base assembly will have two stiffener plates and the half-sized assembly will have one.

(3) Flip the base assemblies over and line them up parallel to each other, so that all the fronts are facing the same direction and spaced approximately 18 in. apart.



(4) Using a base connector, connect each adjacent base assembly in the front and back with M10-20 mm bolts. Lightly tighten these bolts.

(5) Assemble according to the image below, all four base assemblies will be connected as one solid base.



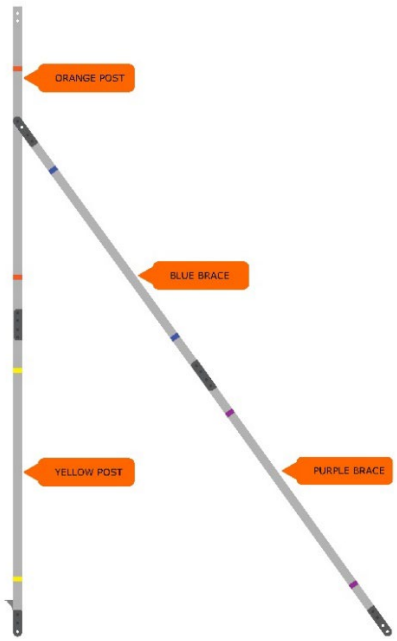
(6) Using the threaded feet, adjust the base assembly until it is level on all sides, and all the faces are flush with each other. The frame needs to be a minimum of 3 in. off the ground.

(7) Prepare to assemble the eleven vertical posts by gathering one lower post (yellow stripe), one upper post (orange stripe), one diagonal brace with a coupler (blue stripe), and one diagonal brace (purple stripe) for each vertical post.

(8) Begin with the yellow striped post. The end with the cleat is the bottom and faces outward. Use M10-50 mm bolts to attach the yellow post to the orange post using the coupler attached to the orange post.

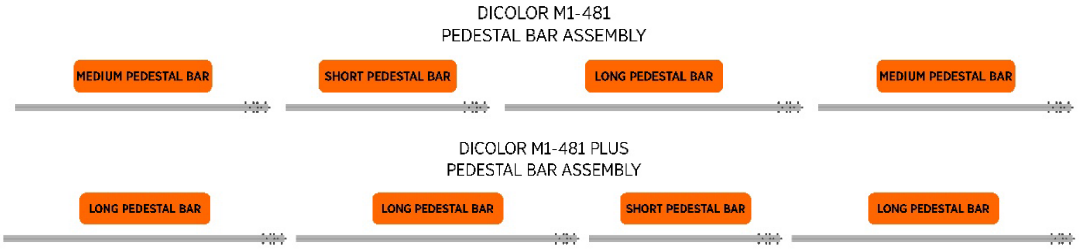
(9) Use M10-50 mm bolts to attach the blue and purple diagonal braces using the coupler attached to the blue post.

(10) Use M12-60 mm bolts to attach the diagonal brace assembly to the vertical post assembly. Secure the connection using the coupler at one end of the diagonal brace as shown below. Repeat until all eleven posts are assembled.



(11) Begin attaching the vertical posts to the base assembly. Start by attaching the diagonal brace to the rear of the base assembly using M12-60 mm bolts, snugging the bolt and nut before moving to the vertical post. Use M12-60 mm bolts to attach the vertical post to the base assembly making use of the welded nut. Snug the bolts with hand tools. Repeat this process with all eleven vertical post assemblies.

(12) The pedestal bar is comprised of four square aluminum bars. The channel with multiple oval cutouts is considered the top of the pedestal bar. Assemble from left to right using the image below as a reference. Using the attached metal inserts, combine the four pieces into one long pedestal bar.



(13) Place the assembled pedestal bar on the cleats on the bottom of each of the eleven vertical posts. Line up the holes on the pedestal bar with the holes on these cleats and use M8-40 mm bolts to tighten them down.

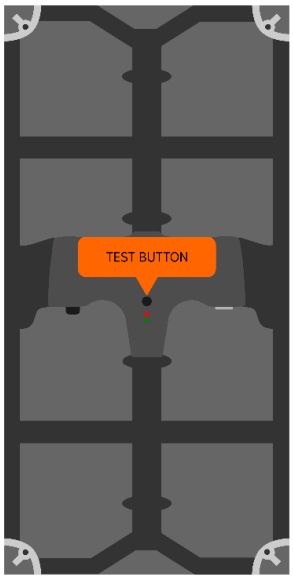
(14) Using the string-line method, make sure the pedestal bar is completely level at all four base sections by adjusting the feet. If it is not leveled, the LED panels will not easily latch together. Refer to Appendix C for information on the string-line method of straightening.

(15) Before mounting the LED panels, they must be tested. Refer to Chapter 5, Electrical Distribution Equipment for instructions on setting up the power distribution unit and the video wall remote power box. For locations receiving a Geist power unit, have a competent electrician connect it to the video wall. Using the provided video wall power cables with connectors (grey for the M1-481 and blue for the M-481 Plus), connect each panel to the video wall remote power box. Alternatively, use the panel testing cable with the inline switch to connect panels to a standard outlet. Always use the inline switch or the corresponding breaker to de-energize the output before connecting or disconnecting the cables each time.

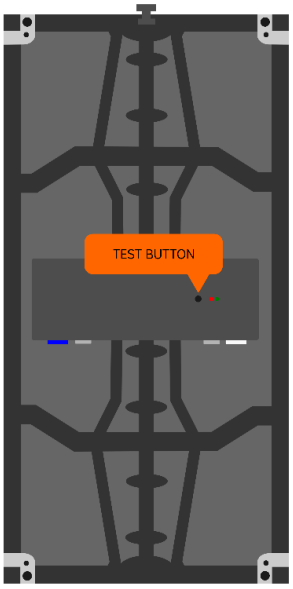
(16)Locate the "TEST" button on the rear of the LED panel near the center. Press the button twice in quick succession. All the LEDs on the front of the panel will turn red. Every subsequent press will cycle the colors on the front. While performing this test, look for sections of LEDs that do not light up or appear different and set these panels aside. If only single LEDs appear to not light up, this is still acceptable for installation. Repeat this process with all thirty panels, remembering to turn the breaker or the inline switch to the OFF position before removing and installing the connector (grey

for the M1-481 and blue for the M-481 Plus). If there are any major issues with the LED panels, contact the WHQ Broadcasting Department for direction.

DICOLOR M1-481
LED PANEL



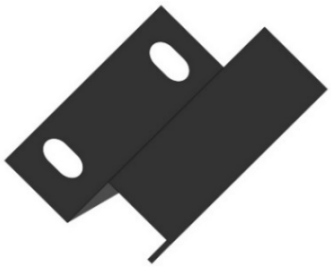
DICOLOR M-481 PLUS
LED PANEL



(17) When all panels have been tested, the frame is constructed, and the pedestal bar is leveled, the LED panels can be mounted to the frame. Each wall consists of ten panels across and three panels high.

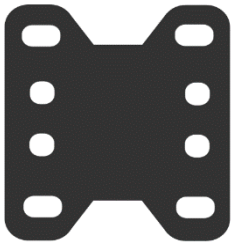
(18) Starting on the left side of the pedestal bar, place an LED panel and align the left side of the panel with the left-most vertical post so that the edge of the panel is centered on the post.

(19) Using a corner bracket with an M10-20 mm bolt and washer, attach the panel to the left-most vertical post.

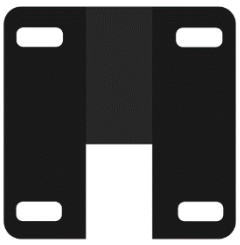


(20) Place the next panel and use the latches to connect the two panels together. Secure each panel to the frame by attaching them to a panel mounting plate with M10-60 mm bolts. Attach the two panels together. Do not fully tighten these bolts until the video wall is completely assembled.

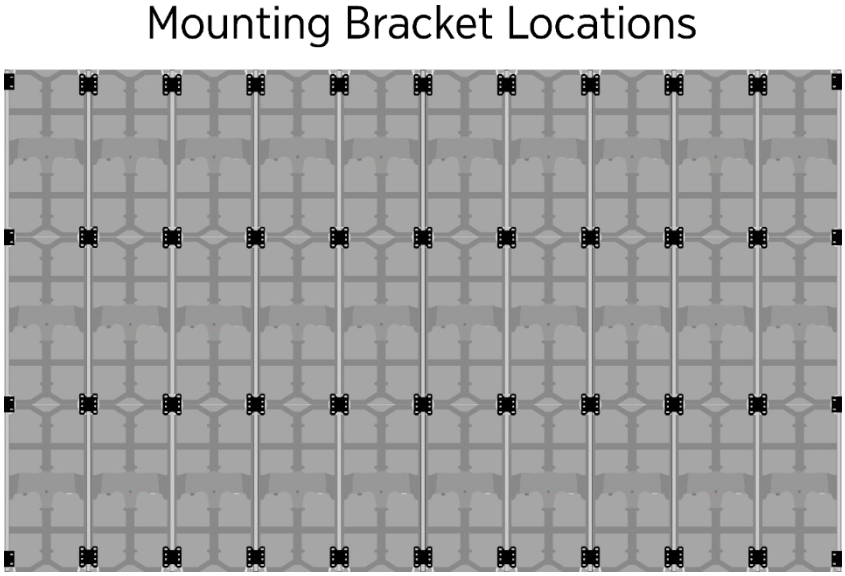
DICOLOR M1-481
PANEL MOUNTING PLATE



DICOLOR M-481 PLUS
PANEL MOUNTING PLATE

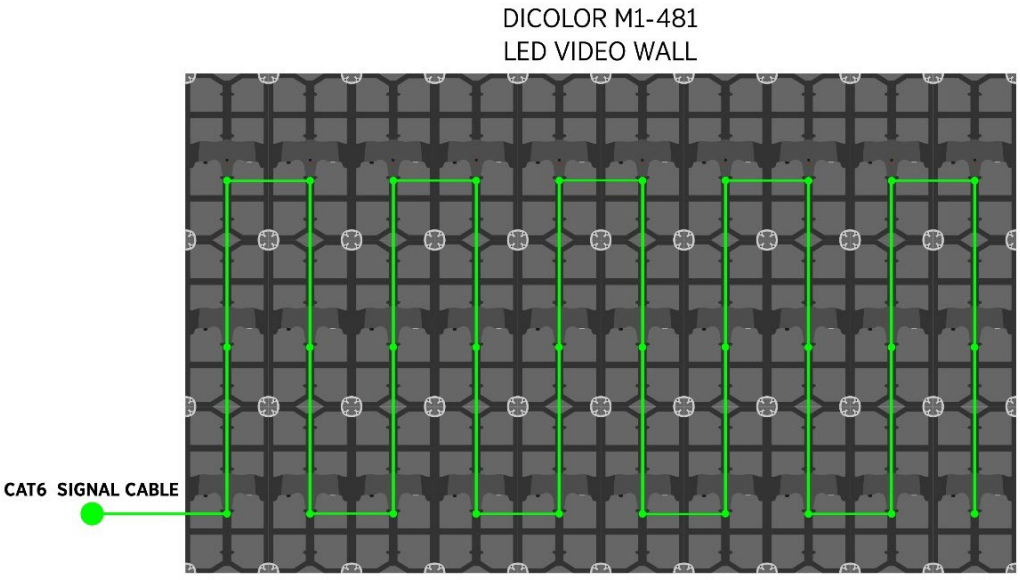


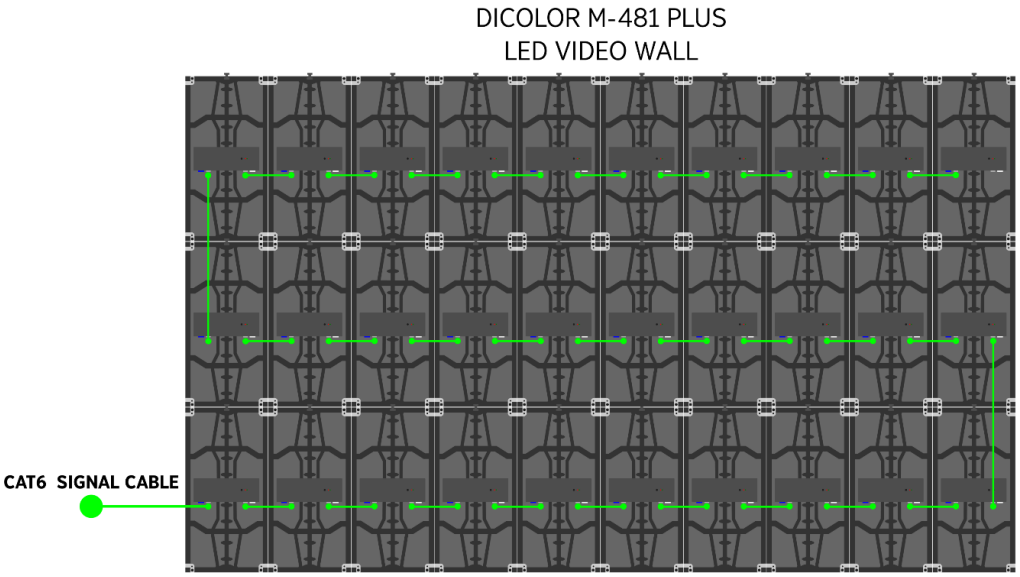
(21) Continue this process until the bottom row is complete, ensuring both ends are attached with corner brackets to the metal frame. Proceed with the second and third rows following the same process, making sure all panels have all four latches latched together and secured to the metal frame. If the latches become difficult to connect to the next panel, it is likely due to the pedestal bar not being completely level. Once all panel faces and edges are flush to each other, fully hand-tighten all bolts.



100. **How to Wire the DiColor LED Video Wall:** Follow these instructions to wire the DiColor LED video wall.

(1) Locate the (29) data cables and connect them according to the image shown below.

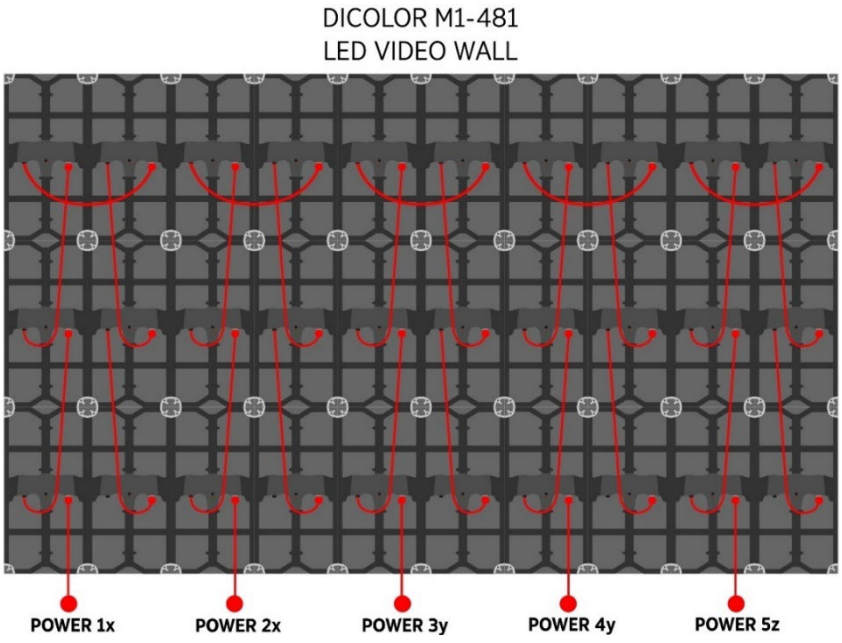


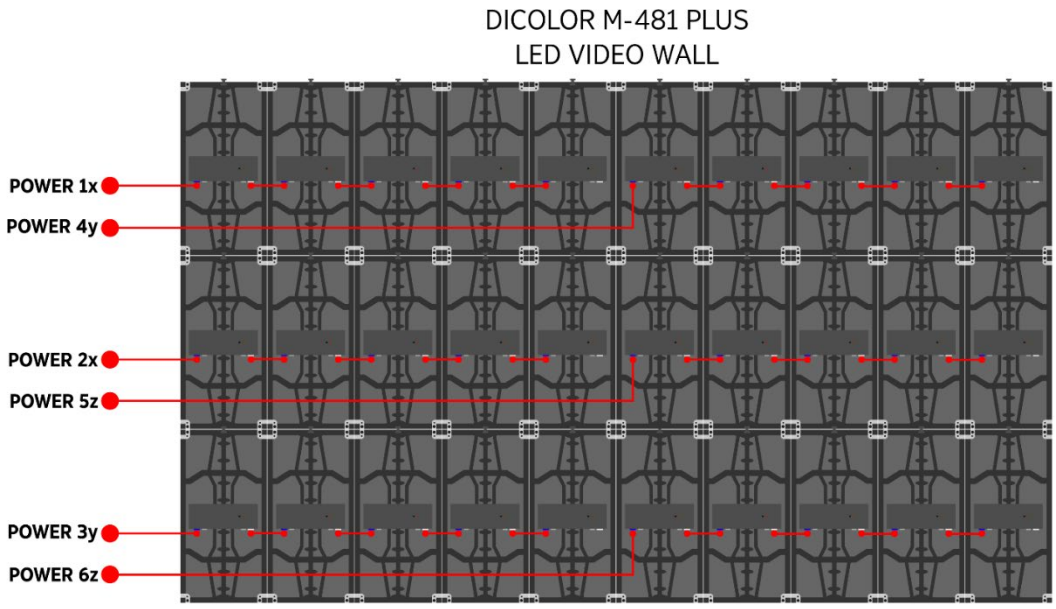


(2) Connect the LED video wall to the video processor using the provided CAT6 cable.

(3) Before connecting the power cables, ensure all the video wall remote power box breakers are in the OFF position. The power connections are not designed to be connected and disconnected under load, as this will result in damage to the equipment.

(4) Locate the power cables and connect them according to the diagram below. Power connectors should be pushed in, twisted, and locked in place.





(5) When connecting the DiColor M1-481 LED video wall, plug the five main power cords into the video wall remote power box using outlets 1x, 2x, 3y, 4y, and 5z.

(6) When connecting the DiColor M-481 Plus LED video wall, plug the six main power cords into the video wall remote power box using outlets 1x, 2x, 3y, 4y, 5z, and 6z.

101. When all the power cables are installed and checked, power the LED wall by turning on the breaker switches. All the red indicator lights on the back of each LED panel should be illuminated. If there is a connection to the video processor, the green indicator lights should blink once per second.

102. **Mozu X4:** The Mozu X4 LED video wall is a 5.2 ft x 9.4 ft (1.6 m x 2.88 m) display with a 0.15 in. (4 mm) pixel pitch. It consists of forty-five panels, each measuring 12.6 in. x 12.6

in. (320 mm x 320 mm). This video wall can be used at both indoor and outdoor venues and is hung on a truss with tripods.

103. **Mozu X6:** The Mozu X6 LED video wall is a 5.2 ft x 9.4 ft (1.6 m x 2.88 m) display with a 0.23 in. (6 mm) pixel pitch. It consists of forty-five panels, each measuring 12.6 in. x 12.6 in. (320 mm x 320 mm). This video wall is suitable for both indoor and outdoor venues and is hung on a truss with tripods.

104. **Leyard VSS4-O:** The Leyard VSS4-O LED video wall is a 5.2 ft x 9.4 ft (1.6 m x 2.88 m) display with a 0.15 in. (4 mm) pixel pitch. It consists of forty-five panels, each measuring 12.6 in. x 12.6 in. (320 mm x 320 mm). This video wall can be used at both indoor and outdoor venues and is hung on a truss with tripods.

105. **How to Set Up the Mozu and Leyard LED Video Walls**:

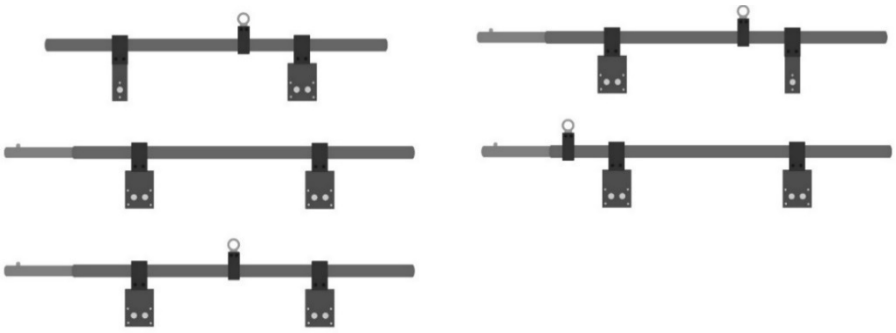
(1) Connect the two truss pieces together with the three truss pins. Secure each truss pin with the provided cotter pin.

(2) Set up the tripods on a flat, level surface and ensure the truss bracket is installed on top of each tripod. Orient the clamps on the truss bracket so that they face the same direction.

(3) Space the tripods apart the approximate length of the assembled truss.

(4) Using two people, lift the truss onto the tripods and secure the truss bracket.

