

**LCPC Tech Handbook
Final Draft
2/3/09**

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I. Introduction

Thanks to everyone who is reading this audio/visual handbook for LCPC. I think this book will prove to be very useful for training, troubleshooting, and Sunday morning setup. My hope is that each of you will look to this book to help us achieve a high level of excellence, sound quality, and consistency. Most of the ideas and techniques in this handbook are things that I have discovered through my experience with Live Sound, Lighting, and Recording, as well as some mixing Techniques taken from “The Mixing Engineers Handbook” by Bobby Owsinski. In this handbook you will find specifics for the Sanctuary, Worship Arts Center, and Fellowship Hall. LCPC appreciates everyone who is volunteering their time to help meet our technical needs. I am grateful to work with such a talented team of people. Hopefully, this handbook will help us to accomplish our goal as an audio/visual team.

Jason Stephenson

a. Mission Statement

Our mission is to provide excellent audio/visual reinforcement that does not distract the congregation from the message being conveyed by the musicians, pastors, or actors on stage.

b. Goals

- i. Helping to provide an enjoyable worship experience for the congregation
- ii. Maintain an organized and efficient system to help things operate consistently from week to week
- iii. To build a strong, confident, and competent audio/visual team

II. Mixing in the Church Environment

From my experience running sound in a variety of churches, there are a couple of basic principles that must be understood in order to create a successful worship experience.

- a. **Volume** – When adjusting the volume to the appropriate level for each service, one must consider the style of music and demographic of people attending the service. For a traditional service with choir, organ, orchestra, and lectern, it is important to keep a natural and acoustic feel. With this in mind, we want to use very minimal sound reinforcement for the 1st and 2nd

services at LCPC. By doing so, we will prevent the sound reinforcement from degrading the quality of the performance on stage

In the 3rd service however, there will be a great deal of sound reinforcement needed. The contemporary service will have a typical Rock Band feel. While it is appropriate to have a higher decibel level than the first 2 services, it is also very easy to let the volume level get out of control. It is the job of the sound technician to keep the volume at a reasonable level. This includes letting the drummer know if he needs to play softer. By keeping this service at a reasonable volume level it will create a more worshipful environment for all.

With the Decibel Meter set to “A” weighting and slow response. The decibel meter should never exceed these level.

*******Sanctuary decibel level should not exceed 90dB**

*******Worship Arts Center decibel level should not exceed 95dB**

b. Importance Of Lyrics and Legibility – When it comes to church music, **the most important element in the mix is the vocals**. If the lyrics cannot be understood, the music will not provide a truly worshipful experience for the listener. The instrumentation is there to support the vocal. With this in mind, take extra precaution to make sure the lyrics are not being drowned by the instrumentation on stage.

III. Expectations of the Sound Technicians

a. Punctuality – Punctuality is of utmost importance when it comes to set up and rehearsal times. It is the technician’s responsibility to arrive with enough time to make sure that they have everything set up and tested before the start time of the rehearsal.

b. Positive Attitude – A Sound Tech must always maintain a calm and positive attitude. We want to keep the participants relaxed, comfortable, and in good spirits. It is easy to get stressed out or frustrated when running sound, but just try to remember that your attitude may be affecting somebody else.

c. Communication with the Performers – If a musician asks for something, do your best to accommodate them. I know from experience that **there is nothing more frustrating** than a sound guy who doesn’t listen to your needs or responds in a condescending and negative manner. If you can convince the performers that you are on their side, you will get good results in your overall sound.

This is extremely important when it comes to monitor mixes. If a musician feels like they cannot hear themselves in the monitor, they will not be inspired to give a good performance. In order to achieve optimal sound reinforcement it is necessary for the sound tech to let the musicians know what he needs. Vice versa the tech should be constantly asking the musicians if everything is fine and if he needs to bring anything up or down in the monitor. It's better for the sound tech to ask then to assume that they will tell you if something isn't right. A lot of musicians assume that sound guys don't care and so they just deal with a bad monitor mix and their performance may suffer.

- d. Organization** – It is important to be as organized as possible when dealing with sound set-up and teardown. Setting the stage in an organized manner will make the stage look more presentable and will allow you to keep track of where things are plugged in. Also, using the magnetic labels on the mixer will help you to quickly find the channel you are looking for while mixing. Probably the most important thing is to put everything back in the sound room in an organized manner and in its proper place. If everyone can maintain this standard it will help us to keep better track of what equipment we have at our expense and will hopefully keep things from getting lost.

IV. Sound Equipment

a. Microphones and Direct Boxes

1. Condenser



- AKG 414 – This large diaphragm condenser microphone with selectable polar patterns and pad can be used as Choir mics, and on instruments like piano, drum overheads, and an acoustic guitar without a direct output. This microphone requires phantom power.



- Neumann KM184 – This pencil shaped condenser microphone can be used in similar situations as the AKG 414. However, it does not have the selectable polarity pattern and pad options. The most common usage is on piano, drum overheads, strings, acoustic guitar, and choir. This microphone requires phantom power.



- Neumann TLM 103 – This large diaphragm condenser microphone can be found hanging in the choir loft above the choir. While these are great microphones you may find that they serve as more of an ambience microphone than anything else. In some cases they may work just fine if the organ, orchestra, or big band is not playing. I recommend using spaced stereo pair

of AKG 414's if the TLM 103's are not picking up the choir well. This microphone requires phantom power.



- Shure PG 81 - A sensitive, flat response microphone ideal for acoustic instruments such as drums, piano, strings, etc. This microphone is not as good as any of the other condenser microphones but will work great for a drum overhead.

2. Dynamic



- Sennheiser 421 – This dynamic microphone is a popular studio classic and is used for drums, guitar amplifiers, and percussion. There is a variable bass setting on the ring near the XLR connector to switch between M-music and S-speech. This setting should remain on M because it will be used primarily as an instrument microphone.



- Sennheiser e945 – Supercardioid lead vocal microphone similar to an SM58 but with a tighter pickup pattern for increased clarity and off axis rejection.



- Shure SM57 – This dynamic microphone has also proven to be a live and studio classic. It is best know as a snare and electric guitar amp microphone. This microphone can be used to pickup any instrument that puts out a high sound pressure level.



- Shure SM58 – Similar to the SM57, with the addition of a metal windscreen, this microphone is meant to be used for live vocals. It has the same characteristics as the SM57 and can be used in the same applications if need be.



- Shure PG52 – A cardioid dynamic Kick Drum microphone tuned to capture low-end punch.



- Shure PG56 – A cardioid microphone made to clip onto the side of a snare or tom drum.

3. Wireless

- Shure UR14D – A UHF-R Professional Wireless Microphone System that uses the latest wireless technology, delivers



outstanding audio clarity, and is rugged and reliable. The body pack(UR1) and Beta58(UR2) handheld microphone will be used as the transmitters.



- Sennheiser G2 ew300 – Wireless Microphone System using both bodypack and handheld wireless microphones. These mics are found on the 700MHz frequency range and may run into interference in the near future.

4. Direct Boxes

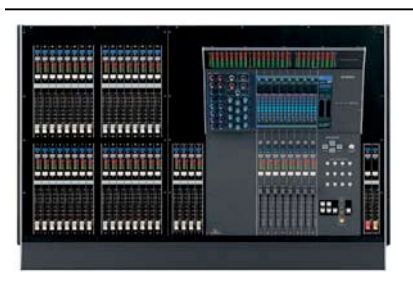


- Whirlwind Director - This passive Direct Box converts line, instrument, or speaker level signals to a low impedance mic level. The input is Hi-Z bridging. The DI box includes a 30dB pad switch for selecting level, a switchable low pass roll-off filter to eliminate amp noise, and a ground lift switch on the Lo-Z output. This will be used for Keyboards, Acoustic and Bass Guitars.

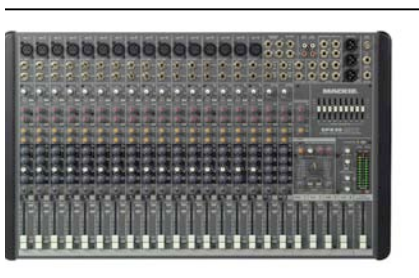


- Countryman Type 85 FET – This active Direct Box is the ultimate in quality and convenience. It lets you connect an acoustic instrument pickup or an electronic instrument directly to a microphone input. This will work great for Acoustic Guitar, Bass, and Keyboard.

b. Mixers



1. Yamaha M7cl – A Large digital mixer with built in EQ, Dynamics, and Effects. This mixer will be the main tool used to process and mix the sound going to the house in the Worship Arts Center and Sanctuary.



2. Mackie CFX20 – A medium size 20 Channel Analog mixer with built in effects used in the Fellowship Hall



3. Tapco mx120 – A small 12 channel portable mixer used for special events outside or in locations without an installed sound system.

c. Monitors



1. Passive Floor Wedge – Small speakers used to help the performers on stage to be able to hear themselves. These monitors must be used with a separate power amp to produce sound. They can also be daisy chained together when using multiple monitors on the stage.



2. Aviom Monitor System – This System allows each person on stage to be in control of his or her own 16-channel mix. It is made possible due to a card installed in the M7cl and Aviom distribution unit.

d. Sanctuary Equipment Racks

1. Sound Booth Left (Top to Bottom)

- Video Camera Input – This input sends video signal directly to the Audio/Video Matrix.
- Shure Antenna Distribution System – Receives antenna signal and distributes to the wireless receivers.
- Shure UR14D – These wireless receivers are used with the bodypack(UR1) and handheld transmitter(UR2) found in the bottom drawer.
- Shure Auto-mixer – Can be used to control the volume of the auto-mix channels marked accordingly on the stage.
- Patchbay – This can be used to patch channels on stage into the desired channel on the mixer. Also there is a patch marked blue and red that is necessary for use of the stage monitors.
- Dbx dynamics processor – The main outs from the mixer are routed through this unit to help gate and compress the house sound.
- Microaudio POD – 28 band EQ for House mains



- Peavey IDL 1000 – Delay unit used to prevent phase between front and back house speakers
- Microaudio POD – 28 band EQ for Choir Loft stage monitors
- Sliding Drawer – Patch cables and Batteries
- Sliding Drawer – Wireless transmitters and Countryman earpieces.

