

Rod Stewart World Tour – Atlanta, Georgia

Welcome!

thinking sound



Meyer
Sound

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Sound

MIXING WORKSHOP

Let's talk about sound mixing!

Feel free to ask questions.

Please enjoy yourself!



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MIXING WORKSHOP

TOPICS FOR DISCUSSION

A little bit of History
My Introduction into Professional Audio
The Importance of the Sound Mixer
Linear Sound Systems
Mixing to a Equal Amplitude Frequency Response
Controlling Sub Woofers
Mixing in Isolation
Sound Pressure Levels at Concerts
Signal Path-Gain Structure
Mixing Tips
Listen to Live Show Mixes (console recordings)
Mixing in Surround
Hands-On Live Mixing

Three Dog Night
Eric Burden
It's A Beautiful Day
The Guess Who
The Carpenters
Lynyrd Skynyrd
Jeff Beck
ZZ Top
Linda Ronstadt
James Taylor
David Bowie
Bad Company
Kinks
Stevie Wonder
IggyPop/Bowie
Ron Wood/Keith Richards
Jackson Browne

Prince
Don Henley
Pat Benatar
Corey Hart
Pink Floyd
Al Jarreau
Eric Clapton
Shakira
Julio Iglesias
Faith Hill
David Bowie
George Harrison
Jewel
SHeDAISY
Travis Tritt
Clint Black
Counting Crows

TOURING CREDITS



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MIXING WORKSHOP

MY HISTORY

Raised in south Texas in musical family

Father built/repared musical instruments

Developed a strong interest in music and started playing
mainly guitar but also a bit of piano.

I then found that mixing on a sound console was very
similiar to playing an instrument! We are musicians!

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MIXING WORKSHOP

CAN I TEACH YOU TO MIX?

I'm very happy to try!

We are artists who take the tools of the trade and then we paint a picture.

Be yourself and show your passion!

MIXING WORKSHOP

Interesting Cab Ride.....

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MIXING WORKSHOP

**In 1977 a NYC cab driver asked what brought me to town, I told him I was a concert sound mixer. He said, “who do you mix?”I said Linda Ronstadt....He said....
“Oh, she bakes the cake and you serve it!”**

Well put! That is the one of the best ways I know of to describe what we do as live sound mixers.

SOUND MIXER DEFINITION?

Some people are able to discern sounds quicker than others

We all listen in different ways

WHAT IS A SOUND MIXER?

TITLES AND WHAT DO THEY MEAN?

Mix Engineer, system engineer, sound mixer, foh engineer,
band engineer, audio engineer, sound engineer, etc.

System Engineer/Mix Engineer

Many tours do not budget for a separate mix engineer

Mix engineer IS a band member

FREELANCE OR COMPANY EMPLOYED?

Advantages and Disadvantages

How much can you earn?

THE IMPORTANCE OF THE SOUND MIXER

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THE IMPORTANCE OF THE SOUND MIXER

Live Mix Engineer versus Studio Mix Engineer

No rewind or stop button!

One chance to execute the mix!

Must mix several “records” within the concert

THE IMPORTANCE OF THE SOUND MIXER

The mix should be collective input from the artist, musicians, staff and most importantly, the audience!

Trying to achieve perfection in sound mixing helps promote touring, rental companies, and the entire entertainment industry!

Therefore a longer and more prosperous career!

HOW DO I GET STARTED IN LIVE SOUND?

Love of Music!!

Music Education

Universities, Colleges and Trade Schools

Books, Magazines, Internet forums, Internet browsing

Stagehand work at local venues

Local rental companies

Personal recording studio

Attending seminars and webinars!

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MIXING WORKSHOP

My introduction to pro audio....

Completed 2 year degree in Electronics

Repaired Home Hi-Fi Equipment

Joined Showco in 1970

First gig - system tech-Three Dog Night
and

additional assistance on Led Zeppelin

Booming time in live sound

Learned audio in the trenches



Mixing David Bowie-1973

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SOUND REINFORCEMENT IN THE 70's

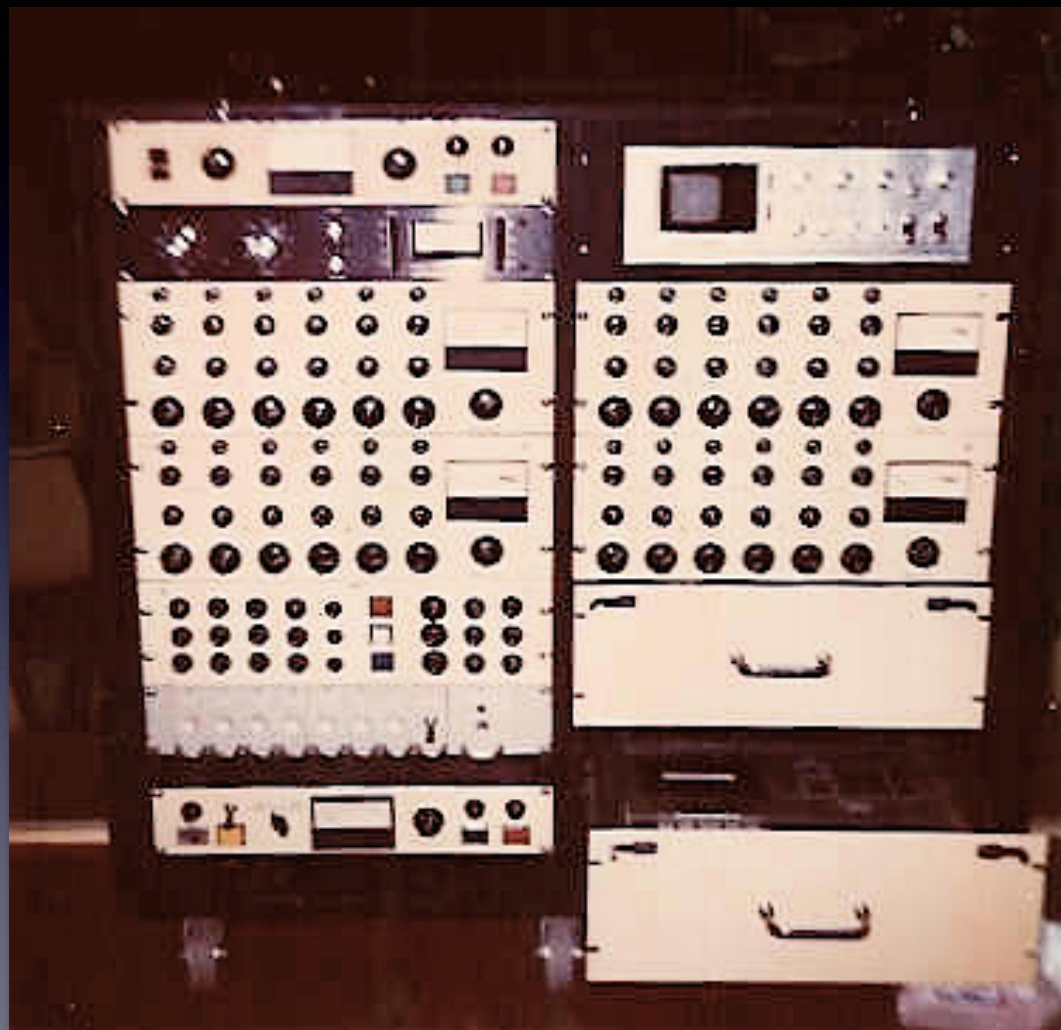
Showco 24in/4out
(Proprietary Mixer)

