# Albuquerque Central S.D.A. Church

## Audio/Visual Production Training

Presented by
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V2017.0529.1754

## Romans 10:17

So then faith comes by hearing, and hearing by the word of God.

## My Background

- 10 years theatrical experience
- Learned some lighting & sound
- Navy taught me to strive for perfection, professionalism
- Completed Navy Basic Instructor Training
- 3 years Head A/V
  Sutter Hill SDA Church, CA

## Teamwork

How do we work as a team?

- Provide the same level of commitment
- Adhear to established procedures
- Provide feedback
- Offer support

All this includes the Worship Leader, Praise Team and Pastor. We are all ONE team.

# Purpose

The purpose of the chuch audio production is revealed when you first look at the other people in the church sanctuary and their primary purposes;

- The pastor's primary purpose, during the service, is giving the message to the congregation.
- The worship leader's purpose is leading the congregation in the worship of God through song.
- The musicians' purpose is assisting the worship leader in accomplishing their goal.
- The congregation has a purpose as well. Their purpose is to be fed, nutured, taught, called to worship and bring a sacrifice of praise

*Therefore by Him let us continually offer the sacrifice of praise to God, that is, the fruit of our lips, giving thanks to His name.(Hebrews 13:15)*


# Resources

A crazy amount of searches on the internet learning terms, equipment and processes

"Audio Essentials for Church Sound"
From behindthemixer.com
By Chris Huff

# Objectives

- Understand the terminology associated with audio and visual (A/V) equipment
- Understand the roles/purposes of various A/V equipment
- Understand the relationships between various A/V equipment
- Learn how to manage or use some of the basic equipment
- Describe the steps performed to prepare for a performance
- Describe the steps to perform during a performance
- Describe the steps performed post-performance
- Cover In-depth the Sound Board *(OPTIONAL)*

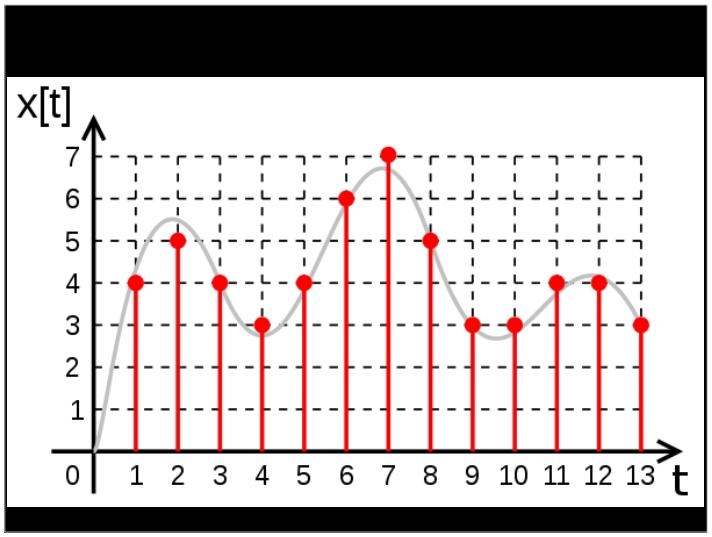
# Terminology

## NOUNS

**SOUND:** Vibrations that travel through the air and can be heard when they reach a person's ear

**SIGNAL:** A representation of sound, typically as an electronic value

- **Analog:** Using a physical item (electricity or AM-FM waves) to transmit data
- **Digital:** Using a bit pattern (0 and 1) to transmit data




# Terminology

## NOUNS

**AMBIENT AUDIO:** Background noise

**STEREO:** Audio which is made up of two channels – left and right

**MONO:** Audio which is made up of one channel, typically the left

**PHANTOM POWER:** A 48v DC current which is sent through audio cables to provide power for devices such as microphones.

# Terminology

## NOUNS

**PEAK:** The highest level of strength of an audio signal. Often (incorrectly) refers to an unacceptably high level, where the signal begins distorting.