2. Sound Booth Right (Top to Bottom)



- Main Power Switch can be found on the right side of this rack space. The center switch can bring up and down the Projector Screen.
- Pioneer DVD Player – Patched into the video switcher to be displayed using the projector.
- Analog Way Smart Cut-2 – Video Switcher used to select sources to be sent to the projector
- Panasonic VCR – Patched into the video switcher to be displayed using the projector
- Denon CD Player – Used for CD playback
- HHB CD Recorder – This unit is used to Record live audio CDs. The audio feed comes from the Master Channel on the Mixer
- Denon Cassette Tape Player – This unit is used for tape playback.
- Extron Distribution Amp and Converter – These units are used to boost and convert the signal going to the projector.
- Sliding Drawer – Blank CDs, CD Sleeves, Permanent Markers, etc.

e. Worship Arts Center Equipment Racks

1. Sound Booth (Top to Bottom)



- Furman PS-8R – This unit Turns on and off the power for all of the equipment in the sound booth, and amps.
- Marantz CD/Cassette Player – This unit is used for CD and Cassette Tape Playback
- Analog Way Octofade – This unit is used to select sources that will be routed to the projectors.
- Auto-mix/Manual mix selector – This unit can be used to switch between Auto and Manual mix. Also, it can be used to control the volume levels in the Narthex.
- HHB CD Recorder – This unit is used to record live audio CDs. The audio feed comes from the Master Channel on the mixer.
- Sennheiser Antenna Splitter – This unit is used to distribute the antenna signal to all of the wireless receivers.

- Sennheiser Wireless Receivers – These units receive the signal from the wireless hand held and/or bodypack microphones found in the bottom drawer.
- Sliding Drawer – contains wireless transmitters, Countryman earpieces, batteries, tape, decibel meter, etc.

2. Equipment Room Main Rack (Top to Bottom)



- Listen Transmitter – Used to send an amplified signal to the receivers of people who are hard of hearing.
- Audia Flex – Digital Signal Processor and Distributor for the WAC Narthex and Video Audio Matrix.
- APC Smart UPS – Power Distributor and battery back-up for audio equipment
- Aviom A-16D Pro – Distribution system for the Aviom monitor mix system
- Speakon patch bay – This patchbay can be used to patch outputs from the mixer to amplifiers, and from the amplifiers to the wall input desired.
- QSC amplifiers – These amplifiers are used to power the house speakers and wedge monitors

3. Small Rack on Floor (Top to Bottom)



- Furman PL-8 – Power Conditioner for units in this rack
- Extron Distribution Amplifier – Used to amplify the signals coming out of the Audio/Video Matrix
- Extron Audio/Video Matrix – The Hub for all audio and video signals on campus. This can be used to send signal from one venue to another.

f. Fellowship Hall Equipment Racks

1. Mixer Rack (Top to Bottom)



- Mackie CFX20 – Serves as the main mixer in the Fellowship Hall
- Furman PL-8 – Power Conditioner for units in this rack
- Panasonic DVD/VHS Player – Used for DVD/VHS Playback in the Fellowship Hall
- Tascam CD/Cassette Deck – Used for CD/Cassette Playback in the Fellowship Hall
- Sliding Drawer – Used to store wireless microphones, batteries, projector remote control, and audio/video adapters.

2. Main Rack (Top to Bottom)



- Listen Transmitter – Used to send an amplified signal to the receivers of people who are hard of hearing.
- Sennheiser Antenna Splitter – This unit is used to distribute the antenna signal to all of the wireless receivers.
- Sennheiser Wireless Receivers – These units receive the signal from the wireless hand held and/or bodypack microphones
- Projector Screen Controller – This unit can be used to bring the projector screen up and down
- Auto-mix/Manual mix selector – This unit can be used to switch between Auto and Manual mix.
- Audia Flex – Digital Signal Processor and Distributor for the Fellowship Hall and Video/Audio Matrix.
- APC Smart UPS – Power Distributor and battery back-up for audio equipment
- Furman PL-8 – Power Conditioner for Units in this rack
- Quattro D Video Switcher - This unit is used to select sources that will be routed to the projector
- Extron Distribution Amp and Converter – These units are used to boost and convert the signal going to the projector
- QSC amplifiers – These amplifiers are used to power the house speakers and wedge monitors

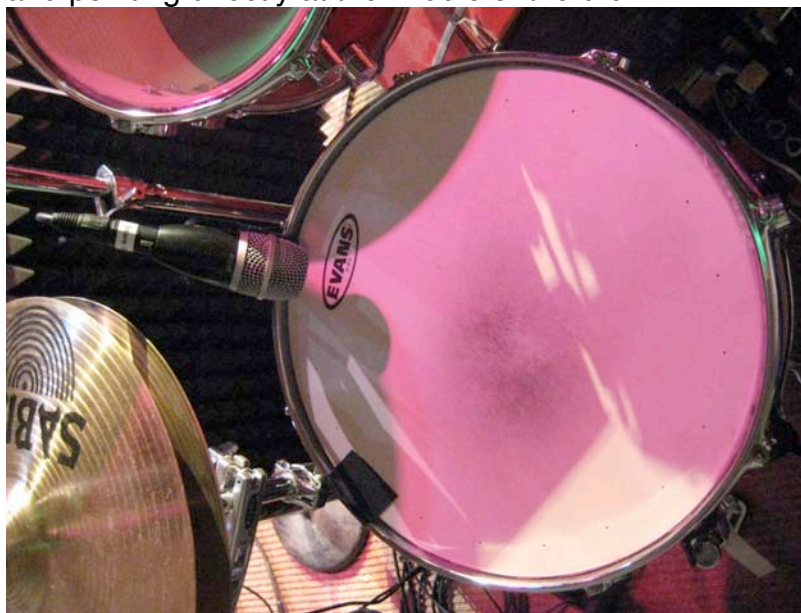
V. Microphone Techniques

a. Drums and Percussion

1. **Kick Drum** – Use the Shure PG52 Microphone in combination with a short boom microphone stand. Place the mic in the sound hole on the front of the Kick Drum so that it is not touching any part of the drum. If the mic is too far inside the drum it will sound snappy and thin. If it is too far outside of the drum it will sound muddy with very little attack.



2. **Snare** – Use the Shure PG56 Microphone with its drum-mounting clip. The microphone should be placed on the upper left side of the drum or under the hihat to avoid it being hit by the drummer's stick. The microphone should be a couple inches off the head of the snare and pointing directly at the middle of the drum.



- 3. Toms** – Sennheiser 421's or Shure sm57's will work well on toms. Use a boom stand to position the microphone in between the tuning knobs of the drum and out of the drummer's way. The microphone should be a couple inches off of the drumhead and pointing directly at the center of the drum.



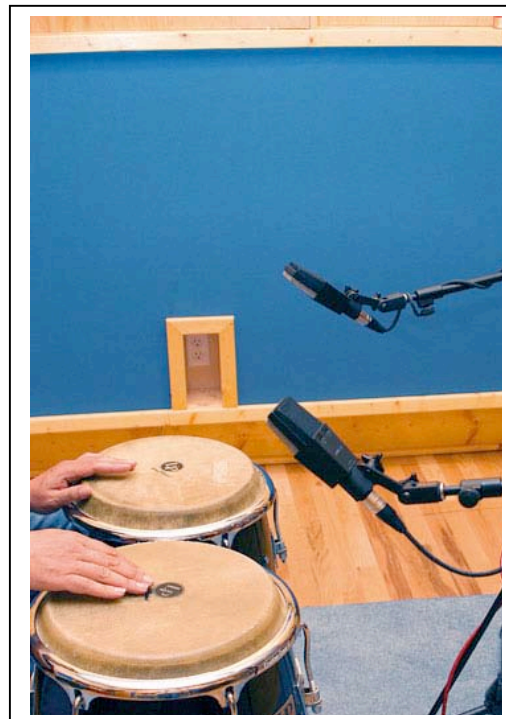
- 4. Overheads** – A Neumann 184, Shure PG81, or AKG 414 will work well as an overhead microphone on a drum set. The microphones can be placed using a stereo pair or single microphone above the center of the drum set. Make sure that it is high enough above the drummer so that he will not hit it, but close enough that it will not pick up a lot of other stage noise.



- 5. Djembe or Cajon** – Use a Sennheiser 421 or Shure sm57 to close mic a djembe or cajon. If the drum needs increased low end, place the mic in the sound hole of either instrument. For increased overall sound, place the mic within a foot of where the drum is being struck and make sure it is out of the drummer's way.



