Legacy Schools Audio Training Manual

Created by Infosmart Solutions LLC

INTRODUCTION TO THE SYSTEM

The system installed in the Legacy Schools has been designed to provide you with capabilities to present an audio/visual presentation using some of the latest in electronic AV technology. The users are given a range of audio input options, including the playing of iPod /mp3/computer equipment as well as wireless and wired microphone systems.

Some schools have different equipment than others but the majority of systems are identical. This manual will cover both types of systems as best possible. There is a learning curve when it comes to audio control and mixing but this will be a great start in understanding YOUR system.

System Components and Definitions:

*Loudspeaker*s - A loudspeaker (or loud-speaker or speaker) is an electroacoustic transducer; a device which converts an electrical audio signal into a corresponding sound.

Amplifier - An audio power amplifier is an electronic amplifier that amplifies low-power audio signals (signals composed primarily of frequencies between 20 - 20 000 Hz, the human range of hearing) to a level suitable for driving loudspeakers.

Microphone - an instrument for converting sound waves into electrical energy variations, which may then be amplified, transmitted, or recorded.

Equalizer - In sound recording and reproduction, equalization is the process commonly used to alter the frequency response of an audio system using linear filters. Most hi-fi equipment uses relatively simple filters to make bass and treble adjustments.

Mixer - is an electronic device for combining (also called "mixing"), routing, and changing the level, timbre and/or dynamics of audio signals. A mixer can mix analog or digital signals, depending on the type of mixer. The modified signals (voltages or digital samples) are summed to produce the combined output signals.

A Closer Look:

LOUDSPEAKERS - There are two types used in the schools. I refer to these as the “main” speakers or “house” speakers. We also have a few schools with on-stage ceiling monitors to help the performers hear the music on-stage.

House Speaker Type 1

House Speaker Type 2

On Stage Monitor Speaker

The main / house loudspeakers are mounted on each side or just above the stage opening on both sides. The on-stage monitor speakers are mounted to the ceiling structure on stage and point straight down.

AMPLIFIER – Most amplifiers look very similar in regards to physical appearance. There are a few different brands used in the schools and I will use the brand Crown for this manual.

On the above style of amplifier all of the input and output connections are on the back of the unit along with the volume controls.

On this style of amplifier the input and output connections are on the back of the unit but the volume controls are on the front.

MICROPHONES– There is 3 styles of microphones used at Legacy:

Handheld – A large capsule microphone that is built to be “hand held” is more durable than most microphone styles and has a large pickup pattern to easily pick up the speakers voice. Also can be wired or wireless.

Lavalier – Also called “lapel” mics get attached to a person’s clothing and are used to pick up a person’s speaking voice without being noticed. These mics are very small in size and are “hands free”.

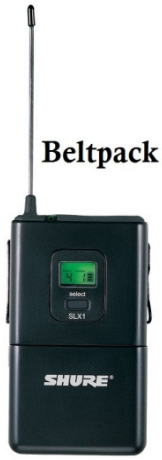
Headset – this microphone is another “hands free” microphone and is worn on the “head”. This microphone has a very direct pickup pattern which helps it from not picking up the other sounds on the stage. The microphone can also be located close to the sound source which helps with the more shy performers. These mics are not as durable as the other two styles and is a good idea to speak to users in advance in regards to handling and care of the units.

Handhelds

Lavalier / Lapel

Headset

We are using Shure brand of wireless at the schools. Below is an image of the wireless receiver and beltpack units. The receiver units are installed in the wall rack. Wireless *handheld* mics do not require a separate(transmitter) belt pack for the microphone because the body of the microphone itself is physically large enough to hous the transmitter. The headset and lavalier mics are too small to install any equipment within thus the need of the separate beltpack.



These units also have a volume control. It's on the back of the receiver and by the battery compartments on the Beltpacks and handheld units. A good starting point is in the middle of the range. In the mixer section it mentions that there are some scenarios where this should be either turned up or down depending on the performer.