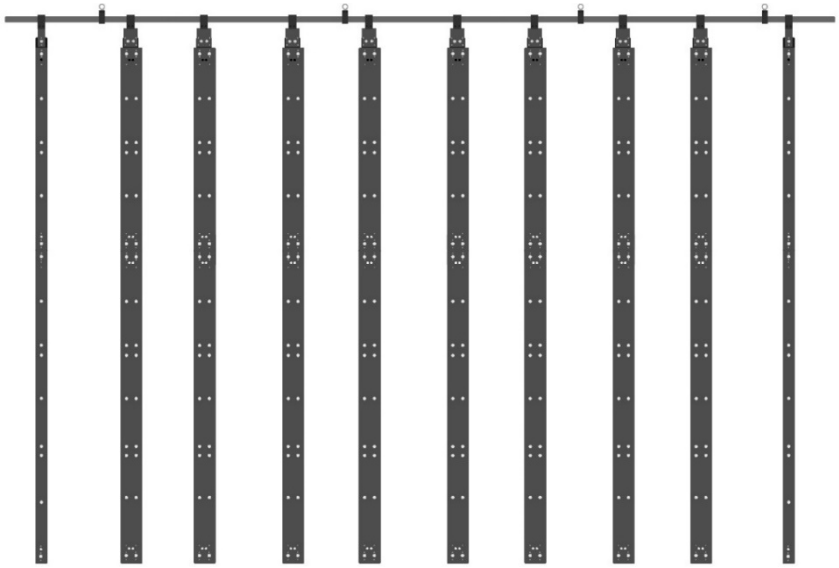
(5) Connect the five pieces of the hanging bar together, assembling from left to right following the labels on each.



(6) Using the four C-clamps, attach the hanging bar to the truss.

(7) Assemble the ten carbon fiber strips. There are eight wide strips for the middle of the video wall and two narrow strips for the ends. Each strip is comprised of a short and long section attached using the connecting plate.

(8) Attach the assembled carbon fiber strips to the hanging bar.

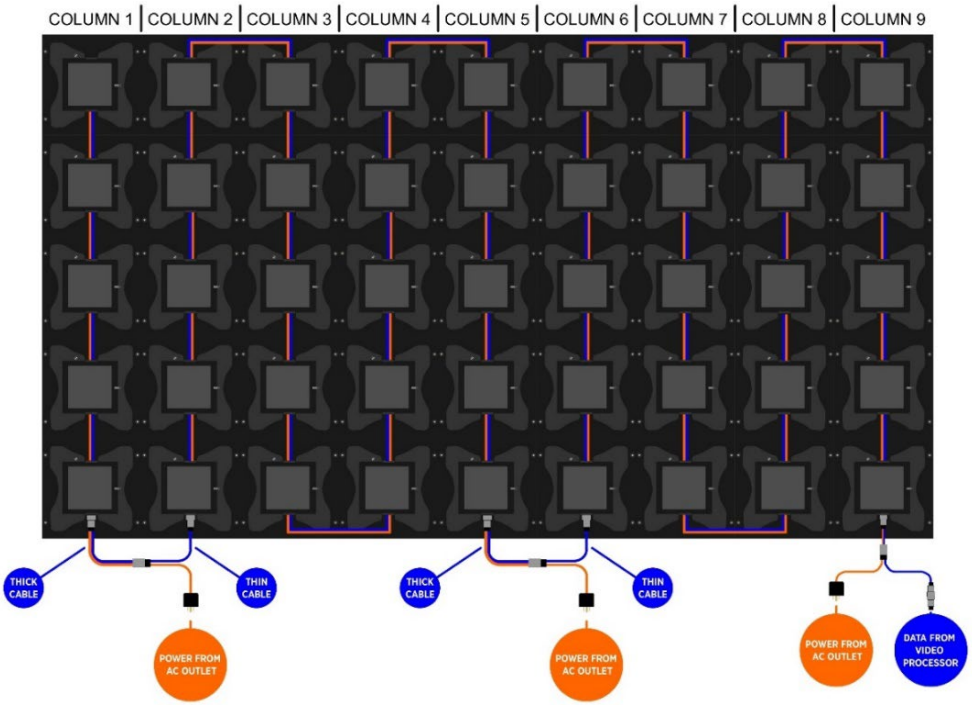


(9) Once the hanging bar and all carbon fiber strips are mounted, the LED panels can be attached to the carbon fiber strips.

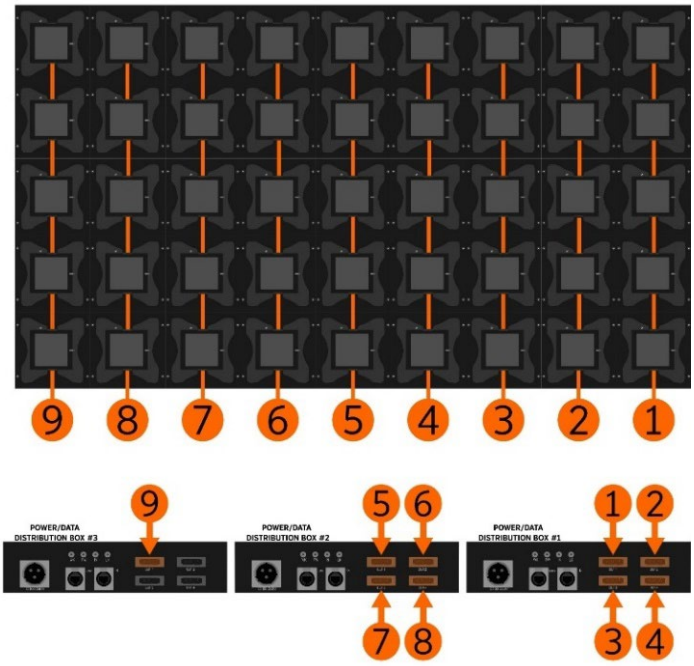
(10) Use four plate screws to attach each LED panel to the carbon fiber strips. For the Leyard video wall, the plate screws come in two different lengths; make sure to use the correct screw accordingly. Assemble in columns, starting from the top. Mount the panels with the hardwired cable facing up.

106. **How to Wire the Leyard LED Video Wall:** Wire the LED video wall according to the diagram below. Power and data are carried over the same cable. Be cautious when connecting the data to data with power cables. The thinner side of each cable must connect to

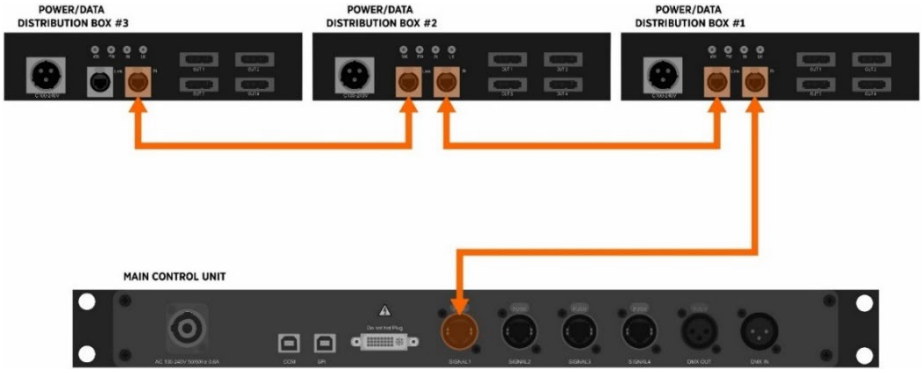
columns 2 and 6. This side of the cable has data but no power. Otherwise, a power short will occur.



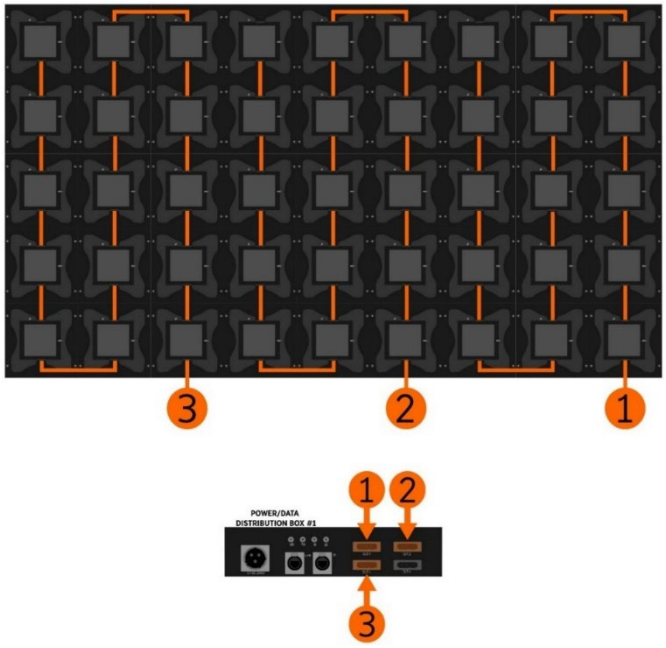
107. **How to Wire the Mozu X4 LED Video Wall:** Wire the LED video wall according to the image below. Power and data will be delivered to the video wall over the same cable. Power the distribution boxes with the provided cables once all connections are complete.



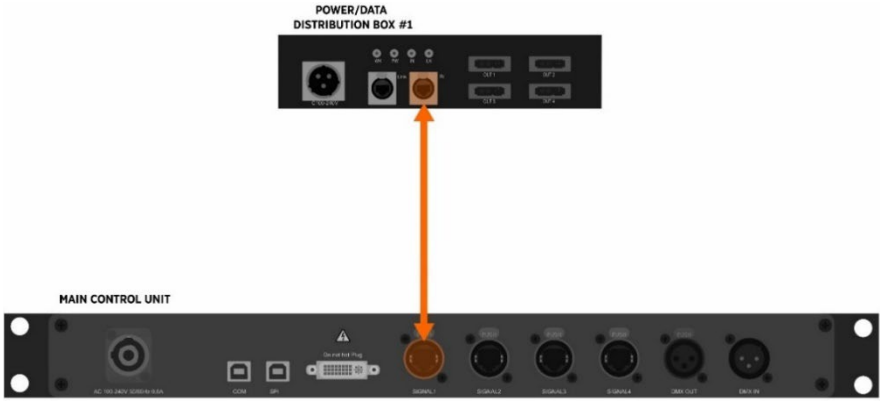
108. Connect the data signal according to the image below using the provided data cables.



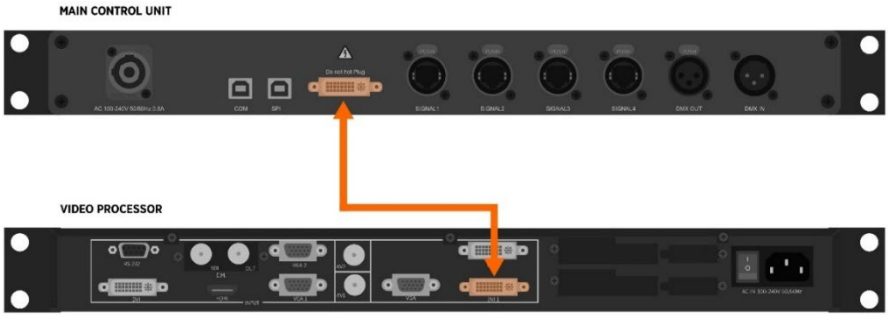
109. **How to Wire the Mozu X6 LED Video Wall:** Wire the LED video wall according to the image below. Power and data will be delivered to the video wall over the same cable. Power the distribution boxes with the provided cables once all connections are complete.



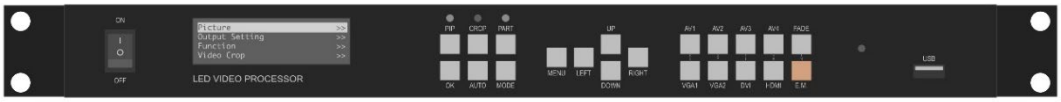
110. Connect the data signal according to the image below using the provided data cables.



111. **How to Set Up the Video Processor for Leyard and Mozu LED Video Walls:** Connect the main control unit to the video processor with the provided DVI cable, as seen in the image below. Connect the provided power cables once all connections are made.



112. Connect an SDI cable from the video system to the SDI input on the video processor. Once the video processor is powered up and connected, press the “E.M.” button on the front of the processor. The LCD on the front of the processor will show that a 720p SDI signal is recognized.



113. **Dismantling and Repackaging LED Video Walls:** De-energize the entire LED video wall using the power switches on the video wall remote power box or power distribution units before dismantling. When removing LED panels from the video wall frame, place them immediately inside the LED panel crate instead of laying them on the ground. Take care to return each individual LED panel and all video wall components to their correct crate and slot, checking the equipment labels and attached packing guides inside the crates to ensure all pieces and quantities are returned. Certain frame posts and braces keep the couplers attached to them. The packing guides posted inside the crates will give appropriate direction.

VIDEO PROCESSORS

114. The LED video walls at your convention will have NovaStar or Magnimage video processors. Follow these steps to connect and configure the video processors.

115. **NovaStar VX400:** The NovaStar VX400 video processor is used to combine multiple LED panels into one unified display. It takes a video signal from an SDI cable and converts it to a video signal on a CAT5e cable that can connect to the LED video wall.

116. **How to Set Up the NovaStar VX400 Video Processor:** Follow these steps to set up the video processor.

(1) Connect the first CAT5e cable from the LED video wall to RJ45 port 1 on the back of the video processor. Connect the second CAT5e cable from the LED video wall to RJ45 port 2 on the back of the video processor.

(2) Connect an SDI cable from an SDI distribution amplifier (DA) at the video desk to the SDI input on the rear of the processor.

(3) Plug the video processor into power on the video wall remote power box and turn the switch on the back of the unit to the “1” position.

(4) Press the SDI button on the front of the processor to select the SDI input.

(5) Load the preset by pressing the Preset button. Select the “CCJW” preset and press in the selection knob. Select “Load” and press in the selection knob. Press ESC to exit to the home page.

117. The following settings should already be set. However, it is good practice to make sure that these settings are correct in order to avoid problems.

118. Verify the scale of the LED wall by following these steps.

(1) Press the MAIN button on the front of the video processor.

(2) “Scaling Mode” should be set to CUSTOM.

(3) The “H Width” should be set to 1280.

(4) The “V Width” should be set to 768.

(5) Once verified, press the ESC button twice to return to the home screen.

119. If the scale is off for the LED video wall being used, follow these steps to adjust.

(1) Press the “MAIN” button on the front of the video processor.

(2) Rotate the selection knob to select “Scaling Mode.” Push the selection knob, then rotate to select “Custom,” then press in the selection knob to confirm.

(3) Rotate the selection knob to select “H Width.” Push the selection knob, then rotate to set the number to “1280,” then press in the knob to confirm.

(4) Rotate the selection knob to select “V Width.” Push the selection knob, then rotate to set the number to “768,” then press in the selection knob to confirm.

(5) Press the “ESC” button twice to return to the main menu.

120. The LED video walls are set up to be plug and play. They should not need additional adjustments. However, in the event that any configuration settings are incorrect please contact the WHQ Broadcasting Department.

121. Each venue must perform a test using the LED Video Wall Adjustments information in Appendix I as well as the configuration image loaded on the media laptops. It may be necessary to adjust the brightness and contrast of the LED video wall depending on the ambient light level. Follow these instructions to make additional adjustments on the processor.

(1) Push the selection knob.

(2) Rotate the selection knob to select “Input Settings,” then push the knob.

(3) Rotate the selection knob to select “SDI,” then push the knob.

(4) Rotate the selection knob to select “Input Color,” then push the knob.

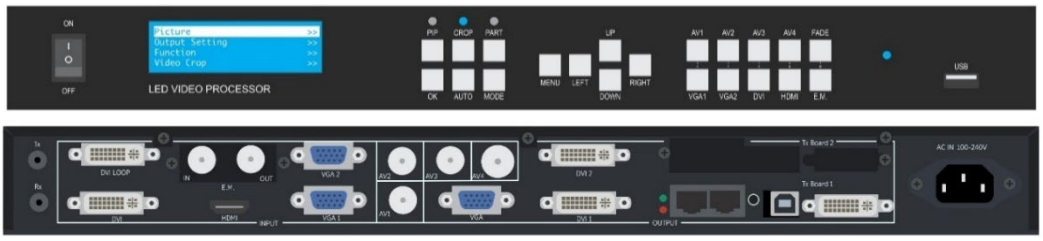
(5) Rotate the selection knob to select “Brightness,” then push the knob. Then rotate the selection knob to adjust the brightness according to the adjustment image. Once adjustments are completed, push the knob to confirm.

(6) Rotate the selection knob to select “Contrast,” then push the knob. Then rotate the selection knob to adjust the contrast according to the adjustment image. Once adjustments are completed, push the knob to confirm.

(7) Press the “ESC” button four times to get back to the home screen.

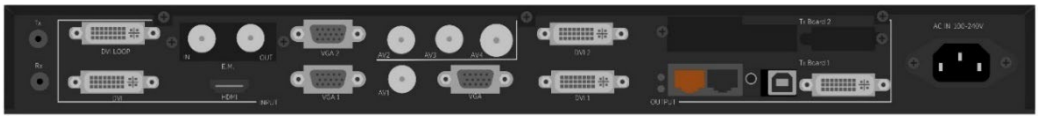
122. Once you have completed adjusting the LED video walls using the adjustment image, test a medium close-up camera shot of a brother standing at the lectern. All lights should be on as they will be during the program, and cameras should be properly white-balanced. The colors of the background and the brother’s skin tone should look natural on the LED video wall and not oversaturated. It will not be possible to achieve perfect color; your goal is to find a balance that looks natural and will not distract the audience.

123. **Magnimage:** The Magnimage video processor is used to combine multiple LED panels into one unified display. It takes a video signal from an SDI cable and converts it to a video signal on a CAT6 cable that can connect to the LED video wall.

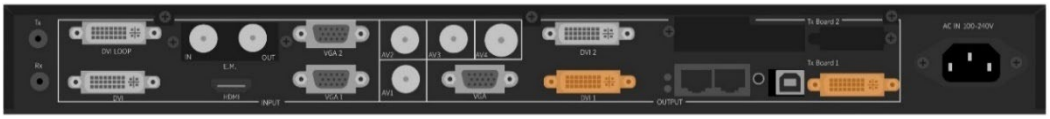


124. **How to Set Up the Magnimage Video Processor:** Follow these steps to set up the video processor.

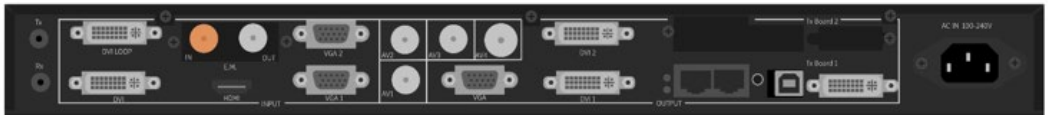
(1) Connect the CAT6 cable from the first panel on the LED video wall to the RJ45 port on the back of the video processor.



(2) On the back panel of the video processor, connect the DVI 1 output port to the DVI port located under the Tx Board 1 label using the included DVI cable.



(3) Connect an SDI cable from an SDI DA at the video desk to the E.M. IN input on the rear of the processor.



(4) Plug the video processor into power and turn the switch to the ON position. Press the “E.M.” button on the front of the unit to select the SDI input.

(5) Load the preset by pressing the “MODE” button. Press the “AV1” button to load template 1 and press “MENU” to exit to the home page.

125. The following settings should already be set. However, it is good practice to verify the scale of the LED video walls according to the list below.

- **Dicolor:** 1040 x 624
- **Leyard:** 720 x 400
- **Mozu X4:** 720 x 400
- **Mozu X6:** 432 x 240

126. If the scale is off for the LED video wall being used, follow these steps to adjust.

(1) Press the MENU button on the front panel of the processor, use the UP and DOWN buttons to navigate to Output Setting. Press the OK button.

(2) Navigate to Output Resolution and press the OK button. Press the RIGHT button to set the output to 1920 x 1080 60 Hz, then press OK to return to the home screen.

(3) Return to the Output Resolution menu and use the UP and DOWN buttons to navigate to the H Window option. Using the LEFT and RIGHT buttons, set the horizontal resolution.

- **Dicolor:** 1040
- **Leyard:** 720
- **Mozu X4:** 720
- **Mozu X6:** 432

(4) Navigate to the V Window option and set the vertical resolution.

- **Dicolor:** 624
- **Leyard:** 400
- **Mozu X4:** 400
- **Mozu X6:** 240

(5) Press the MENU button twice to return to the main menu.

127. The LED video walls are set up to be plug and play. They should not need additional adjustments. However, in the event that any configuration settings are incorrect please contact the WHQ Broadcasting Department.

128. Each venue must perform a test using the LED Video Wall Adjustments information in Appendix I as well as the configuration image loaded on the media laptops. It may be necessary to adjust the brightness and contrast of the LED wall depending on the ambient light level. Follow these instructions to make additional adjustments on the processor.

(1) Press the “MENU” button.

(2) Press the RIGHT button to select Picture.

(3) Use the DOWN button to select Brightness.

(4) Use the LEFT and RIGHT buttons to decrease or increase brightness. Adjust the brightness until the image displays correctly.

(5) Use the DOWN button to select Contrast.

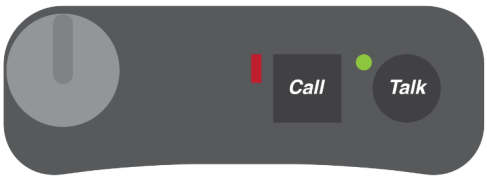
(6) Use the LEFT and RIGHT buttons to decrease or increase contrast. Adjust the contrast until the image displays correctly.

