

# Sound System of the Crafton-Preyer Theatre

There is a lot of information to know about the sound system. This manual hopes to serve as a reference for the various components and systems that we use in the Crafton-Preyer theatre. In some cases there will be operational notes about how we typically do a particular function, or use a specific device. In most cases you will be referred to the operators manual for that device to learn the specific information you need.

This document is divided into the areas where you will be working. Each area is further subdivided into the equipment and systems that you will use in that area.

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## Stage

### Hall lines

There are 16 balanced XLR lines running from various places onstage to the amp rack in the light booth. These lines can be used to send signals both to and from the stage. These lines are for mic or line level signals.

They are distributed as follows:

<u>Line#</u>	<u>Location</u>
1	Grid Stage Right
2	Grid Stage Right
3	Down stage Right
4	Down stage Right (Further SR)
5	Plaster Line stage right
6	Plaster Line center
7	Plaster Line stage left
8	Down stage left
9	Down stage left
10	Down stage left
11	Down stage left
12	Orch Lift stage right
13	Orch Lift center
14	Orch Lift stage left
15	Beam center
16	Beam center

Lines 15 and 16 have semi-permanent lines that run to the pipe dead hung just down stage of the proscenium.

### DSR Snake:

There are also six balanced XLR lines that run from down stage right to the FOH Sound position. Speaker line #3 is located in the same box as these mic lines.

### Speaker Lines

The speaker lines in the CPT are for the most part hard wired to amplifiers. The proscenium speakers and the surround speakers are all permanently connected. There are four speaker lines running from the amp rack to the stage that you will need to physically hook up to a speaker. They are located approximately in the four corners of the stage i.e. DSL, DSR, USL and USR.

<u>Line#</u>	<u>Location</u>
1	Up stage right
2	Up stage left
3	Down stage right
4	Down stage left

The inputs to the amplifiers as well as their outputs are clearly labeled on the Amp Rack. See the Amplifiers section of this document to learn more.

### Microphones

There are a variety of microphones available for use in the CPT. Dynamic microphones do not require phantom power. Condenser microphones do require phantom power to operate. The wireless systems require batteries for the transmitters, the receivers do not require phantom power!

<u>#</u>	<u>Manufacturer</u>	<u>Dyn/Cond</u>
2	Shure SM58 Handheld Mics	Dynamic
6	Audio Technica 853A overhead/stand mount	Condenser
3	Crown PCC 160 floor plaques	Condenser
3	Shure SM90 Omnidirectional floor plaques	Condenser
3	Shure SM91 Unidirectional floor plaques	Condenser
4	Countryman ISOMAX II Lavaliers	Condenser
2	Countryman ISOMAX II Goosenecks	Condenser
12	Sony Wireless	Wireless
7	Telex Wireless Lavalier	Wireless
3	Telex handheld Wireless	Wireless

Two of these operate on the same frequencies as two of our lavalier systems.

All of our wired microphones connect to our sound system with XLR style connectors. All of our mic and associated supplies are kept in the A/V Storage room. Some of our condenser microphones have their own power supplies in case you need to use a battery to power the mic. We will use the phantom power supplied at the mixer inputs when we use these mics onstage.

#### Speakers

Speakers are stored in the “cage” outside the Gel Room. Most of our speakers have 1/4” connectors on them. The cables are stored in the A/V storage room. We have:

<u>Speaker</u>	<u>Power Handling</u>
1 pr JBL MR822 speakers	
1 pr Klipsch(?) speakers	
1 pr TOA SL120 speakers	240W
1 pr Altec Lansing 1234C	120W RMS
1pr JVC SK202 (home Stereo)	40W RMS
1 pr home-made speakers	
1 pr 12” GSI 0162 Trapezoidal speakers	
1 Sunn 1275 floor monitor wedge	

The fixed speakers in the CPT are as follows:

<u>Location</u>	<u>Model</u>	<u>Power handling</u>
Prosc L & R	EV 1502ER 2/side	200W
Prosc Center	(HF) Altec Lansing 909-8B (Orch) 2 x Altec Lansing 909 16A (Balc) In Altec Lansing MR11524 Horns	60Wpgm/120Peak 60W/120W
	(LF) 2 x Altec Lansing AB8500 Each has 2 x 15” drivers	800W
Surround Speakers	EV FR12-2B 2/channel	100W pgm

### Portable Amp Rack

The portable amp rack is stored in the “cage” outside the Gel Room. Basically it is a portable sound system. You can send a signal from a mixer to the amps in the Monitor rack if you’ve already used all the amps upstairs. Or if it would be more convenient to have additional speakers down stage after using both the DSL and DSR speaker lines. There are four channels of power amplification available for running various monitor or effects speakers. There are two Crown D-75 amplifiers, a stereo one octave graphic equalizer, a 31 band single channel graphic equalizer, two Sabine FBX 900 Feedback Exterminators and space to put playback devices and a mixer. The top amplifier has the octave EQ as its input. The signal sent to the EQ should be a balanced line level signal. The bottom amp does not have an EQ so if you need to use the 1/3 octave you will have to patch it into whichever channel you wish. The FBX 900’s, if you decide to use them, require some attention to their proper configuration and setup. Read their manuals.

As it stands now (9/02) the inputs to the monitor rack are directly into the various components in the back of the rack. The outputs of the amplifiers are available in the patch bay on the front of the rack.

### A/V storage room

Located above the Gel room and across from the dimmer room, this is the room where most of the audio equipment used onstage is stored. In this room you will find all our microphones and their accessories, cables, mic stands, and other supplies. We also store various projection and video equipment in this room.

Please keep it neat and orderly!

All the mics and their accessories are stored in the blue cabinet. In the cabinet is a briefcase holding all of the Sony wireless mics. There is another briefcase holding the majority of the mics used onstage. Also in the cabinet are 12 devices for using the Lavalier mics as head worn mics. Please make sure all the equipment is returned to the A/V room each night.

There are a couple of spools for storing mic cables and speaker cables. The long mic cables should go onto the spool that stands on the floor. The shorter cables go on the hand spools. The cables should be plugged into each other making a continuous cable on the spool. Any other method of putting them on the spools tends to make a large chaotic snarl!

### Light/Sound Booth

Located in the back of the Balcony. It is where lights are run for the main stage performances. There is a large audio rack which houses the majority of our amplifiers, a lot of patch bays for signal routing and our spare (Telex) wireless receivers.

### Patch cords

Hanging on the side of the rack are the Tip Ring Sleeve (TRS) patch cords used for signal routing. There are also a couple of charts posted on the side of the rack giving a graphic representation of where the Hall Lines and Speaker Lines terminate in the theatre.

Make sure the patch cords are clean! They can perform unreliably if they are dirty. Wipe the contacts off with a soft cloth to clean off tarnish, dust and dirt. In extreme cases you might have to use a metal cleaner to cut through severe tarnish.

### Amp Rack

The large vertical rack housing the amps, the patch bays and other sundry equipment. It is on wheels, but be careful, it could tip over. All the wiring coming from the amp rack is dressed and strain-relieved allowing you to position the rack more or less where you want.