Showco 2-way Crossover

UREI 1176 System Limiter

Melcor 7-Band Graphic EQ

Kenwood Lab Scope

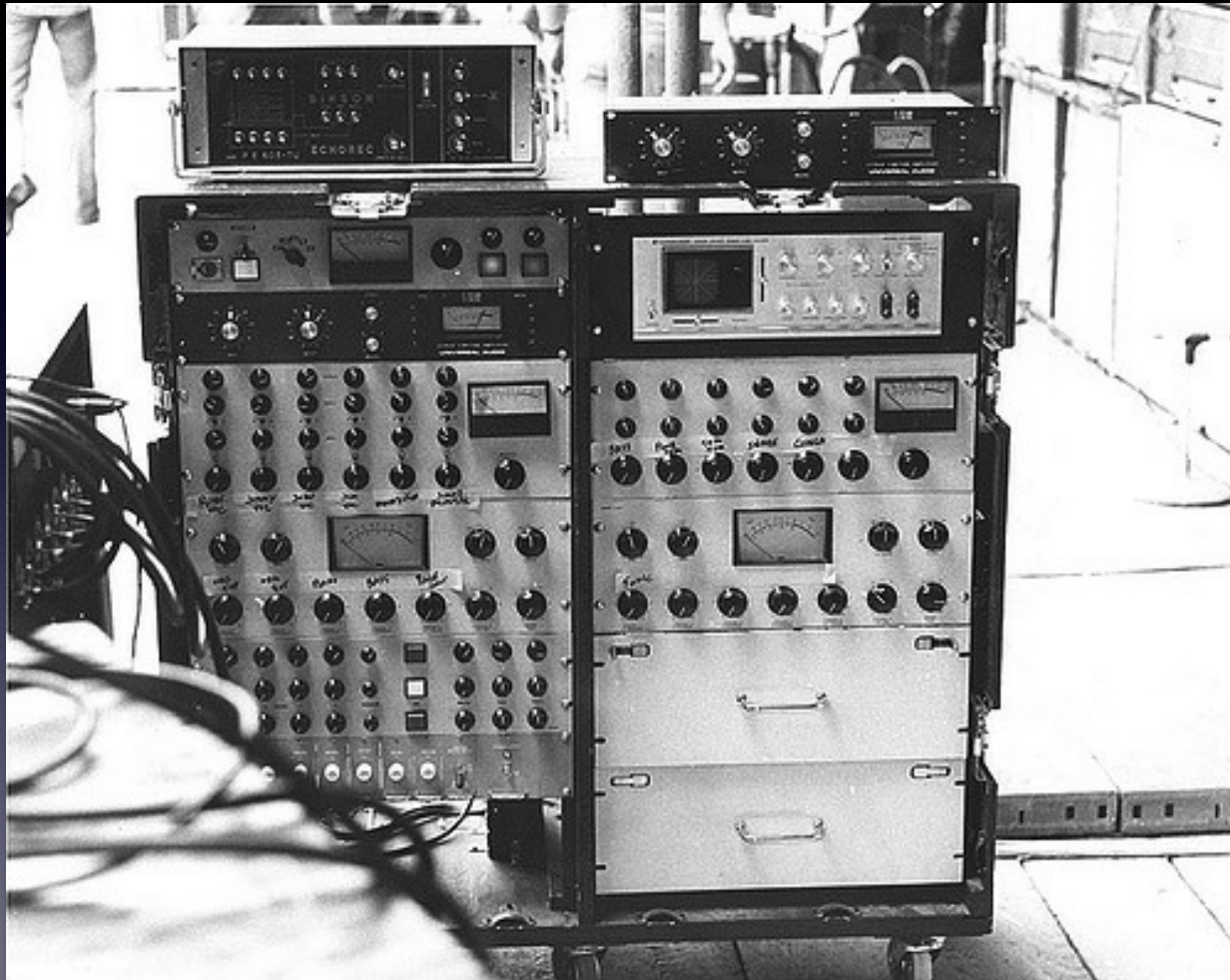


Showco Audio Mixers-1973

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SOUND REINFORCEMENT IN THE 70's



Showco Audio Mixers-1972

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SOUND REINFORCEMENT IN THE 70's



Showco Sound System-1973

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SOUND REINFORCEMENT IN THE 70's