(7) Press the MENU button twice to return to the main menu.

129. Once you have completed adjusting the video walls using the adjustment image, test a medium close-up camera shot of a brother standing at the lectern. All lights should be on as they will be during the program, and cameras should be properly white-balanced. The colors of the background and the brother's skin tone should look natural on the LED video wall and not oversaturated. It will not be possible to achieve perfect color; your goal is to find a balance that looks natural and will not distract the audience.

TELEX INTERCOM SYSTEM

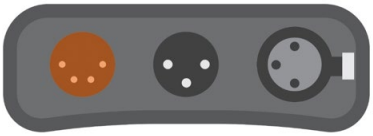
130. The Telex intercom system is used for communication between the various brothers in the audio and video departments. The roles that may make use of the Telex belt packs and headsets are as follows: one technical director, two manned camera operators, one PTZ operator, one switcher operator, one audio mixer assistant, and one media player operator. Each kit includes six or seven Telex belt packs, six or seven headsets, and the power supply unit required to operate the system.



131. **How to Set Up the Telex Intercom:** Follow these instructions to set up the Telex intercom system.

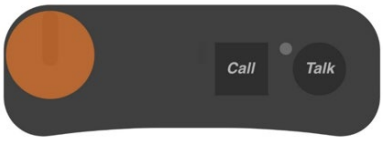
(1) Using XLR cables, connect each Telex belt pack to the panel on the rear of the audio headend labeled "Intercom." The intercom functions as a party line; therefore, any belt pack can be plugged into any of the ports labeled "Intercom" and still function properly.

(2) Plug one headset into each belt pack and turn the volume knob until it clicks on.

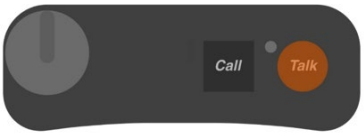


132. **How to Operate the Telex Intercom**:

(1) The large grey dial on the top left turns the belt pack on and then adjusts the volume.



(2) Press the round Talk button to activate the microphone and press it again to turn it off. If you are not speaking into the microphone, switch the microphone off so it does not pick up noise.



STANDARDS CONVERTERS

133. A converter kit will be provided that contains all the devices needed to convert and distribute video, and in some cases audio, within the venue. Every device in this kit comes with a power supply. Most kits will include the quantities of converters listed below.

134. **Blackmagic SDI to HDMI Micro Converter:** These converters are provided to distribute audio and video, and when used with locally supplied televisions, can provide the program at department locations. The SDI loop output can feed other converters in a chain to provide distribution. The maximum distance between converters is 300 ft. Sixteen of these are included in the converter kit.

135. **Blackmagic SDI to HDMI Mini Converter:** These converters are provided to distribute audio and video, and when used with locally supplied televisions, can provide the program at department locations. The SDI loop output can feed other converters in a chain to provide distribution. Additionally, the ¼ in. analog outputs can provide audio signal to a preamp system if audio is embedded on the SDI signal. The maximum distance between converters is 300 ft. Two of these are included in the converter kit. If a television provided by the WHQ Broadcasting Department does not have an SDI input, one of these converters will be mounted to the rear of the television.

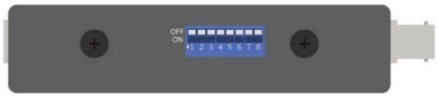
136. **Blackmagic SDI to Analog Mini Converter:** This converter can be used to convert the SDI signal from the video system to an analog video format, such as component or

composite video. Additionally, the ¼ in. analog outputs can provide audio signal to a preamp system if audio is embedded on the SDI signal. One of these is included in the converter kit.

137. **Blackmagic Audio to SDI Mini Converter:** This converter can be used to embed audio into the SDI video signal. This signal can be distributed to the house system or to the locally supplied televisions used to provide the program to the departments. Two of these are included in the converter kit.

138. **How to Set Up the Blackmagic Audio to SDI Mini Converter:** The audio-to-SDI converter will need to be configured for use. Follow these steps and refer to the “Video System Wiring Diagram” in your drawing set for more information.

(1) Confirm switch 1 is in the OFF position and power up the unit with the provided power supply.



(2) Connect the SDI source from the video desk to the SDI input.

(3) Connect an audio signal from the audio headend to the “CH1 Analog” and “CH2 Analog” input using the provided connectors.

(4) Confirm that the audio source is being received by observing the white LED next to the “CH1 Analog” input. It will flash according to the signal being received.

139. **Blackmagic SDI Distribution Mini Converter:** These converters, also referred to as distribution amplifiers (DA), have an SDI input and eight SDI outputs that can be used to split a single SDI to multiple destinations. Four of these are included in the converter kit.

140. **Blackmagic UpDownCross Mini Converter:** For venues where the house video system cannot be adjusted to match the output of the video switcher, this converter can be used to adjust the output resolution. Two of these are included in the converter kit.

141. **How to Set Up the Blackmagic UpDownCross:** The UpDownCross will need to be configured for use. Follow these steps to set it up.

(1) Set switch 1 to the ON position.

(2) Use the chart on the rear of the UpDownCross to set the conversion type and format selection.

(3) Plug in an SDI cable from the SDI DA at the video desk to the SDI “IN” port, and connect the SDI “OUT” port to the house video system. See the “Video System Wiring Diagram” in your venue’s drawing set for more information.

(4) Power the unit with the provided power supply.

142. **Blackmagic Sync Generator Mini Converter:** This converter is used as a backup in the event that the sync generator inside the Ross Crossover Solo fails. This device will

connect to each camera and the switcher in order to sync all cameras and the video switcher together. One of these is included in the converter kit.

143. **Blackmagic HDMI to SDI Micro Converter:** This converter takes an HDMI signal and converts it to SDI. These are primarily used to get video signals from the media players into the switcher. These are powered directly from the laptops. Two of these are provided with the media player kit.

FIBER RATTLER KIT

144. Venues that need to send audio and video over long distances may use a fiber rattler kit. Each kit includes a send and receive rattler that utilizes a fiber cable to transmit audio and video signals over long distances. There are two models used in the United States branch territory: Telecast Rattler kit and Grass Valley Rattler kit. Both units function the same way.

145. **How to Set Up the Fiber Rattler Kit:** Follow these instructions to set up the fiber rattler kit.

(1) Identify the fiber path from beginning to end.

(2) Connect an SDI cable from the video source to the BNC connector on the transmitter.

(3) Run a fiber cable from the ST connector on the transmitter to the fiber distribution near the source.

(4) Connect a fiber cable from the fiber distribution to the ST connector on the receiver.

(5) Run an SDI cable from the BNC connector to the destination device.

(6) Connect both DC power supplies to the power inputs and ensure the power LED is lit on both devices.

(7) Verify that the signal strength is good on the receiver.

TELEVISIONS

146. Most venues require televisions in various locations, and some of these televisions will be provided by the WHQ Broadcasting Department. Most televisions will make use of SDI when connected to the convention video system. Some televisions have built-in SDI connections, and those that do not will have an SDI to HDMI converter attached to the rear. Below is a list of televisions you may receive and general information about them.

147. When possible, connect televisions located near the stage to the power distribution set, either directly to the PDU or to one of the remote power boxes. For televisions located in remote locations, there is no need to run extension cables back to the stage location for power.

148. **Confidence Monitor:** A 32 in. television is included for use as a confidence monitor on stage. Information about where to place this television can be found in the Stage Layout section of this document.

149. **Multiview Monitor:** A 42 in. television is included for use as the multiview monitor connected to the video switcher. Information about where to place this television can be found in the Video Desk section of this document.

150. **Television with Wall Mount:** The television with wall mount is shipped as a pair and is usually 55 in. These televisions can be mounted backstage for the participants and at times can be mounted and used as fill televisions for audience sections that cannot see the larger displays.

151. **How to Set Up the Television with Wall Mount:** These televisions ship with a standard VESA mount.

(1) Remove the VESA mount from the case, being careful not to damage the television.

(2) Securely attach the mount to a firm piece of backer material (e.g., plywood) when mounting to the stage, or dimensional lumber when mounting in an audience area. Always make sure that safety is the priority when mounting. Avoid creating trip hazards for those attending and causing any damage to the venue.

(3) When the mount is securely fastened, use two or more people to raise the television onto the mount and secure it in place.

152. **Television in Lift Case:** This television ships in a motorized case that allows the television to raise out of the top. These are used as fill televisions for sections in the audience that cannot see the larger displays. They come in two sizes, 55 in. and 65 in.

153. **How to Set Up the Television in Lift Case:** Follow these instructions to set up the televisions that ship in lift cases.

(1) Roll the lift case to the location where it will be deployed and remove the top of the case.

(2) Connect the case to power and use the buttons in the case to raise the television to its full height.

(3) These televisions should never be placed on elevated platforms as they can be top heavy.

154. **Safely Handling and Packaging Televisions:** Many televisions are shipped in cases or crates that have an adjustable spacer. This spacer keeps the television securely in place

for shipping but must be removed in order to take the television out of its case. Take care to return this spacer to the shipping case after placing the television in the case upright. There is no need to remove the television stand or legs to place it inside the case.

OTHER EQUIPMENT

155. All venues are different; therefore, some venues may receive equipment not included in this document. Consult any documentation included with these pieces of equipment, and contact the WHQ Broadcasting Department with any questions when it comes to setting up and operating these pieces of equipment.

CHAPTER 5 ELECTRICAL DISTRIBUTION EQUIPMENT

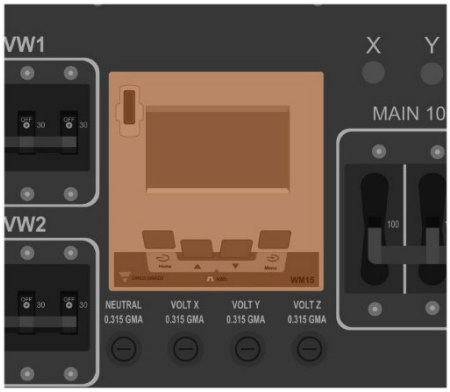
POWER DISTRIBUTION SET

1. Most sites will receive a Power Distribution Set (PDS), which includes all the necessary equipment and cables for operation. The PDS takes power from the facility, typically provided as three-phase power at high voltage, and converts it to the appropriate voltage for the equipment supplied by the WHQ Broadcasting Department. The PDS provides power and a unified ground for convention AV systems. Most AV equipment will connect to the PDS. Do not connect anything other than AV equipment to the PDS.

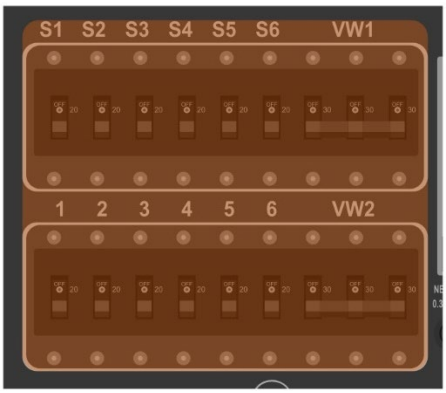
2. Certain sections in this chapter are relevant to qualified electricians. These will be marked with the tag **(ATTN: Qualified Electricians)**.

3. **Power Distribution Unit (PDU):** The PDU is the main component of the PDS. It provides electrical protection and distributes power to the AV equipment.

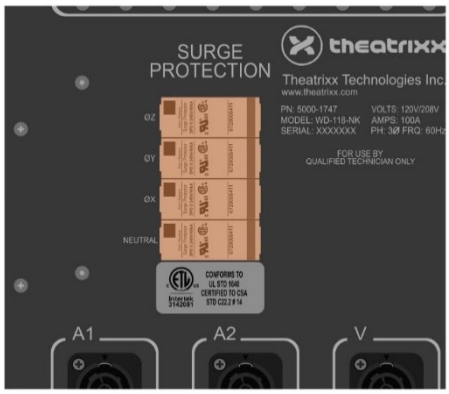
(1) **Power Meter:** Indicates voltage and amperage coming in and out of the unit for all three phases.



(2) **Output Breakers:** Controls the flow of power to receptacles. Breaker labels correspond to the receptacle designations on the PDU.



(3) **(ATTN: Qualified Electricians) Surge Protection:** Provides surge protection for components in the PDU. A red indicator shows that a high-powered surge has affected the unit.



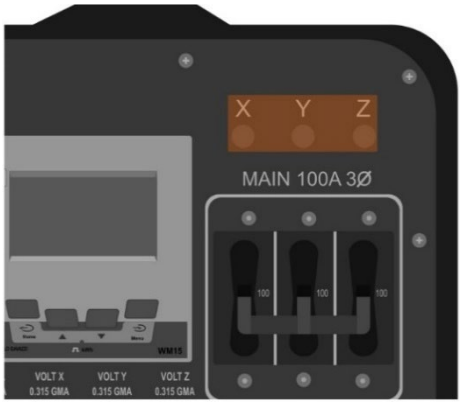
(4) **Remote Power Box (RPB) Receptacles:** Six powerCON TRUE1 receptacles (120 VAC, 20 A, single phase) providing power to the RPBs.

(5) **Spare Receptacles:** Six receptacles (120 VAC, 20 A, single phase) providing power to power strips or other AV equipment. They are color-coded to assist with load management between phases.

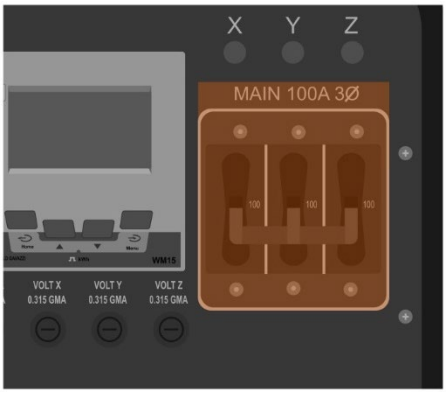
(6) **(ATTN: Qualified Electricians) Camlock Power Ports:** Ports that receive house power via feeder cables. The green port is for the grounding conductor, the white port is for the grounded (neutral) conductor, and the black, red, and blue ports are for the

ungrounded conductors for three phases of power: black (ØX) = Phase X, red (ØY) = Phase Y, and blue (ØZ) = Phase Z.

(7) **Power Indicator LED Lights:** Indicates when the PDU is receiving house power. If any of the lights are not lit, there is no power coming in on that phase.

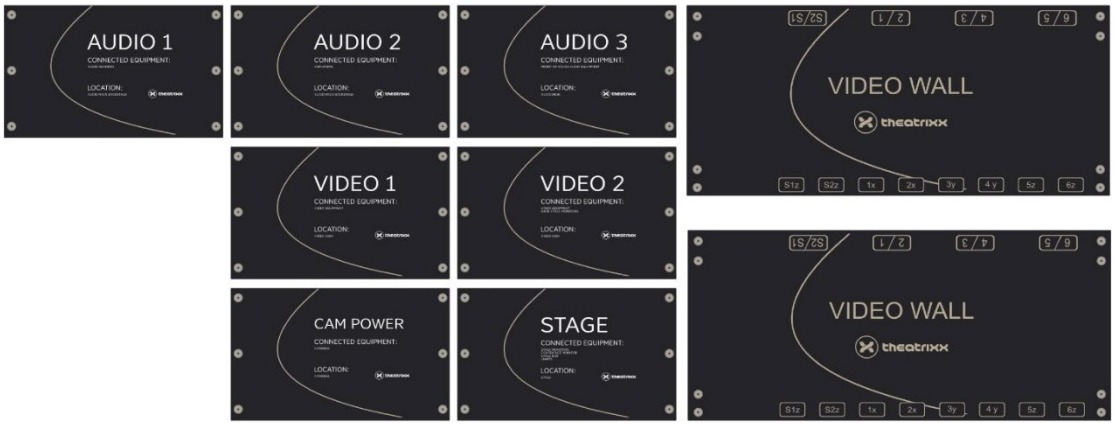


(8) **(ATTN: Qualified Electricians) Main Circuit Breaker:** Energizes the unit with house power.

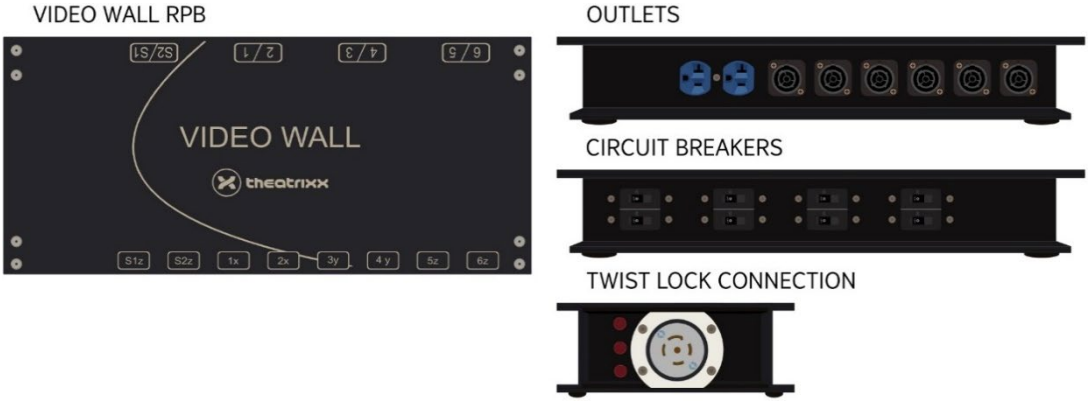


(9) **Video Wall Remote Power Box Receptacles:** Two receptacles (120/208 VAC, 30 A, three phase) providing power to the video wall RPBs.

4. **Remote Power Boxes (RPB):** There are three audio, two video, one stage, and one cam power RPB included in each PDS. An LED video wall RPB will be included with each video wall. Each RPB includes a label showing its location and connected equipment.

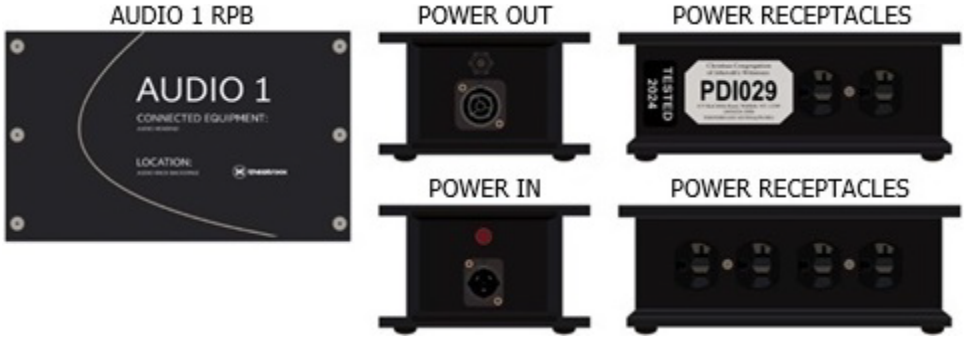


5. **Video Wall RPB:** Feeds power to the video wall. Each RPB includes two 20 A receptacles and six powerCON TRUE1 receptacles, each controlled by a 20 A circuit breaker. **NOTE:** These RPBs are stored in the video wall frame crates and connect to the PDU using the twist lock connector on the back of the unit. They also power the video processor.

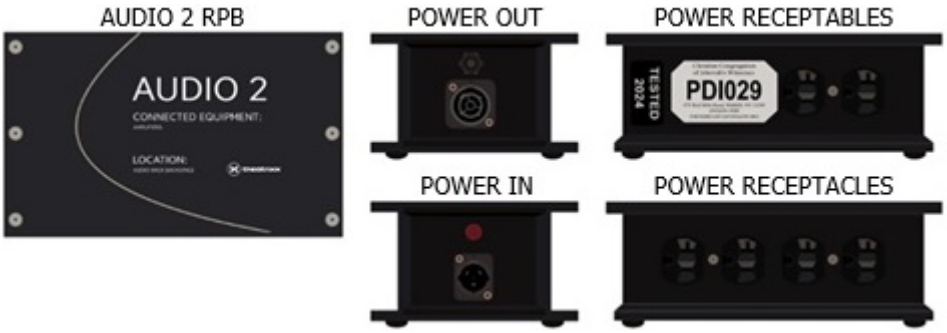


6. **Audio, Video, Stage and Cam Power RPB:** Feeds power to the audio and video equipment. Each RPB includes two powerCON TRUE1 receptacles and six 20 A receptacles. The powerCON TRUE1 receptacles on the back and front of the unit allow multiple RPBs to be daisy-chained together.

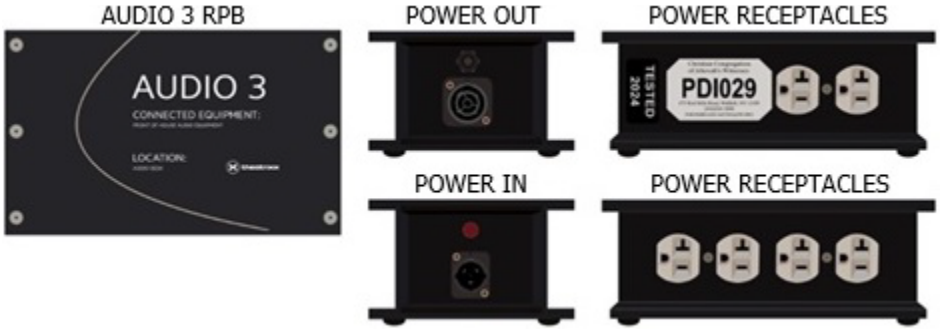
(1) **Audio 1 RPB:** Located at the audio headend backstage, this RPB powers all devices in the audio headend except the amplifiers.