### Amplifiers

The amplifiers boost the level of the signal coming from the mixer so that it can be heard through the speakers. The outputs of the various amplifiers are hard wired either directly to speakers or to speaker lines onstage. There is a chart posted on the front of the Amp Rack which details this information also

<u>Amp</u>	<u>Chan</u>	<u>Watts 8/4Ω</u>	<u>Speaker</u>
QSC PLX 1602	1	300/500	Prosc. Left
	2	300/500	Prosc. Right
Yamaha 6150	1	100/120	House side Left
	2	100/120	House side Right
	3	100/120	House rear Left
	4	100/120	House rear Right
	5	100/120	Up stage Right
	6	100/120	Up stage Left
Altec Lansing 1269	1	120/N.G.	Down stage Right
	2	120/N.G.	Down stage Left
JBL 6630 (Balc) (Orch)	1	190/300	Center cluster HF
	2	190/300	Center cluster HF
Crown Com Tech 1650	1	520/810	Center cluster LF
	2	520/810	Center cluster LF

Note that the Center cluster is the only bi-amped system in the UT. The JBL amp drives the high frequency section, Channel 1 covers the Balcony section and channel 2 the Orchestra section. The Crown 2000 drives two low frequency boxes. The settings for the amplifiers and for the active crossover are all marked and should not be adjusted.

The EQ for the Center Cluster has some features you should understand and use. Leaving the EQ switched off bypasses the device. There are several switches and nine LED's on the front of the EQ. The bypass switch bypasses the Feedback filters only. The EQ curve is still in the signal chain when the bypass switch is pressed. One of the switches locks the settings so they cannot be changed. Another switch is for clearing the nine self-centering notch filters.

To set the filters first clear them by holding the button in. When you SLOWLY bring a microphone up to its feedback level the EQ will assign

one of the filters to that frequency and you will hear the feedback stop. Again SLOWLY increase the gain on the mic until you hear the next feedback and wait for the EQ to “catch” it also. Be patient, it takes the EQ a little while to do it’s job, the trick is to hold the system right at its’ steady state ringing point without having it go screaming into full-blown out of control feedback. Patience and a delicate hand are required for this task. Nine filters for Feedback suppression is a lot. Typically using more than three or four creates other problems with the tonal balance of the speaker system. If you set 3-4 of he filters and then press the recessed “lock” switch on the front of the EQ the EQ remains locked at that setting. The remaining filters will not be used and the integrity of the overall curve will be preserved.

In practice, the Amplifiers are the LAST piece of equipment turned on, and the FIRST piece of equipment turned off. This protects the speakers from large transient signals as other equipment is switched on. The Stage Line, Proscenium and Surround amplifiers are all switched on by the power strip mounted at the very top of the amp rack.

The Center Cluster takes some special attention since there is an equalizer and an active crossover that need to be turned on before the amps get turned on, and turned off after the Amps get switched off. The power strip mounted in the middle of the amp rack powers the Center cluster. Switching it on will turn on the EQ and Crossover. Then you need to manually switch on the two amplifiers that power the Center Cluster speakers. When shutting down the system, turn off the Center Cluster Power amps first, then switch off the power strip.

#### Interconnection lines

The Amp Rack is the hub of signal routing in the University Theatre. The Amp rack has twenty-six lines running to the FOH position, the sixteen Hall lines, and eight lines that run to the production studio. It also has a patch bay for the outputs of the Telex wireless receivers, as well as the inputs to the power amplifiers. All of the patch bays are clearly labeled.

Keep in mind that all of the lines are balanced, and that they can all serve as both inputs and outputs. They are just wires run between two places.

A piece of advice: Try and adopt a “logic” to how you lay out your signal routing. Tracing down problems is much quicker if you are quickly able to locate all your mixer outputs or microphone inputs. One way of doing this is to keep all of the signals going TO the FOH mixer on one end of the patch bay, and all of the signals coming FROM the FOH mixer on the other. It is usually a good idea to keep stereo pairs in their proper orientation so that Left and Right are left and right with respect to each other. There are a lot of different things with similar numbers in the sound system. Sometimes that can be useful as a mnemonic, but don’t be confused by the same numbers in different places! If you patch something into hall line #12 it isn’t going to automatically appear at the mixer input #12 unless you put it there!

One of the great strengths of our sound system is the flexibility we have in configuring the system. The ease of completely changing how the system is setup requires a clear understanding of the signal flow through the system.

Unfortunately, this flexibility is also one of the weaknesses in the system. Patch cords not plugged in all the way, or patched into the wrong jack or patch bay are common problems. Especially with large, complicated shows. It is really common to use close to two hundred patch cords on a big show. The patch bays turn into a snarl of cords. Tracing down a problem becomes challenging. The time you spend in carefully considering how to patch your show will be worth it when you are troubleshooting something that doesn't work as expected.

#### Wireless receivers

Also in the Amp Rack are the seven Telex wireless microphone receivers. They are color coded by Red, Blue, Yellow, White, Green and Black. There is one Telex handheld wireless mic that doesn't have a color.

The White and Green receivers each have a lavalier transmitter and a Handheld transmitter that can be used with them. You can only use ONE of the transmitters at a time on the Green and White systems, it will overload the Receiver if you try to use both the lavalier and the handheld on the same receiver at the same time.

The six lavalier systems are functional, but they are probably best used as backup systems for the Sony wireless. The Telex mics are physically larger, the RF signal is in the VHF band therefore more prone to interference and dropouts, and the systems as a whole are older.

The antennae for the five older Telex receivers are mounted on the balcony rail and the cables are permanently run to the receivers. The antennae for the WMR 100 and HT 150 are on the backs of the receivers. The receivers are powered through the lower power strip in the rack. The receivers outputs are mic level signals.

#### FOH Mixing Position

The Front of House Mixing position is where you will be spending most of your time. As you sit in the chair at the FOH position there is a rack of playback devices and EQ's on your left. On your right there is a rack with patch bays, signal processors and the Sony Wireless receivers. In front of you is the FOH mixer. Below the mixer is a custom designed table that has three rack bays. In those rack bays are the playback computer, power supply for the mixer, intercom lines, the Sony wireless antenna power supply/splitter, a DAT machine and several drawers for storage. Behind you is a partition that has the patch cords and the antennas for the Sony Wireless systems mounted on it.

#### Mixer:

The mixer is an Allen & Heath GL3300. It would be categorized as a 32x8x2 console. This means 32 inputs and 8 subgroups mixing down to a stereo pair. All the inputs and outputs of the console are brought out to the patching rack. It is beyond the purview of this document to explain all the possible configurations and uses of the mixer, but what we will do is follow a signal through the console from the input to the various possibilities for outputs. The manual for the console is in the binder in the drawer. Read it. Even better...understand it!

A signal is brought into the mixer at the patching rack, All 32 of the inputs are exactly the same. We will describe the controls and their effect on the signal starting at the top of the input strip and working down to the bottom of the input strip. Then the output section shall be described.