Showco "Super Board"
David Bowie "Diamond Dogs" Tour -1974

MIXING CONSOLES



David Bowie "Sound & Vision" Tour-1990

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MIXING CONSOLES



Faith Hill "This Kiss" Tour 1999-Remote Mixing-ATI Paragon Console

MIXING CONSOLES



Digico SD7



Studer Vista Digital Console



Midas XL8



Yamaha CL5



Soundcraft Si2



Allen & Heath iLive Digital Console

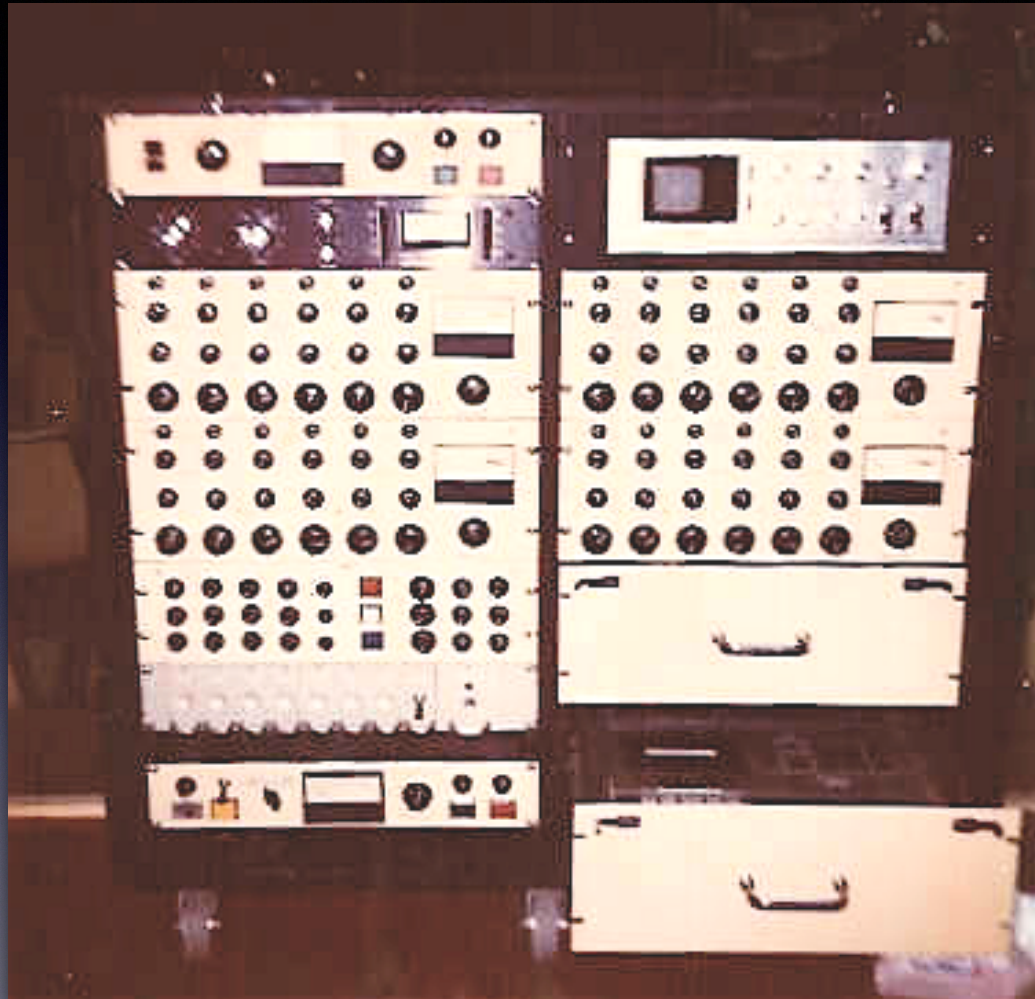
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DIGITAL CONSOLES

Digital Mixing Consoles sales have increased dramatically since their introduction in the 1990s.

WE HAVE COME A LONG WAY!



DIGITAL CONSOLES

The mix style of the person mixing is more important than the make and model of audio console.

DIGITAL CONSOLES

Some live sound professionals agree....

microphones and loudspeakers are a much
greater source of coloration of sound

than the choice of the mix console.

COMPACT MIXERS

SOFTWARE MIXERS

Saving space at the engineer's mix position.

Will we soon reach a point where the sound mixer
will carry his own console?

COMPACT MIXERS



Studer Vista Compact Remote

SOFTWARE MIXERS



Audio Integrated Research

AIR Consoles offer their versions of SAC systems to the industry professional.



SAC by RML Labs

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SOFTWARE MIXERS



Summing engine uses the 64 bit integer math techniques

SAC by RML Labs

SOFTWARE MIXERS



SAC by RML Labs

LINEAR SOUND SYSTEMS

LINEAR SOUND SYSTEMS

Meyer Sound[®]
EXP

Linear, Self-Powered Systems

John Meyer on Cinema Sound

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LINEAR SOUND SYSTEMS

Many benefits to mixing on a well tuned system

Use phase alignment and coverage as first priority

Tune sparingly when using EQ

Tuning with SIM, RTA's, CD's and Voice

Prediction programs-MAPP Online Pro

EQUAL AMPLITUDE SYSTEM TUNING

Working With Linear Sound Systems

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MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

Not the “normal” way of tuning

Why isn't this format accepted?

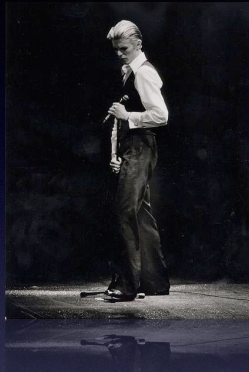
MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

How the “flat response” concept started with me....

MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS



David Bowie-Station to Station Tour 1976

Concert recordings sounded lack of low frequencies due to the fact that the sound system had low-frequency emphasis added during tuning.

MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

Comparisons:

MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

Developing Film



Original



Enhanced

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MIXING ON AN EQUAL AMPLITUDE SYSTEM

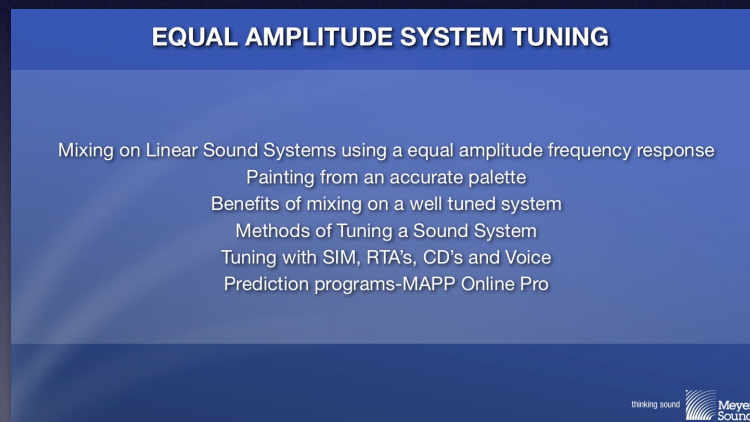
LINEAR SOUND SYSTEMS

Not linear!

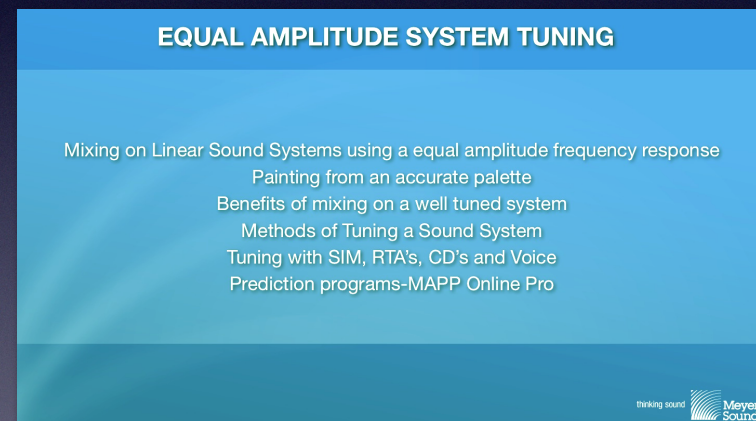
MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

Video Presentation Calibration



Original



Reproduced on another
projection system

MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

Not linear!

MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

However, if color bars were used in creating video material and playback, linear and accurate results can be achieved no matter where the content is presented





**What the color bar is video,
pink noise is the same in audio!**

MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

Taking a live project into a studio....

MIXING ON AN EQUAL AMPLITUDE SYSTEM

LINEAR SOUND SYSTEMS

Testing a new Microphone
or any other sound input...

Without evaluation on an 'equal amplitude' system,
then the results are confusing.

CONTROLLING SUB BASS

CONTROLLING SUB BASS

CONTROLLING SUBS FROM A DEDICATED SEND

Sub Group or Aux Send ???



Mexico City's Auditorio Nacional

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CONTROLLING SUB BASS

CONTROLLING SUBS FROM A DEDICATED SEND

OR NOT...



Mexico City's Auditorio Nacional

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CONTROLLING SUB BASS

Some prefer....

Using Subs as an Effect...

CONTROLLING SUB BASS

I do feel that if an instrument doesn't contain useful and musical sub-frequencies, it has no use in the sub speakers.

Therefore, I use group sends to route certain instruments to the subs. Just as I would route an input channel to calibrate the sound system with an included group send.

SOUND SYSTEM OUTPUT LEVELS

SOUND SYSTEM OUTPUT LEVELS

MOST people I question say that concerts are too loud!

What is the comfortable range?

Powerfulbut not painful or fatiguing!

Look at your audience to help determine a proper sound level

Use delay systems to aid coverage when possible

Learn to pull faders back!

GAIN STRUCTURE

GAIN STRUCTURE

Signal to Noise Ratio
Dynamic Range

GAIN STRUCTURE

CORRECTLY SET:

Good Signal to Noise Ratio

Minimal hiss or noise

Adequate headroom

Highest quality sound

INCORRECTLY SET:

Poor Signal to Noise Ratio

No headroom

Distortion and Clipping

Unnatural Sound

GAIN STRUCTURE

Check the specifications of your console

Test it for yourself to be absolutely sure!

GAIN STRUCTURE

In my point of view, the output meters dictate every build of the gain structure throughout the console.

GAIN STRUCTURE

SOME BASIC PROCEDURES:

Set input trim until signal clips and then back down 3-5db

Bass and snare drum to clip? Analog-Yes/Digital-No

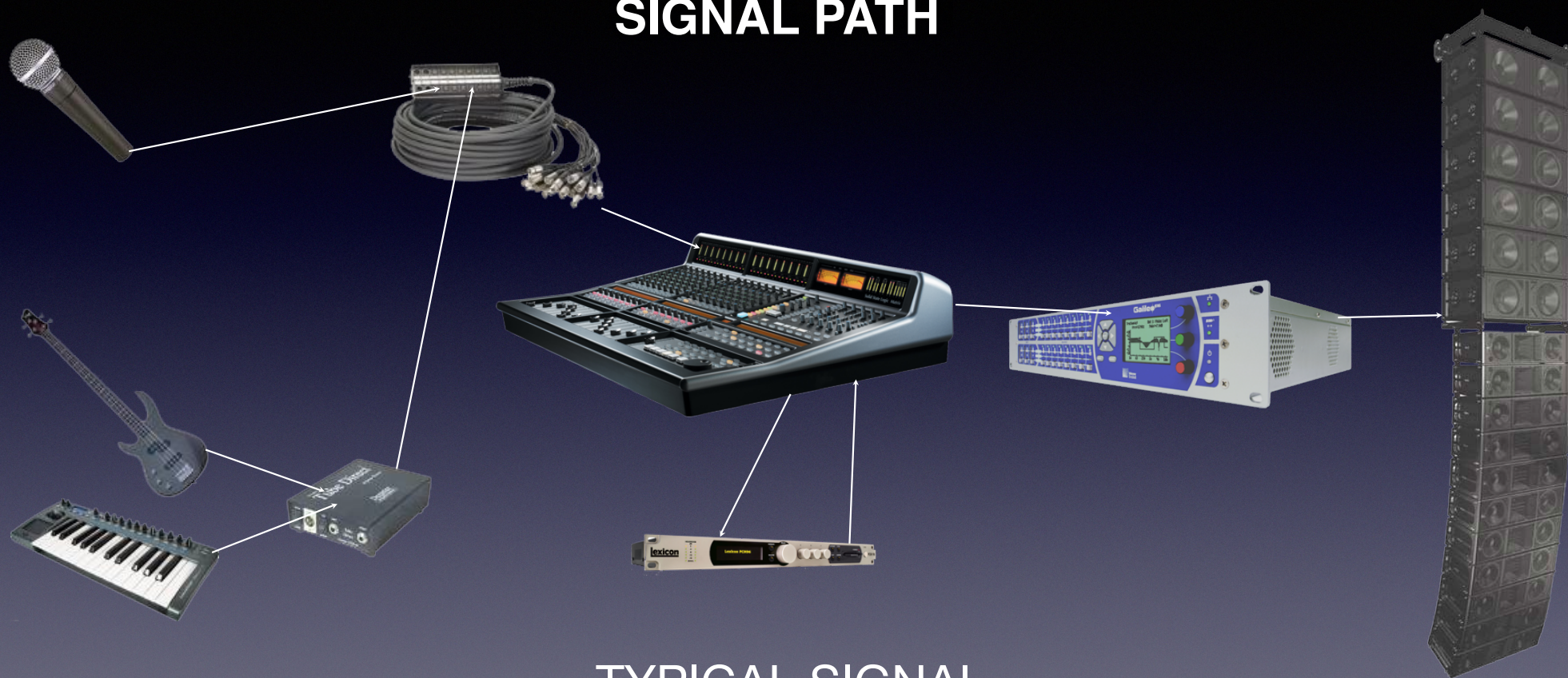
Use input faders near unity or “0”