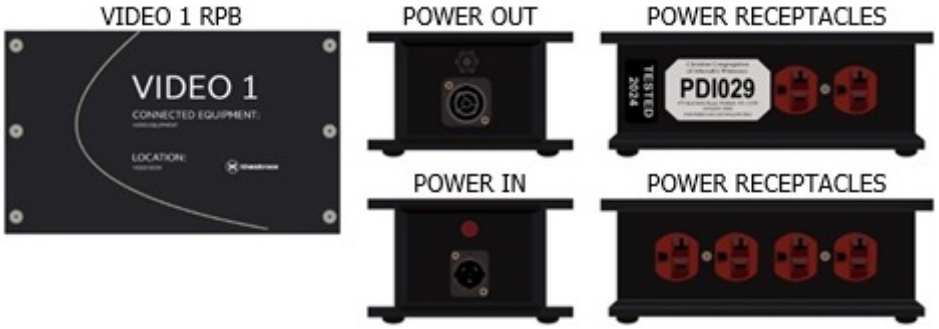
(2) **Audio 2 RPB:** Located at the audio headend backstage, this RPB powers the amplifiers.



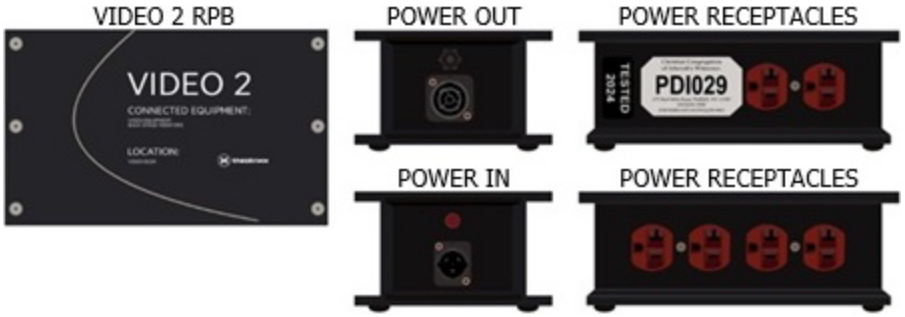
(3) **Audio 3 RPB:** Located at the audio desk in the field of sound, this RPB provides power at the audio desk for any audio equipment.



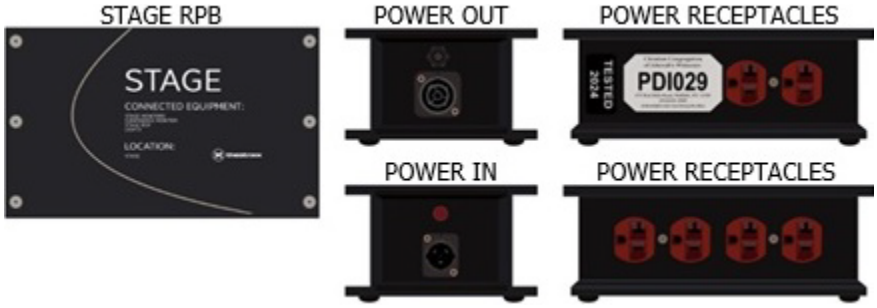
(4) **Video 1 RPB:** Located at the video desk backstage, this RPB provides power at the video desk for the video equipment.



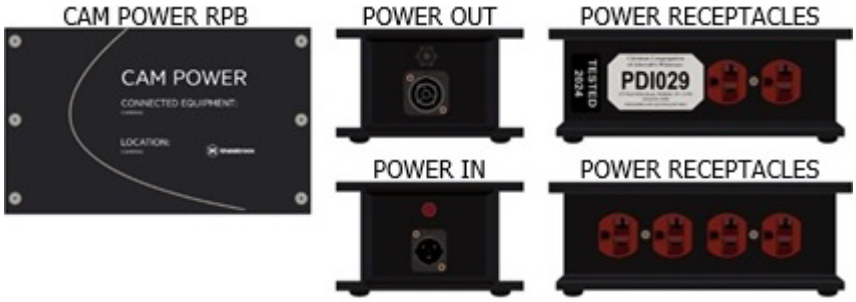
(5) **Video 2 RPB:** Located at the video desk backstage, this RPB provides power at the video desk for equipment.



(6) **Stage RPB:** Located near the stage, this RPB powers AV equipment on the stage, including lights, stage monitors, stage boxes, and confidence monitor.



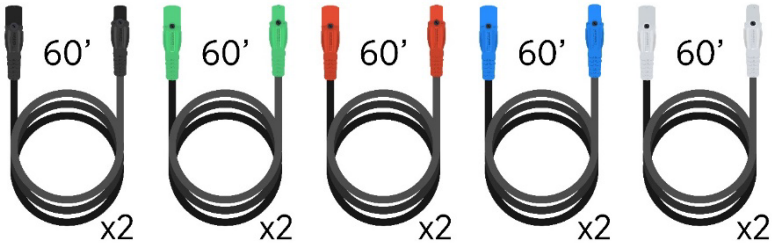
(7) **Cam Power RPB:** Located near the cameras, this RPB powers the cameras.



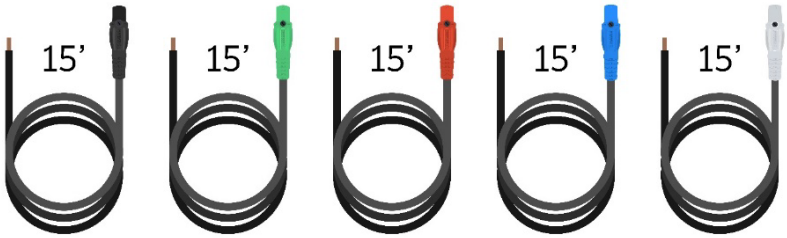
7. At times, power strips will be needed to connect all pieces of equipment to the PDS. Locally supplied power strips and extension cords can be used.

8. **Cables:** The PDS includes a number of cables used to connect all the components together.

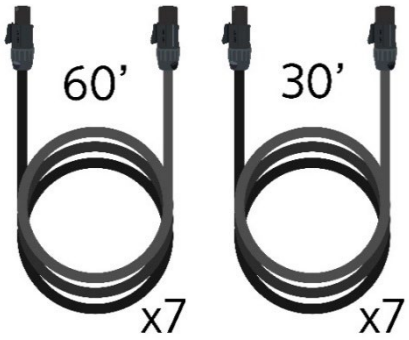
9. **(ATTN: Qualified Electricians) Feeder Cable (Two sets of five cables):** 1 AWG, Type SC cable, 60 ft, camlock (M) to camlock (F). Camlock connectors are also known as Series 16 connectors. These cables feed the PDU power from the house system and are color-coded to match the power ports on the PDU. Two cables of the same color can be used to extend the length of the cable run from the house panel to the PDU.



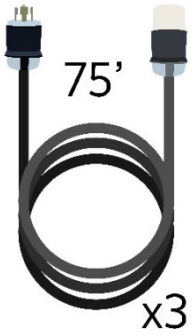
10. **(ATTN: Qualified Electricians) Feeder Cable Pigtail Adapter:** 1 AWG, Type SC cable, 15 ft camlock (F) to bare wire. For sites without camlock ports at the house panel, this pigtail can be used to connect the feeder cables. There is a matching pigtail for each feeder cable color.



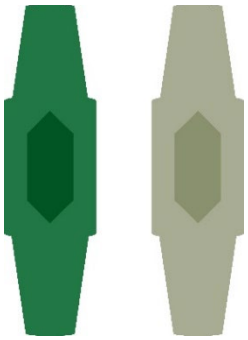
11. **Extension Cable for RPB:** 12/3 AWG, 30 ft and 60 ft powerCON TRUE1 (M) to powerCON TRUE1 (F). Cable connects the RPB receptacles on the PDU to the remote power boxes. These can be connected together when needed to reach the location of the RPBs.



12. **Video Wall RPB Power Cable:** 8/5 AWG, 75 ft, twist lock (M) to twist lock (F). Cable connects the video wall RPB receptacles on the PDU to the video wall remote power boxes. One cable will be stored in each video wall frame crate. The extra cable is located in the PDS crate.



13. **Turn Around Adapters:** Two double female connectors are included in the PDS. Some sites have inverted ground and neutral camlock ports on their panel.



14. **Video Wall Power Cable for LED Video Walls:** 12/3 AWG, these cables will be stored in the video wall frame crate.

(1) **Absen PL3.9 XL:** powerCON TRUE1 (M) to powerCON TRUE1 (F). Cables connect the video wall RPBs to the Absen video wall panels. Each video wall will use six cables.

(2) **Dicolor M1-481:** powerCON TRUE1 (M) to grey powerCON (F). Cables connect the video wall RPBs to the Dicolor video wall panels. Each video wall will use five cables.

(3) **Dicolor M-481 Plus:** powerCON TRUE1 (M) to blue powerCON (F). Cables connect the video wall RPBs to the Dicolor video wall panels. Each video wall will use six cables.

(4) **Leyard VSS4-O:** Edison (M) to proprietary connector (F). Cables connect to either a video wall RPB or a standard power outlet to the Leyard video wall panels. Each video wall will use three cables.

15. **How to Set Up the Power Distribution Set:** Follow the instructions below to set up the PDS. Please note some parts of the setup should only be performed by a qualified electrician.

(1) Ensure that the PDU is not in a high traffic area where it could be bumped or knocked over. During installation, the area should be stanchioned off or closed for the safety of the people and equipment in the area. Make sure to set up the PDU before setting up the AV equipment.

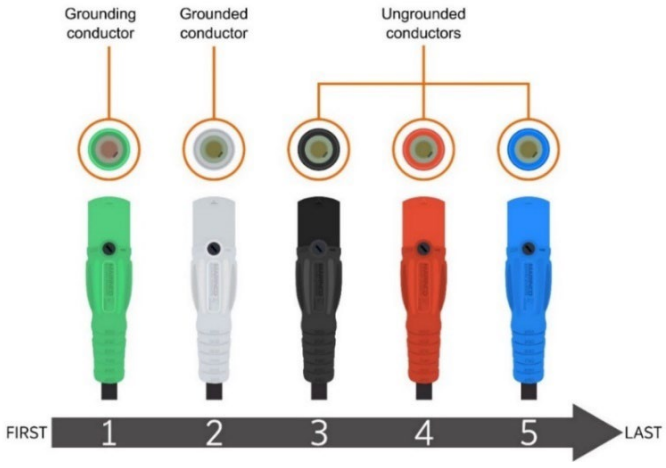
(2) Place the PDU close to the video desk, if possible. The PDU should be set upright with the lid open. This will provide easy access to the connections and provide stability for the front of the unit. The handle on the top of the unit should be retracted.

(3) **(ATTN: Qualified Electricians)** Prepare to connect the PDU to house power. De-energize systems whenever possible before working on them. Make sure to protect all live electrical installations such as receptacles, switches, cables, and panels from accidental contact. The qualified electrician is responsible to make sure that the feeder cables are safely installed and protected. Cables should lay flat on the ground. Do not bundle cables together.

(4) **(ATTN: Qualified Electricians)** Confirm that the house power (circuit breaker/disconnect) and main circuit breaker on the PDU are turned off before installation. A 200 A circuit breaker or fused disconnect is recommended. If the facility does not have camlock connectors, you can use the provided pigtail adapters to connect to the facility house power.

(5) **(ATTN: Qualified Electricians)** Before you connect feeders to house power, inspect the connectors, and the entire length of cable for cuts, cracks, broken parts, loose connections, or exposed copper conductors. Inspect the camlock connectors on the PDU to ensure they are not loose or damaged. If any issues are found, please inform the program overseer and contact the WHQ Broadcasting Department before you connect any equipment.

(6) **(ATTN: Qualified Electricians)** Connect the five feeder cables to the PDU camlock ports. In the interest of safety, connect the cables from left to right as shown in the diagram below. After connecting the cables to the PDU, connect the five feeder cables to the house power in the same order.



(7) **(ATTN: Qualified Electricians)** Energize the house power source (circuit breaker/disconnect). Once the PDU is receiving power, the three power indicator LED

lights on the unit will turn on and the power meter will begin to monitor incoming voltage from the house power. Energize the main circuit breaker on the PDU.

(8) **(ATTN: Qualified Electricians)** Using the built-in power meter, verify the PDU is receiving the correct voltage. The voltage should be as follows.

- Phase to Phase = 208 VAC
- Phase to Neutral = 120 VAC

(9) **(ATTN: Qualified Electricians)** If the surge protector on the PDU is displaying a red indicator, it has been hit with a power surge from the house power. If this happens, please inform the program overseer and contact the WHQ Broadcasting Department.

(10) **(ATTN: Qualified Electricians)** Exercise all PDU output breakers to ensure they are working properly and are staying energized. If they will not stay energized, please inform the program overseer and contact the WHQ Broadcasting Department. Once all are tested, turn off all output breakers. Set the meter to amp mode for the Audio/Video Department, as this will be the primary mode used for operation.

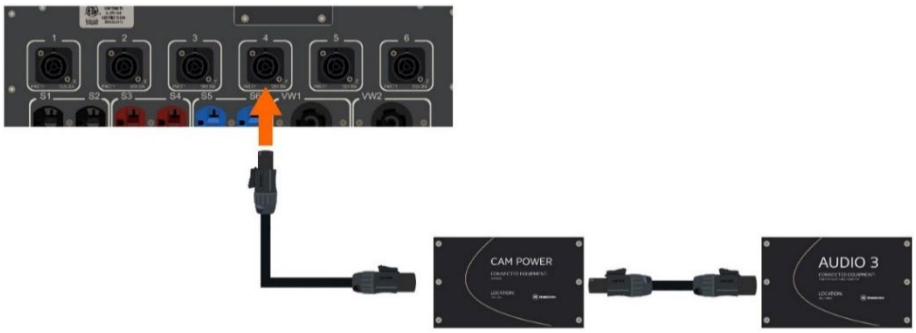
16. The PDU can now be turned over to the Audio/Video Department to connect the RPBs and other AV equipment. Multiple extension cables can be connected together, if needed. Follow the instructions below to connect the RPBs.

(1) Connect output 1 to the “Audio 1” RPB, which is located at the audio headend and powers the audio equipment.

(2) Connect output 2 to the “Audio 2” RPB, which is located at the audio headend and powers the amplifiers.

(3) Connect output 3 to the “Video 1” RPB, then connect the “Video 1” RPB to the “Video 2” RPB. Both of these RPBs are located at the video desk and are used to power the video equipment.

(4) Connect output 4 to the “Cam Power” RPB located near the cameras which powers all the AV equipment near the cameras. Then connect the “Cam Power” RPB to the “Audio 3” RPB located at the audio desk and is used to power the audio equipment.



(5) Connect output 5 to the “Stage” RPB located on stage and used to power AV equipment located on or near the stage.

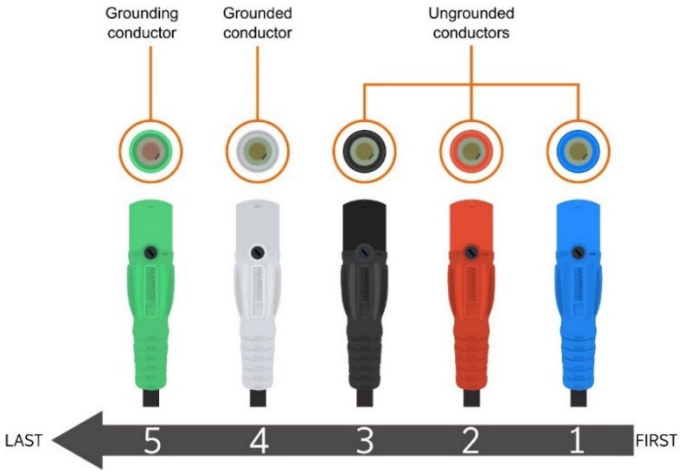
(6) Connect outputs VW1 and VW2 to the two video wall RPBs located behind each video wall and are used to power the video walls and the video processors.

(7) Energize the output breakers for each circuit that is utilized only after all cables are connected. A red LED light will illuminate on each RPB once it is energized.

17. The blue or grey powerCON cables that connect to the LED wall cannot be unplugged while the circuit is energized. Either de-energize the circuit or disconnect the output cable at the LED wall RPB.

18. **(ATTN: Qualified Electricians)** At the end of the convention, prepare to disconnect the PDU from house power. After the AV crew has powered down all AV equipment, turn off all output breakers on the PDU. Turn off the main circuit breaker on the PDU. De-energize house power at source (circuit breaker/disconnect).

19. **(ATTN: Qualified Electricians)** Disconnect the five feeder cables from the house power source in the order shown in the diagram below. Then, disconnect the five feeder cables from the PDU from right to left.



20. **How to Operate the Power Distribution Unit:** On the power meter, press the up or down arrow to navigate to the meter shown below. This will allow you to see the amperage used on each phase. Ensure that the readout for Phase X, Phase Y, and Phase Z are below 80 amps.

21. Make periodic checks to ensure that no phase is above 80 amps. Key times to check the readings could include during songs or media playback.

22. **Dismantling and Repackaging the Power Distribution Unit:** After disconnecting all equipment safely, wrap each cable neatly and use the attached Velcro straps to keep them coiled. The coil size of the cables may depend on the corresponding slot of the shipping crate. Consult the packing guides attached to the interior of the crate to determine the placement and quantities of all components. **NOTE:** Some power equipment is returned to the *video wall frame* crates. Consult the equipment labels and crate packing guides to determine this.

OTHER EQUIPMENT

23. All venues are different; therefore, some venues may receive equipment not included in this document. Consult any documentation included with these pieces of equipment, and contact the WHQ Broadcasting Department with any questions regarding setup and operation.

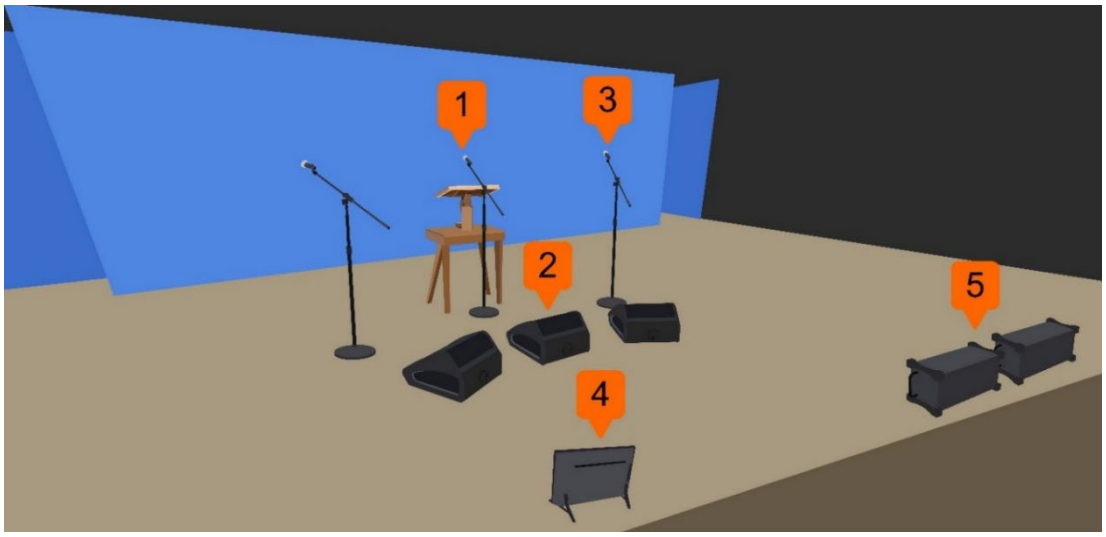
CHAPTER 6 STAGE AND AUDIO/VIDEO CONTROL AREAS

INTRODUCTION

1. This section covers various principles and requirements for setting up the stage, as well as the audio and video desks.

STAGE LAYOUT

2. Below is an example of a stage layout.



3. The following points are important to keep in mind when setting up the stage.

(1) Place the lectern in the center of the stage from side to side, a few feet from the backdrop. Adjust the distance based on the shadows seen on the back wall.