- 6. Percussion Section** – Use a Neumann 184, AKG 414, Shure PG81 or Sennheiser 421 to mic a percussion section. The first two microphones should be used to help increase clarity and definition. The Sennheiser will produce more warmth and less high-end brilliance. The mics should be placed generally above the percussion section and out of the performers way.



b. Bass

1. **Electric Bass** – Generally speaking most Bass Guitars have a ¼ inch High Z output jack. In this scenario you would use a Whirlwind Director or Countryman direct box to convert the instrument level unbalanced signal to a low impedance mic level balanced signal. There is often an undesired hum that happens in this situation. This can often be resolved by flipping the ground switch on or off.
2. **Acoustic Bass** – If the Acoustic Bass has a ¼ inch output, use that as you would a normal electric bass. However if the Bass needs to be miked, place a Sennheiser 421 so that it is pointing at the lower body of the instrument. Place it closer to the bridge for more attack and bow sound. Microphone placement will have a large impact on the type of sound that is being captured. As always, keep the microphone out of the performers way as much as possible.

c. Piano

1. **Acoustic Piano** – Acoustic Piano is one of the hardest things to mic and isolate well. It requires the lid to be open and other sounds fill the piano with unwanted noise. If possible, move the piano in a way that it does not open up toward other loud instruments such as drums, electric guitar amps, etc. Use a Neumann 184 or AKG 414 with a telescoping boom stand to get the mic into the center of the piano above the strings. Keep the mic away from the higher strings, as it will create a piercing sound when those notes are struck. Move the mic toward and away from the hammers until the desired amount of fullness and attack is achieved. If there is a lot of noise coming into the piano make sure to position the mic away from any loud sources. Use the microphone's off axis rejection to help you isolate the direct sound of the piano.



d. Acoustic Guitar

1. **Acoustic/Electric** – Most Acoustic Guitars will have a ¼ inch instrument output. Use this output in combination with a Direct Box to convert the signal to a low impedance balanced signal. Flip the ground switch to get rid of undesired hum.
2. **Acoustic** – If there is no ¼ input and the guitar must be miked, use a Neumann 184, AKG 414, or Shure PG81. Place the mic so that it is pointing between the 12th fret and sound hole of the guitar. The closer you can get it to the guitar the better. It is extremely hard to isolate an acoustic guitar with a microphone on it in a live situation. You will most likely be battling feedback if the guitar is being pumped through the stage monitors. Do as much as you can to isolate the guitar from the other instruments. Putting the mic between the 12th fret and sound hole, and close to the guitar will help you to avoid these problems as much as possible.



- e. **Electronic Keyboard** – Use a Whirlwind Direct Box to convert the line level signal from the keyboard to a Balanced XLR signal. Flip the ground switch if undesired hum occurs.
- f. **Lectern** – When the lectern is used on a Sunday morning, a Shure sm58 should be placed in the mic clip and the cable should be neatly hidden being the hanging fabric. It is important to use this mic in particular because it has a fairly wide cardioid pick up pattern and will provide a consistent signal level even when the speaker is not speaking directly into the microphone.

g. Electric Guitar

1. **Miking the Amp** – Use a Shure sm57 with a short mic stand on an electric guitar amp. Point the mic directly at the speaker and get it as close to the screen as you can without touching. Typically you don't want to point the mic at the center of the speaker. Instead point the mic at the outside cone of the speaker. This will produce a less irritating and rounder tone. Encourage the musician to keep their stage volume down as much as possible, this will allow you to have more control of the guitar in the house.



2. **Going Direct** – Some performers may prefer to use a Direct Box with their guitar. Often times they have amp modelers that imitate the sound of an electric guitar coming out different amplifiers. Some pedals may even have XLR outs. If this is the case then there is no need for a direct box. Plug the XLR cable into his rig and you should be good to go.

- h. **Orchestra** – A stereo pair of microphones is often enough to capture the sound of an Orchestra. Use AKG 414s or Neumann 184s in a spaced pair or XY formation to capture the stereo image of the Orchestra. If the Orchestra is being miked for recording purposes only, the mics can be placed anywhere from the middle of the room up to the area right behind the conductor. However, if the Orchestra is being miked for sound reinforcement, the microphones must not be placed out in the seating area. They cannot be in a direct line of the speakers or else you will have certain feedback.
- i. **Big Band** – A Big Band will require very little sound reinforcement. The only things that might possibly need to be miked would be quieter instruments that will be taking solos. Use a Sennheiser 421 or Shure sm57 with a boom stand for an instrument solo mic. Work with the musician to make sure it is out of

their way, and so that they can easily access it when they are ready to take a solo.

j. **Orchestral Instruments**

1. **Strings** – Use a Neumann 184, AKG 414, or Shure PG81 to mic the instrument. Place the mic above the instrument angling down and so that it is not in their way.
2. **Brass/Woodwinds** – Use a Sennheiser 421 or Shure sm57 to mic the instrument. Place the mic pointing toward the bell of the instrument or wherever the sound is projected. Allow the performer room to move toward the mic for solos. If the sound produces a high level of wind such as a flute, use a Shure sm58 with a windscreens to keep the air from their mouth from reaching the actual microphone.

k. **Choir**

1. **Chancel Choir** – Use the hanging Neumann TLM103 microphones in the sanctuary to pick up the chancel choir when they are performing with the piano or organ. Often times it is necessary to set up a stereo spaced pair of microphones (AKG 414's) in order to get a more isolated signal. This is usually the case on Orchestra Sunday, Big Band Sunday, and Children's Sunday. Place the mics in front of the choir and position them as close as you can to the choir without them being able to touch or bump the microphone or stands. Often times raising the mics and angling them downward at the choir a bit will help to clean up the signal from other elements that might be bleeding into the mics.
2. **Kids Choir/Ensemble** – Use AKG 414's to create a spaced stereo pair in front of the risers. Place the mic stands as close to the kids as you can without them being able to touch them while they are on the risers. Raise the mic stands and angle them downward for better isolation.



I. Vocal



1. **Lead Vocal** – In most cases a Sennheiser e945 will work best. It has a hyper cardioid pick up pattern and will only pick up what is directly in front of it. In some cases it may be appropriate to use a wireless handheld microphone if the lead singer will be moving around the stage or switching between instruments in different locations.
2. **Backing Vocals** – If a Sennheiser e945 is not available, a Shure sm58 will certainly work great as well.

VI. Setup & Teardown Procedure – The sound setup on a Sunday morning can be extremely simple, but sometimes when there are many different elements involved it can be a rather complicated set-up. If you follow the setup procedure in the order suggested, it will maximize your setup time and allow the performers the time that they need to rehearse before the service begins.

1st and 2nd Service

a. Sound Setup Checklist

1. Power on all Equipment
2. Load the Default LCPC Scene on the Yamaha M7CL
3. Assess the service schedule and determine what needs to be set up. (Microphones, Mic Stands, Cables, Direct Boxes, Monitors, Lectern, Drum Shield, etc.)
4. Set up all Mic Stands and Microphones with instrument isolation in mind.
5. Set up all Direct Boxes and Monitors
6. Run cable neatly to all Microphones, Direct Boxes, and Monitors. (Leave the extra cable coiled at the base of the microphone stand in case the microphone needs to be moved or adjusted. Make sure to wrap the cable several times around the mic stand when using a condenser microphone. This will keep the mic from falling to the ground if it is accidentally knocked out of its stand.)
7. Check all microphones to make sure that they are getting signal.
***** When doing this DO NOT just turn all the channels on and go speak into the microphones. If the gain is up too hot on a channel

and you speak into a microphone there may be severe feedback with all of the microphones open. If no one is available to help you check microphones, then play a CD through the house sound system or stage monitors. You should then be able to see signal level on each channel.

- 8.** Patch the monitors on the patchbay, blue to blue and red to red. Test all monitors to make sure they are getting signal.
- 9.** Make sure any extra sound equipment is cleared off of the stage and ready for Rehearsal.
- 10.** Do your best to accommodate the musicians and pastors so that the rehearsal can start on time. (It does not matter how good the sound is. If the performers do not get to rehearse and do not feel comfortable, they will not perform well.)
- 11.** Adjust the headamp(gain) on every channel so that you are getting a good signal without the possibility of clipping.
- 12.** Check with the musicians to make sure that they are getting everything that they need in the monitors before starting on your house mix. **** THE MONITOR MIX IS JUST AS IMPORTANT AS THE HOUSE SOUND.
- 13.** Follow the 6 Elements of a Good Mix in order to achieve your house mix.
- 14.** Check back with the musicians to make sure that nothing needs to be adjusted in the monitors due to the addition of the house sound.
- 15.** Once a decent house sound is achieved it is time to prep the wireless mics and get them to the participating pastors.
- 16.** Put a CD in the CD burner and get it ready to begin recording the service.
- 17.** Assign desired channels to DCA/Mute Groups for quick muting and volume capabilities.
- 18.** As the service is about to begin start the CD Burner and be ready to un-mute channels or groups.
- 19.** Turn on the sound in Narthex by turning on the Mono Master Fader and bring up the level.

b. Sound Tear Down Checklist

- 1.** Make Sure all Channels are turned off on the mixer.
- 2.** Finalize the CD Recording of the service.
- 3.** Label the CD and leave it on top of the Equipment Rack.
- 4.** Turn off the Sound System, and Monitor Amp.
- 5.** Clean up and put away all microphones. **** DO NOT start cleaning up until all music on stage is complete, including any organ or orchestra postlude.

6. Roll up all cable, put away all mic stands, monitors, and direct boxes.
7. Make sure the stage is clean of all sound equipment
8. Lock up all racks and cover the M7cl mixer.

3rd Service

c. Sound Setup Checklist

1. Power on all Equipment
2. Load the Default LCPC Scene on the Yamaha M7CL
3. Assess the service schedule and determine what needs to be set up. (Microphones, Mic Stands, Cables, Direct Boxes, Aviom, Monitors, Lectern, Drum Shield, etc.)
4. Set up all Mic Stands and Microphones with instrument isolation in mind.
5. Set up all Direct Boxes, Aviom Mixers, and Monitors
6. Run cable neatly to all Microphones, Direct Boxes, and Monitors. (Leave the extra cable coiled at the base of the microphone stand in case the microphone needs to be moved or adjusted. Make sure to wrap the cable several times around the mic stand when using a condenser microphone. This will keep the mic from falling to the ground if is accidentally knocked out of its stand.)
7. Check all microphones to make sure that they are getting signal.
***** When doing this DO NOT just turn all the channels on and go speak into the microphones. If the gain is up too hot on a channel and you speak into a microphone there may be severe feedback with all of the microphones open. If no one is available to help you check microphones, then play a CD through the house sound system or stage monitors. You should then be able to see signal level on each channel.
8. Test all monitors to make sure they are getting signal.
9. Make sure any extra sound equipment is cleared off of the stage and ready for Rehearsal.
10. Do your best to accommodate the musicians so that the rehearsal can start on time. (It does not matter how good the sound is. If the performers do not get to rehearse and do not feel comfortable, they will not perform well.)
11. Adjust the headamp(gain) on every channel so that you are getting a good signal without the possibility of clipping.
12. Check with the musicians to make sure that they are getting everything that they need in the Aviom and monitors before starting on your house mix. ***** THE MONITOR MIX IS JUST AS IMPORTANT AS THE HOUSE SOUND.