### Input Channels:

**+48V** Phantom power for microphones. Do not send phantom power to line level devices such as CD players or Mini Disc Players as it can damage the equipment!

**Ø** Inverts the phase of the channel. Useful for mis-wired cables. Also particularly useful when you have two people wearing lavalier mics in very close proximity to each other. If you invert the phase of one mic, you can eliminate some phase problems.

### **Mic/Line 20dB Pad**

A pad used to lower the volume of a line level signal such as a CD player, Mini Disc player etc.

**Gain** Used to adjust the level of input signal, it should be set so that the Yellow LED above the channel fader is illuminated some of the time. It is OK if the red LED occasionally comes on, but if it is on a lot, you are likely to be overloading (clipping) the input.

**100Hz** Reduces the volume of frequencies below 100Hz. Useful for vocal and area mics to reduce the sound of footsteps/air currents and other low frequency noise. This filter is independent of the EQ section.

**EQ** A four band equalizer offering high frequency shelving, two mid-frequency sweepable bands, and low frequency shelving. At the bottom of the EQ section is a switch that puts it in or out of the signal chain.

**AUX** There are 8 auxiliary sends. They are divided into two sections of 4 auxiliary sends each. Each bank of 4 can be switched between pre fader or post fader by the button beneath the bank. Each Aux send has a master volume control at the output section of the mixer. Notice the 0 marking on each send. That is the Unity gain, neither boosting or attenuating the signal. If you set a post fader aux send to 0 you will be essentially sending the mix from the faders to the auxiliary master. The aux sends are a convenient way to get additional signals out of the board. Very handy for sending a signal to a processor, or to the video class when they are taping a rehearsal, or to a speaker located onstage. See the Output section for additional information on the Auxiliary sends.

**PAN** The pan knob routes the channels output between the Odd (Left) or Even (Right) groups that are selected in the Group assignment section.

**MUTE** The Mute button switches off the signal. It illuminates when it is pressed, it also illuminates when the channel is muted by one of the 4 mute groups

(see below).

### **LED Meter**

The three LEDs give you a visual indication of the level of the signal coming into the channel. Ideally the yellow 0dB LED should be lit. If the red LED's flash occasionally it's ok, if they are on a lot you should lower the gain on the input of the channel to prevent clipping. In practice a line level signal that triggers the yellow LED may be so loud that you would only have to move the channel fader up slightly to get the volume necessary. In that instance you should lower the input gain so that you have a sufficient amount of "travel" on the fader for mixing. Conversely, an area mic may not give you any level on the LEDs before it starts to feed back through the system. That's OK too as long as the signal isn't too noisy.

**PFL** The Pre Fader Listen button routes the channels input directly to the headphones. This lets you check the level of the signal, and verify that you are in fact, receiving a signal that doesn't trigger the Level LED's. There is a LED by the PFL button that lights when the button is pressed reminding you that the signal is superseding the usual signal sent to the headphones. The signal is also sent to the L/R peak meter in the output section and the Mono/PFL VU meter on the meter bridge.

### **Groups**

The Group assignment buttons determine which output groups the channel sends its' signal to. The groups are paired on the buttons. The setting of the PAN knob determines how much of the signal is sent to each group of the pair. The group buttons are: L/R, 1/2, 3/4, 5/6, 7/8. See the Output section for more information on groups.

**Fader** The faders are what you use to adjust the level of the signal when mixing. They offer +10dB of gain above the nominal "0" operating level.

### **Mute Groups**

The four Mute Group assignment buttons determine which mute groups the channel will be assigned to. The Mute Group masters are in the Output section of the mixer.

### Output section:

Unlike the input channels the output section is not a single linear strip on the mixer. The output section of the mixer is divided into several different sections that will be described below. It would be helpful to have the mixer in front of you so you can see the various parts of the output section. All of the Mixer's outputs are brought out to the Patching Rack.

The output section of the mixer is located in the center of the mixer between inputs 16 and 17.

### **Group Outputs**

Groups 1-4 do not have a physical outputs. Groups 1-4 can be used for sub mixes to the Matrix or to L/R, but they do not have individual outputs. Groups 5-8 have balanced outputs available in the the Patching Rack. The Group Output section shall be described from the top down.

**Matrix A & B**

Determines the level of the Group output that is sent to the Matrix. 0 = unity gain.

**L-R**

Assigns the Groups output to the L/R Outputs. This is the traditional use of the groups as a subgroup mix to L/R

**Pan**

Positions the signal between the L/R Outputs

**Mute**

Switches off the Group. A red LED illuminates to indicate the group is muted.

**LED's**

The 4 LED's provide signal metering for the group.

**AFL**

After Fader Listen. Routes the output of the group to the headphone jack. There is an LED next to the AFL button which illuminates when the AFL button is pressed.

**Fader**

Controls the volume of the Group output.

**L/R Outputs**

The L/R faders control the volume of the Left and Right Outputs. Signals can be assigned to L/R at each input channel and at each Group and also at the Stereo returns. Both L and R have matrix knobs for sending their respective signals to the Matrix outputs.

**Mono Output**

The Mono output is the sum of L/R outputs. Currently the Mono send is post L/R faders, but it can be configured to be Pre-L/R faders by changing some internal wiring. The recessed switch by the Mono Knob switches the input of the Mono section between L/R Sum and AFL/PFL. For our purposes the Mono section needs to remain L/R summed together. So far it has proven easiest to have it be post L/R faders.

**Aux Outputs**

The Aux Output Masters are located at the top center of the Mixer. 0 = unity gain, and there is an additional 10dB of gain above that. Each group has an After Fader Listen button and an LED to show that AFL is selected.

**Group/Aux Reverse**

Just below the Aux Output Section there are 8 recessed switches that allow you to swap the Group fader section with the Auxiliary master section. This is a very powerful feature that will be elaborated on later.

### **Stereo Returns**

There are two stereo returns labeled, oddly enough, 1 and 2. These are suitable for any stereo line level signal such as a CD player or an effects processor. There is a Pan knob for L/R odd/even panning, and three output assignment buttons on each stereo return. Both Returns can be assigned to L-R, and Matrix A-B. Return 1 can also be assigned to Groups 1-2. Return 2 can be assigned to Groups 3-4.

### **Matrix Outputs**

The matrix masters have a fader to control the volume and an After Fader Listen button for headphone monitoring. An LED indicates that the AFL button is engaged.

### **2 Track Send/Return**

The 2-track Send could be used for recording purposes. It is an electrically isolated send of the L/R signal with its own volume control. The 2-Track return is not use in our configuration.

### **Talkback**

The XLR connector at the top center Mixer is a microphone input whose output can be routed to any of the 8 Aux Sends. This can be a useful feature when you are doing wireless mic checks....or any other time you need to address the actors.

### **Lamp**

There is a BNC connector for a gooseneck lamp. Please disconnect the lamp when not in use. When the dust cover is placed over the mixer it forces the lamp down onto the knobs and faders and melts them!