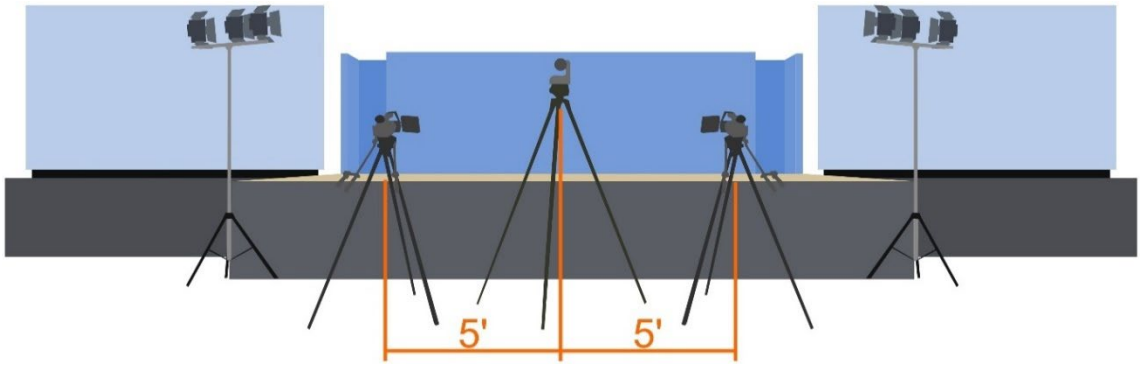
(2) Place the stage monitors approximately 5 ft from the microphones and directly behind them. This configuration ensures the microphone's greatest rejection is directly in line with the stage monitors.

(3) Position participants a few feet from the main lectern and slightly downstage. This ensures they are properly captured by the cameras with the backdrop behind them.

(4) Place the confidence monitor where it can be easily seen by anyone giving a part on the stage.

(5) Place the primary and backup audio stage boxes where they can be easily accessed in case of an emergency.

(6) Place cameras approximately 17 ft from the front of the stage and 5 ft apart from each other. As seen in the image below, the middle camera should be raised to maximum height, while the side cameras should be raised to use the top two sections of the tripods.

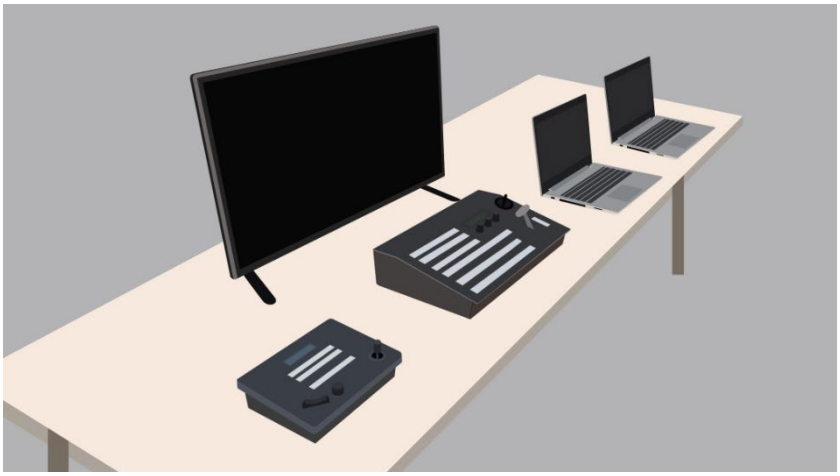


(7) Place lighting equipment lifts at the corner of the stage, on the floor of the venue, and raise them to full height.

VIDEO DESK

4. The video desk should be located where the technical director, switcher operator, PTZ operator, and media operator can communicate freely during the program without distracting the audience. Refer to the drawing set for the exact location of the video desk.

5. Below is an example of how the PTZ controllers, switcher, multiview monitor, and media players can be set up at the video desk.



6. The following points are important to keep in mind when setting up the video desk.

(1) Each operator should have enough room to sit comfortably and perform their job.

(2) The switcher operator should have a clear view of the multiview monitor to switch between various cameras and media players.

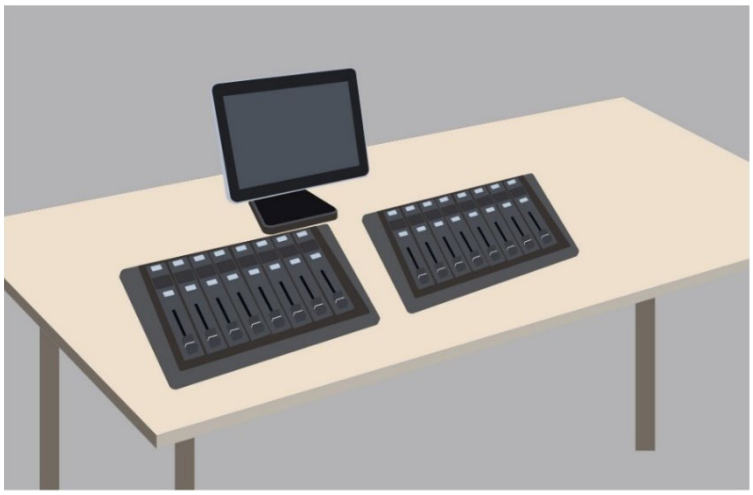
(3) The PTZ camera operator should be able to clearly see the “Preview” output on the multiview monitor to make small adjustments before going live.

(4) The media operator should be able to see the screens on the laptop as well as the outputs on the multiview monitor.

AUDIO DESK

7. The audio desk is located in the field of sound, generally in or around the audience, so that the operators can hear what the audience hears and adjust accordingly. Refer to the drawing set for the exact location of the audio desk.

8. Below is an example of how the audio mixers and audio meter can be set up at the audio desk.



9. The following points are important to keep in mind when setting up the audio desk.

(1) A small desk can be used for the limited equipment, especially since it is located in the audience area. Ensure there is enough room for the mixer operator and assistant to sit comfortably without significantly impacting the surrounding seating.

(2) The audio laptop can be used to configure the audio system at the audio desk during setup and as a meter if the CC-10 fails. However, it should generally be located back-stage at the audio headend during the program.

APPENDIX A SIMULTANEOUS INTERPRETATION

1. Some conventions will require additional equipment for simultaneous interpretation. This section contains instructions for this equipment.

INTERPRETATION SETUP

2. To accommodate simultaneous interpretation at select events, venues will receive an interpretation kit that includes: one Mackie mixer, one Rane headphone amplifier, one RDL distribution amplifier, three Audio-Technica interpreter headsets, one Sony headset, and various power supplies and converters.

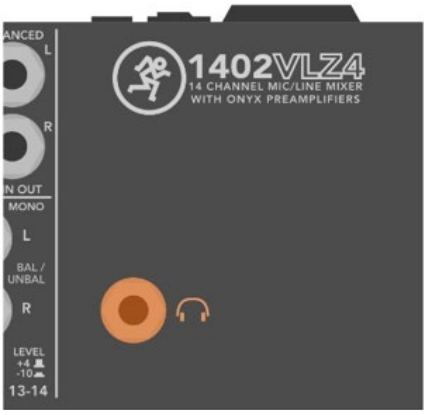
3. The simultaneous interpretation room should be enclosed to limit noise from the convention. If possible, it should be located close to the video crew, as several AV connections between the two areas are necessary.

4. **Mackie 1402VLZ4 Mixer:** The Mackie mixer is used to mix the interpreters' voices and send this interpreted mix to listeners.

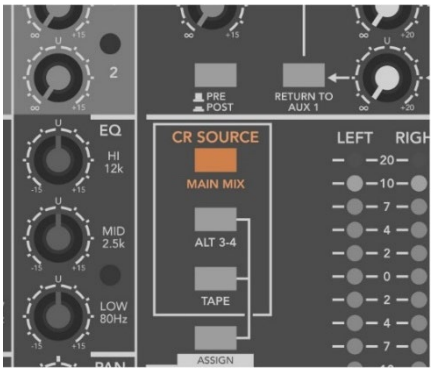
5. **How to Set Up the Mackie 1402VLZ4 Mixer:**

(1) Refer to the drawing detail “Simultaneous Interpretation” for information on connecting the interpretation mixer to the audio system.

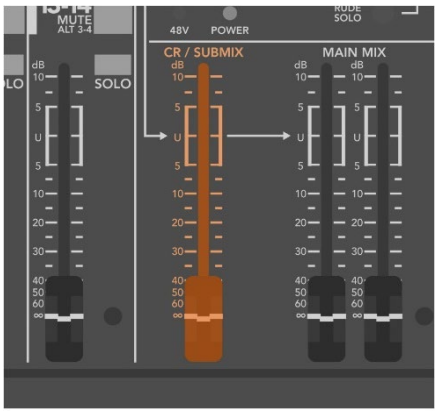
(2) Plug the mixer operator's Sony headset into the headphone jack on the mixer.



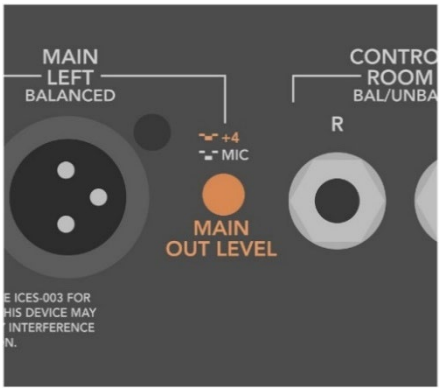
(3) To hear the audio through the headset, press down the Main Mix button in the CR SOURCE box.



(4) Adjust the headphone volume using the CR/SUBMIX slider.



(5) On the back of the mixer, ensure the MAIN OUT LEVEL is set to +4.



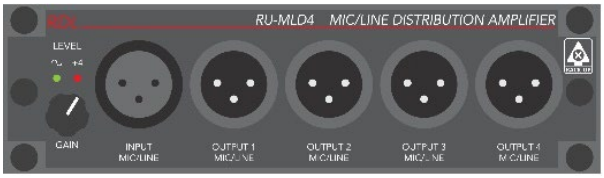
6. **Operating the Mackie 1402VLZ4 Mixer:** Raise and lower the slider for the corresponding interpreter or media input in order to send the audio to those listening to the translated program.

7. **Rane HC6S Headphone Amplifier:** This provides audio to the interpreter headsets, allowing each interpreter to control the volume at which they hear the audio from the main program.

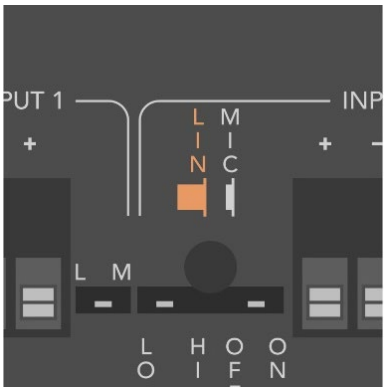
8. **Setting up the Rane Headphone Amplifier:** Set the front panel switch to MONO.

9. **Operating the Rane Headphone Amplifier:** Each interpreter can raise and lower the volume to their headset by adjusting the corresponding knob.

10. **RDL RU-MLD4 Distribution Amplifier:** The RDL RU-MLD4 DA supplies line-level audio to the headphone amplifier and the Mackie mixer.



11. **Setting Up the RDL RU-MLD4:** Ensure the button on the back of the RDL RU-MLD4 is set to LIN. The button should be up.



INTERPRETATION OPERATION

12. The interpreters and mixer operator will sit at a table. Each interpreter will be provided with a broadcast headset. These headsets will be connected to a headphone amplifier that allows each interpreter to individually adjust the volume at which he or she hears the program. Each headset also has an attached microphone. Place a video monitor on the table so that both the interpreters and the mixer operator can see the convention program as it is displayed to the audience.

13. This system supports three simultaneous interpreters.

- The primary interpreter translates for the chairman and for those who give talks.
- The male interpreter translates for other male program participants, such as those who deliver interviews, soliloquies, or demonstrations.
- The female interpreter translates for all female program participants.

14. The mixer operator will not hear the primary convention language. His headphones will be connected only to the mixer, allowing him to carefully monitor and adjust the level and EQ of the interpreters. When music is played, he will raise the mixer input that receives audio from the primary convention sound system. When videos are played, he will raise the mixer input that receives the alternate language feed from the primary media player.

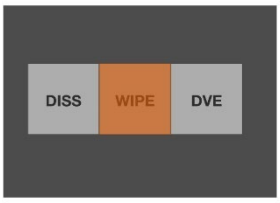
15. The mixer operator should keep levels balanced throughout the program. Interpreter microphones should be turned off when the interpreter is not speaking.

APPENDIX B SPECIAL INSTRUCTIONS FOR BAPTISM USING MULTIPLE POOLS

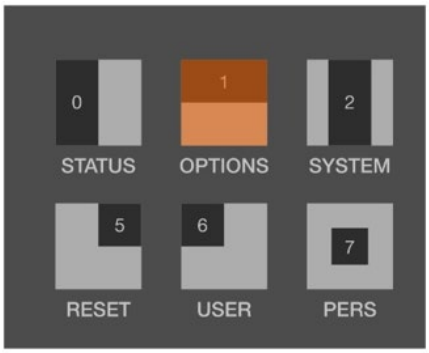
1. If two pools are being used for the baptism at a special or international convention, the switcher operator will need to frame a split-screen shot horizontally to show both pools. Follow these steps closely to correctly split the screen for the baptism.

(1) Start by pushing the buttons labeled as BLACK in both the Program and Preview buses. This is important, as all adjustments after this step will be live to the audience on the program screens.

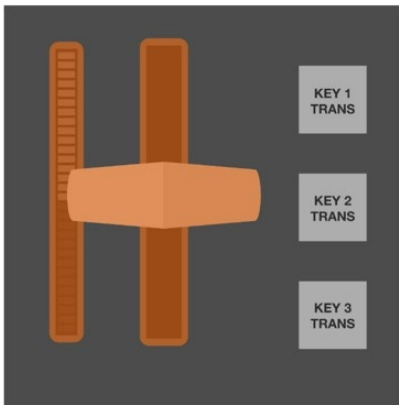
(2) Push the WIPE button next to the Program bus. It will highlight green.



(3) Press the “1” button near the top of the switcher.



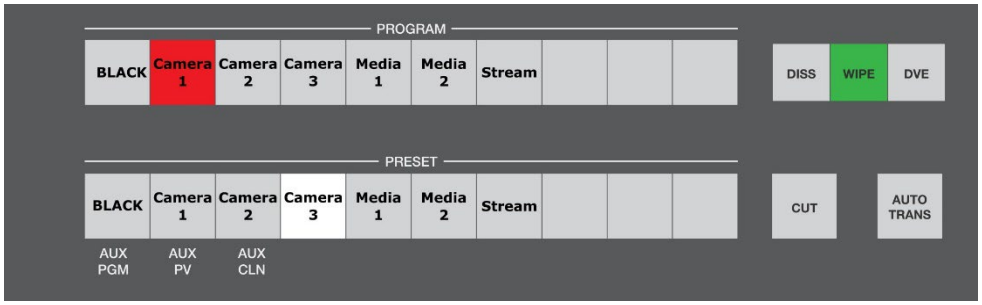
(4) Pull the fader down halfway to split the two camera sources. Half of the green lights on the fader bar should be lit.



2. The technical director will need to give the camera operators feedback to ensure their shots are lined up. Communicate clearly with the camera operators during the baptism, as only half of their shot will be used. The camera operators will need clear direction to line up their shots with the proper half of their screen (either the top or bottom half of their shot).

(1) Once the shots are lined up, instruct the camera operators to lock their shot (lock pan and tilt on their tripods).

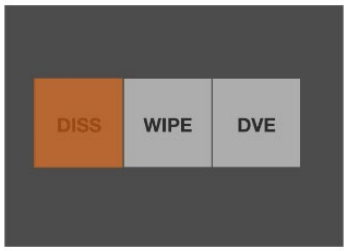
(2) The switcher operator will take the one of the baptism cameras on the Preview bus and the other on the Program bus at the same time.



(3) When the baptism is complete, push BLACK on both the Preview and Program buses at the same time.

(4) Pull the fader back to its original position.

(5) Press the DISS button next to the Program bus to return the switcher to its settings for the program.



(6) Move the cameras back to their previous positions.

APPENDIX C STRING-LINE METHOD OF STRAIGHTENING

1. The string-line method is a simple yet effective way to achieve a perfectly straight horizontal and vertical plane for the LED video walls.

2. Items required:

   (1) Nylon string, such as a mason's line, minimum of 25 ft in length.

   (2) Three wooden blocks, all of the exact same thickness (e.g., cutting an 8 in. length of a 1 in. x 3 in. board into equal lengths works well).

3. Follow these steps to use the string-line method to level the pedestal bar on the LED video wall. Refer to Figure 1 below for more information.

   (1) Lay one block horizontally on each end of the pedestal bar.

   (2) Stretch the string line over the blocks, pulling it taut to prevent sagging.

   (3) Use the third wooden block as a gauge block at various locations along the pedestal bar.

   (4) Use the adjustable feet of the video wall frame to adjust the frame base section so that the wooden block just clears, but does not raise, the taut string line when you slide the block under it.

4. Follow these steps to use the string-line method to level the vertical posts on the LED video wall. Refer to Figure 2 for more information.

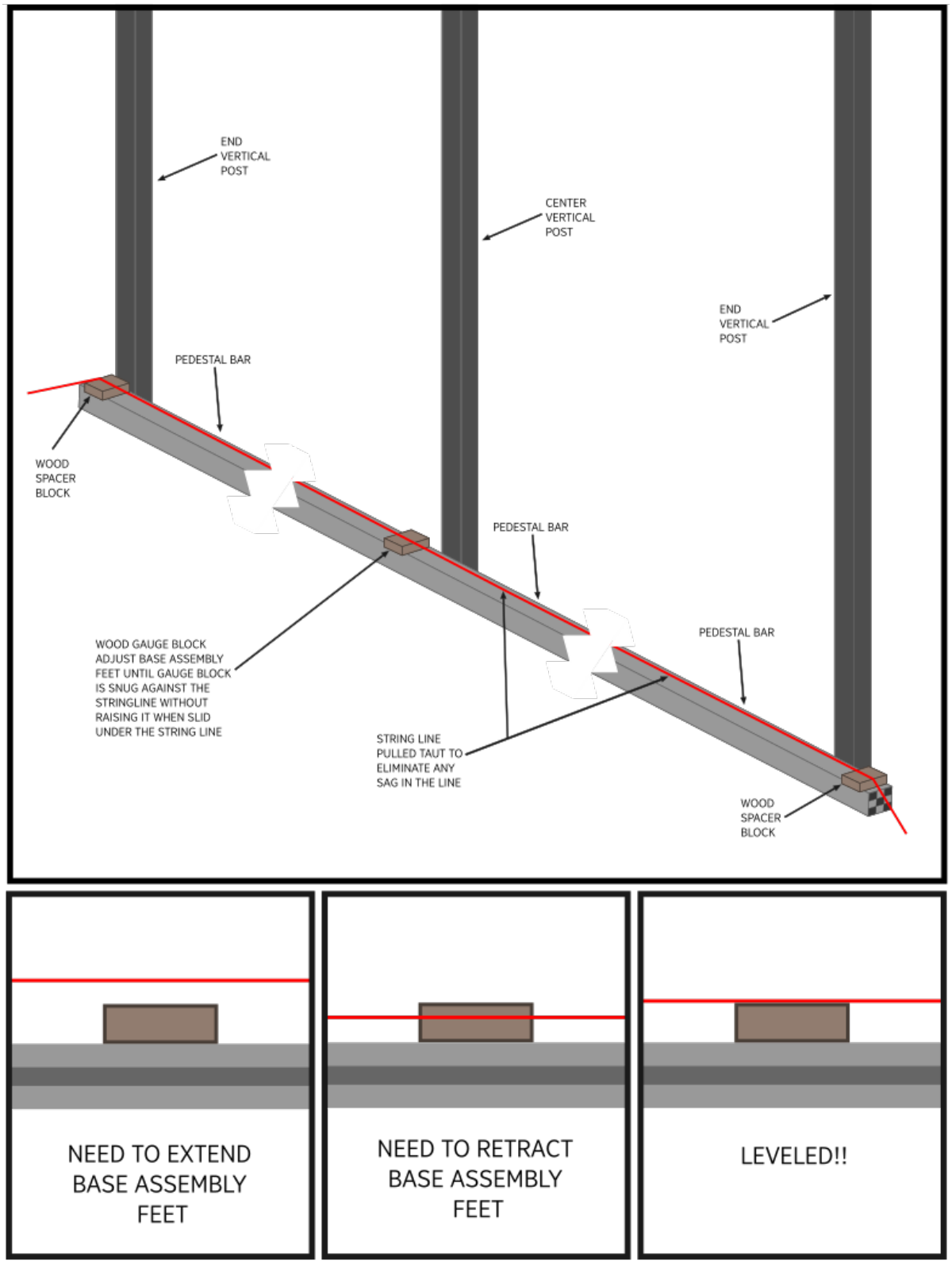
   (1) Lay one block vertically on each end of the vertical posts.

   (2) Stretch the string line over the blocks, pulling it taut to prevent sagging.

   (3) Use the third wooden block as a gauge block at each vertical post of the frame.