13. Follow the 6 Elements of a Good Mix in order to achieve your mix.
***** DO NOT RUN SOUND THROUGH THE HOUSE UNTIL THE 2nd SERVICE HAS BEEN LET OUT. MIX IN THE HEADPHONES.
14. Once the 2nd Service has been let out, bring up the mix in the house.
15. Bring up the Bass and Kick in the Subwoofer and make sure that the Sub MX Master channel is turned on by hitting MIX1-8 button and finding the channel labeled (Sub).
16. Check back with the musicians to make sure that nothing needs to be adjusted in the monitors due to the addition of the house sound.
17. Once a decent house sound is achieved it is time to prep the wireless mics and get them to the participating pastors.
18. Assign desired channels to DCA/Mute Groups for quick muting and volume capabilities.
19. As the service is about to begin play a contemporary worship CD and be ready to un-mute channels or groups.

d. Sound Tear Down Checklist

1. Make Sure all Channels are turned off on the mixer.
2. Turn off Sound System
3. Clean up and put away all microphones and Direct Boxes. **** Do not start cleaning up until all performing on stage is complete.
4. Leave all labeled cables plugged into the wall, all mic stands and Aviom units on stage. They stay on stage from week to week.
5. Roll up all extra cable, put away extra mic stands, and monitors.
6. Make sure the stage is clean of all unnecessary sound equipment
7. Cover the M7cl mixer.

VII. Mixing on the Yamaha M7cl

Using the Yamaha M7cl can be a bit challenging if a person has little or no experience on a digital mixer. But it does have all of the same functions as an analog mixer; you just have to know how to access them.

- a. **Basic Operation** – The M7cl is controlled by a combination of a touch screen and corresponding knobs around the outside of the touch screen

1. Screen Views

Scene List – Found at the bottom right corner of the touch screen, the Scene List is used to save and load Scenes.



Setup – Found at the bottom right corner of the touch screen below the Meter, the Setup screen is used for User Log in, Storage, and Setup and System options.



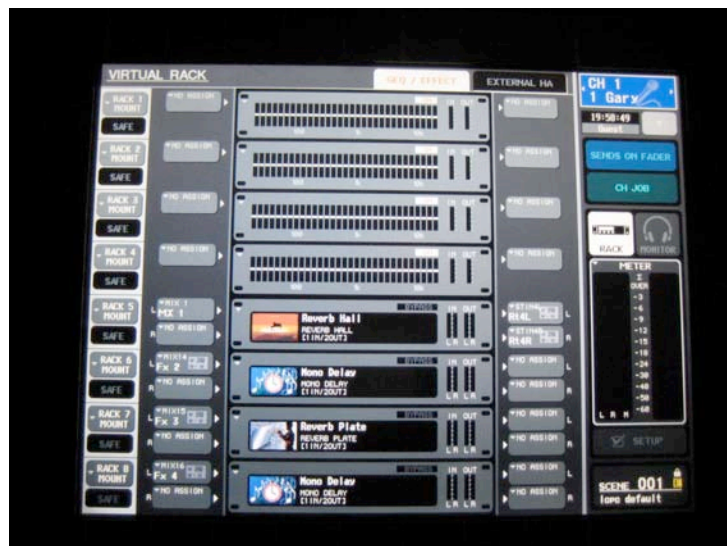
Meter – Found on the right side of the touch screen, the Meter screen can be used to observe the faders for all inputs and layers.



Monitor – Found on the right side of the touch screen above the meter, the monitor screen can be used to adjust the cue level and source, the talkback input, and oscillator.

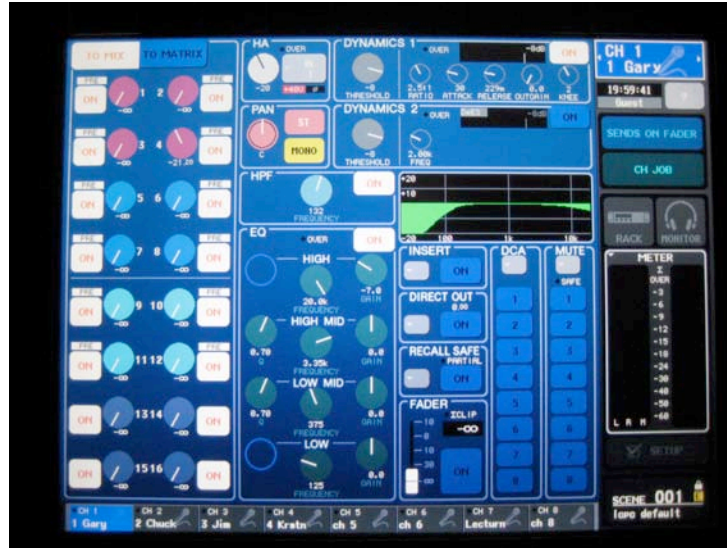


Virtual Rack – The Virtual Rack can be found next to the monitor icon above the meter on the right side of the touch screen. This screen can be used to adjust the internal effects units (reverb, delay, etc.), effect returns, and assignable EQ units.



- Chanel Job – The Channel Job screen can be found on the right side of the touchscreen under Sends on Fader. This screen is used to edit and control DCA and Mute Groups.

Selected Channel Overview – This screen can be accessed by pressing down on any knob to the left of the touch screen. On this screen you will be able to view and adjust everything about the selected channel including: EQ, Dynamics, Headamp, Sends, Pan, Direct out, DCA, and Mute Groups.



8 channel Overview – This screen can be accessed by selecting the 1-8, 9-16, 17-24, 25-32, 33-40, or 41-48 buttons found below the User Defined Presets. From this screen you can view Headamp, EQ, Dynamics, Sends, Pan, and DCA/Mute Groups.



- 2. Selecting a channel –** A channel can be selected by using the select button above the fader or by simply moving the fader. Selecting a channel will allow you to work on that specific channel only.
- 3. Muting –** Each channel has an “ON” button above the fader. If that channel is lit up Orange, the channel is on. If the Button is not lit, the channel is muted.

4. **Soloing** – Each channel has a “CUE” button above the fader. When that button is hit, it will send that channel’s signal to the headphones pre-fader.
- b. **User Defined Presets** – These buttons found on the bottom right side of the mixer can be assigned to do almost anything. At LCPC we will use them to select a monitor send, effect send, mute groups, tap tempo, and as a talkback on/off switch.
- c. **Saving and Loading a Scene** – this will be used every week to load the default preset.
 1. Go to the Scene List Screen and use the corresponding knob in the bottom left corner to select the desired scene.
 2. Hit Recall to load a scene or Store to save a scene to an open number.
 3. Use the lock feature to prevent a preset from being overwritten.
- d. **Adjusting the Headamp/Gain** – The gain controls the sensitivity of the source plugged into it. Each channel’s headamp should be adjusted so that it has significant signal without the possibility of peaking or distortion.
 - To adjust a channels headamp: Select the channel, and turn the knob labeled “HA.”
 - Make sure there is significant gain on that channels meter. If the meter ever goes into the red “OVER” area, then the headamp is too high and needs to be turned down.
- e. **Adjusting the EQ** – Each channel’s EQ can be adjusted by using the EQ knobs on the left hand side of the touch screen or by touching the Parametric EQ on the touch screen to control the selected channel. From this screen you can adjust the Bass Roll Off, Lows, Low-Mids, High-Mids, and Highs.
 - You can save and load EQ settings by going to the library on the EQ adjustment screen.
- f. **Adjusting the Dynamics** – 3 dynamic functions: Gating, Compression, and a De-esser can be applied to each channel. Each dynamic function can be adjusted by touching Dynamic 1 or 2 on the touch screen.
 - You can save and load Dynamic settings by going to the library on the Dynamic adjustment screen
- g. **Sends** – These are used to send a signal somewhere other than the House.
 1. *Sends on Fader* – The M7cl has a cool feature that allows you to select a send, and then all of the faders for each channel will move to represent how much signal they are sending.
 - Touch “SENDS ON FADER” on the upper right side of the touch screen, and select the desired send. You will then see all of the faders move to represent how much signal they are sending.
 - This will allow you to quickly see and adjust the monitor sends.
 2. *Stage Monitors* – To access the sends to the stage monitor use the “user defined keys” or “sends on fader” screen to select the desired

monitor mix. Either way, the faders will move to represent how much each channel is sending.

- In the Sanctuary you will find Choir, Rear Monitor, and Front Monitor Mixes going out of MX 4, MX 5, and MX 6.
- In the Worship Arts Center you will find Monitor mix 1-4 on MX 1-4.
- Each Send has a master that can be found by selecting MIX1-8 or MIX9-19 on the bottom right side of the mixer. The 8 changeable faders will then move to represent the selected 8 master channels. You can turn a monitor on/off or up/down on this layer.

3. *Aviom Personal Monitor System* – In the WAC the main monitor system will be the Aviom Personal Monitors. This system allows each person on stage to have control of their own 16-channel monitor mix. There is a card installed into the back of the M7cl that is used to send 16 channels directly to the Aviom Distributor via cat 5 cable. To change what is being sent to each channel of the Aviom follow these steps.



- Go to the Setup Screen, and select Output Ports
- At the bottom of the Output Port screen touch Slot 1-8 to see channels 1-8 being sent to the Aviom and Slot 9-16 to see what is being sent to channels 9-16.
- On the channel that you wish to change, touch the name of the source that is currently designated to that output and select the new source that you wish to send to that channel of the Aviom.