**CLIP/CLIPPING:** The point at which a signal distorts

**SIGNAL FLOW:** A path the signal travels from source to speakers

**STAGE NOISE:** Sound coming directly from the stage

# Terminology

## NOUNS

**WIRE:** A single conductor.

**CORD:** Carries electricity in the form of amps and voltage, providing power to equipment. Made of many wires creating a single conductor.

**CABLE:** Carries electricity in the form of voltage to provide a representation of sound. Made of two or more insulated wires wrapped in a single jacket.

# Terminology

## VERBS

**RAISE/LOWER...**
**BOOST/ATTENUATE...**
**INCREASE/DECREASE...**
**BRING UP/BRING DOWN:** To change the signal strength or sound volume

**SECURE:** To tape into place

**ACTIVATE/DEACTIVATE:** To turn on or off

**NOISE CONTROL:** Reducing the amount of sound coming directly from an instrument, amp or floor wedge

# Terminology

## ADJECTIVES

**HOT/COLD...**
**STRONG/WEAK:** Describes the *strength* of a *signal*

**LOUD/QUIET:** Describes the *volume* of *sound*

# Terminology

## MEASUREMENTS

**DECIBEL (dB):** Logarithmic measurement of signal strength. 1/10 of a Bel. *This is a relative measurement to the ambience of the room.*

**HEADROOM:** In a cable or audio device, it's the difference between the maximum level of the signal being carried and the maximum level the device is capable of carrying without distortion. Headroom is safety room.

**IMPEDANCE:** The amount of opposition a device has to an audio signal

# Terminology

## MEASUREMENTS

**WAVELENGTH:** The length of a wave, measured from any point on a wave to the corresponding point on the next phase of the wave. Not to be confused with Frequency.

**FREQUENCY:** The number of occurrences of a repeating event per unit time

# Terminology

## MEASUREMENTS

The wavelength and frequency of light are closely related. The higher the frequency, the shorter the wavelength. Because all light waves move through a vacuum at the same speed, the number of wave crests passing by a given point in one second depends on the wavelength.

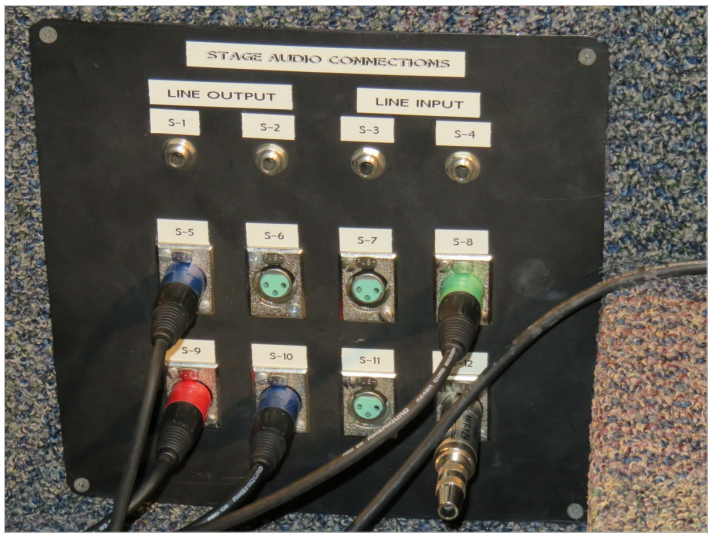
**HERTZ:** Unit of frequency, cycles per second.

# Equipment

*The Basics*

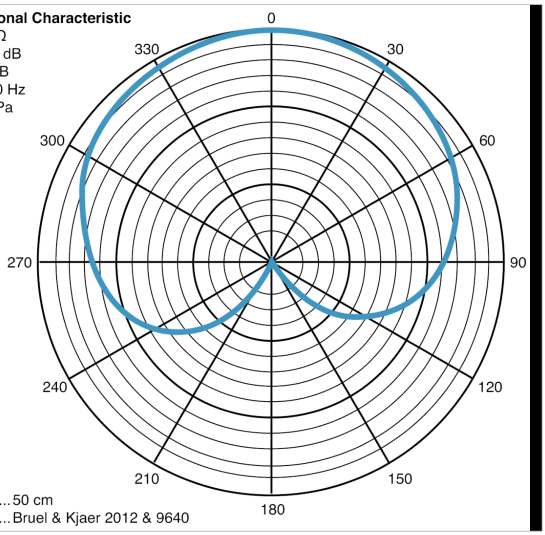
Sources
Mixers
(EQs, DSPs)
Amplifiers
Speakers