Most wireless microphone systems require setup prior to first use. There is a group and channel number that is required to match in order for the transmitter to talk to the receiver. In the above picture of the receiver the settings are Group 1 and Channel 1 but on the Beltpack it is set as Group 4 Channel 1 – these units would not work so you would need to change either device to match the other. Shure manufacturing has a tool on their website where you can go and type in your address and or zip code, wireless series which is "SLX" and press search it will give you achart based on the "Band of your equipment" ,(the band can be found on the front bottom right of the receiver) . You will then get a chart with a suggested list of Group and Channel numbers to use for your equipment. I highly recommend doing this as to avoid any crosstalk from other wireless devices in the area. I have printed this chart for each school and will distribute on training day. Here is the website address:

http://www.shure.com/americas/support/tools/wireless-frequency-finder

How to change the Group and Channel numbers on your handheld microphone or beltpack. There is an automatic setup that can be used but since the schools have more than 1 system I recommend manual programming since we do not want both to be on the same Group and Channel.

Receiver Programming (this is a page out of the user manual and I will also show you during training):

English

SLX Programming

Any option displayed on screen will generally "time out" after five seconds.

SLX4 Receiver Programming

Group Selection ① **2x** [menu] ② [select] ③ [sync]

Allows manual selection of a frequency group. Pressing **select** increases the group number by one. When the correct frequency is displayed, either wait five seconds for the screen to time out, or press **sync**. For best results when operating multiple systems, set all systems to a single group; then set each system to a unique channel within that group.

For more information on frequency groups and channels, see "Frequency Band Selection" on page 2.

Manual Channel Selection ① **3x** [menu] ② [select] ③ [sync]

Allows manual selection of a frequency channel. Pressing **select** increases the channel number by one.When the correct frequency is displayed, either wait five seconds for the screen to time out, or press **sync**.

Display Frequency ① **4x** [menu] ② [select]

Displays the current frequency in MHz for approximately 5 seconds. Press and hold to increase display length.

Lock or Unlock Receiver Settings [select] + [menu]

Hold down the **select** key and press **menu** to lock or unlock the receiver. When locked, the current receiver settings cannot be changed.

Antenna Status

Indicates RF activity. Only one antenna is active at any one time.

Transmitter Battery Status

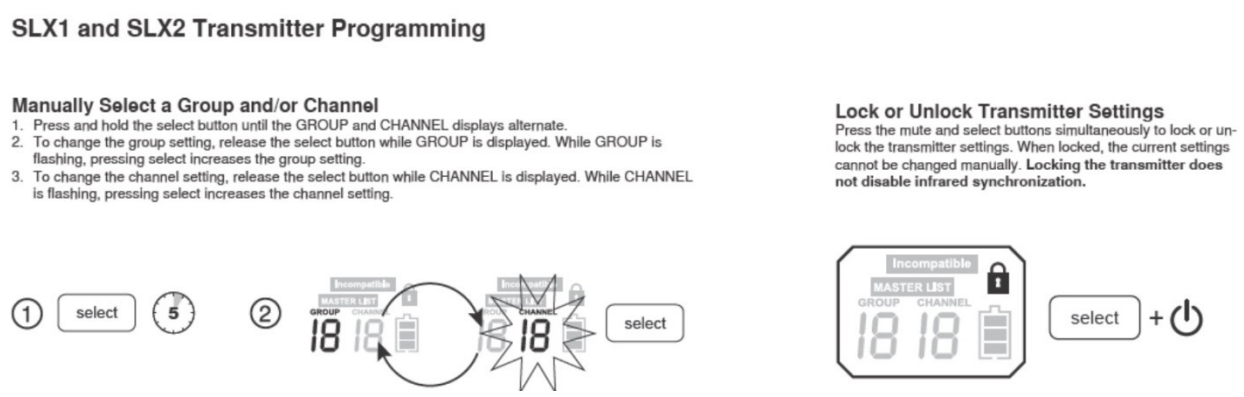
Indicates a low transmitter battery charge.