4. *Talkback* – The Talkback microphone can be used to talk to the performers on stage without being heard in the house.
 - The talkback mic can be activated by touching the bottom right User Defined Preset button on the m7cl.
 - In the WAC the talkback mic will be sent to channel 16 on the Aviom.
 - In the Sanctuary the talkback mic will be sent to the 3 monitor sends on stage.
5. *Recording* – Each mixer has a CD Burner hooked up to record audio from the mixer. The audio coming out from the mixer to the CD Burner is sent from the Matrix layer out of Outputs 13 and 14. The signal will be an exact duplicate of that being sent to the house.

- h. **Stereo Inputs** – There are 4 stereo inputs on each mixer. These inputs are used for the CD Player, Video, Computer Media, and Reverb Return.

i. Mute Groups/DCA – Groups of channels can be designated on the mixer to make group muting and sub-masters possible.



- The channels selected in each mute group can be muted by hitting the designated User Defined Presets.
- The channels selected in each DCA Group can be controlled on the 8 interchangeable faders by hitting the DCA button on the bottom right side of the mixer.
- To add or remove channels from a group go to the Channel Job Window and select Mute or DCA Group. You can then select a group and see which channels are currently included in that group. Hit the “select” button at the top of a channel to add or remove it from the group.

j. Master Channel – On the m7cl there is a stereo and mono Master Fader. Each channel must be turned on to be active. These channels can have EQ and compression just like any other channel.

- The Stereo Fader will control the level of signal going to the house sound.
- The Mono Fader will control the level of signal being send to the Narthex.

VIII. 6 Elements to a Great Mix

In order to obtain a great mix, I strongly recommend using these steps in order. You will find it much easier to single out problems and create clarity within your mix when using these techniques.

a. Balance – is achieving the best possible mix **BEFORE** Panning, EQ, Compression, Reverb, or Delay. All those other things are there as back up in case you need to manipulate a sound to help it fit into the mix better.

1. Start by adjusting the gain so that you get a good level from every instrument without the chance of clipping.
2. There are two approaches to obtaining a good balance at this point.
 - Bring all the faders up to “0” and adjust them until the best mix possible is achieved
 - Start with all the faders down and bring up one element at a time starting with the Foundation instruments (Kick, Snare, Bass). Next bring in the other rhythmic elements (Guitar, Keys, Percussion) one at a time. Finally, bring in the Vocals and make sure they are setting on top of the rest of the mix.
3. As you work on your balance take note of things that might need to be tweaked later on.

b. Panning – is moving elements left or right in the sound field in order to create space.

1. An Instrument might sound great by itself, but may disappear as another element is added to the mix. Instead of automatically going to the EQ, you can use panning to move the elements away from each other and give them space to be heard.
 2. In a live situation it is important to use small panning adjustments. You want to be careful not to pan something hard left or right to where the people on one side of the room are not able to hear that element due to your adjustment.
- c. Equalization** – is a tool used to sculpt and manipulate the sound by removing unwanted frequencies and adding desirable frequencies.
1. There are 3 primary goals when EQing:
 - To make an instrument sound clearer and more defined
 - To make an instrument sound bigger and larger than life
 - To make all of the elements of a mix fit together better by juggling frequencies so that each instrument has its own predominant frequency range.
 2. There are a million techniques to achieve one or all 3 of these goals but here is one method that I use while EQing
 - Determine what you do and do not like about the sound of the element that you are working on.
 - Determine if the element could benefit from a bass roll off. If the element has undesirable low-end frequencies, adjust the bass roll off until you have successfully cut out the boominess of the element without making it sound thin. This one thing can sometimes make a world of improvement especially on a vocal or drum overhead.
 - Consider whether the sound needs to be less muddy, less irritating, warmed up, or brighter.
 - a. Less Muddy – Use a narrow notch of 8 dB to sweep the low-mids (250Hz – 2kHz) of the element until you eliminate the muddy frequencies. Adjust the volume of the notch up and down until it sounds less muddy without sounding thin.
 - b. Less Irritating – Use a narrow notch of 8 dB to sweep the high-mids (2 – 4kHz) of the element until you eliminate the irritating frequencies. Adjust the volume of the notch up and down to find a balance between removing the harshness without losing presence.
 - c. Warmed Up – Use a wide peak of 8 db to sweep the low-mids (200Hz – 2kHz) of the element until you find the warmth of the element. At this point you will need to bring down the volume of the peak to achieve a balance of warmth without making it sound boomy or muddy.

- d. Brighter – Use a high-end shelf between 4-16kHz to increase the presence and brightness of an element. Sweep up and down to find the best spot that does not make it sound too thin or crispy.

3. Use this frequency chart to help in the EQing process

Instrument	Magic Frequencies
Bass Guitar	50-80 Hz – Bottom of the bass 700 Hz – Attack 2.5 kHz – Snap / Presence
Kick Drum	80-100 Hz – Thump 400 Hz – Hollowness (Cardboard Box Sound) 3-5 kHz - Snap
Snare	120-240 Hz – Fatness / Thump 900 Hz – Boing 5 kHz – Crispness / Attack 10 kHz – Snap / Presence
Toms	240-500 Hz – Fullness 5-7 kHz – Attack / Presence
Floor Tom	80-120 Hz – Fullness 5 kHz – Attack / Presence
Hi hat and Cymbals	200 Hz – Clang 8-10 kHz – Sparkle
Electric Guitar	240-500 Hz – Fullness 1.5-2.5 kHz – Presence
Acoustic Guitar	80 Hz – Fullness 240 Hz – Body 2-5 kHz – Presence 5-10 kHz – Sparkle
Organ / B3	80 Hz – Fullness 240 Hz – Body 2-5 kHz – Presence
Piano	80 Hz – Fullness 2.5-5 kHz – Presence 2.5 kHz – Honky-tonk
Horns	120-240 Hz – Fullness 5 kHz – Piercing frequency
Voice	120 Hz – Fullness 240 Hz – Boominess 3 kHz – Nasal sound 5 kHz – Presence and Sibillance 10-15 kHz – Air
Strings	240 Hz – Fullness

	7-10 kHz – Scratch of bow on strings
Conga / Djembe	200 Hz – Ring 5 kHz – Slap

- If it sounds muddy cut some at 250 Hz
- If it sounds honky cut some at 500 Hz
- **Cut if you are trying to make things sound better**
- **Boost if you are trying to make things sound different**

d. Effects – is used to make an element sound like it is a bigger or different space than it actually is. Things like Reverb and Delay will create these kinds of effects.

1. If the room is already very live and bright, you will not likely need to add much reverb or delay to increase the quality of the mix
2. Reverb can be used to push something forward or back in the mix.
3. Reverb should be used very sparingly on instruments that need to remain up front and present. By adding too much reverb to something it will often times start to add muddiness to the general mix and even mask other instruments.
4. Reverb can be used on vocals to help soften a bright vocal sound. It will also make the vocal seem as though it has more sustain
5. Delay is a good substitute to reverb when the room is already very live. It can still add a sustaining quality, but with less mudiness.

e. Dynamics – After all of these other steps have been taken, use compression to help control the volume of a source with inconsistent levels

1. Things that will often times need dynamic adjustment: Vocals, Bass, Kick, Snare, Acoustic Guitar, Pastor's mics, etc.
2. There are 3 types of dynamics that will be used in our situation.
 - Gate – Will prevent sound from being heard unless its volume level rises above the threshold. This can be used to keep open, unused, or noisy mics from muddying up the mix or causing feedback.
 - a. Common uses: Gating out the sound in between snare and kick drum hits, gating a vocal mic that has a lot of extra noise when the person is not singing, and gating a mic that is susceptible to feedback when it is left open.

Here are a few steps to follow when a gate is needed:

1. Listen in the headphones while gating. The goal is to make the gate sound as natural as possible without cutting out the attack or release of the sound source.
2. Watch the volume of the source that needs gating and bring down the threshold until it is allowing the desired sounds

through while cutting out the unwanted noise or silences below the threshold.

3. Adjust the attack to the fastest setting. This will cause the gate to open up as soon as sound crosses the threshold, which is what you want 95% of the time
 4. Adjust the Hold and Decay to find a natural release for the gate when the sound falls down below the threshold. More often than not a slight amount of hold time and a medium decay will sound pretty natural. You want to be sure not to be cutting off the ring from a snare hit, a fading chord of an electric guitar or the final consonant of a spoken phrase.
 5. The Range adjustment will allow you to change the amount of signal being heard when the sound level falls below the threshold. You can use this to let a make the gate sound a little more natural if the gate is sounding too obvious.
- Compressor – Using a ratio of input:output, a compressor takes the input of a source and limits its output at a set threshold by compressing the audio at the desired ratio. Basically, compression is an automatic volume adjustment that kicks in when an instrument gets louder than you want it too. It is important when using a gate and a compressor to use the gate first and the compressor second. If you compress the signal and then attempt to gate it, there will be less dynamic range to work with on the gate and it will be very difficult to cut out the unwanted noise without it effecting the sound source.

Here are a few steps to follow when compression needs to be used:

1. Watch the volume of the instrument on the meter and determine how much or how little compression is needed.
2. Start with the ratio at 3:1 and slowly bring down the threshold until you can see and hear the compression kicking in. Leave the threshold in a spot where it is not compressing the quieter sections but is compressing the louder sections.
3. Adjust the attack and release to the desired position. This will decide how fast the compressor kicks in when the sound level rises above the threshold, and how fast it fades out when the sound falls below the threshold.
4. Adjust the ratio to determine if the compression needs to be softer 2:1 or more severe 4:1 – 20:1.
5. Watch the Gain Reduction (GR) meter to determine how many dB are being removed in the loud sections. Raise the compressor “Out Gain” knob to make up for the dB lost on the GR meter.

- De-esser – is basically a compressor that will only compress high-end frequencies. This is often necessary after adding a great deal of compression to a vocal channel. The release of the compression will cause the hard consonants at the end of words to sound really bright and crispy. A De-esser can then be applied to dampen those harsh frequencies.