LOW Z OUTPUT
db 100
high to low
impedance
converter
RAPCO
International
INPUT
OUTPUT
GROUND LIFT


STAGE AUDIO CONNECTIONS
LINE OUTPUT
LINE INPUT
S-1
S-2
S-3
S-4
S-5
S-6
S-7
S-8
S-9
S-10
S-11


NUMARK
NUMARK
DVD
SONY
PIONEER
CD-2
SONY
TAPE

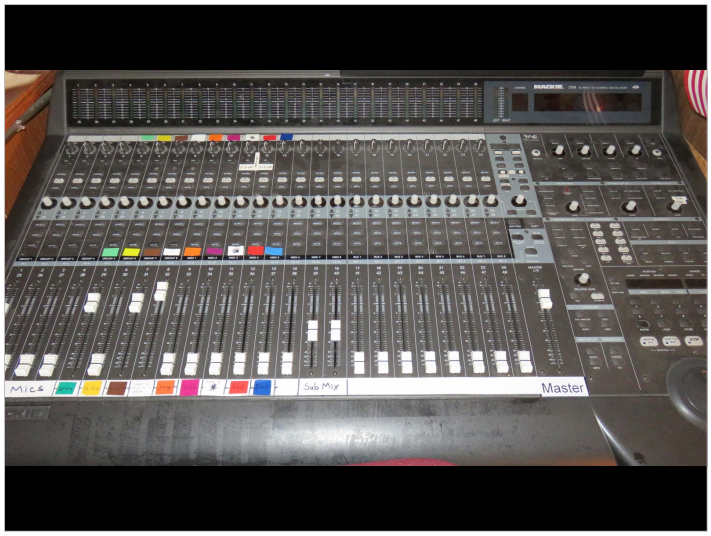

**Microphone Directional Characteristic**
**Type:** .....250Ω
**Top Level:** .....57.8 dB
**Range:** .....30 dB
**Frequency:** .....1000 Hz
**Source Level:**..0.1 Pa