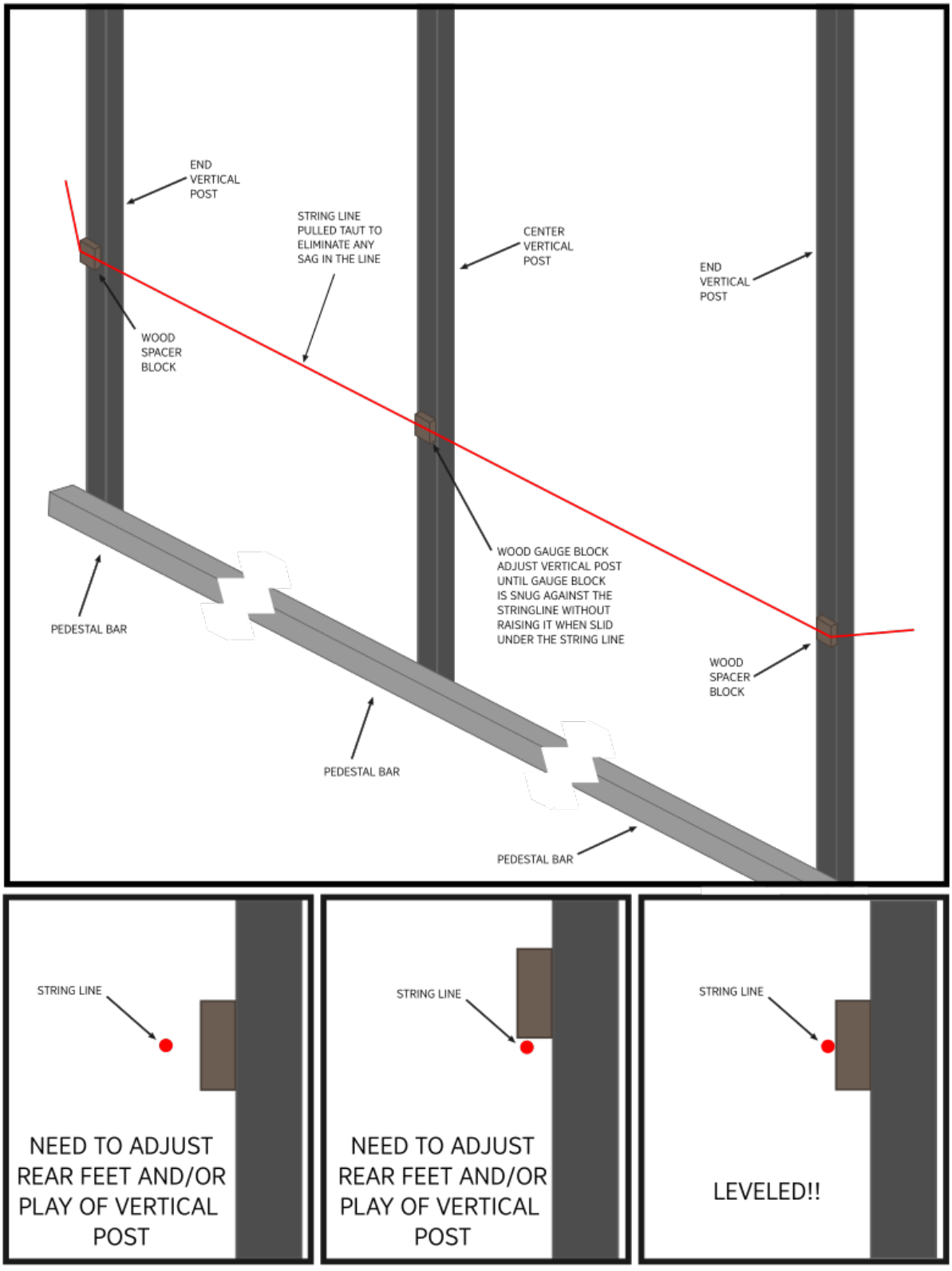
   (4) Adjust the feet in the rear and/or adjust the play in the vertical post connection to the base frame so that the wooden block just clears, but does not raise, the taut string line when you slide the block under it.

FIGURE 1


END
VERTICAL
POST
CENTER
VERTICAL
POST
END
VERTICAL
POST
PEDESTAL BAR
WOOD
SPACER
BLOCK
PEDESTAL BAR
PEDESTAL BAR
WOOD GAUGE BLOCK
ADJUST BASE ASSEMBLY
FEET UNTIL GAUGE BLOCK
IS SNUG AGAINST THE
STRINGLINE WITHOUT
RAISING IT WHEN SLID
UNDER THE STRING LINE
STRING LINE
PULLED TAUT TO
ELIMINATE ANY
SAG IN THE LINE
WOOD
SPACER
BLOCK

NEED TO EXTEND
BASE ASSEMBLY
FEET
NEED TO RETRACT
BASE ASSEMBLY
FEET
LEVELED!!

FIGURE 2


END VERTICAL POST
STRING LINE PULLED TAUT TO ELIMINATE ANY SAG IN THE LINE
CENTER VERTICAL POST
END VERTICAL POST
WOOD SPACER BLOCK
WOOD GAUGE BLOCK ADJUST VERTICAL POST UNTIL GAUGE BLOCK IS SNUG AGAINST THE STRINGLINE WITHOUT RAISING IT WHEN SLID UNDER THE STRING LINE
PEDESTAL BAR
WOOD SPACER BLOCK
PEDESTAL BAR
PEDESTAL BAR
STRING LINE
NEED TO ADJUST REAR FEET AND/OR PLAY OF VERTICAL POST
STRING LINE
NEED TO ADJUST REAR FEET AND/OR PLAY OF VERTICAL POST
STRING LINE
LEVELED!!

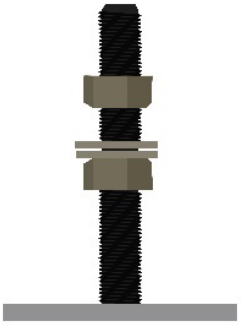
APPENDIX D ABSEN PL3.9 XL PARTS LIST

1. Below is a list of the names, quantity, and pictures of parts and accessories included with the Absen PL3.9 XL LED video wall.

2. Short base extensions with adjustable feet (8)

3. Long base extensions with adjustable feet (8)

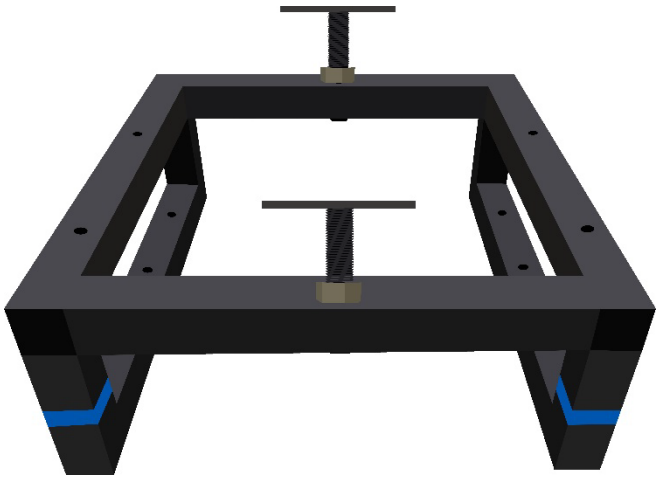
4. Adjustable feet (12)



5. Lower base section, long (3)

6. Upper base section, long (3)

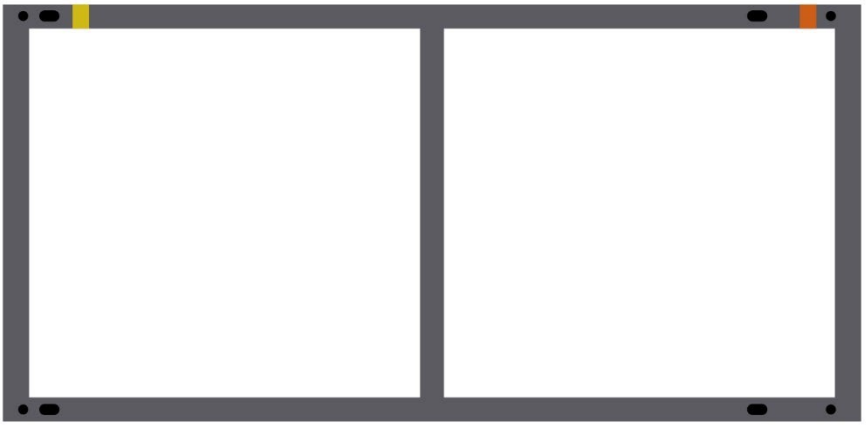
7. Lower base section with adjustable feet, short (1)



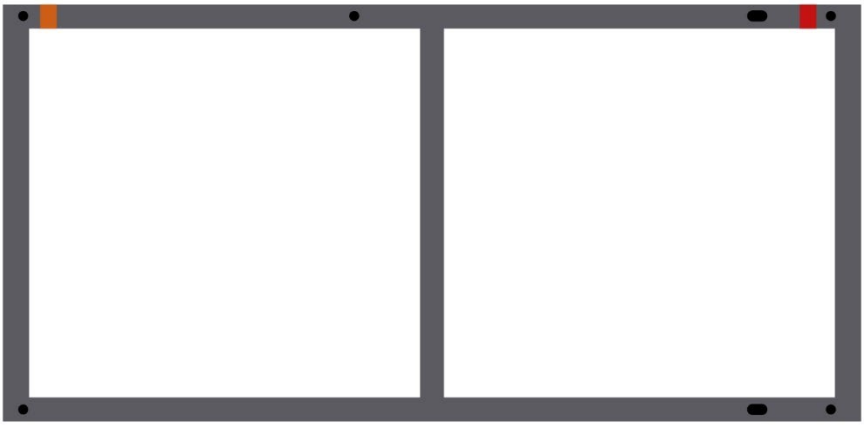
8. Upper base section, short (1)

9. Spacer bars (6)

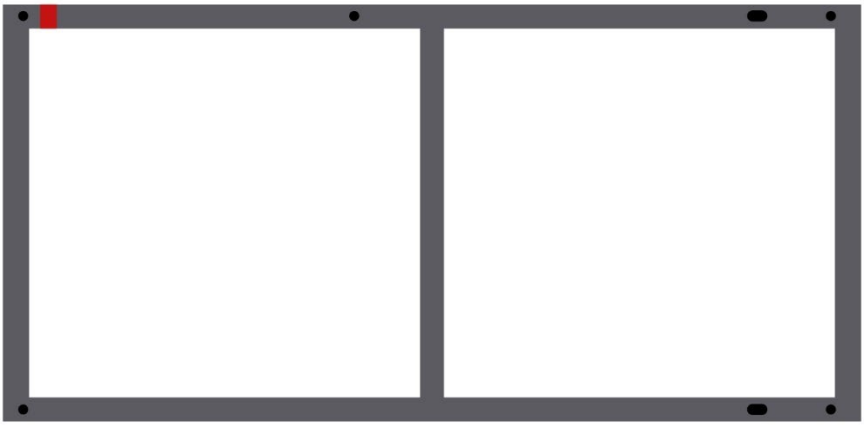
10. Rectangular support, bottom (11)



11. Rectangular support, middle (11)



12. Rectangular support, top (11)



13. Horizontal braces (9)

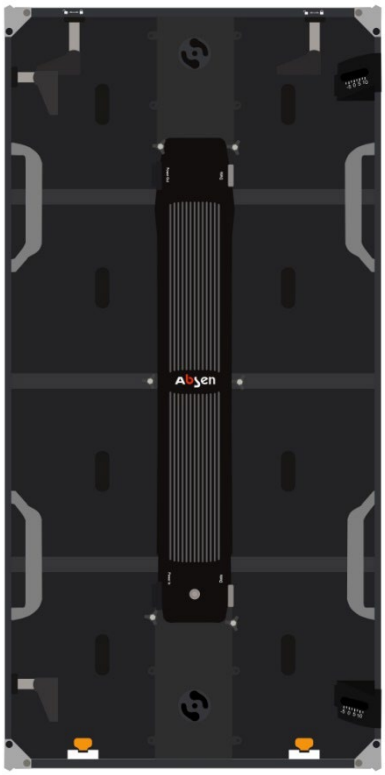
14. Diagonal brace with one connector (8)

15. Diagonal brace with two connectors (8)

16. Pedestal bar, long (3)

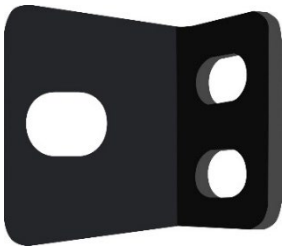
17. Pedestal bar, short (1)

18. LED panels (30)

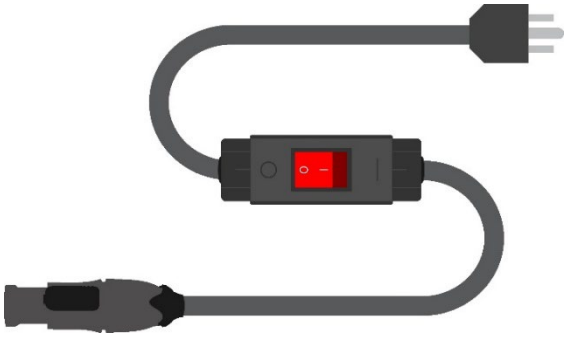


19. Panel mounting brackets (24)

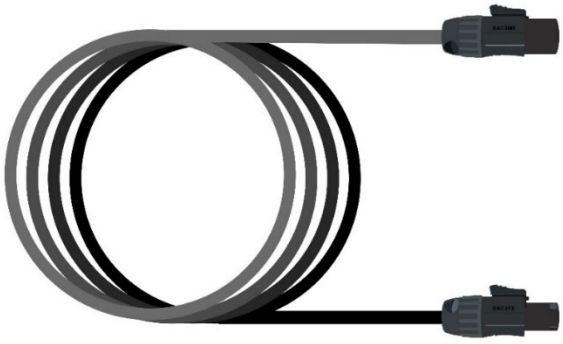
20. End brackets (10)



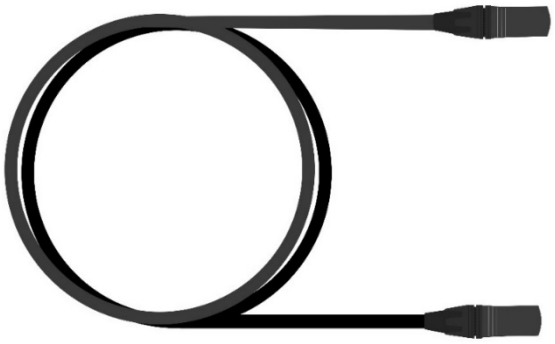
21. Panel testing cable with inline switch (1)



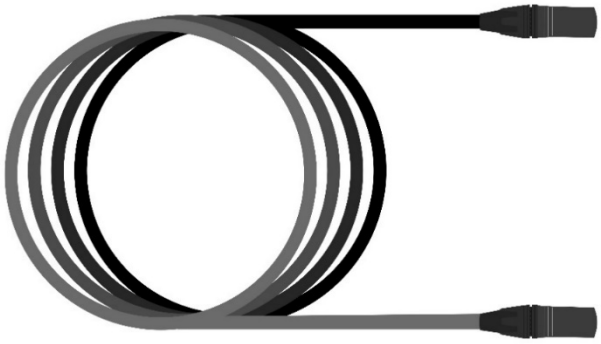
22. Power cables, short (27)



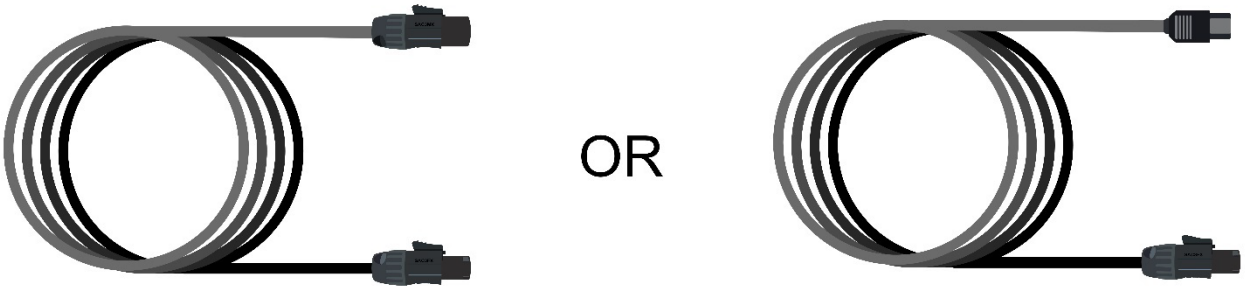
23. Data cables (31)



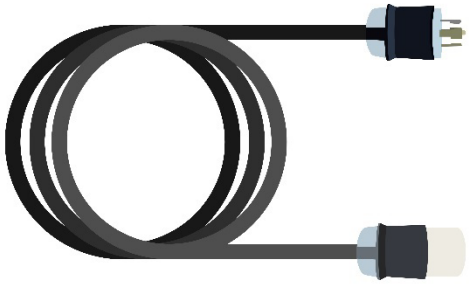
24. Long data cable for processor (2)



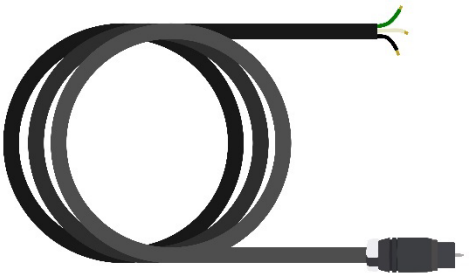
25. Main power supply cables for video wall RPB (6) or Geist (6) *[you will receive one or the* other*]*



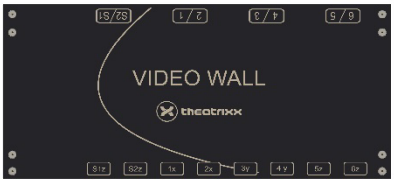
26. 75 ft power feeder cable (1) or 100 ft power supply (1) *[you will receive one or the other]*



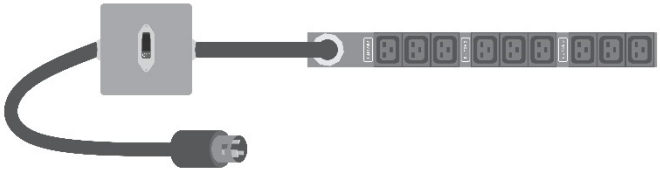
OR



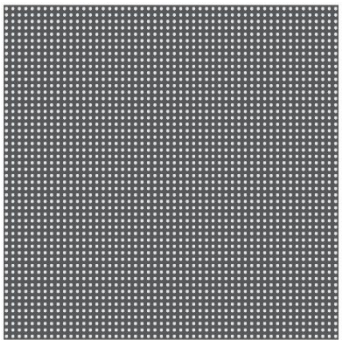
27. Video wall remote power box (1) or Geist power distribution unit (1) *[you will receive one or the other]*



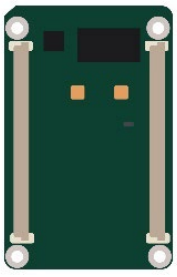
OR



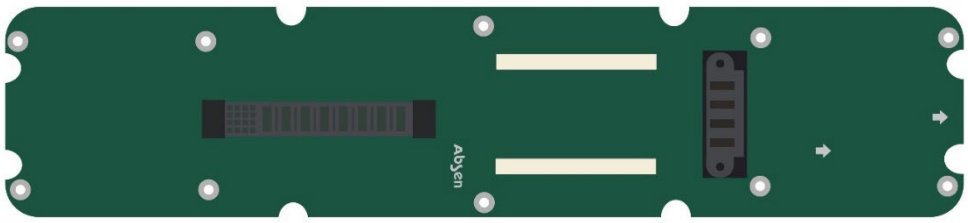
28. LED replacement module (2)



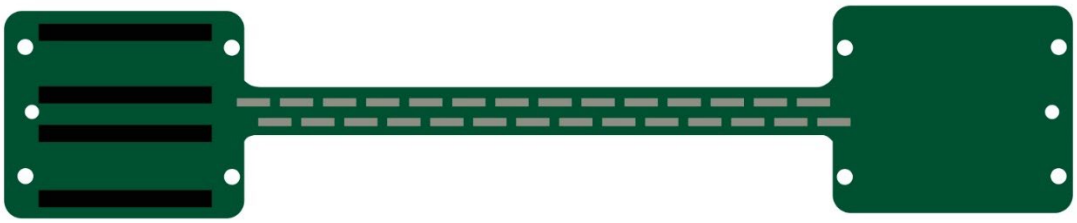
29. Receiving card spare (1)



30. Power distribution board spare (1)

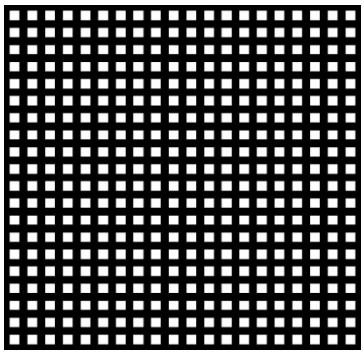


31. Distribution board extension spare (2)

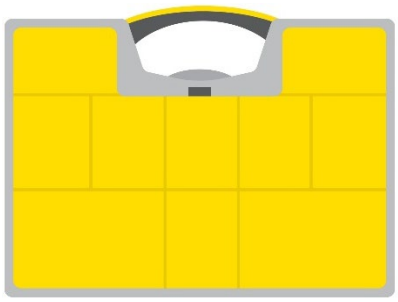


32. Power and data core spare (1)

33. LED panel bezel (5)

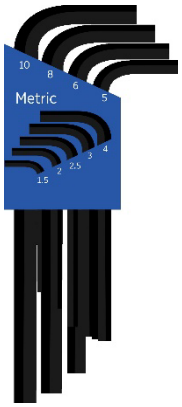


34. Hardware kit (1)



35. NovaStar video processor (1)

36. Allen wrench set (1)



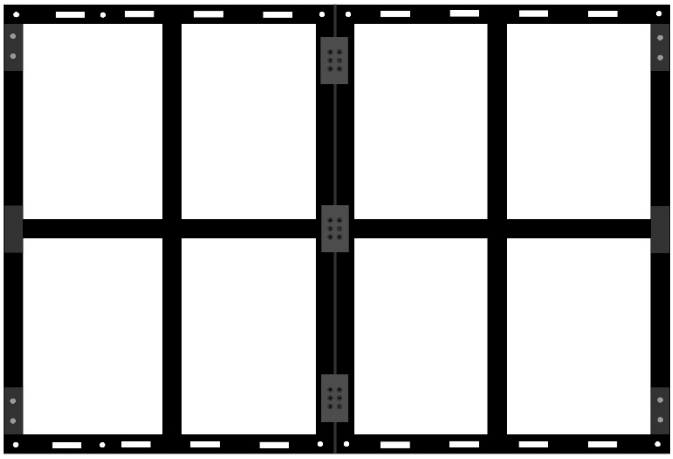
37. 17 mm open wrench (1)

38. 32 mm open wrench (1)

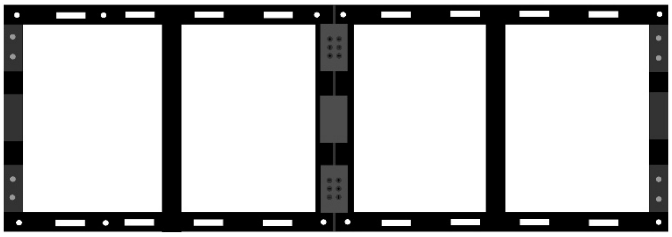
APPENDIX E DICOLOR M1-481 PARTS LIST

1. Below is a list of the names, quantity, and pictures of parts and accessories included with the Dicolor M1-481 LED video wall.