Here are a few steps to follow when a De-esser needs to be used:

1. A De-esser should always be applied AFTER gating and full frequency compression.
2. Set the De-esser at 3kHz since this is generally where the harsh frequencies are found.
3. Bring down the threshold until you begin to see significant Gain Reduction (GR) when a hard “S” or “T” is spoken or sung. Adjust the threshold until the hard constantans are dampened to your liking.
4. Move the effected frequency knob up or down until the source sounds the most natural and the De-esser is not obviously noticeable.

**** It is important to remember!!! By adding compression you are changing the natural dynamics of the instrument. Do not use compression arbitrarily!!! Only use it when it will really benefit the overall mix.

f. Interest – is the creative process of mixing. Once all of your levels are set, listen to the music and determine if there is anything you can do to make the music more interesting. Here are some things to think about:

1. Listen for the lead instrument in the song and make sure that it is able to be heard clearly when it is playing the hook or any kind of a solo.
2. Bring the Reverb and Delay up and down during certain section to create a spacey special effect.
3. Give different instruments a chance to stand out in different section of a song.
4. Make sure the melody is heard clearly at all times. Harmonies are not as interesting as the melody, but they do add texture and depth to the vocal section. Use them to your advantage but don't let them swamp the main vocal.

**** Follow these steps in order and you will find your mixes to be fuller without a high dB level.

IX. Video and Audio

a. Equipment

1. Projectors



- Eiki LC-W4 – 2 of these projectors can be found in the Worship Arts Center, one directed toward the front screen and one toward the back wall. These Projectors can be turned on and off using the remote controls found near the media computer in the WAC Sound Booth.
- Sanyo Projector – Found in the Sanctuary, this projector can be turned on and off using the remote control in the Sanctuary sound booth.



2. Media Computers – A media Computer will be found in the WAC and Sanctuary sound booths. This computer will be used to control Mediashout Slide/Video Presentations.

3. DVD/CD Players – There is a DVD and CD Player found in each sound booth. These can be used to play video and audio directly in the WAC, Sanctuary, or Fellowship Hall.

4. Stage Computer Input – Each Room has a VGA input on the stage that can be used to send a computer display to that room’s projector.

- WAC – located under center stage
- Sanctuary – located on stage left wall next to XLR Snake
- Fellowship Hall – located under floor panel on center stage right

5. Video Switchers – These are used to toggle between different sources that are to be sent to the projector in each room.



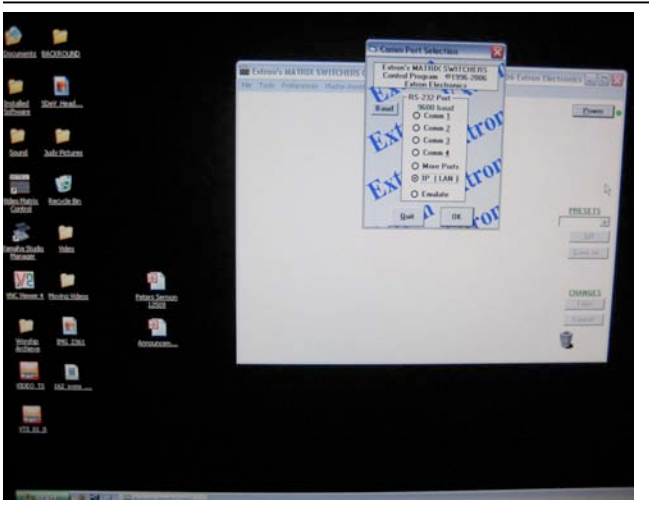
- WAC – Using the Octofade Video Switcher in the sound booth rack, you can change video/audio sources by hitting the input that you wish to be displayed.
- Sanctuary – Using the Smart Cut-2 Video Switcher in the Center Rack of the sound booth, you can change video/audio sources by hitting the input that you wish to be displayed and hitting “CUT”. The input lit green is the input currently selected, while the input flashing green is ready to be displayed by pressing “CUT”.



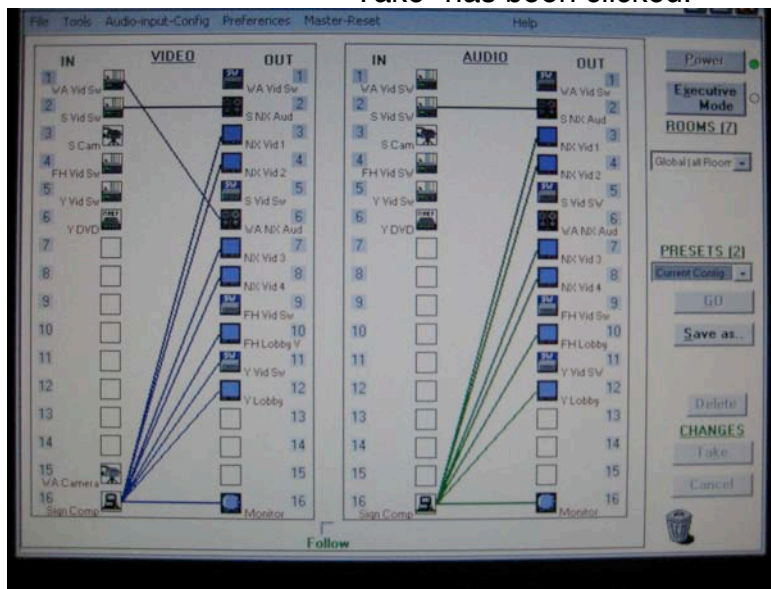
- Fellowship Hall – Using the Quattro D Video Switcher in the Main Rack, you can change video/audio sources by hitting the input that you wish to be displayed.

- b. Using the Video/Audio Matrix** – The Video/Audio Matrix links all of our Audio/Video Inputs to all of our Audio/Video Outputs. This will be used most often in overflow situations to send audio/video feed from one room to another. The audio from the Sanctuary and WAC is patched into the Narthex using the Matrix.

How to patch Audio and Video using the Matrix



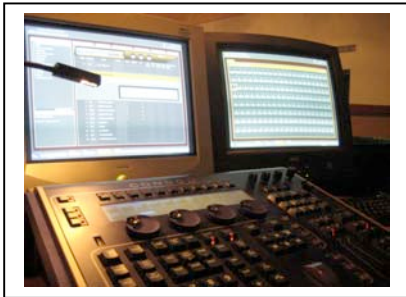
- i. Log onto the Media Computer in the Worship Arts Center
- ii. Click on “Video Matrix” found on the desktop.
- iii. Select “IP (LAN)” and click OK. There is no password, so click on Connect to proceed.
- iv. Drag an icon from the “In” side to the “Out” side to make an Audio or Video patch. Drag an icon from the “Out” side back to the “In” icon to un-patch something. Sometimes you will want to patch the Audio separate from the Video.
- v. After your changes to the patching have been made, click the “Take” button to make your changes happen. Nothing will be re-patched until “Take” has been clicked.



X. Lighting

a. ETC Congo JR

1. How to Power up and Log on

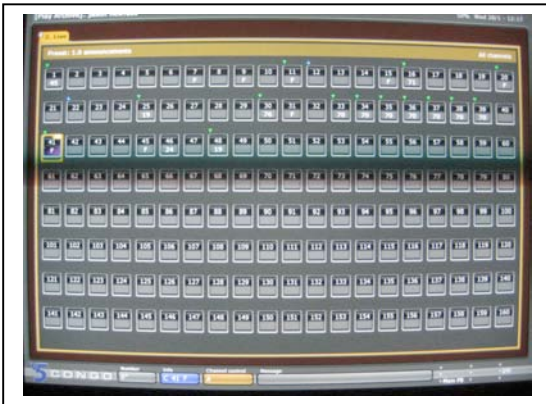


- Push the Rocker Switch on the Back of the Congo to the on position, then push down on the power switch until it powers up.
- Make sure both monitors are turned on.
- Click on Start Server to begin using the Congo
- Select “Use Data From Last Shutdown”

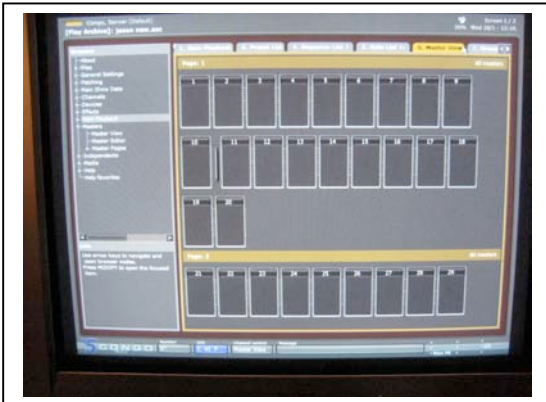
2. Basic Operation

- Screen Views

- a. Live (left) – Allows you to adjust a lighting fixture individually or a group of lights simultaneously.
- b. Go To List (below) – Allows you to jump from preset to preset by hitting the “GO TO” button.



- c. Master View (left) – Allows you to assign a group of lights to be controlled by one master.
- d. Preset List (below) – Allows you to see preset names and what lights are being used in each.



- Click on the arrow next to Play Archive, and then double click the file you wish to overwrite or the folder where you would like your new file to be saved.

5. Loading and Saving a Preset/Scene

To Save A Scene/Preset

- Use the Live window to choose the lights that you would like to adjust.
- Once you are happy with the lighting for that scene, Hit Record.
- Type in the name of your preset and click on Record at the bottom of the popup window.

To Load a Preset/Scene

- Once you are in a Play Archive you can go from scene to scene in order by hitting the “GO” button at the bottom right side of the Congo JR. The upcoming scenes can be seen from the “Main Playback Window.”
- In the same way you can go backward through the scenes by hitting the “Go Back” button found just above the “Go” Button.
- To Load a Preset/Scene that is not in order on the Main Playback Window. Go to the “Goto List” and select the preset that you would like to load. Hit “GoTo” found just above the button with the letter “A” on it, and that preset will be loaded.