**Measure Distance**.....50 cm
**Test Instrument** .....Bruel & Kjaer 2012 & 9640


Personal Monitor
LINE 6
SHURE LX
BLUE

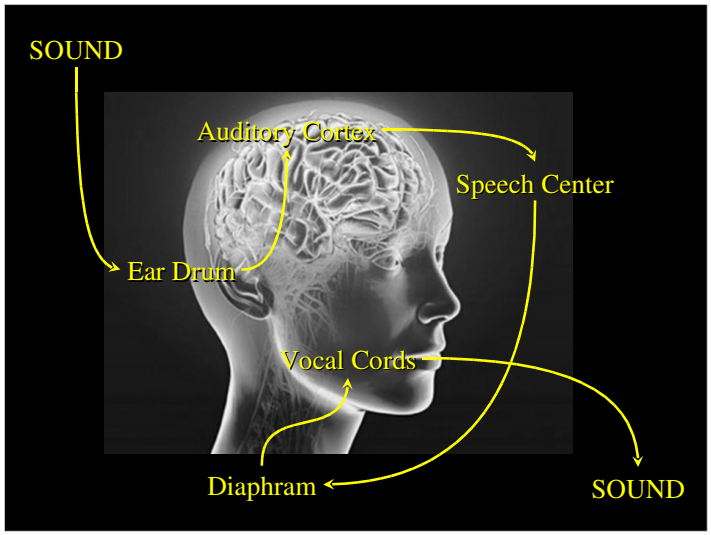

Choir Mics
Sub-Mix

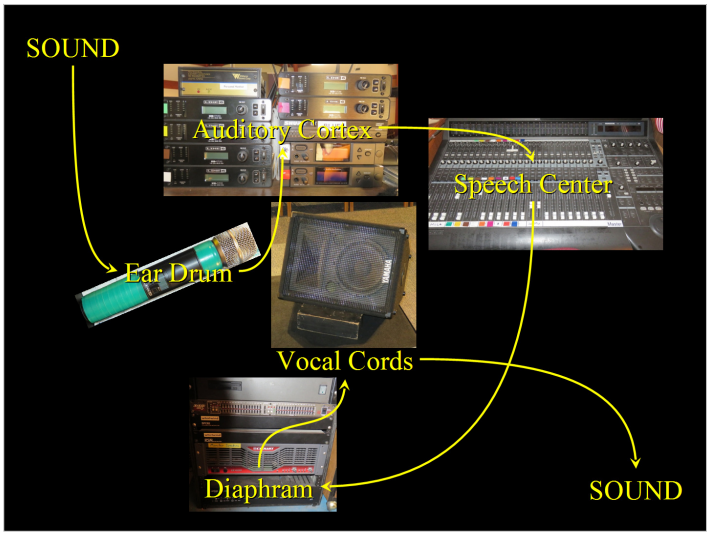

Mics
Sub Mix
Master


whirlwind
SPC82
whirlwind
SPC82
Monitor Speakers
crown


EV


YAMAHA


SOUND
Auditory Cortex
Speech Center
Ear Drum
Vocal Cords
Diaphram
SOUND


SOUND
Auditory Cortex
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SOUND

# Equipment

CONNECTIONS

PLUGS: XLR

1/4” TRS

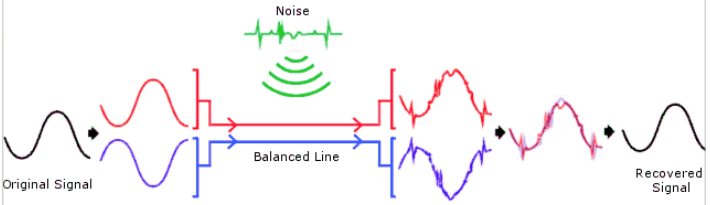
1/4” TS

1/8” Stereo

# Equipment

CONNECTIONS

Balanced vs Unbalanced




# Coiling Cables

We do NOT coil Cables the same as Cords.

A cord transmits POWER
A cable transmits DATA

Coil cables using the Over-Under technique

# Performance Preparation

*Equipment Activation*

1. Organ Sound Board
2. Front Power Strip
3. Main Mixer
4. Rear Power Strip
5. Main Speakers

This sequence eliminates the possibility of damaging the speakers.

## Performance Preparation
*Power Checks*

- Power lights
- Batteries

## Performance Preparation
*Microphone Placement*

We need a microphone for the people who do the...

- Welcome / Prayer Request
- Tithes and Offerings
- Children's Story
- Special Music (As needed)

Let's figure out how to make this easy

## Performance Preparation
*Cable Management*

When cables are being used in an area where people will be walking, they need to be taped down.

There are many ways to tape down cables, but only ONE way to pull them up.

## Performance Preparation
*Line Checks*

*This checks for signal **into** the **mixer***

- The Gain knobs on the mixer should be PRESET or at the Unity "U" level
  (12 O'clock position)
- There should be some indication of input on the meters when providing a source signal

## Performance Preparation
### *Level Checks*
*This checks the **sound volume***

- Turn off the Mutes
- Set Channel and Main Faders to Unity
- Set Monitor level (12 O'clock) if required

## Performance Preparation
### *Sound Check*
*This checks the **sound quality***

*This step is only needed for Special Music and whenever a new situation exists*

- One at a time, each person (vocal or instrument)
- Apply dynamics (EQ, Gate, Compression) as needed

## Performance Preparation
### *Rehearsal*
*This step is only needed for the Praise Team and Special Music*

- The Resersal is for the Singers to practice
- Special Music is an exception
- Try not to interrupt
- Walk the room

## During Performance
### *Observing*

- Watch for different people speaking
- Constantly observe input levels
- Inputs should be ~ 2/3 of meter's mid point
- Keep an eye on the audience for signs of not being able to hear or if it's too loud

STAY FOCUSED

## During Performance
*Listening*

- Cracking: Signal too strong
- Hissing: RF interference, weak signal
- Popping: Static or broken wires