Use Master Fader at 0db or unity gain

Use matrix outputs or System Management
to set output level to sound system to desired volume level

GAIN STRUCTURE

SIGNAL PATH

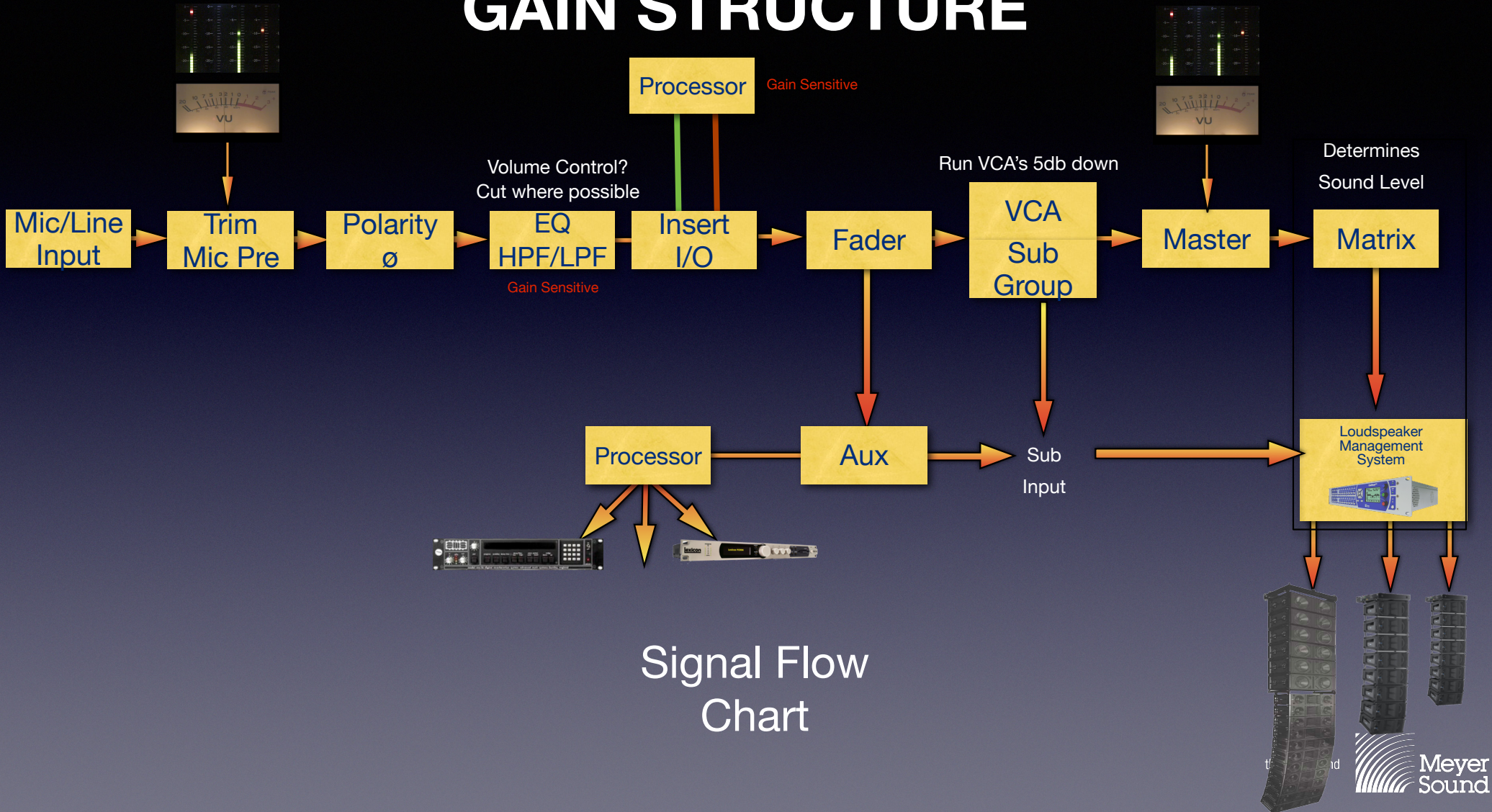


TYPICAL SIGNAL
FLOW

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GAIN STRUCTURE



GAIN STRUCTURE

You can make this as simple
or difficult as you like.....

Use whichever method you feel most effective with.

Be Comfortable!

Don't forget to listen!!!!