### **Headphones/Meter**

There are two jacks for headphones hidden on the front of the board just below the L/R faders. There is a volume control just above the L/R Faders. Below the volume control is a switch for setting the headphone input to be L-R or the 2 Track return. Whenever you press a PFL or AFL button you will be sending that signal directly to the Headphones as well as to the Peak meter and AFL/PFL VU meter.

Note that there is a hierarchy, L/R is the usual signal sent to the Headphones and the peak meter, AFL overrides L/R, and PFL overrides AFL. This feature lets you listen to an AFL source, a group for example, and check channel signals by pressing and releasing the PFL buttons of the channels sent to that group. A very handy troubleshooting tool.

### **Mute Groups**

Located between the Group and L/R faders are the four Mute Group buttons. Each button has a red LED to indicate when it is activated. Mute group assignments are made at the input channel (M1-M4). Mute Groups allows you to mute different combinations of channels with a single button. When the Mute Group button is pressed the Mute Group switch and the channel mute switches for all channels assigned to that group will illuminate,

and the input channels signals will be muted. A handy way to turn off all the stage mics, or the wireless mics as a group.

Nominal Output levels:

This chart details the kind of signal available at the various outputs. All the outputs are available at the Patch bays in the Patching Rack on 1/4' Tip/Ring/Sleeve or Tip/Sleeve jacks. Tip is hot (+), ring is negative(-), sleeve is the shield.

<u>Output</u>	<u>Bal/Unbal</u>	<u>Level</u>
Left/Right Mono	Balanced	+4dBu
Group Out 5-8	Balanced	+4dBu
Aux Out 1-4	Balanced	+4dBu
Aux Out 5-8	Unbalanced	-2dBu
Matrix Out A/B	Unbalanced	-2dBu
2-Track send	Unbalanced	Var. +21dBu max.

Operation of the Mixer:

Obviously, there is a lot to know about the FOH mixer....here are a few tips and guidelines for proper and efficient use of the mixer.

- Keep like inputs together. If you keep all the Wireless mics in one area of the inputs, all the stage mics in another, the computer playback and line level input signals in another you will be able to quickly get to any specific channel.
- SFX (the software we use for playing back sound effects) has its' own internal mixer which lets you set the volume of the effect coming out of the computer. This lets you set the mixer inputs at 0 and simply press the GO button in SFX during performances.
- We have a very flexible system but we typically use the following assignments for the outputs:

<u>Mixer Output</u>	<u>Speaker assignment:</u>
Left	Proscenium Left
Right	Proscenium Right
Mono	Center Cluster
Group 5	House Left surround speakers
Group 6	House Right surround speakers
Group 7	House Rear Left surround speakers
Group 8	House Rear Right surround speakers
Aux 1	Hearing Augmentation
Aux 2	Send to Video people
Aux 3	Send to onstage speaker (Effects or Monitor)
Aux 4	Send to Onstage Speaker (Effects or Monitor)
Aux 5	Send to Processor
Aux 6	Send to Processor

This setup works for a wide variety of applications. Note that you have 2 remaining Auxiliary sends and the two matrix sends for additional outputs.

One drawback of this setup is that the Mono Send is dependent on the level of the L/R outputs. For most shows that will be fine.

QUIZ: How would you setup the system to keep Left, Right and Center completely independent of each other? Make sure your solution includes both the left and right channel of all stereo inputs in the Center channel.

- Setting Mic Levels: The ultimate limitation on the volume of a microphone onstage is the point at which the mic begins to feedback. Here is a method of setting the input gain on a microphone so that you know how much higher you can set the fader without going into feedback:
  - 1) With the Fader down and the input gain down, make the proper Output assignments. Keep in mind that feedback can also occur through onstage monitors or effects speakers if the microphone is sent to them so it is important to set the mic level with all send at their operating levels.
  - 2) Bring up all the Output faders, Aux sends, Matrix outputs to their normal operating levels. They should be set at "0"
  - 3) Set the Channel fader at +6dB.
  - 4) Slowly...very slowly, bring up the input gain until the microphone just starts to feed back. Turn the gain back down until the channel is just below the level that it feeds back with the Fader still at +6dB.
  - 5) Lower the Fader on the input channel to 0dB. That is the maximum level for that channel *when it is the only mic in use!* Using multiple mics to the same speakers will result in feedback at a lower level.
  - 6) Repeat for all other mics.
  - 7) For fixed mics that should be sufficient. This technique also works for wireless mics but you would be best to err on the side of caution and set these levels with the person wearing the mic standing as far down center as possible.
- Group Outputs: Since groups 1-4 do not have outputs, they can be used as submix groups to balance the levels of signals sent to the L/R outputs. For instance, you could assign all the Male singers to Group 1, the female singers to group 2 and all of the band mics to Groups 3 and 4. Route Groups 1-4 to the L/R mix and you will have individual control of the volume and stereo images of your subgroups in the stereo mix.
- Group/Aux reverse: Just when you have the board all figured out, you can press a button that completely changes the way it behaves! This feature is a very powerful option when used correctly. The function of the Group/Aux reverse button is very simple:

**When the Group/Aux Reverse button is pressed the Aux Master and**

## **Group Master faders trade functions.**

Simple eh? Consider what this means, take Group 1 and Aux 1 for example. When the Group/Aux Reverse button is pressed the signal sent to Aux 1 on all of the input channels is routed to the Group 1 Master section which includes the Matrix and L/R sends on that Group. All of the channels that are assigned to Group 1 now have their signals sent to the Aux 1 Master for volume control and you have an Output available for them in the patch bay. If the Aux 1 send on the input channel is set at 0, the level sent to the Aux bus (group 1 master fader) is the same level as the signal sent to the Group bus (Aux 1 master fader).

A handy tool for complicated mixes. This feature is something best learned on a simple setup before trying in on a complex show. Using this function adds another layer of complexity to the signal routing since the labels on the patch bay will be inaccurate when the Group/Aux are reversed! It is a very handy way to deal with monitor mixes and to keep the Center Cluster signal independent from the L/R masters. In our configuration, since we do not have Outputs for Groups 1-4, using the Groups/Aux reverse is a convenient way to control volumes using the Group 1-4 faders.

- People needing an audio send: There are any number of reasons we might need to provide someone with an audio feed. Most common is the Video production class wanting a send to add to their mix. We will happily provide an audio send at our patch bay. This requires the use of a 1/4" TRS or TS plug. Plugging into the back of the Mixer is prohibited. There are a couple of TRS-XLR adaptors in the drawers if the people needing the feed do not have the proper equipment.
- Inserts: Due to some noise issues there are currently (9/02) no inserts available.

### Patch cords

The patch cords for the FOH position are the same as the ones used at the Amp Rack. They are stored on the partition beside the Playback Rack. Make sure they are clean before use!

### Patching rack:

The Patching rack is the rack on the House right side of the FOH position. In it you will find signal processors, the receivers for the Sony Wireless systems, and the patch bays for signal routing.