STAY FOCUSED

## During Performance
*Adjusting*

- Adjust Gains to keep signal in proper range
- Keep music lower than vocal

STAY FOCUSED

## Post-Performance
*Equipment Reset*

- Reset Gains to the LOWEST positions or the Unity "U" level
- Lower **Channel** and **Main** Faders to Minimum
- Lower Main **Monitor** volume

## Post-Performance
*Equipment Deactivation*

- Main Speakers
- Rear Power Strip
- Main Mixer
- Front Power Strip
- Organ Mixer

# Post-Performance
## *Equipment Stowage*

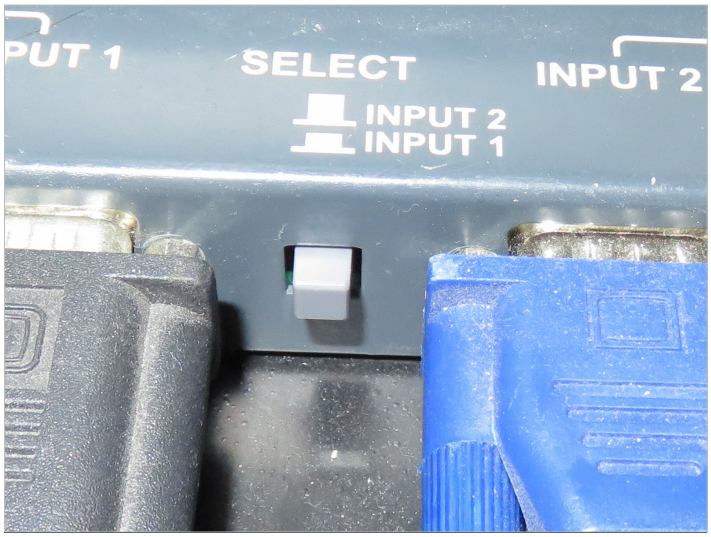
- **Ensure** Wireless BeltPacks are **OFF**
- **Ensure** Wireless Hand-held Microphones are **OFF**
- Recharge batteries as needed
- Lock it up


# Video
## *Equipment*

Computer w/Dual Monitor & Projection

What's the Password?

- Video Switch
  - Main Projector
  - Dual Rear Displays
- Remotes
  - Projector
  - Rear Displays
- Clicker (Right-hand Monitor MUST be "active")





# The End

In Depth

The Mackie D8B
Digital Mixing Sound Board

# Terminology

## MIXER TERMS

**INPUT:** A plug connection to connect equipment

**CHANNEL:** A pathway through an audio device, along which an electrical signal flows

**BUS:** The pathway to an output, along which an electrical signal flows

**FAT CHANNEL:** Provides Digital Signal Processing (DSP) *(Frequency Adaptive Transform)*

**DYNAMICS:** High Pass Filter*, Gate, Compressor, Limiter*, Equalizer

** Not available on the D8B*

# Terminology

## MIXER TERMS

### INPUT LEVELS

**MIC INPUT:** The lowest, or weakest, level signal of the four and requires a preamplifier to bring it up to Line level.

**INSTRUMENT INPUT:** Are between MIC and LINE level signals and have the most variation. You typically see this kind of signal come from an electric guitar or bass. A preamplifier is required to bring the signal up to line level.

# Terminology

## MIXER TERMS

**LINE INPUT:** The highest level signals *before amplification*. This is the type of signal that typically flows through your recording system after the preamplifier stage and before the amplifier that powers your speakers.