GAIN STRUCTURE

Using gain of inserted compressors to increase/decrease gain in channels



GAIN STRUCTURE



SIGNAL PROCESSING COMPRESSORS

SIGNAL PROCESSING COMPRESSORS

**One of the most misunderstood
of all the audio processors**

SIGNAL PROCESSING COMPRESSORS

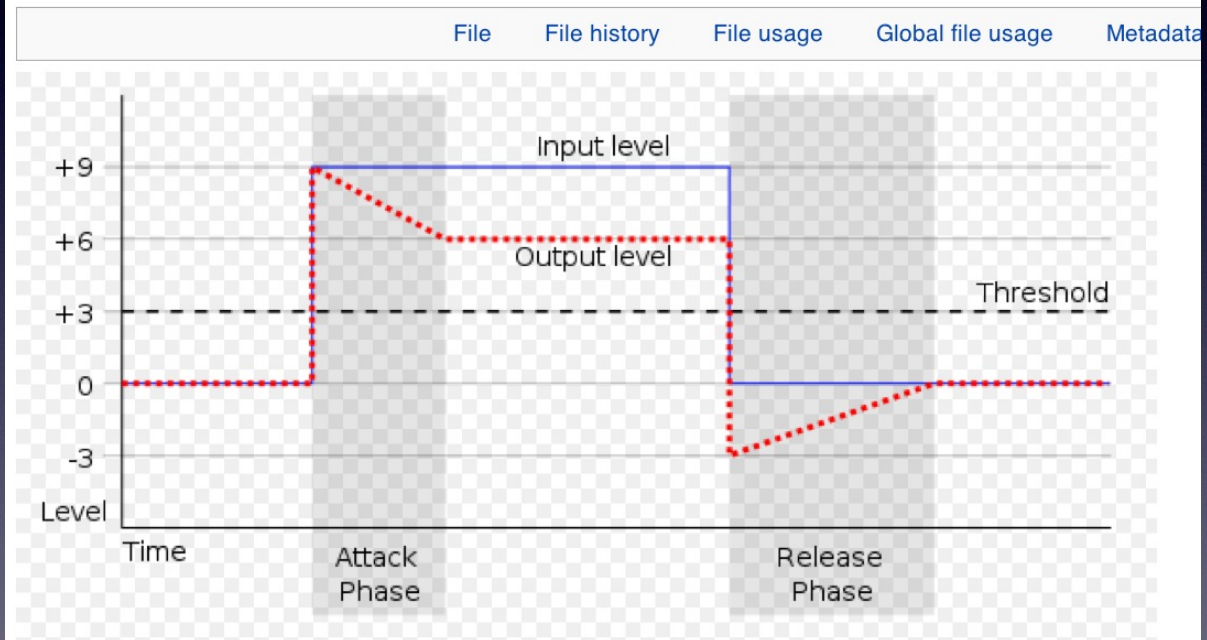
**Practically all music we hear
is compressed.**

SIGNAL PROCESSING COMPRESSORS

**Difference between
compression and limiting?**

SIGNAL PROCESSING COMPRESSORS

From Wikipedia, the free encyclopedia



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SIGNAL PROCESSING COMPRESSORS



UREI 1176LN

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SIGNAL PROCESSING COMPRESSORS



UREI LA-4

SIGNAL PROCESSING COMPRESSORS



API2500

SIGNAL PROCESSING COMPRESSORS



DBX-162

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SIGNAL PROCESSING COMPRESSORS



API 2500 Plugin Waves

SIGNAL PROCESSING COMPRESSORS



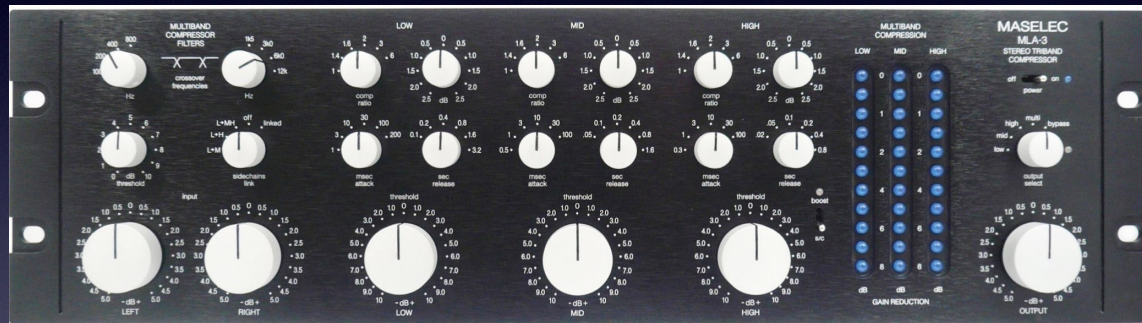
SSL Comp-Plugin Waves

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SIGNAL PROCESSING COMPRESSORS

Hardware Multi-band Compressors



PrismSound Maselec MLA-3

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SIGNAL PROCESSING COMPRESSORS

Hardware Multi-band Compressors



Prism MEA-2

SIGNAL PROCESSING COMPRESSORS



Multi-band Compression

SIGNAL PROCESSING COMPRESSORS

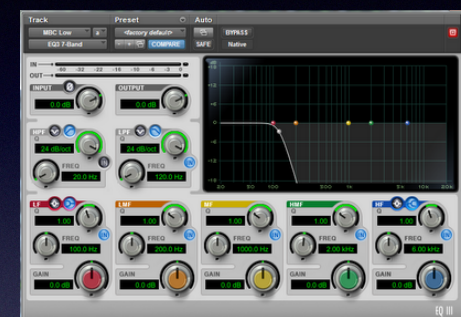
DiGiCo SD Consoles



A&H iLive



ProTools



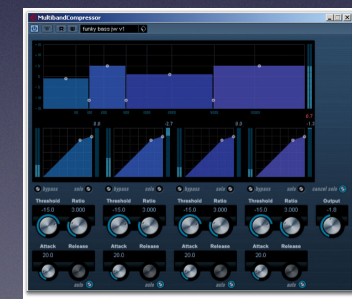
McDSP MC2000



Waves C6



Cubase



Software Multi-band Compressors/Expanders

PLUGINS



Waves Audio C6 Multiband Compressor



Waves Audio InPhase



Waves Tony Maserati Collection



Waves Apex Vintage Aural Exciter

PLUGINS

An amazing advancement in audio processing!