Full Group Warning

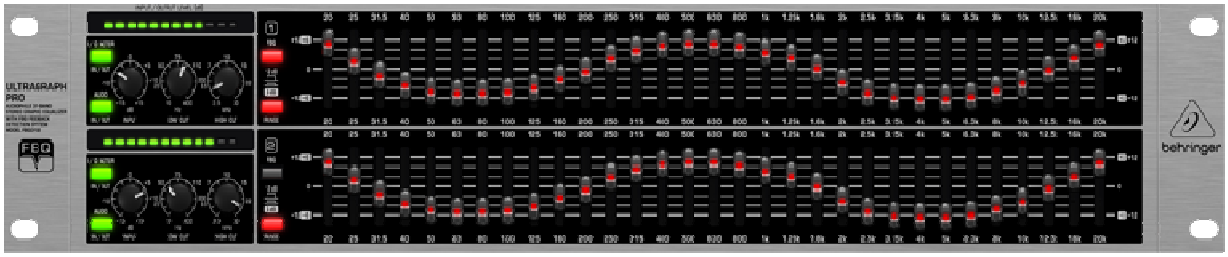
The **FULL** warning indicates that all available channels in the currently selected group are in use. When this occurs, reprogram all systems to an alternate group.

Press either the **menu** or **select** button to exit the warning screen.

Transmitter Setup – Controls are in the battery compartment on the handlehld unit and on the front face for the beltpack:



EQUALIZER – Most of the schools do not have an equalizer “EQ”. Any schools that have choir mics have one of these units to help with feedback issues that some types of microphones bring to the system.



The two rows of handles represent stereo channels (left and right / 1 and 2) or it can be two separate audio inputs that require the use of an EQ. Each handle represents a frequency range and by moving it higher than the middle will boost those frequencies and moving it below the middle will decrease those frequencies. We normally set this up for your system and never needs to be adjusted again unless you change speakers and or microphone systems.

MIXER – All the rack mount mixers are the same brand and model. Moving forward we are going to a different manufacturer, but the way it works will be pretty much the same. Below is an image of the mixer and I will define what each control knob does in detail further in the manual.

All the mixers at the school have the two wireless systems on Channels 1 & 2. There are two microphone input jacks located beneath the rack and these are typically connected to channels 3 & 4.The last input provided is an iPod / mp2 / computer input which is connected on channels 11/12.

INPUT CHANNEL DEFINED: Below is a picture of one channel on the mixer. Most channels on the mixer are identical except the last 2-4 channels might be combined on one section. This is to help accommodate those devices like a CD player, or iPod that have a stereo output. Microphones are a single output device and only require one channel.

Before I get into the detailed descriptions, I want to advise that the information I provide is only for general knowledge and by actually using the mixer and becoming more educated with general audio practices will you get better at mixing your performances.

FADER: This is the Volume Control of the input channel. I've misspoke in the past by calling the Gain knob (at the top of the channel) another volume control but this isn't true and I will clarify a bit when I get to that control piece. You see that there are numbers on the fader – typically you want this fader to be at 0 during your performance for all channels. Some performers for example are super loud and some are super quiet this is where you can "even" those volume differences out by running the fader down a bit for louder performers but for those shy performers I recommend a bit different solution. First ensure the microphone is as close as possible to the sound source – next ask them to project there voice as loud as they can and be persistent. If they are doing the best they can keep the fader at 0 and then we can use a bit of the Gain control. Reminder: there are also volume controls on the wireless receivers and transmitters that can help get that perfect volume level without using the Gain control first.

GAIN: This can also be labeled as sensitivity or even trim. The main purpose of this control is to make a channel have more "presence" in the mix, If a person is whispering into the microphone this can help hear that better in the mix without turning up the "volume". This is tough to explain and I recommend reading about how Gain works in the mixing structure. Each microphone has some noise or "hiss" that it can introduce into the sound system. We want to minimize this as much as possible but turning up the Gain control will amplify this lots more than just using the slide fader.