### Processors

There are two devices available for signal processing. The most typical use of the processors is to add reverb to an otherwise "dry" signal coming from a microphone. The manuals for the processors are in the folder in the Drawer. They each have their features and drawbacks.

The top Processor is a DigiTech DSP 256 Multi-Effects Processor. It can perform several different processing functions simultaneously.

The DSP 256 has two inputs and two outputs, a true stereo device.

The second Processor is a Yamaha SPX90 II. It can only perform one effect at a time. The SPX90 II has a single input and two outputs.

Some notes on the use of the Processors:

- Pay attention to the both the signal being sent to the device, and the processed signal coming out of the device. It's not difficult to overload either of the stages in a complicated show.
- We typically bring the output of the processor back into one of the input channels of the Mixer. This too has advantages and drawbacks. You have great flexibility with routing the signal where you need it, but you have to be careful not to send the device its own output on one of the Aux sends or it will feedback. You also use up two or four channels of the mixer's inputs bringing the processors back into the mixer this way.
- You will need to set the processors to send only the processed, or "wet" signal as their output. You will already have the unprocessed signal coming into the mixer.
- Listen carefully to the effect the processors have on the overall mix. It is easy to end up with a "murky" unintelligible sound if they are used improperly. LISTEN!

#### Sony Wireless Receivers

There are twelve receivers for the Sony Wireless systems mounted in two Tuner Base units in the Patching Rack. The top unit holds receivers 1-6, the bottom holds 7-12. These will be discussed in greater detail in the Sony Wireless systems section of this document. Their outputs are in the Patching Rack. The audio outputs of these receivers are mic level signals, and there is the option of having the receiver mix together the signals of the six receivers mounted in each base unit.

#### Patch bays

There are six patch bays in the Patching rack. This is where signals are routed into the Mixer, and out to the Amp Rack and elsewhere. We will start at the top patch bay and describe each one left to right working down to the bottom patch bay. It's a patch bay with two rows of jacks, the numbering will go from the top left to right, then the bottom row left to right.

#### Mixer Inputs & Outputs

A few things to note about the Mixer patch bay: Inputs are labeled in red, outputs in black. The inputs to the left of the mixers output section are the first 16 jacks on the top row, the inputs to the right of the mixers output section are the first sixteen jacks on the bottom row.

The Left, Right and Mono outputs are sent to two sets of jacks in case you

need an additional send for those signals. Be careful how use use those, the two sends are not electrically isolated from each other. A short circuit, or large transient coming down the secondary send WILL affect the primary signal! Consider using the 2-Track send for an isolated, easily adjustable send of the same signal.

### Mixer Inputs and Outputs Patch bay

Jack #	Function	Jack #	Function
1	Mixer in 1	25	Mixer in 17
2	Mixer in 2	26	Mixer in 18
3	Mixer in 3	27	Mixer in 19
4	Mixer in 4	28	Mixer in 20
5	Mixer in 5	29	Mixer in 21
6	Mixer in 6	30	Mixer in 22
7	Mixer in 7	31	Mixer in 23
8	Mixer in 8	32	Mixer in 24
9	Mixer in 9	33	Mixer in 25
10	Mixer in 10	34	Mixer in 26
11	Mixer in 11	35	Mixer in 27
12	Mixer in 12	36	Mixer in 28
13	Mixer in 13	37	Mixer in 29
14	Mixer in 14	38	Mixer in 30
15	Mixer in 15	39	Mixer in 31
16	Mixer in 16	40	Mixer in 32
17	Stereo Return 1 Left	41	Stereo Return 2 Left
18	Stereo Return 1 Right	42	Stereo Return 2 Right
19	Matrix A Out	43	2 Track Out Left
20	Matrix B Out	44	2 Track Out Right
21	Empty	45	Empty
22	Left Out	46	Left Out
23	Right Out	47	Right Out
24	Mono Out	48	Mono Out

DSR Snake / Group & Aux outputs:

The second patch bay from the top has the Lines running to Down Stage Right, the Group outputs and finally the Auxiliary Outputs.

DSR Snake/Groups Out/Aux Out Patch bay

Jack #	Function
1	DSR Line #1
2	DSR Line #2
3	DSR Line #3
4	DSR Line #4
5	DSR Line #5
6	DSR Line #6
7	Empty
8	Empty
9	Empty
10	Empty
11	Empty
12	Empty
13	Empty
14	Group Out #5
15	Group Out #6
16	Group Out #7
17	Group Out #8
18	Empty
19	Aux OUT #1
20	Aux OUT #2
21	Aux OUT #3
22	Aux OUT #4
23	Aux OUT #5
24	Aux OUT #6
25	Aux OUT #7
26	Aux OUT #8

Lines to Booth

This patch bay simply has 26 lines running to the Amp Rack in the Light Booth.

### Computer/Sony Wireless

This Patch bay has the outputs and inputs from the Gina card in the Playback computer, as well as the Sony Wireless systems outputs.

### Computer I/O & Sony Wireless Patch bay

Jack #	Function
1	Gina Out #1
2	Gina Out #2
3	Gina Out #3
4	Gina Out #4
5	Gina Out #5
6	Gina Out #6
7	Gina Out #7
8	Gina Out #8
9	Gina In #1
10	Gina In #2
11	Empty
12	Empty
13	Sony RF #1
14	Sony RF #2
15	Sony RF #3
16	Sony RF #4
17	Sony RF #5
18	Sony RF #6
19	Sony RF #7
20	Sony RF #8
21	Sony RF #9
22	Sony RF #10
23	Sony RF #11
24	Sony RF #12
25	Combined RF 1-6
26	Combined RF 7-12

## Playback Rack

This patch bay has two rows of jacks. It has the Inputs and outputs of the rest of our playback devices and processors. In general, the inputs to devices are on the top row of jacks, the outputs of devices are on the bottom row. Inputs are labeled in red, outputs in black.

Playback Rack Patch bay

Top Row Jack #	Function	Bottom Row Jack #	Function
1	Hearing Aug. IN	1	CD Out Left
2	Empty	2	CD Out Right
3	Mini Disc In Left	3	Mini Disc Out Left
4	Mini Disc In Right	4	Mini Disc Out Right
5	Cassette In Left	5	Cassete Out Left
6	Cassette In Right	6	Cassette Out Right
7	DAT In Left	7	DAT Out Left
8	DAT In Right	8	DAT Out Right
9	Empty	9	Empty
10	Empty	10	Empty
11	Empty	11	Empty
12	Empty	12	Empty
13	DSP 266 In Left	13	DSP 256 Out Left
14	DSP 256 In Right	14	DSP 256 Out Right
15	Yamaha SPX90II Mono In	15	SPX90
16	Behringer EQ#1 Ref. Mic In	16	SPX90
17	Behringer EQ#2 Ref. Mic In	17	Empty
18	Behringer EQ#3 Ref. Mic In	18	Empty
19	Behringer EQ#1 In Left	19	Behringer EQ#1 Out Left
20	Behringer EQ#1 In Right	20	Behringer EQ#1 Out Right
21	Behringer EQ#2 In Left	21	Behringer EQ#2 Out Left
22	Behringer EQ#2 In Right	22	Behringer EQ#2 Out Right
23	Behringer EQ#3 In Left	23	Behringer EQ#3 Out Left
24	Behringer EQ#3 In Right	24	Behringer EQ#3 Out Right

## Playback Rack

The rack on the house left side of the FOH position contains most of our conventional playback devices, and the three Behringer 1/3 Octave EQ's.