PLUGINS

Be careful and don't be guilty of mixing with your eyes
and not your ears!!!

PLUGINS



Blue Cat Audio Blue Cats All Plug-ins Pack



Metric Halo Labs Production Bundle

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SIGNAL PROCESSING GATES

GATES

SIGNAL PROCESSING GATES

Noise gate

From Wikipedia, the free encyclopedia



This article **needs additional citations for verification**. Please help [improve this article](#) by [adding citations to reliable sources](#). Unsourced material may be [challenged](#) and [removed](#). *(August 2007)*

A **noise gate** or **gate** is an [electronic device](#) or [software](#) that is used to control the [volume](#) of an [audio signal](#). **Gating** is the use of a gate. Comparable to a [compressor](#), which attenuate signals *above* a threshold, noise gates attenuate signals that register *below* the threshold.^[1] However, noise gates attenuate signals by a fixed amount, known as the range. In its most simple form, a noise gate allows a [signal](#) to pass through only when it is above a set threshold: the gate is 'open'. If the signal falls below the threshold no signal is allowed to pass (or the signal is substantially attenuated): the gate is 'closed'.^[2] A noise gate is used when the level of the 'signal' is above the level of the '[noise](#)'. The threshold is set above the level of the 'noise' and so when there is no 'signal' the gate is closed. A noise gate does not remove noise from the signal. When the gate is open both the signal and the noise will pass through. Gates typically feature 'attack', 'release', and 'hold' settings and may feature a 'look-ahead' function.^[3]

SIGNAL PROCESSING GATES



GATES

SIGNAL PROCESSING GATES



QUICK SETTINGS

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MIXING SUGGESTIONS

The most important word in tour mixing is consistency

Get stage sound and monitor in control first!

Scan the mix continuously

Attention must remain on the console at all times!

Mix musically instead of technically

MIXING SUGGESTIONS

Panning preference-Visual perception

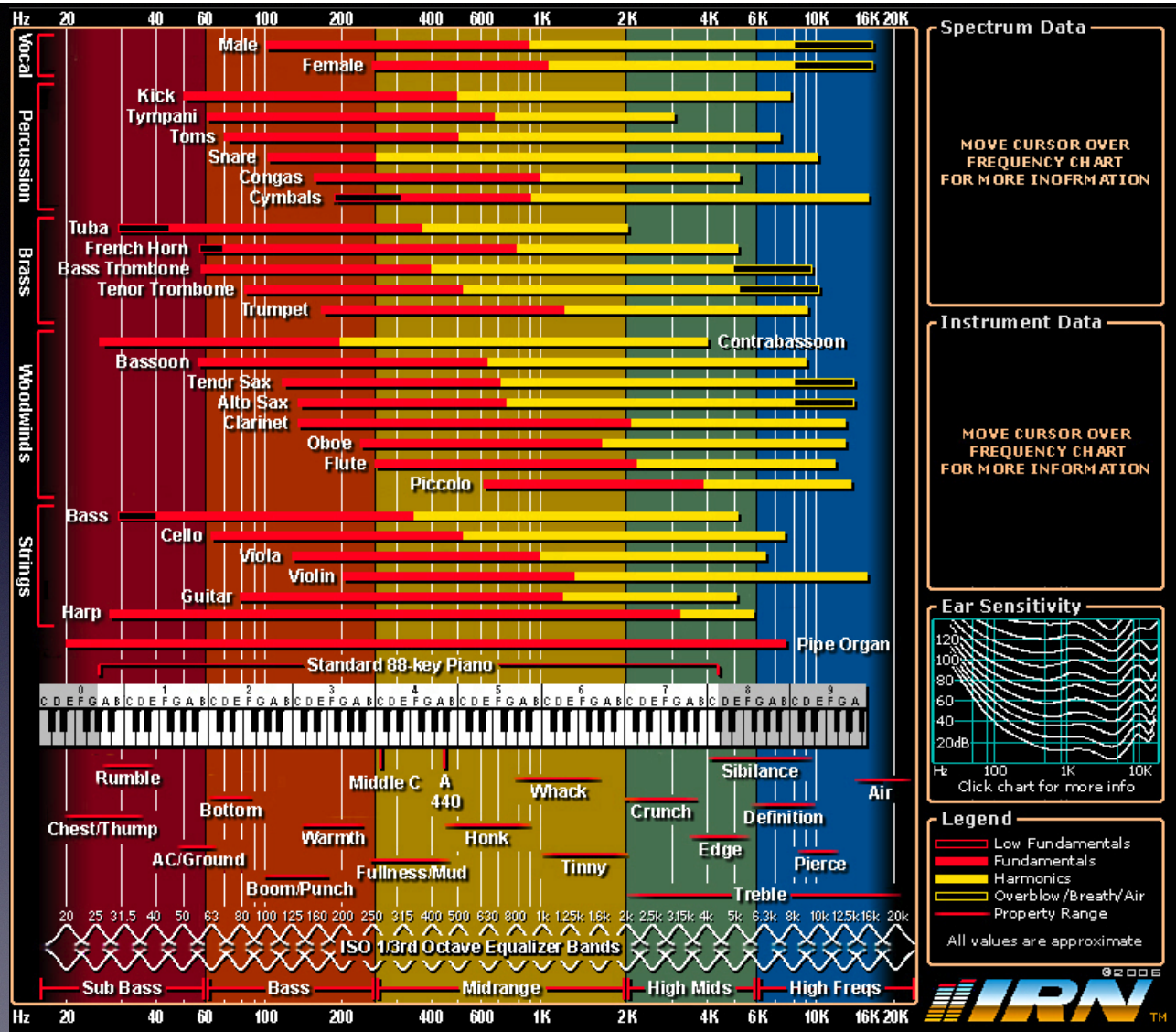
Mix from VCA's

Recognizing distortion and feedback.....