**Be careful not to send a line level signal to a preamplifier expecting a mic or instrument level signal.**

**SPEAKER LEVEL:** The highest level of the four signals that come out of an amplifier

# Terminology

## MIXER TERMS

### BUSSES

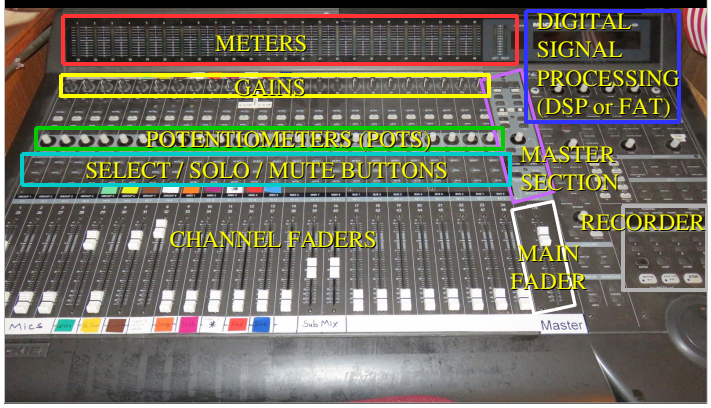
**MAIN BUS:** The primary output to the House Speakers' amp

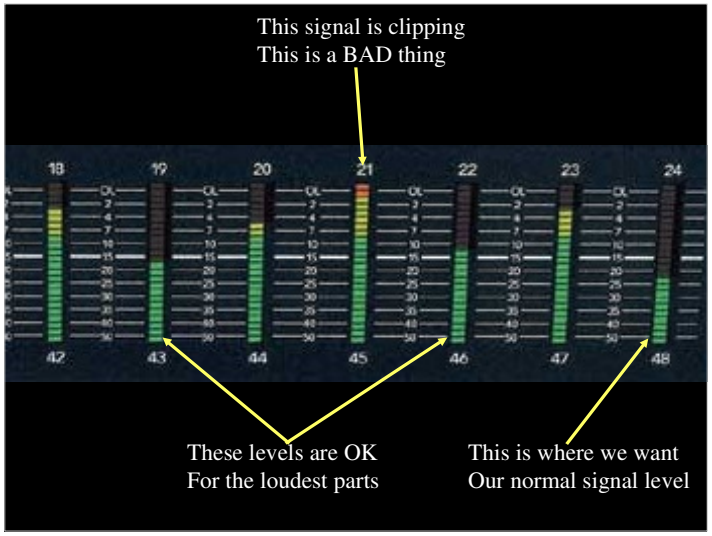
**AUX BUS:** An auxilary output ie. to a Floor Wedge Speakers' amp

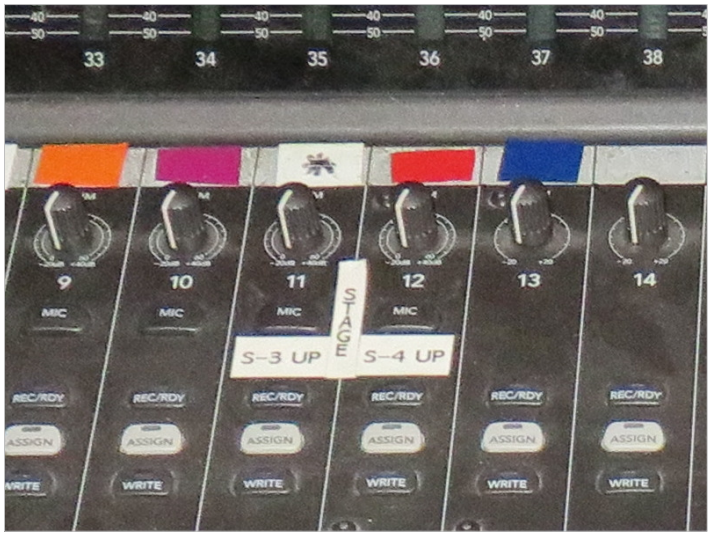
**FX BUS:** A path signal takes to add effects

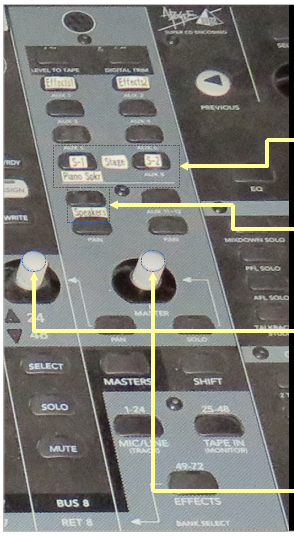
**DYNAMICS BUS:** (Also the FAT channel) A path signal takes through digital signal processing (DSP)