## CD Player

We have a CD player. It's reasonably straight forward in operation. It does have an Auto Cue feature. When Auto Cue is enabled the CD player will pause at the start of the next track, waiting for the Play button to be pressed. A very handy feature during a show! the

inputs and Outputs of the CD player are available in the Patching Rack. There is an optical cable connected to the MD player for digital transfers.

#### MD Recorder/Player

The Sony Mini Disc recorder/player is also available for playback and recording. It too has an Auto Cue feature making it very easy to use during a performance. This device has many features that can help to make the Board Operators job easier. Take the time to read the manual and become familiar with these features. One of the friendliest features is track naming. It takes some time to do, but it is worth it to look over and KNOW that you will be hearing Q 35 when you press the play button during a busy show!

#### Cassette Deck

There is a standard cassette deck which can be used for playback and recording. If you are using cassettes, take the time before each performance to accurately cue up each cassette. The 10-15 seconds of silence at the beginning of a cassette is a long, long time when you are waiting to hear the cue!

#### EQ's

In the Playback rack are three Behringer 31 band Equalizers. They are very useful for adjusting the frequency response of speakers, Time-aligning speakers, and reducing feedback frequencies. The manuals for these devices are in the folder in the drawer of the FOH position. You should read and understand the manuals. These are powerful devices that can help our sound system a lot. Used improperly, they can hurt the sound so be careful!

Some notes on the use of the EQ's:

- The EQ's either function as an Equalizer or a Real Time Analyzer, but not both at the same time. Know what this means BEFORE you start pushing a lot of buttons during a rehearsal!
- The EQ's have a curve set for the Proscenium L/R speakers, a curve for the side speakers with a delay to bring them in phase with the Proscenium L/R speakers, and a curve for the Altec 1234's. All of these curves were set using pink noise and attempt to create a flat response out of the speakers.
- There are a hundred memories in the EQ. I'm sure we will be using many curves for different things. Please save your curves with a distinctive name for easy identification.
- The side speakers are about 47 feet from the Proscenium speakers. The delay to bring the Side speakers into phase with the Proscenium L&R speakers is approximately 50ms.
- For rehearsals and performances the RTA Output should be set to

OFF, for additional security and piece of mind you can set a password to keep accidental changes from happening. Use each EQ's number as it's password to keep things simple and safe. If I gotta track you down to find out what password you used, it ain't gonna be pretty when I find you!

- The reference microphone inputs to the EQ's are in the patching Rack. I'll have the reference mic available if you need it. Don't use just any mic for this! It's important to have a mic with a flat response.
- The EQ's have 3 stereo channels of feedback extermination. Understand how to set and change these filters.
- The Center Cluster already has an EQ in its' signal chain. Inserting another one is not necessary.
- As with the rest of the system, spend some time get to know and understand the EQ's before you use them in a show.

### Computer Playback

Undoubtedly the most complicated playback device we use. The Playback Computer is an IBM Clone running at 350 MHz, 128MB Ram, 9G hard drive. Currently it is running Windows 98. The playback computer is networked with the Production Computer for transferring audio files once they have been produced. We use SFX v5.5 for playing back sound effects. We also use CDex to convert CD audio into the .wav format that SFX can playback

There is a brief two page tutorial to SFX in the folder in the drawer. The full manual is also in the same folder. It doesn't take long to learn the fundamentals of the program. Implementing it efficiently and artistically requires a thorough understanding of its capabilities. Here are some general guidelines as well as some operational notes.

- Assign the channels in a way that makes sense. A typical configuration might be:

<u>Chan:</u>	<u>Speaker:</u>
1	Prosc L (& Center)
2	Prosc R (& Center)
3	House Left
4	House Right
5	House Rear Left
6	House Rear Right
7	Onstage effects speaker
8	Onstage effects speaker

- Typically we set the levels of the effects in the mixer of SFX and leave the faders of the FOH Mixer set at 0.
- The default level for an effect added to a cue list is -12dB on Group 1

(channel 1 and 2). This allows you 12dB of gain in case it needs to be louder...without having to adjust the faders on the FOH Mixer.

- The mixer SFX uses goes from 0 down to -100. In actuality levels below 70 or so are effectively inaudible. This makes the first few seconds of a fade up from -100 fairly pointless since you are fading up from one level of inaudibility to another level of silence! Pay attention to this and practice making smooth cross fades between several cues. Most of the time starting an effect at -75 rather than -100 will work fine.
- The logarithmic fades tend to work better than the linear fades for most applications.
- Trigger cues, keyboard triggers and multiple cue lists are several advanced features that can be useful in some applications. Learn how to use them and be ready to incorporate them into shows when appropriate.
- If you fade out a long effect, place a STOP command shortly after the fade. Otherwise the computer will use its resources to play an effect you aren't listening to! Fade effects have Stop Cue After Fade as an option so you don't have to add a bunch of additional cues.
- Latency: If you happen to send the same .wav file out of different groups then recombine them at the FOH Mixer you will discover some phase problems due to the "latency" or slight delay between the groups. This should be avoided.
- Long cues such as preshow or intermission music are best played back over a more conventional device like CD or Mini Disc. Digital audio takes up a lot of space on a hard drive. Really long effects take up a huge amount of disc space and take a long time to transfer also. Use a CD or a Mini Disc.
- You can however, get SFX to loop an effect. That is a handy way of keeping file size of long cues manageable.
- Due to some hardware/software issues the computer's CD cannot be triggered by SFX to playback a CD track. You can however, convert a CD track to .wav format using the CDex program. Make sure you save it in the proper file format. The default parameters of the .wav files that SFX will playback is 16 bit 44.1kHz sample rate.
- SFX is for playback. If you need to do some basic editing we have CoolEdit Pro SE available on the Playback PC. Sophisticated editing, mixing and processing is probably best done on the Production system upstairs.
- Backing up Computer Files: All of the cues that are played off of the computer will be backed up to CD or Mini Disc. The system is stable but it is after all, a computer. These backup files will not have the degree of control that SFX offers. In an emergency it will be better to be able to play back an effect through the Proscenium speakers than to have no effects for

the entire performance. Typically these backup files are done after the second or third dress rehearsal to give the director/sound designer time to make changes. Getting the backup files produced has been a collaborative effort by the Sound Board Operator and the Sound Production Assistant.

Think carefully about how you will need to lay out your backups. Also give careful consideration as to how you plan to be ready to use your backups in the event the Playback computer freezes in the middle of a performance.