2. Full-sized hinged frame base (3)



3. Half-sized hinged frame base (1)



4. Stiffener plates for hinged frame base (8)

5. Base connector (6)

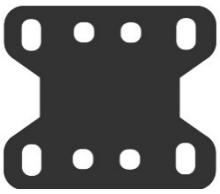
6. Lower post with cleat and yellow stripe (11)

7. Upper post with coupler and orange stripe (11)

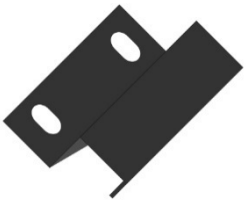
8. Diagonal brace with rounded coupler and rectangular coupler and blue stripe (11)

9. Diagonal brace with rounded coupler and purple stripe (11)

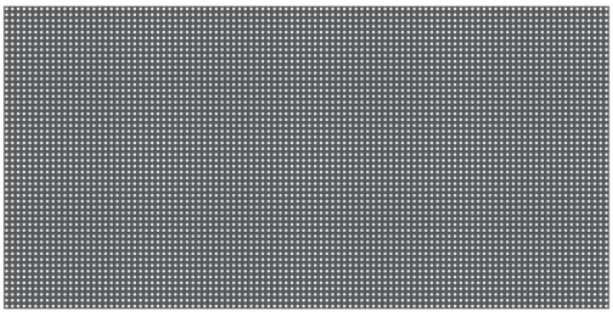
10. Panel mounting plate (35)



11. End/corner bracket (10)

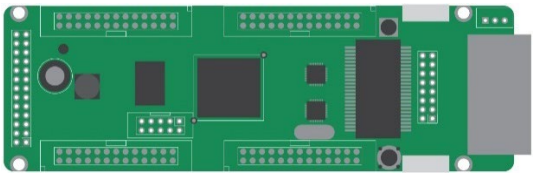


12. LED replacement quarter panel (1)

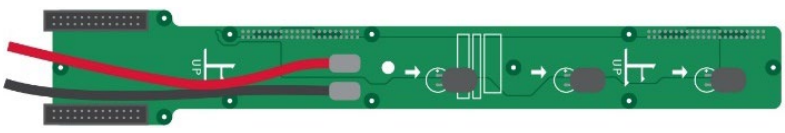


13. Power supply spare (1)

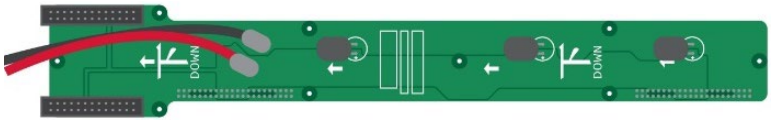
14. Receiving card spare (1)



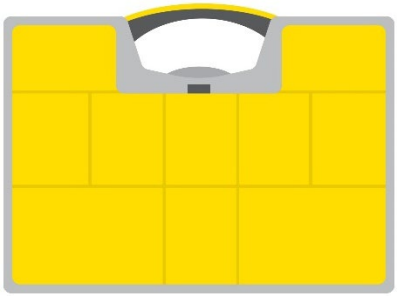
15. Long power distribution board spare (1)



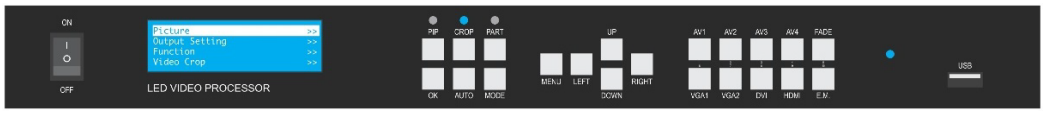
16. Short power distribution board spare (1)



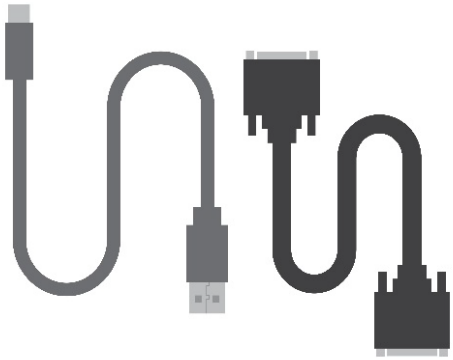
17. Hardware kit (1)



18. Magnimage video processor (1)

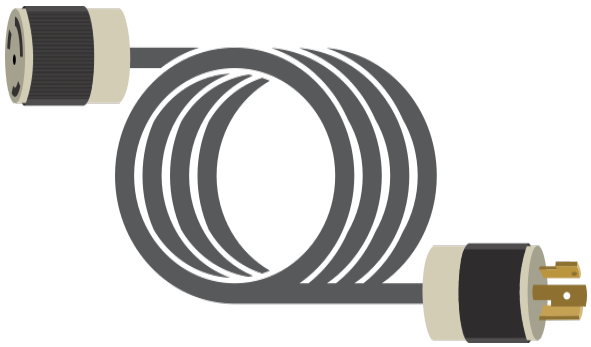


19. DVI and USB cable set (1)

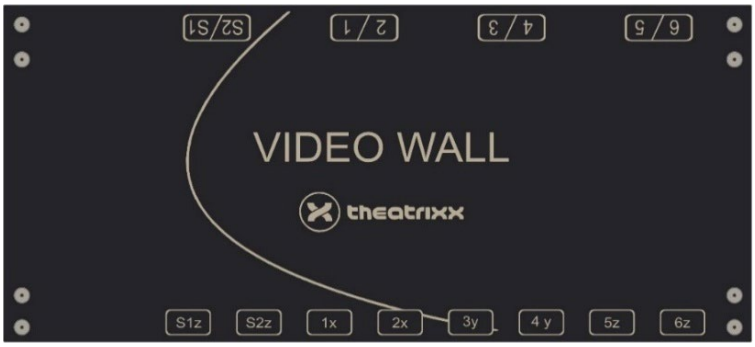


20. Power supply cable (5)

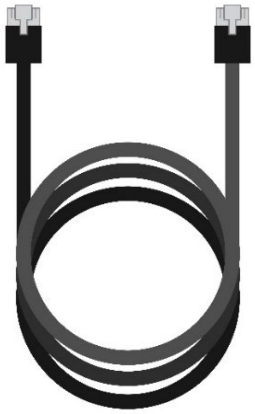
21. 75 ft power supply cable (1)



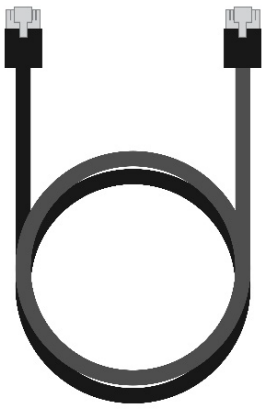
22. Video wall remote power box (1)



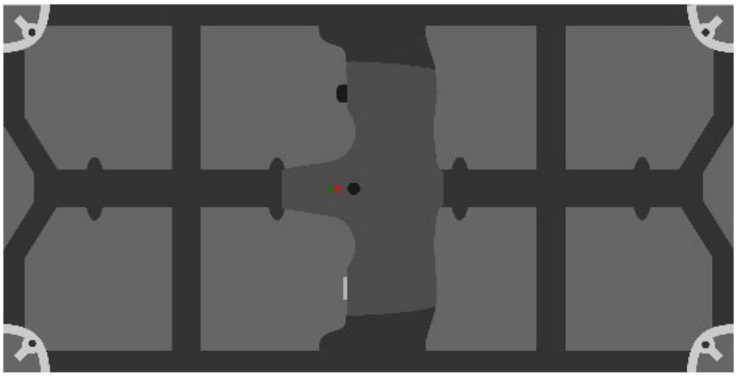
23. Long data cable (1)



24. Short data cable (32)



25. LED panel (30)

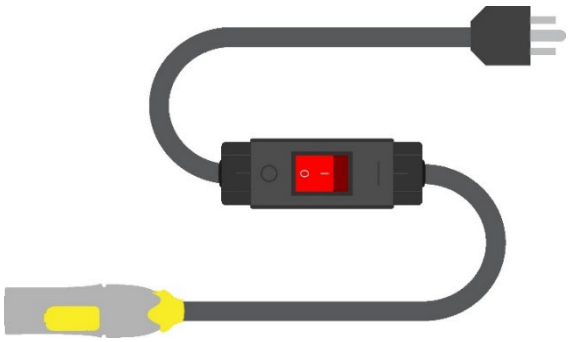


26. Pedestal bar, long (1)

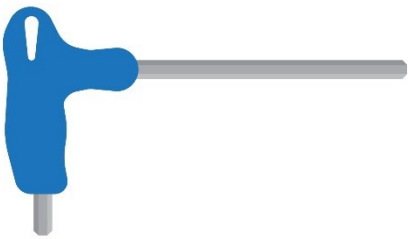
27. Pedestal bar, medium (2)

28. Pedestal bar, short (1)

29. Panel testing cable with inline switch (1)



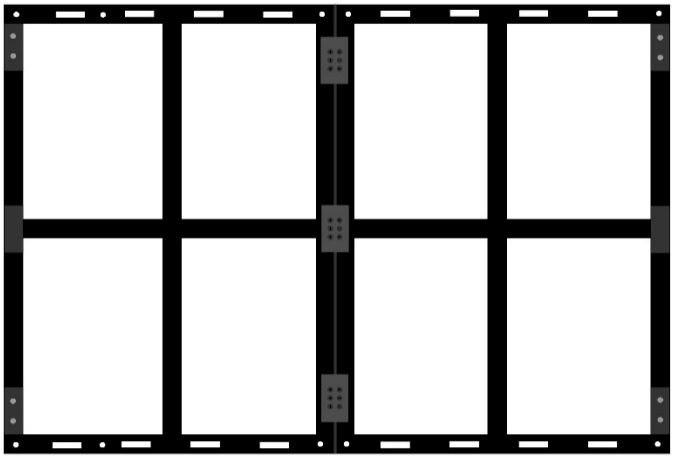
30. 8 mm T-handle Allen wrench (1)



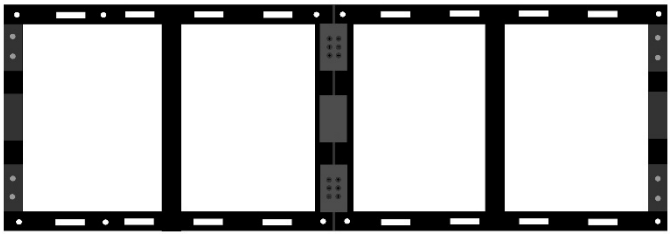
APPENDIX F DICOLOR M-481 PLUS PARTS LIST

1. Below is a list of the names, quantity, and pictures of parts and accessories included with the Dicolor M-481 Plus LED video wall.

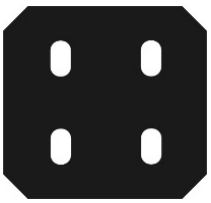
2. Full-sized hinged frame base (3)



3. Half-sized hinged frame base (1)



4. Stiffener plates for hinged frame base (8)



5. Base connector (6)

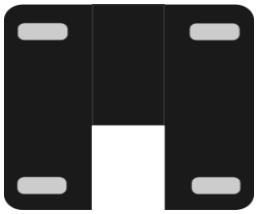
6. Lower post with cleat and yellow stripe (11)

7. Upper post with coupler and orange stripe (11)

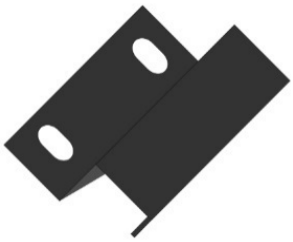
8. Diagonal brace with rounded coupler, and rectangular coupler and blue stripe (11)

9. Diagonal brace with rounded coupler and purple stripe (11)

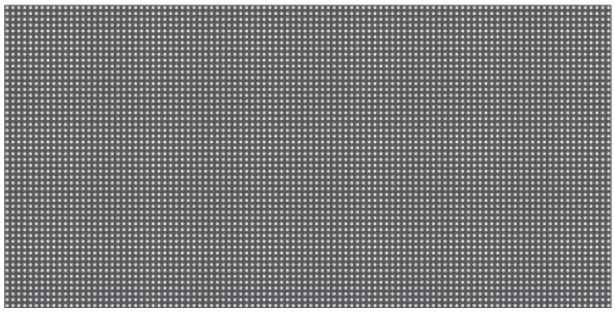
10. Panel mounting plate (40)



11. End/corner bracket (10)

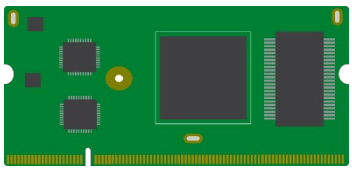


12. LED replacement quarter panel (2)

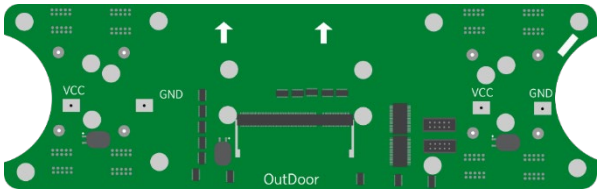


13. Power supply spare (1)

14. Receiving card spare (1)

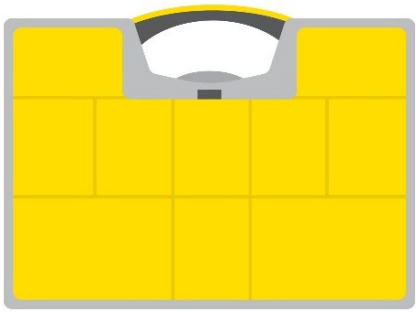


15. Power distribution board spare (1)

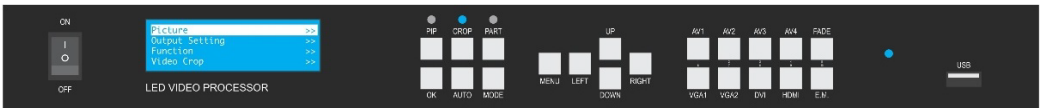


16. Ribbon cable (1)

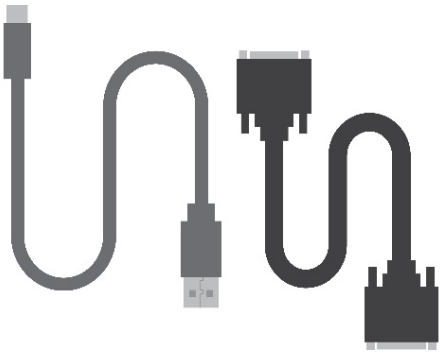
17. Hardware kit (1)



18. Magnimage video processor (1)

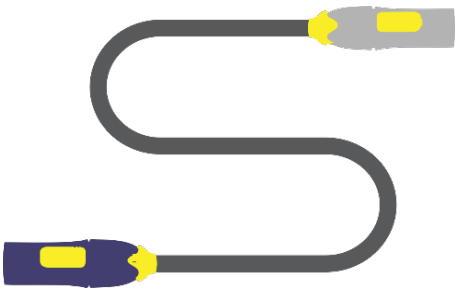


19. DVI and USB cable set (1)

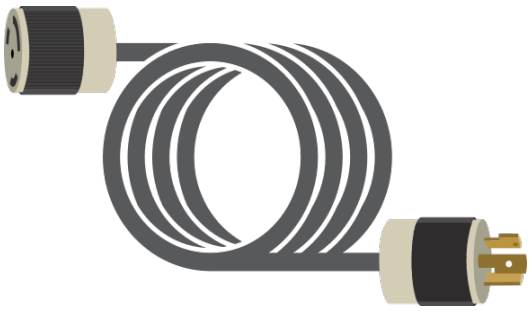


20. Power supply cable (6)

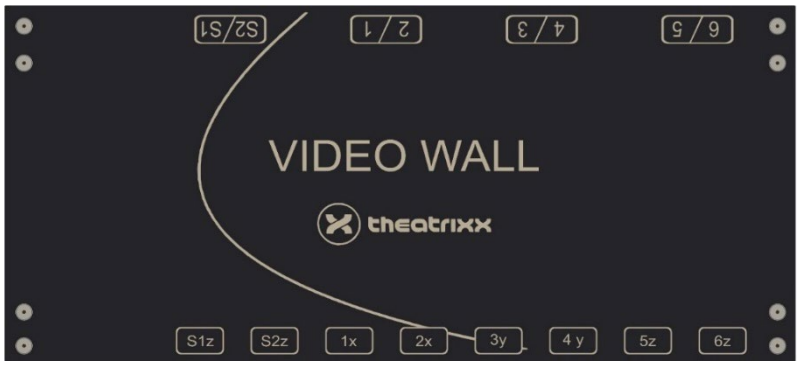
21. Short power jumper (26)



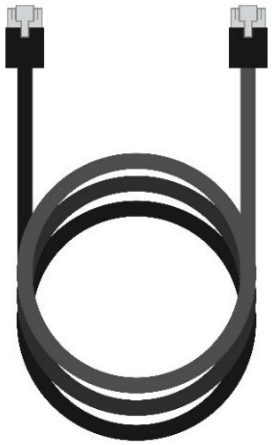
22. 75 ft power supply cable (1)



23. Video wall remote power box (1)

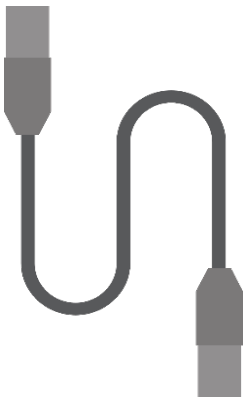


24. Long data cable (1)

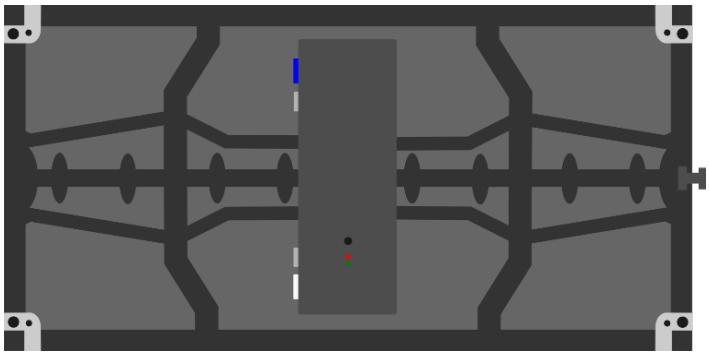


25. Medium data cable (3)

26. Short data cable (29)



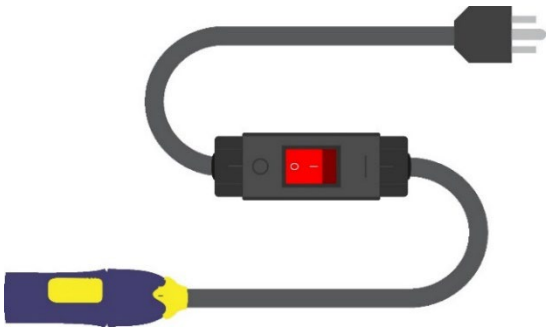
27. LED panel (30)



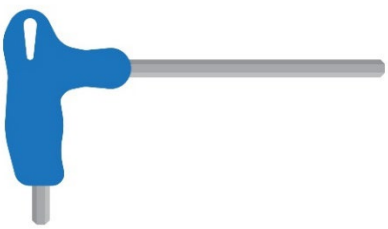
28. Pedestal bar, long (1)

29. Pedestal bar, medium (3)

30. Panel testing cable with inline switch (1)



31. 8 mm T-handle Allen wrench (1)



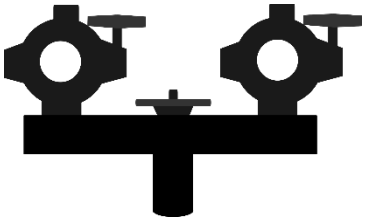
APPENDIX G LEYARD VSS4-O PARTS LIST

1. Below is a list of the names, quantity, and pictures of parts and accessories included with the Leyard VSS4-O LED video wall.