# Mackie D8B Digital Mixer



MASTER SECTION

By selecting the S-1 & S-2 Buttons, We can also send channel signal to The stage S-1 & S-2 outputs

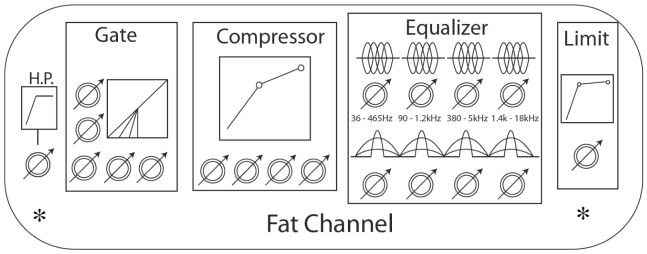
Press SPEAKERS to select the Floor Wedge AUX BUS

Turn the POT on the required Channel to adjust the amount of signal to the floor wedge speaker

Turn the POT on the MASTER To adjust to overall volume


# FAT Channel / DSP

Typical flow of signal is through…




HIGHPASS FILTER* – GATE – COMPRESSOR – EQUALIZER – LIMITER*

** Not included on the D8B*

# High Pass Filter / Low Cut Switch

*The Main Mixer does not have this feature.*
*The Mixer in the Media Room does.*

- This feature will cut lower frequencies, allowing the HIGH freqs to PASS through the channel.
- Some boards have a fixed freq ie 75 or 150Hz
- Others have variable freq settings.