#### Hearing Augmentation:

Underneath the FOH table is a small FM transmitter used to broadcast to receivers that patrons may use to as assistive listening devices. You will set this up for every production. Spend some time listening to the mix being sent to Hearing Augmentation. The most important signals will be the stage mics. You will want to include some of the playback channels in the mix without overpowering the mic mix. There is one of the Wireless receivers stored in the drawer so that you can listen to the transmitted signal also.

#### Sony Wireless Mic systems:

This is a 12 channel wireless microphone system that offers a great deal of flexibility and control. The components of the system are:

##### Antennae

The two antennae are mounted on the partition behind the FOH position directly above the two racks.

##### Power supply/splitter:

The antennae power supply and splitter is mounted in the FOH table in the right hand side. It's a pretty nondescript black box with a power button on it. For the system to work as designed, it needs to be on!

##### Tuner Base Units:

The two base units are mounted in the Patching Rack. The top unit holds receivers 1-6. The bottom unit holds receivers 7-12.

##### Receiver modules:

Each receiver has an LCD display and four buttons for setting the parameters of the receiver. There is a GP button for adjusting Group parameters. The CH button adjusts channel parameters. The + button and the - button adjusts the parameters incrementally. The groups and channels have a default assignment that seem to work without interference. The chart detailing group/channel assignments to the transmitter/receivers is at the end of this section.

The LCD on each receiver shows a graphic representation of the Radio Frequency (RF) signal the unit is receiving. The Audio Frequency(AF) indicator shows that the unit is receiving audio and gives an indication of the level. There is a battery display on the receiver which indicates the condition of the battery in the transmitter! That is a handy little trouble shooting

tool!

The receivers have a self-muting function which will operate in any of three things happen:

- 1) Muting by RF input level: The audio output is muted if the RF input level is too low.
- 2) Tone Squelch: Audio output is muted unless it includes a specified (Inaudible) tone. This eliminates noise when the transmitter is turned on/off or if the receiver gets an interference RF signal.
- 3) Noise Squelch: Audio output is muted to eliminate noise from such excessive RF interference that Tone Squelch does not work.

To turn off the muting functions:

While holding the GP and the CH buttons, turn the power switch on. The LCD will show all indications, then go blank. "OFF" is then displayed. This cancels all three muting functions at the same time.

To turn the muting functions back on:

Turn the power switch off then back on. The three muting functions are activated at the same time.

Transmitters:

Each transmitter has an on/off switch, an LCD screen and several buttons on the front for setting the parameters of the transmitter. On the side of the transmitter is a 20dB pad switch and a Ø switch for reversing the phase of the audio signal.

Each transmitter is numbered to help keep track of them. The microphones connect to the top of the transmitter with a 1/8" mini jack that has a screw on strain relief. This strain relief keeps the mic from coming unplugged, but it causes the cable to break if it is pulled on too hard.

Using the controls on the front of the transmitter you can set which group and channel the transmitter broadcasts on, set the input attenuation and control whether the LCD displays the Group/Channel assignment or shows the actual broadcast frequency.

Typically we will use the input attenuation set at -12dB to keep loud actors from overloading the input stage of the transmitter. You may have to adjust this for an extremely loud actor.

Microphones:

As mentioned above the microphones attach to the

transmitters with a 1/8" mini jack and a screw on strain relief. Encourage the actors to be gentle with them. They are delicate and expensive (the mics, not the actors!)

We have a couple of different models of microphones that can be used. The majority of the mics are very small lavaliers. We currently have a couple that are a little larger.

General notes on the Sony Wireless system:

The transmitters and mics are sophisticated and expensive devices. Unfortunately they take a lot of physical abuse. Before every show that is going to make heavy use of wireless mics you should do an assessment of the state of the systems. Listen to the output of each mic as you gently move the mic cable and antenna. Make sure they all transmit and that their mic cables aren't damaged. Report any problems to the UTSM.

The Group/Channel/Frequency assignment

Transmitter #	Group	Channel	Frequency (MHz)
1	L1	68-9	795.125
2	L1	68-11	795.375
3	L1	68-19	796.375
4	L1	68-25	797.125
5	L1	68-30	797.750
6	L1	68-34	798.250
7	H1	69-9	801.125
8	H1	69-11	801.375
9	H1	69-19	802.375
10	H1	69-25	803.125
11	H1	69-30	803.750
12	H1	69-37	804.625

Batteries:

We go through a lot of batteries. It's ok to use a battery for a couple of rehearsals, but always use a new battery for our performances. Keep the UT Stage Manager apprised of the battery supply. Sometimes it can take several days to get in new batteries. Used batteries go in the battery drawer in the Gel Room.

Mic Placement:

Typically the actors will place the mic on their sternum. If it is placed too high you can get a "dark" sound, too low and you can get reduced volume. One problem with this placement is the mic stays still as the actor turns their head giving a markedly different sound depending on where the actor is looking. A solution to this problem is to mount the mic somewhere on the actors head keeping it in the same position relative to the actors mouth. The headsets for the mics allow a great mic placement, but are a visual intrusion. Most directors concepts for their

shows don't include funny looking widgets hanging on the faces of their actors. Securing the mic in actors hairline is a reasonable compromise. If you inspect the mic inventory you will notice that a lot of the mics have spirit gum residue left on them from actors gluing them by their hairline. It would be preferable to use some surgical tape to hold them in place.

#### Transmitters and sweat:

Actors sweat. Sometimes a lot. The transmitters are not designed to be waterproof and they can perform erratically if they are swimming in a puddle of actor juice. We have a couple of tools or dealing with this issue.

#### Everyone's favorite:

The condom. Take an unlubricated condom and put it around the transmitter. Effective, fun, but kind of fragile and expensive. You can remove the belt clip from the transmitter and reattach it through the condom.

#### Zip locks:

Maybe not quite the same conversation starter, but we have been using some small zip lock bags for the same purpose. Effective, cheap, not as fragile, but not as much fun.

#### Elastic waist belts.

Sometimes the actors don't have any convenient place to put the transmitter. We have some elastic belts with velcro closures for just such a problem.

#### DAT Recorder/Player

The DAT machine is mounted in the house left side of the FOH table. It can be used to playback long effects, or to record performances. It has some handy features, like index points and auto-cueing. These features are not intuitive, read the manual in the folder for detail explanations of them. The inputs and outputs of the DAT are line level unbalanced signals brought out to the Patching Rack.