6. How to Log off and Power Down

- Click on the arrow next to Files in the browser
- At the very bottom of the Files down menu, double-click on Power Off then click modify
- Turn off both screens and put the cover on the Congo JR

b. Dimmer Racks – The dimmer racks can be found on the left wall just inside the doors of the WAC Equipment Room.

c. Lighting Wall Switches – The Lighting Wall Switches can be used to save and load 4 different Presets without having to turn on the Congo JR.

1. Main Wall Switch – Found in the WAC Back Equipment Room, this is the only wall unit that can record zones and presets.

- To record a Preset, use the Congo to adjust the lights to your liking. After doing so, press record on the Main Wall Switch. Then, press whichever preset you would like to record that setting to.
- To record certain lights to a Zone Fader, use the Congo to turn on only the lights that you wish to assign to a Zone. After doing so, press record and then move the Zone fader that you would like to record those lights to.
- Zone 1 will usually be House Lights, Zone 2 will be Front Light, and Zone 3 will be Stage Top Light.





2. Other Wall Switches – found near the doors of the WAC can be used to load 4 lighting presets or turn the lights off completely.

******When the Congo JR is being used to control the lighting THE WALL LIGHTING SWITCH MUST BE TURNED OFF.**

XI. Worship Arts Center How To and Troubleshooting

a. How To

1. Play a DVD

- Turn on Sound System, DVD Player, and Front Projector
- Insert the DVD into the DVD Player on the Sound Booth Desk
- Select DVD on the Octofade Video Switcher
- The DVD should be playing on the front wall screen
- To turn the sound on, turn the channel labeled “VID” on, and turn the Red Master Channel on. Bring both faders up to the desired listening level.
- Use the switch near any WAC door to turn the lights off.

2. Play a CD

- Turn on Sound System
- Insert a CD into the CD Player in the Rack. Let it load then hit play
- Turn on the channel labeled “CD” on the mixer, and the Red Master Channel
- Bring both levels up to the desired listening level

3. Use a microphone

- Plug a microphone into a labeled cable on the stage.
- Turn on the Sound System
- Turn on the channel that corresponds to the label where the mic is plugged in
- Turn on the Red Master Fader and Bring up the Master and Input Channel’s fader up to the desired level.
- If the meter is flashing into the red on that particular channel, lower the (HA) knob until a reasonable level is achieved on the meter.

4. Run Media Shout

- Turn on the Sound System, Projector, and Media Computer
- Open up Media Shout on the Computer
- Select PC on the Octofade Video Switcher
- Turn on the channel labeled “PC” on the mixer as well as the master channel.
- Bring both faders up to until the desired level is achieved

5. Turn on the Lights

- Use the Wall switch by any door to choose 1 of 4 presets

- If more Control is desired, use the Zones on the Main Wall Switch in the WAC back equipment room.
- Turn off the presets and use the Zones to create the desired lighting
 - a. Zone 1 – House Lights
 - b. Zone 2 – Front Stage Light
 - c. Zone 3 – Stage Top Light
- Since the lighting changes cannot be seen from the wall switch, have someone help you make the adjustment. One person at the door into the WAC and one at the Main Wall Switch

6. Use a Floor Wedge Monitor

- Plug a wedge monitor into any output on the wall using a speakon cable, and remember the number that it is plugged into
- Go in the WAC Equipment Room and use the speakon patchbay to patch from the monitor output that you selected to Amp 1. Also patch from Amp 1 to Mon 1.
- The channels going to the monitor must be turned on, even if their levels are all the way down, or else their signal will not be sent.
- Select “Mon 1” in the user defined presets on the mixer. The faders will then move to represent what is being sent to that monitor
- Adjust the faders to achieve your monitor mix, then hit “Mon 1” again to go back to the normal mix
- Make sure the monitor send Master is on and turned up by hitting MIX 1-8. The 8 interchangeable faders will move to represent MIX 1-8. Make sure the channel labeled “Mon 1” is turned up and turned on.

b. Troubleshooting

1. Why can't I hear any sound?

- If the channel you are trying to use does not show signal on the meter, then the mic is not connected properly or the mic cable is bad. Double-check all your connections and that the power is turned on.
- If you see signal on the meter of the channel you are trying to use
 - a. Check to make sure auto-mix is not on. You can find the switch on the center of the rack in the sound booth. Push the knob in, turn it until it lights up “Manual Mix,” and then press the knob again.
 - b. Check to make sure that the “On” button above the channel is lit and the fader is up.
 - c. Check to make sure that the “On” button above the Red Master Fader is lit and the fader is up.

2. Why can't I see video/media on the Projector?

- Check to make sure the projector is turned on. If you see a blue screen as the projector powers up, then it is on
- Check to make sure the power for the sound system is on, and there is power going to the Octofade Video Switcher
- Check the Octofade to make sure that the input you wish to display is selected

3. Why can't I hear anything in the floor monitor?

- Make sure you are patched from the proper mixer input (Mon 1-4) to one of the four amps. Then from whichever amp you choose, into the desired wall output.
- Make Sure the Master for the monitor send is on by going to MIX 1-8 and checking that the channel is on and turned up.
- The channels being sent to the monitor must be turned on to be heard in the monitor. The volume can remain down in the house, but the channels must be turned on to be heard in the monitor

XII. Sanctuary How To and Troubleshooting

1. Play a DVD

- Turn on Sound System, DVD Player, and Projector
- Insert the DVD into the DVD Player on the Sound Booth Desk
- Push the projector screen toggle switch down. It is found at the top of the Sanctuary Equipment Rack to the left of the power switch.
- Select DVD on the Smartcut-2 Video Switcher
- The DVD should be playing on the front projector screen
- To turn the sound on, turn the channel labeled "VID" on, and turn the Red Master Channel on. Bring both faders up to the desired listening level.
- Use the Grafik Eye Lighting Console to bring down the lights if desired.

2. Play a CD

- Turn on Sound System
- Insert a CD into the CD Player in the Rack. Let it load then hit play
- Turn on the channel labeled "CD" on the mixer, and the Red Master Channel
- Bring both levels up to the desired listening level

3. Use a Microphone

- Plug a microphone into an input on the stage.
- Turn on the Sound System
- Turn on the channel that corresponds to the number that the mic is plugged into

- Turn on the Red Master Fader and Bring up the Master and Input Channel to the desired level.
- If the meter is flashing into the red on that particular channel, lower the (HA) knob until a reasonable level is achieved on the meter.

4. Run Media Shout

- Turn on the Sound System, Projector, and Media Computer
- Push the projector screen toggle switch down. It is found at the top of the Sanctuary Equipment Rack to the left of the power switch.
- Open up Media Shout on the Computer
- Select PC BOOTH on the Smartcut-2 Video Switcher
- Turn on the channel labeled “PC” on the mixer as well as the master channel.
- Bring both faders up to until the desired level is achieved

5. Turn on the Lights

- Use the Grafik Eye lighting console by choosing 1 of 4 presets on the right side of the unit.
- Use the up and down arrows on each channel to adjust a specific group of lights or bring the master up and down.

6. Use a Floor Wedge Monitor

- On the stage left side of the Sanctuary stage there is an amp with a blue and red labeled speakon cable. This amp is used to power the monitors.
- Turn the amp on and plug a monitor into either the red or blue labeled speakon cable.
- On the Patchbay, patch red to red and blue to blue using the patch cables found in the drawer below. This must be done to send audio out of the monitors.
- At the mixer, select either front or back monitor in the user defined presets
- Each fader will move to represent how much it is sending to that particular monitor. Make adjustments to get the monitor mix right, then hit the user defined preset button again to return to normal mix mode.
- Make sure the monitor send Master is on and turned up by hitting MIX 1-8. The 8 interchangeable faders will move to represent MIX 1-8. Make sure the channel labeled “Mon Front” or “Mon Back” is turned up and turned on.

b. Troubleshooting

1. Why can't I hear any sound?

- If the channel you are trying to use does not show signal on the meter, then the mic is not connected properly or the mic cable is

bad. Double-check all your connections and that the power is turned on.

- If you see signal on the meter of the channel you are trying to use
 - a. Check to make sure auto-mix is not on. You can find the auto-mix switch on the stage right wall over by the Organ. Make sure auto-mix is **NOT** turned on.
 - b. Check to make sure that the “On” button above the channel is lit and the fader is up.
 - c. Check to make sure that the “On” button above the Red Master Fader is lit and the fader is up.

2. Why can't I see video/media on the Projector?

- Check to make sure the projector is turned on. If you see a blue screen as the projector powers up, then it is on
- Check to make sure the power for the sound system is on, and there is power going to the Smartcut-2 Video Switcher
- Check the Smartcut-2 to make sure that the input you wish to display is selected.

3. Why can't I hear anything in the floor monitor?

- Make sure the monitor amp is turned on. It can be found behind the short wall on the stage right side of the Sanctuary
- Make Sure the Master for the monitor send is on by going to MIX 1-8, and checking that the channel is on and turned up.
- The channels being sent to the monitor must be turned on to be heard in the monitor. The volume can remain down in the house, but the channels must be turned on to be heard in the monitor

4. Why am I getting feedback?

- Most likely you are getting feedback because something is going through the monitors that shouldn't or something is too loud in the monitors
- Check the choir monitors first. If there are any open microphones (especially choral condenser mics) going through the monitors, you will definitely be battling feedback.

XIII. Fellowship Hall How To and Troubleshooting

a. How To

1. Play a DVD

- Turn on Sound System, DVD Player, and Projector
- There should be buttons labeled screen control on the Main Equipment Rack. Use these controls to bring the screen up and down.
- Insert the DVD into the DVD Player in the Mixer Rack
- Select DVD on the Quattro D Video Switcher

- The DVD should be playing on the front wall screen
- To turn the sound on, un-mute the channel labeled “VID.” Bring the Video and Master channel up to the desired listening level.
- Use the switch near any WAC door to turn the lights off.