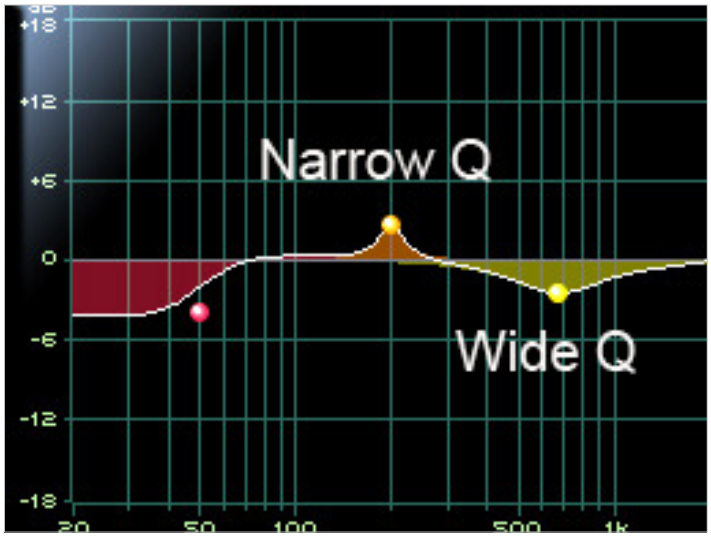
# Equalizer

## TYPES

**FIXED:** A preset Freq and Spectrum (Q) where the gain may be adjusted.

**SEMI-PARAMETRIC:** An Adjustable Freq but a fixed Spectrum (Q) where the gain may be adjusted

**PARAMETRIC:** An Adjustable Freq and Spectrum (Q) where the gain may be adjusted





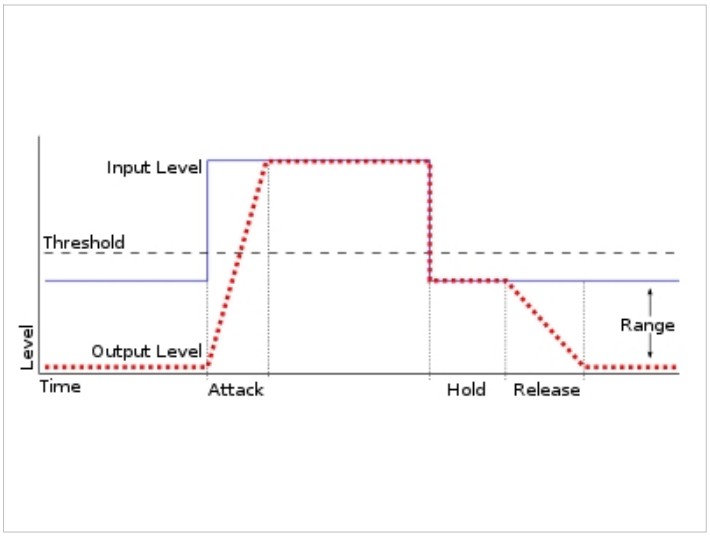

# Gate

**THRESHOLD:** The level at which the Gate opens, It is calebrated in dB, ranging from -60 to -1dB

**ATTACK:** How quickly the Gate opens, It is calebrated in milliseconds (ms), ranging from (10-600)

**RELEASE:** How quickly the gate closes, It is calebrated in ms, ranging from (10-2500)

**RANGE:** Determines the change in output level as a function of the change in input level. This is sometimes called downward expansion. It is calebrated in dB, ranging from 0-100dB.





# Compressor

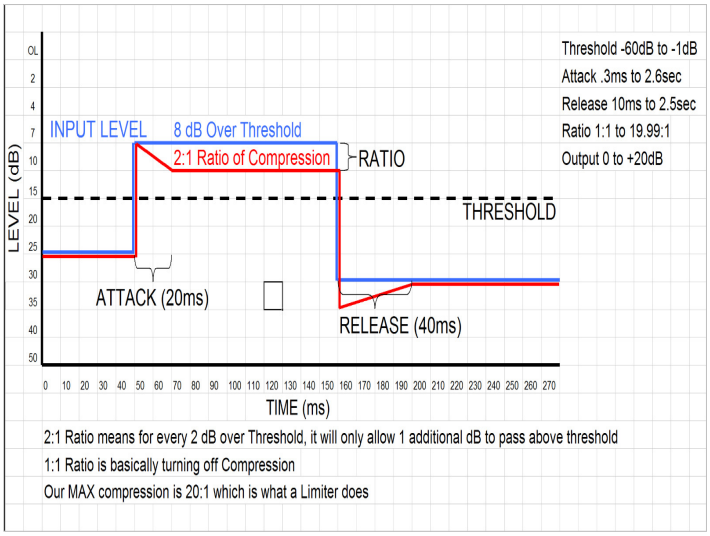
**THRESHOLD:** The level at which the compressor activates

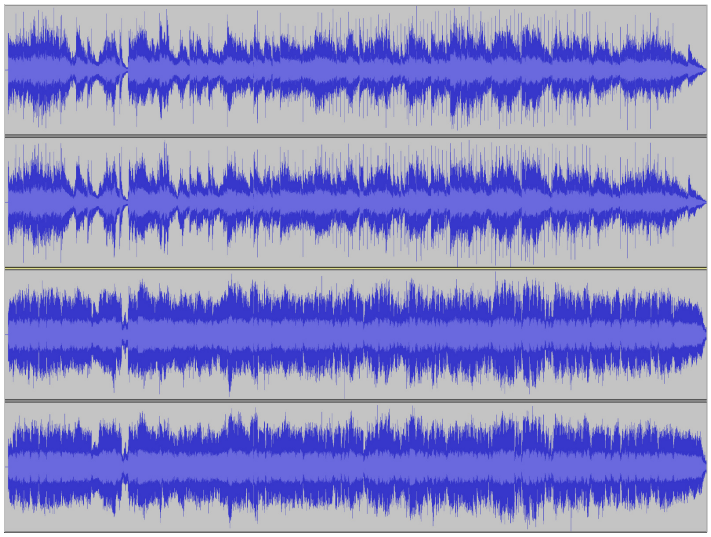
**ATTACK:** The amount of time in Miliseconds (ms) it takes for the compressor to activate

**RATIO:** The amount of compression

**RELEASE:** The amount of time in Miliseconds (ms) it takes for the compressor to deactivate

**OUTPUT:** Compensates for lowered levels





# Limiter

*Our mixers do not have this feature.*

- This feature is a ceiling for signal strength
- It's basically a preset Compressor


That's all folks!

## Documents for Additional Learning

http://www.anadrac.com/church_files.htm

- Lesson
- Handouts
- Mixer Manuals
- Receiver Manuals