HIGH & LOW (EQ): These two controls are pretty easy to understand. The High control is to either increase or decrease the high frequencies of the sound and the Low is to increase or decrease the Low frequencies in the sound. This can be adjusted to what sounds best based on the input source. Much like the EQ in the above descriptions, these controls adjust a very wide band of frequencies and a dedicated EQ adjusts a much smaller range of frequencies.

MON: This controls the amount of sound from this channel you want to go to the monitor output on the back of the mixer. Some schools are starting to install monitors onto the stage. As an example, if the iPod is playing the song that kids are singing to and they can't hear the sound from the main house speakers very well and you do have monitor speakers on stage, you can turn up (clockwise) the Mon control on the iPod channel and it will send more of that signal to those speakers. Turning this does NOT affect the volume to the main / house speakers.

FX also called AUX: This is very similar to the MON control except that the signal from this channel can be sent to external effects equipment (reverbs, chorus units, compressors etc) and then returned back into the mixer via the AUX return connectors on the back and then that signal goes directly to the output section of the mixer.

PAN: This control is used to send the signal either out the left main output of the mixer or the right main output of the mixer. We want to keep this at the 12 o'clock position since we want the signal to go out of both channels (and essentially both speakers) at the same volume.

CLIP: This light tells the controller that there is too much signal being driven by this channel and it needs to be turned down. If the fader is at 0 and the Gain is turned up - please turn down the Gain control. If the gain control is already turned down then turn down the source (for example the microphone receiver or transmitter's volume control).

OUTPUT SECTION DEFINED: Below is a picture of the output section of the console. This contains the volume control of everything coming into the mixer and going out to the amplifier and then to the speakers.

FX Program: This mixer has "built-in" effects. When we proposed the system this was the only rack mount mixer in this size and style that fit the budget. We would have preferred to NOT have the effects but it came with it. The effects are presets that you can add to the sound that changes the sound to have more reverb, more echo and lots of interesting effects. The main issue is that since all these systems are in a gymnasium we all ready have so much natural reverb that any effect we apply to the sound will only make the output sound even more muffled and reverberant. I ask that this remain turned down (all the way counter – clockwise)

FX to Main: This control (if we were to use it which we are not) controls the amount of effect we send to the main mix output.

CD/tape to Mix: from the user manual.

CD/TAPE TO MIX

When the **CD/TAPE TO MIX** switch is pressed, the CD/tape input is assigned to the main mix providing an additional input for tape machines, MIDI instruments or other signal sources that do not require any processing.

CD/tape to Ctrl: from the user manual.

CD/TAPE TO CTRL

Press the **CD/TAPE TO CTRL** switch if you want to monitor the CD/TAPE IN via the CTRL OUT and PHONES outputs. A typical studio application of this function is recording music into a digital audio workstation (DAW) with simultaneous reproduction (see ch. 3.1).

- **When you are recording a signal over the CD/TAPE OUT and simultaneously want to monitor over the CD/TAPE IN, the CD/TAPE TO MIX switch is not allowed to be pressed. Otherwise a feedback loop would occur because this signal would be sent over the Main Mix back to the CD/TAPE OUT. In case of such an application, you should send the CD/TAPE signal to the monitor speakers or headphones by using the CD/TAPE TO CTRL switch. In contrast to the main mix, this signal is not sent to the CD/TAPE OUT.**

FX Solo: from the user manual.

FX SOLO

If you want to only listen to the effects signal with your headphones or monitor speakers, then press the FX SOLO switch. The signal of the effects device can then be heard individually; the main mix or CD/tape signal is inaudible at the PHONES and CTRL OUT outputs.

FX / CTRL (phones / control room): This controls the volume of the signal going to the headphones if you plugged them into the connector on the front of the unit labeled “Phones”.

MAIN MIX: This is the volume control to the main / house speakers. This is the combined signal from all inputs.

Any questions please feel free to call Andy Milkey at (480) 720-6383 or email me iss@q.com - THANK YOU!