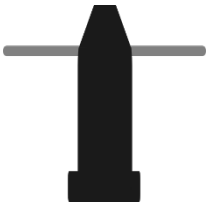
2. Steel truss (2)

3. Vertical support tripod (2)

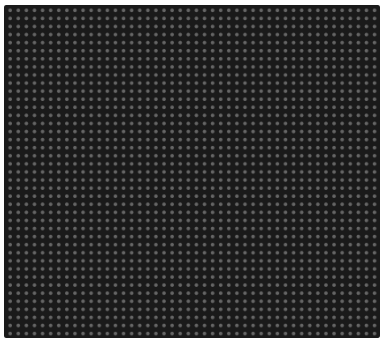
4. Truss bracket (2)



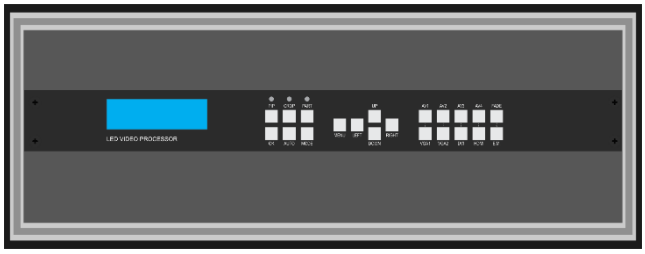
5. Cotter and truss pin (3)



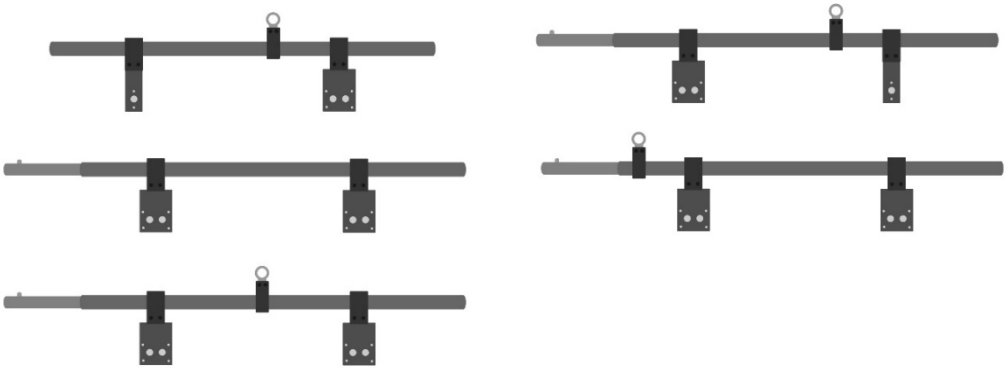
6. LED panel (48)



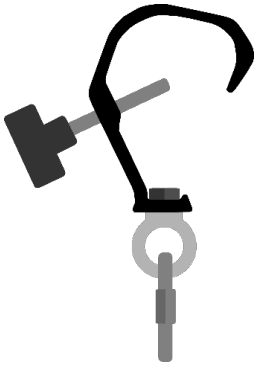
7. Rack case with video processor and cables (1)



8. Support bar (5)



9. C-clamp with ring nut and quick link chain (4)



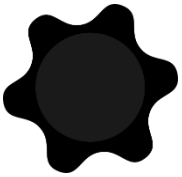
10. Long carbon fiber bracket strip, wide with adapter (8)

11. Short carbon fiber bracket strip, wide with adapter (8)

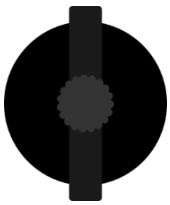
12. Long carbon fiber bracket strip, narrow with adapter (2)

13. Short carbon fiber bracket strip, narrow with adapter (2)

14. Long fastening knob for LED panels (60)

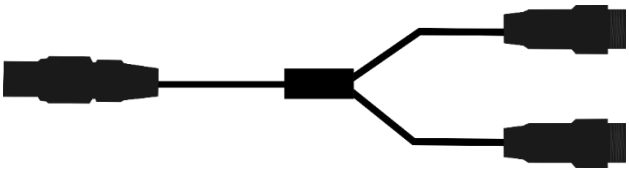


15. Short fastening knob for LED panels (222)



16. Flat head M3 screw (90)

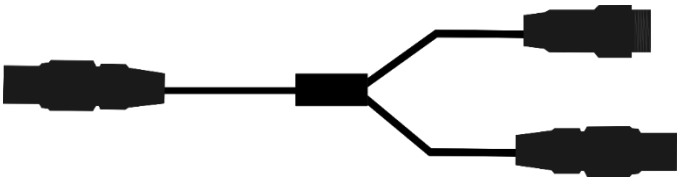
17. Data and power splitter cable (1)



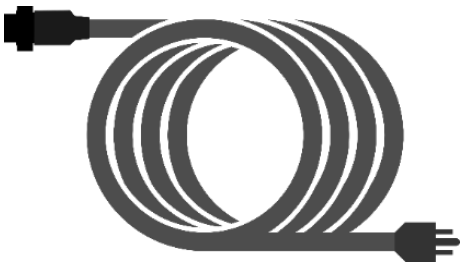
18. Short data/power cable, female to female (5)

19. Long data/power cable, male to male (3)

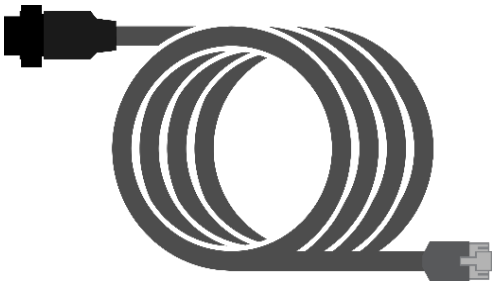
20. Data to data with power cable (2)



21. Power cable (3)



22. Main data cable (1)



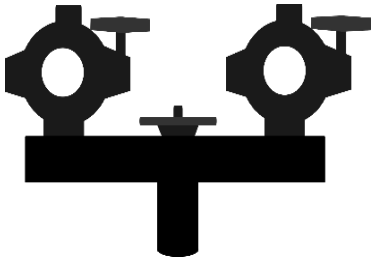
APPENDIX H MOZU X4 PARTS LIST

1. Below is a list of the names, quantity, and pictures of parts and accessories included with the Mozu X4 LED video wall.

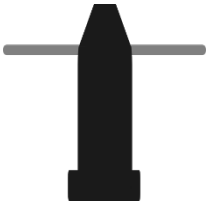
2. Steel truss (2)

3. Vertical support tripod (2)

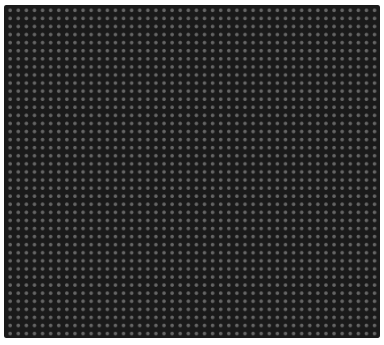
4. Truss bracket (2)



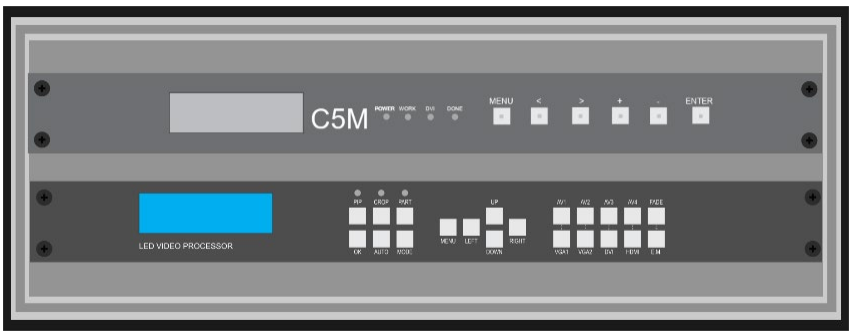
5. Cotter and truss pin (3)



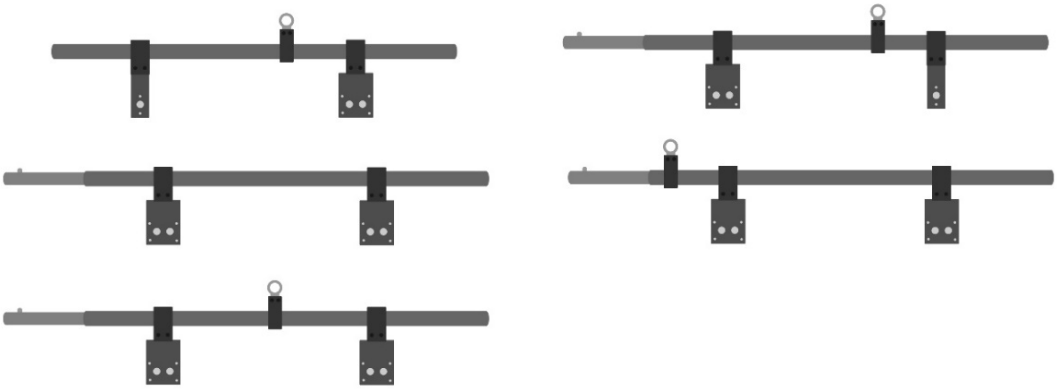
6. LED panel (48)



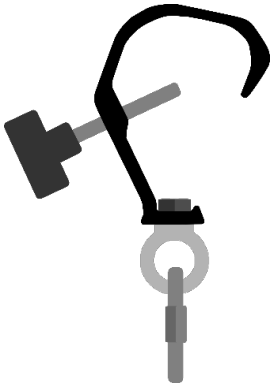
7. Rack case with video processor and cables (1)



8. Support bar (5)



9. C-clamp with ring nut and quick link chain (4)



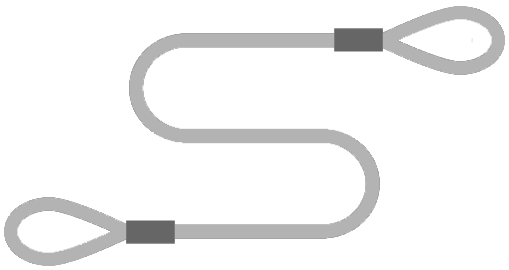
10. Long carbon fiber bracket strip, wide with adapter (8)

11. Short carbon fiber bracket strip, wide with adapter (8)

12. Long carbon fiber bracket strip, narrow with adapter (2)

13. Short carbon fiber bracket strip, narrow with adapter (2)

14. Steel safety cable (4)



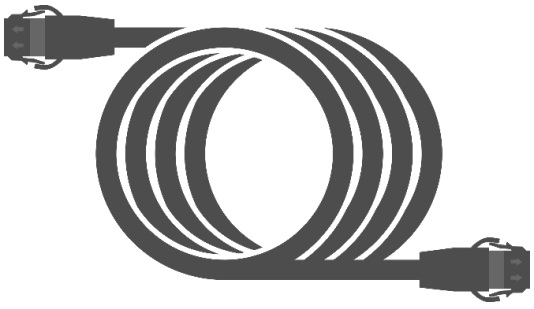
15. Fastening knobs for LED panel (184)

16. Flat head M3 screw (90)

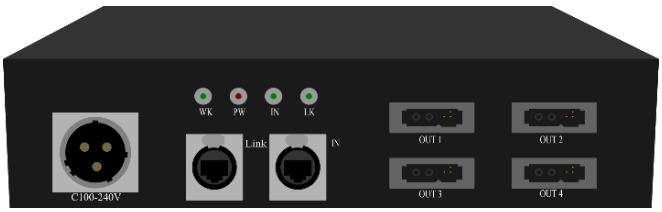
17. Round head M3 screw (50)

18. Short data/power cable (40)

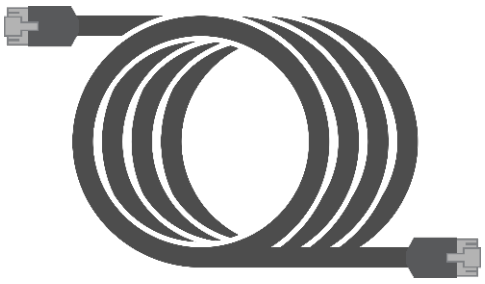
19. Long data/power cable (10)



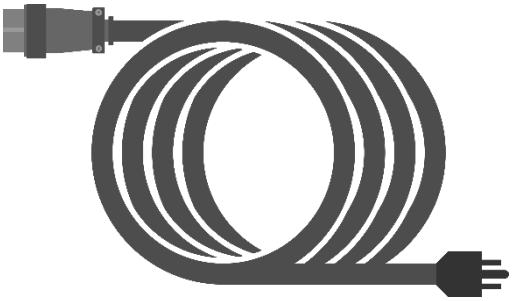
20. Power/data distributor (PT Box) (3)



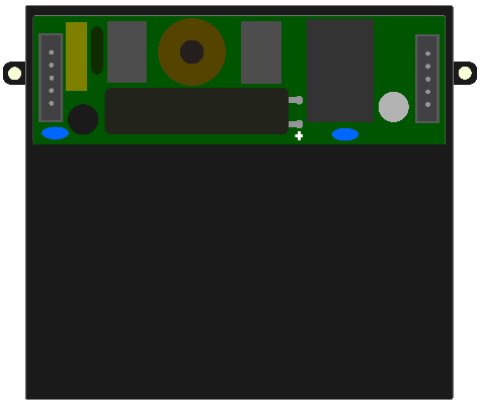
21. Network cable (3)



22. Power cable (3)



23. Spare power supply (1)



APPENDIX I LED VIDEO WALL ADJUSTMENTS

1. These instructions are intended for conventions that receive LED video walls. Before making any adjustments to the video processor, fully assemble the video walls. Turn on all lights used during the program, including house lights, and allow sufficient time for them to reach the desired brightness level that will be used for the program.

2. Use the adjustment image that is loaded onto the media laptops.

3. Each of the three sections in the image will assist you in adjusting the brightness and contrast on the LED video walls. When adjusting, stand at least 30 ft away from the LED video wall.

4. **White Level:** There are ten light-grey squares on a white background. Each should be visible, with the brightest (98) being barely visible against the white background.

5. **Black Level:** There are ten dark-grey squares on a black background. Each should be visible, with the darkest (2) being barely visible against the black background.

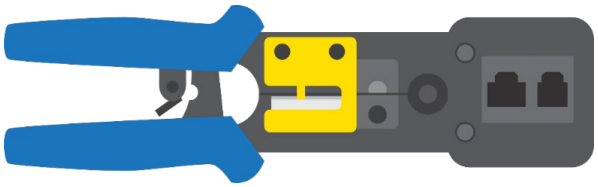
6. **IRE Scale:** Each of the grey bars from 0 (black) to 100 (white) should be distinctly visible from the next, not blending together or into the background.

7. Once you have completed adjusting the LED video walls using the adjustment image, test a medium close-up camera shot of a brother standing at the lectern. Ensure all lights are on as they will be during the program, and cameras are properly white-balanced. The colors of the background and the brother's skin tone should look natural on the LED video wall and not oversaturated. While perfect color may not be achievable, aim for a balance that looks natural and will not distract the audience.

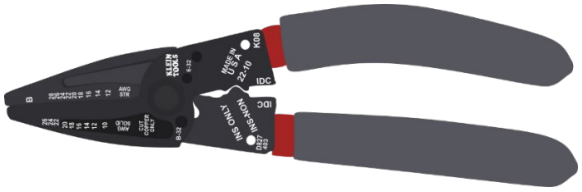
APPENDIX J TEST AND TOOL KIT

1. The WHQ Broadcasting Department will provide a kit containing various tools and testing equipment for setting up the AV equipment on site. Below is a brief description of each item and its use. Due to the number of volunteers, this kit cannot provide tools to all workers but can assist with setup and commissioning of all major aspects of the audio and video systems. Tools shown may vary. Note that some tools have power switches. Please be mindful to turn them off after use to preserve battery life.

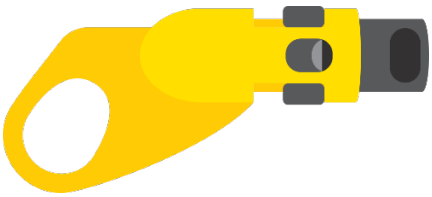
2. **RJ45 Crimper:** This crimper tool allows for easy installation or termination of CAT5/5e and CAT6 connectors to network cable. It also strips the cable. These cables are used to connect the PTZ cameras to their controller and to connect the video wall data connections to each panel and to the video processor. Two of these will be provided.



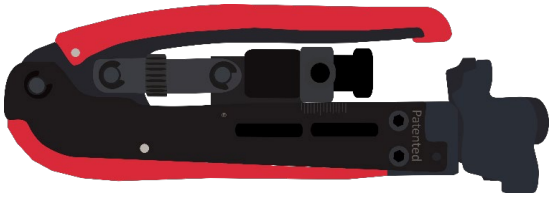
3. **Wire Stripper:** This tool is used to strip 12- to 28-gauge stranded wire. It can also be used as a wire cutter and can crimp B type (e.g., spade, fork) connectors onto wire. This tool can be used for installing the speaker wiring by preparing wires for speaker connections and soldering connectors. Two of these will be provided.



4. **Coax Stripper:** This tool is used to strip RG6 coax cable. It has a depth gauge for easy stripping of the shield and center pin sections of the cable to the correct lengths. BNC connectors can then be installed onto the cable. This cable can be used to make the SDI cables needed for video distribution. Two of these will be provided.



5. **BNC Compression Tool:** This tool will install or terminate coax cables with BNC connectors. It can be used to make the SDI cables needed for video distribution. Two of these will be provided.

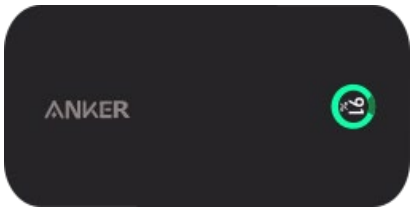


6. **Portable Soldering Iron:** This soldering iron comes with a USB-C cable and uses a portable charger or power bank. When the soldering iron is plugged into the portable power bank or USB-C charger, the display will light up, but the iron is still off and not heating.

- To turn on the soldering iron, press the “A” button. The display will show the temperature as shown below. Once it reaches 650 degrees, it is ready to use.

- To turn off the soldering iron, hold the “B” Button or remove the USB cable, and wait five minutes to allow the soldering iron to cool down before packaging it up.

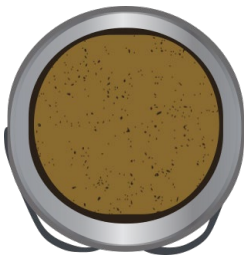
7. **Portable Power Bank for Soldering Iron:** This portable charger has a 30-watt battery that is used to power the portable soldering iron.



8. **USB-C Charger:** Use this charger to recharge the portable power bank used for the soldering iron. This charger can also be used for powering the soldering iron instead of the portable power bank.

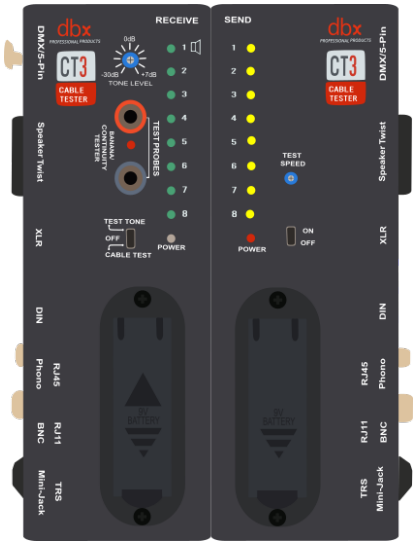
9. **Solder Spool:** This spool can be used for any soldering needed onsite. It contains a rosin core flux.

10. **Solder Tip Cleaner:** This tool can used to hold the soldering iron when it is hot. The soldering tip can also be cleaned on the brass wire sponge by running the tip through it.



11. **Digital Level:** This level and inclinometer (or angle gauge) can be used to set the angles of the speakers. It can also be used to level speaker stands, lifts, and LED video wall pedestal bars.

12. **Cable Tester:** This tester can check the continuity of many cable types and also verify the pinouts are correct. It can test BNC, XLR, RCA, network, DMX, speakON, and ¼ in. connections. It also has a test tone generator. The tester can be separated into two parts and connected to each end of installed wires or cables, such as speaker wires and other long wire runs. This helps speed up the testing or troubleshooting process since the wires can be tested while in place. (**NOTE:** Each of the two parts has an on/off switch that must be turned on to use the tester.)



13. **Digital Multimeter:** This handheld meter can check AC and DC voltage, AC and DC current, resistance, as well as other functions. It comes with two test probes and a custom cable to easily check signal levels for XLR inputs and outputs.