2. Play a CD

- Turn on Sound System
- Insert a CD into the CD Player in the Rack. Let it load then hit play
- Un-mute the channel labeled “CD” on the mixer
- Bring both levels up to the desired listening level

3. Use a wired microphone

- Plug a microphone into any input on the stage.
- Turn on the Sound System
- Un-mute the channel that corresponds to the number that the mic is plugged into
- Bring up the Master and Input Channel to the desired level.
- If the meter is flashing red on that particular channel, lower the Gain knob until a reasonable level is achieved on the meter.

4. Use a Wireless Microphone

- Turn on the Sound System
- Turn on the wireless microphone found in the drawer of the mixer rack. The power is the red button on the bottom of the microphone
- Make sure that the muting control on the bottom of the microphone is turned off.
- Un-mute the Channel marked W-A or W-B depending on which microphone you are using.
- Bring up the Master and Wireless Microphone Channel to the desired level.
- If the meter is flashing red on that particular channel, lower the Gain knob until a reasonable level is achieved on the meter.

5. Run Media on a Computer

- Turn on the Sound System, and Projector
- There should be buttons labeled screen control on the Main Equipment Rack. Use these controls to bring the screen up and down.
- Use a cable from the Equipment Drawer to adapt from your computer to the necessary input (VGA, BNC, Component)
- Plug your computer into the VGA (Stage), BNC (Stage), or Component (Rear Left Corner of the room) input using one of the cables found in the Fellowship Hall Equipment Room.
- Use the corresponding audio input if audio is needed for your presentation.

- Select the appropriate input on the Quattro D Video Switcher. You should see video on the projector
- Un-mute the channel labeled “PC” on the mixer.
- Bring up the PC channel and Master until the desired level is achieved

6. Turn on the Lights

- Use the Wall switch by any door to choose 1 of 4 presets

7. Move the Mixer into the Fellowship Hall

- Turn off all power to the Sound System
- Unplug the Mixer Rack from its power source
- Unplug the big blue cable that goes from the wall on the other side of the Main Equipment Rack to the Mixer Rack.
- Unplug any other cables that may be preventing the mixer from rolling out of the Equipment Room.
- Plug the Mixer rack’s big blue cable into the appropriate wall input in the Back Left Corner of the Room.
- Plug the Mixer rack into power and hook up any necessary video cables into the wall inputs
- Turn on all power at Mixer and in the Equipment Room
- Sound should be operational from the Main Room.

b. Troubleshooting

1. Why can’t I hear any sound?

- If the channel you are trying to use does not show signal on the meter, then the mic is not connected properly or the mic cable is bad. Double-check all your connections and that the power is turned on.
- If you see signal on the meter of the channel you are trying to use
 - a. Check to make sure that the channel is not muted.
 - b. Check to make sure that the Master Fader is up.
 - c. Check to make sure the channel has sufficient gain. The Gain is found at the very top of each channel.
 - d. At the bottom of each channel there is a 1-2 and 3-4 button. One of these must be selected to send audio to the sub-masters, which then sends audio to the house mains.
 - e. Make sure that the sub-masters are turned up, un-muted, and being sent to the Main L-R

2. Why can’t I see video/media on the Projector?

- Check to make sure the projector is turned on. If you see a blue screen as the projector powers up, then it is on
- Check to make sure the power for the sound system is on, and there is power going to the Quattro D Video Switcher

- Check the Quattro D to make sure that the input you wish to display is selected.

3. Why won't the projector turn on?

- The remote for the projector is kind of touchy. The best spot to turn it on is from right in front of the stage.
- Point the remote directly at the projector and hit the power button several times until it finally turns on.

XIV. Conclusion

a. Remember the Mission Statement and Goals – Remember to keep a positive attitude while you work with others. Audio/Visual reinforcement can be a stressful job on Sunday Mornings, so try to be as organized as possible to prevent possible chaos. Use this manual to develop a consistent set-up and mixing procedure. Be willing to learn new things and grow as a technician while you use the techniques found in this handbook.

b. Have Fun – Don't forget that doing sound, lighting, and media is fun. It takes a talented and capable person to understand all of this information. We are truly blessed to have each and every one of you as volunteers at La Cañada Presbyterian Church

XV. Technical Operations Manager Contact Info

Jason Stephenson

Technical Operations Manager
La Cañada Presbyterian Church

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XVI. LCPC Inventory 02/02/2009

Locations:

Sanctuary Sound Booth – located at the back wall of the Sanctuary

Media Room 133 – located in the connecting hallway between the Sanctuary and the Worship Arts Center

Worship Arts Center (WAC) Sound Booth – located at the rear wall of the Worship Arts Center

Worship Arts Center (WAC) Equipment Room – located through the door to the right of the Worship Arts Center

Fellowship Hall (FH) Equipment Room – located next to the kitchen at the front of the Fellowship Hall in the Demarest Family Life Center

Youth Area Sound Room – located through the single door on the left side of the Youth Area downstairs in the Demarest Family Life Center

Sound

Quantity	Item Description	Location
1	AKG 240 Headphones	Sanctuary Sound Booth
2	AKG 414 Condenser Mic	Room 133
1	Allen & Heath GL3300 Mixer	Youth Area
2	Anchor Battery Powered Speaker	Room 133
1	Audix Fusion Drum Mic Kit	Youth Area
1	Aviom 16 CH A-Net Output Card	WAC Sound Booth
1	Aviom A-Net Distributor	WAC Equipment Room
6	Aviom Personal Monitor Mixer	WAC Equipment Room
4	Countryman Active DI Box	(1)WAC Equip Room, (2)Room 133, (1)Youth
10	Countryman Earset Microphone	Sanctuary & WAC Sound Booth
1	Denon CD Player	Sanctuary Sound Booth
1	Denon Dual Cassette Deck	Sanctuary Sound Booth
2	HHB CD Recorder	Sanctuary & WAC Sound Booth
3	JBL Powered Speaker	Room 133
3	Livewire DI Box	Youth Area
3	Livewire DI Box	Youth Area
1	Mackie CFX20 Mixer	Fellowship Hall
2	Mackie Pwr SRM450 Speaker	Room 133
2	Marantz CD/Cassette Player	Youth Area & WAC Sound Booth

21	Mic Stands (Boom)	(11)Room 133, (6)WAC, (2)Fellowship, (2)Youth
6	Mic Stands (Short Boom)	(3)Room 133, (1)WAC, (2)Youth
7	Mic Stands (Straight)	(4)Room 133, (3)Youth Area
6	Monitors (Speakon Wedge Floor)	Room 133
2	Neumann 184 Condenser	(1)WAC Equipment Room, (1)Room 133
2	Neumann TLM103 Condenser Mic	Hanging in Sanctuary above stage
1	Pro-Co 12 Channel 25ft Snake	Room 133
2	Rolls Matchbox DI Box	Youth Area
2	Rolls Matchbox DI Box	Youth Area
4	Sennheiser Bodypack Transmitter	(2)Fellowship Hall & (2)Youth Area
6	Sennheiser Bodypack Transmitter	WAC Sound Booth
10	Sennheiser e945 Vocal Microphone	(4)WAC Equip Room, (3)Room 133, (3) Youth
4	Sennheiser ew300 G2 Receiver	(2)Fellowship Hall & (2)Youth Area
6	Sennheiser ew300 G2 Receiver	WAC Sound Booth
4	Sennheiser Handheld Transmitter	(2)Fellowship Hall & (2)Youth Area
6	Sennheiser Handheld Transmitter	WAC Sound Booth
2	Sennheiser MD421 Dynamic Mic	Room 133
6	Shure E3 Headphone	WAC Equipment Room
1	Shure PG52 Kick Mic	WAC Equipment Room
3	Shure PG56 Snare Mic	(1)WAC Equipment Room, (2)Room 133
2	Shure PG81 Condenser	(1)WAC Equipment Room, (1)Room 133
3	Shure SM57 Dynamic Mic	(2)Room 133, (1)Youth
9	Shure SM58 Dynamic Mic	(6)Room 133, (3)Fellowship Hall
4	Shure UR1 Bdypck Transmitter	Sanctuary Sound Booth
1	Shure UR2 Beta58 Handheld Mic	Sanctuary Sound Booth
2	Shure UR4D Dual Wireless Receiver	Sanctuary Sound Booth
2	Sony MDR-7506 Headphone	WAC Sound Booth & Equipment Room
4	Speaker Stands	Room 133
1	Tapco 12 Channel Mixer	Room 133
1	Tascam CD/Cassette Player	Fellowship Hall
5	Whirlwind Director DI Box	(3)WAC Equipment Room, (2)Room 133
2	Yamaha M7CL Digital Mixer	Sanctuary & WAC Sound Booth
1	Yamaha Powered Hot Spot Monitor	Room 133
4	Yamaha Stage Monitors	Youth Area

Lighting

Quantity	Item Description	Location
1	ETC Congo Jr Lighting Console	WAC Sound Booth
2	ETC Smartfade Lighting Console	Fellowship Hall & Youth Area
46	ETC Source-4 Lights	(24)WAC, (6)Youth Area, (16) Fellowship Hall
28	ETC Source-4 PAR Lights	(14)WAC, (6)Youth Area, (8) Fellowship Hall
1	Grafik Eye Lighting Controller	Sanctuary Sound Booth
4	Source-4 stage Lights	Sanctuary

Video

1	Analog Way Octofade Remote	WAC Sound Booth
1	Analog Way Octofade Switcher	WAC Sound Booth
2	Analog Way Quattro D Switcher	Fellowship Hall, Youth Area
1	Analog Way SmartCut2 Switcher	Sanctuary Sound Booth
2	Eiki LC-W3 Projector	Youth Area
3	Eiki LC-W4 Projector	(2)WAC, (1) Fellowship Hall
2	Eiki Projector Remote Control	WAC Sound Booth
3	Panasonic DVD/VHS Player	Fellowship Hall, Youth & WAC Sound Booth
1	Panasonic VHS Player	Sanctuary Sound Booth
1	Pioneer DVD Player	Sanctuary Sound Booth
1	Sanyo Projector w/remote	Sanctuary Sound Booth