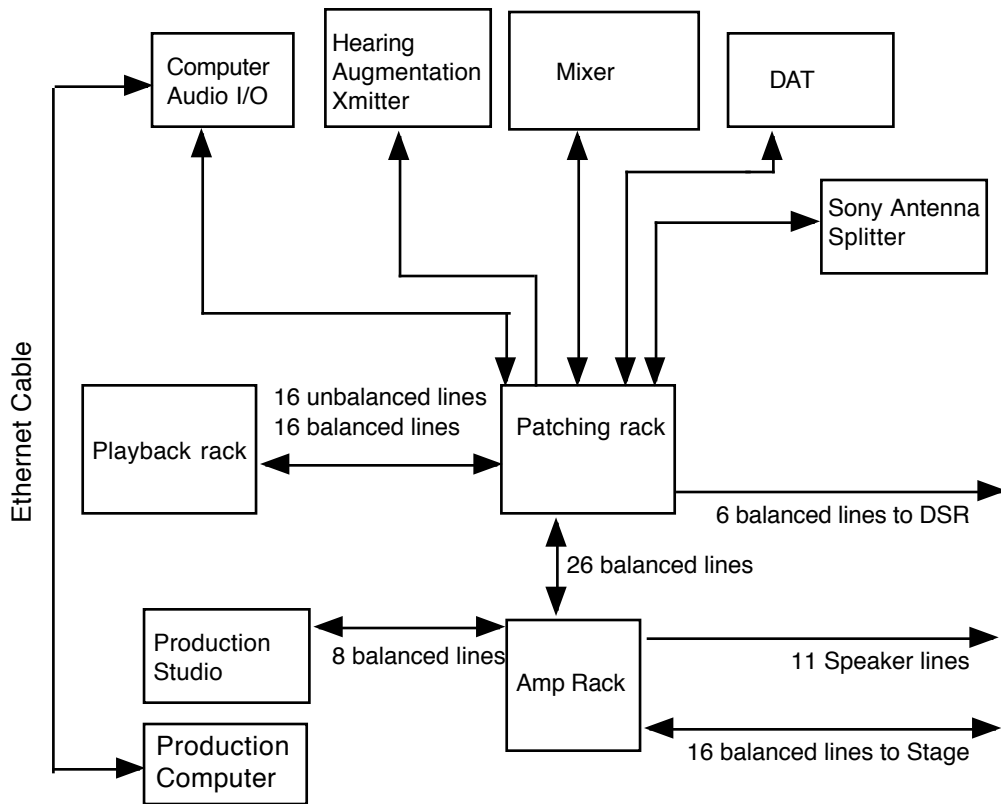
#### Intercom

The intercom connections for the FOH position are in the bay on the house left side of the table. There are two jacks available. Additional headsets may be daisy chained out of the bottom of the belt packs.

In the past there has been some concern expressed about the FOH person being "off headset." Obviously the FOH person has a lot of things to listen to...the overall mix, individual mics in PFL/AFL, constructive criticism from directors, sound designers, TD's and anyone else who happens to be there. It's not surprising that the FOH person is occasionally off headset. To help get the attention of the FOH person, there is a strobe that can be plugged into the headset system. When the call button is pressed the strobe will flash 6-8 times. It's a real attention grabber, and that is its job, to get your attention and let you know that you should check in on headset.

### Block Diagram:

Now that you know where everything is and how it all works, here is a block diagram of how the systems interconnect:



### Miscellaneous Notes:

#### It's big and confusing:

If you try and understand all of it at once, the system is rather daunting. To keep your sanity, break the system down into manageable sized pieces as you begin to learn it. Focus on getting one or two aspects of the system understood at first. Then start adding systems and components and understanding how they interact with the system as a whole.

When things seem to be getting really confusing keep in mind the basics of the signal flow. Acoustic energy is coming from the stage, transformed into electrical energy by a mic, sent to the mixer whose output goes to a power amplifier which drives a speaker which converts the electrical energy into acoustic energy. See, it's not so complicated!

It helps to be very clear as to the direction of the signal flow, i.e. the output of one device goes to the input of some other component which send its' output to the input of the next.....and so forth.

### Board Operator/Sound Production Assistant duties:

The Sound Production Assistant (SPA) will produce all the sound effects and get

them loaded in cue order into SFX. It will be the responsibility of the Board Operator (BO) to set the levels for the cues. If it's possible to do this with the director/sound designer before Dry Tech, you can save a lot of people a lot of time during Dry Tech.

#### Notes/Communication:

Obviously there will be changes that need to be made to some of the cues. It is the responsibility of the the director/sound designer to inform the board operator of changes that need to be made. It is the responsibility of the Board Operator to inform the Sound Production Assistant if editing or remixing of the effects is required. There is a clipboard on the Sound Production Studio door where notes can be left. Occasionally the Stage manager will leave notes on the Stage Managers reports that should be checked each day of technical rehearsals by both the BO and the SPA.  
Be sure the UTSM is kept apprised of the status of the system and the needs of the shows.

#### Call Times and Start times:

The show Stage Manager will issue call times, the time you are required to be at the theatre for a rehearsal or performance. Before every rehearsal or performance you will need to thoroughly check out the system. These system checks test:

- 1) Every input to make sure you are receiving the expected signals.
- 2) Every output to make sure the signal is going where you need and is at the proper volume.
- 3) Every microphone. See #1 above.

You will need to be finished with this system check 1/2 hour before the House opens. If that means you will need to be here before the call time the stage manager issued, that's all right. It's part of the job.

#### Administrative Structure:

The administrative structure of the theatre gives several people the authority to give the Board Operator instructions about cue levels and vocal reinforcement levels. Being on public display in the center of the balcony gives everyone and their duck the ability to offer their opinion on the show sound to the Board Operator. Who has the authority to give the board operator a note regarding show sound depends on the type of note it is:

##### Microphone Levels:

Mic levels of sound reinforcement mics (area mics, wireless mics, band mics, etc.) shall be set by the Technical Director in consultation with the Artistic Director, the director and/or sound designer of the show, or the University Theatre Stage Manager.

##### Effect Levels:

The level of effects played back during performances shall be set by the sound designer/show director in consultation with the Technical Director and the Artistic Director.

Time commitments:

The Sound Board Operators work schedule depends on the production calendar. During weeks that there are no rehearsals or performances the SBO will work at least 6 hours during normal work hours. During productions the SBO's first time commitment to a show is to attend the Final Run Through and all rehearsals and performances after that. During the weeks of rehearsals and performances the weekly shop hours are optional for the SBO.

The Sound Department currently employs two SBO's. The shows should be divided between the two SBO's. Once a commitment has been made to a show the same person shall be the SBO for the run of the show. The point of employing two SBO's is so that one person isn't responsible to be in attendance for every rehearsal and performance of every show. It's also good to have a backup in case of a true emergency.

System setup date:

The SBO shall have the sound system setup by the date of Final Run Through for each show. The UTSM and the SPA will inform you as to special mic'ing and cueing and effects the show requires. Having the system setup by FRT allows a day to troubleshoot any problems that arise.

Public display of the University Theatre:

The Board Operator is in a unique position. They are the only technical staff position the public is likely to see. As such the Board Operator is the representative of the entire technical staff. Proper attire (show blacks or concert dress) shall be worn to all performances. Comments from the patrons shall be graciously accepted and where necessary, directed to the appropriate staff member. Your deportment during our performances influences our patrons experience. Excessive headset chatter during a performance is unseemly. Leaving the FOH position during a performance is unprofessional. Wait until an intermission to take your potty break, no matter how simple or uneventful the show.