Know when to EQ the system or the input channel

Understand frequency boundaries of musical instruments

Learn to identify frequencies

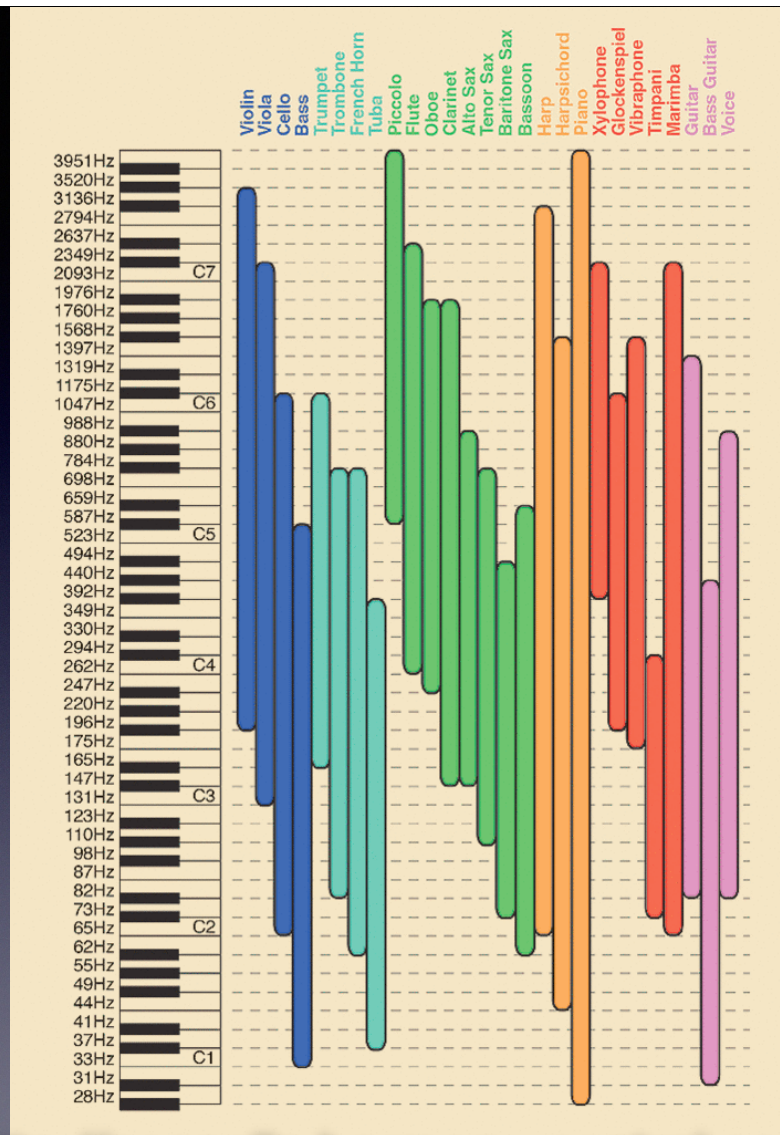


Instrument Frequency Chart

http://www.independentrecording.net/irn/resources/freqchart/main_display.htm

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Meyer Sound



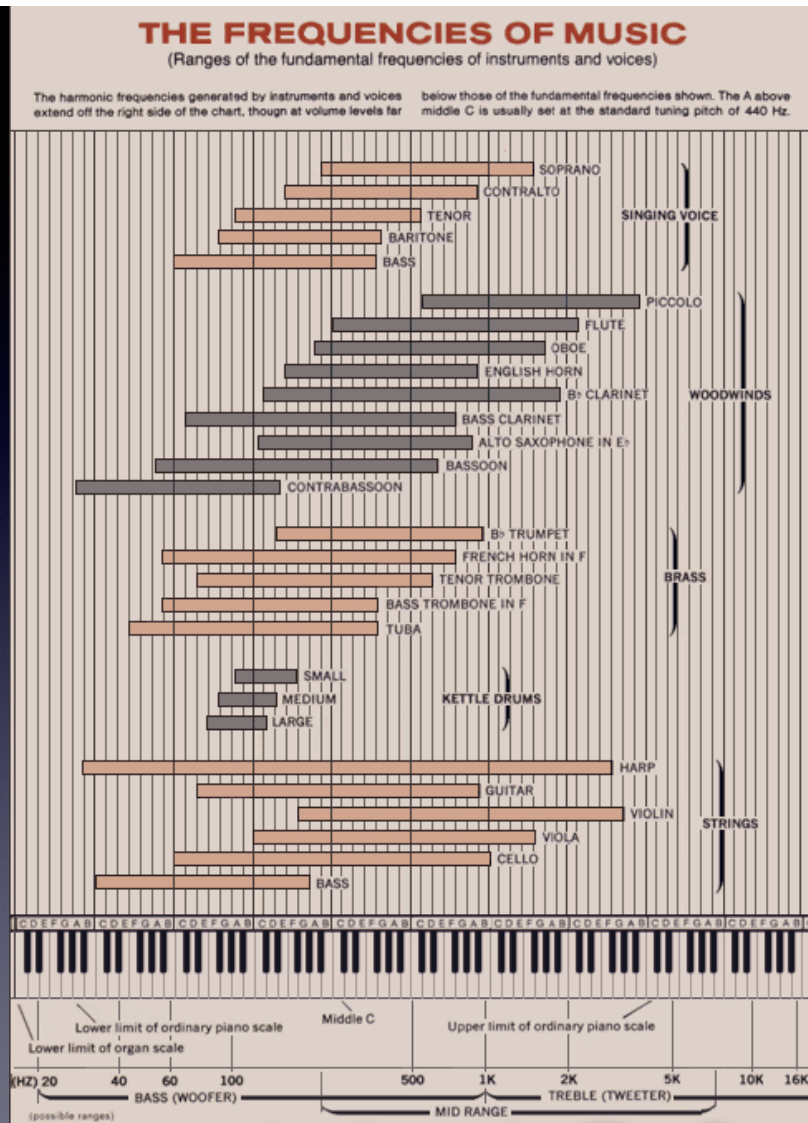
Instrument Frequency Chart

<http://acapella.harmony-central.com/>

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Review, April 1980



Instrument Frequency Chart

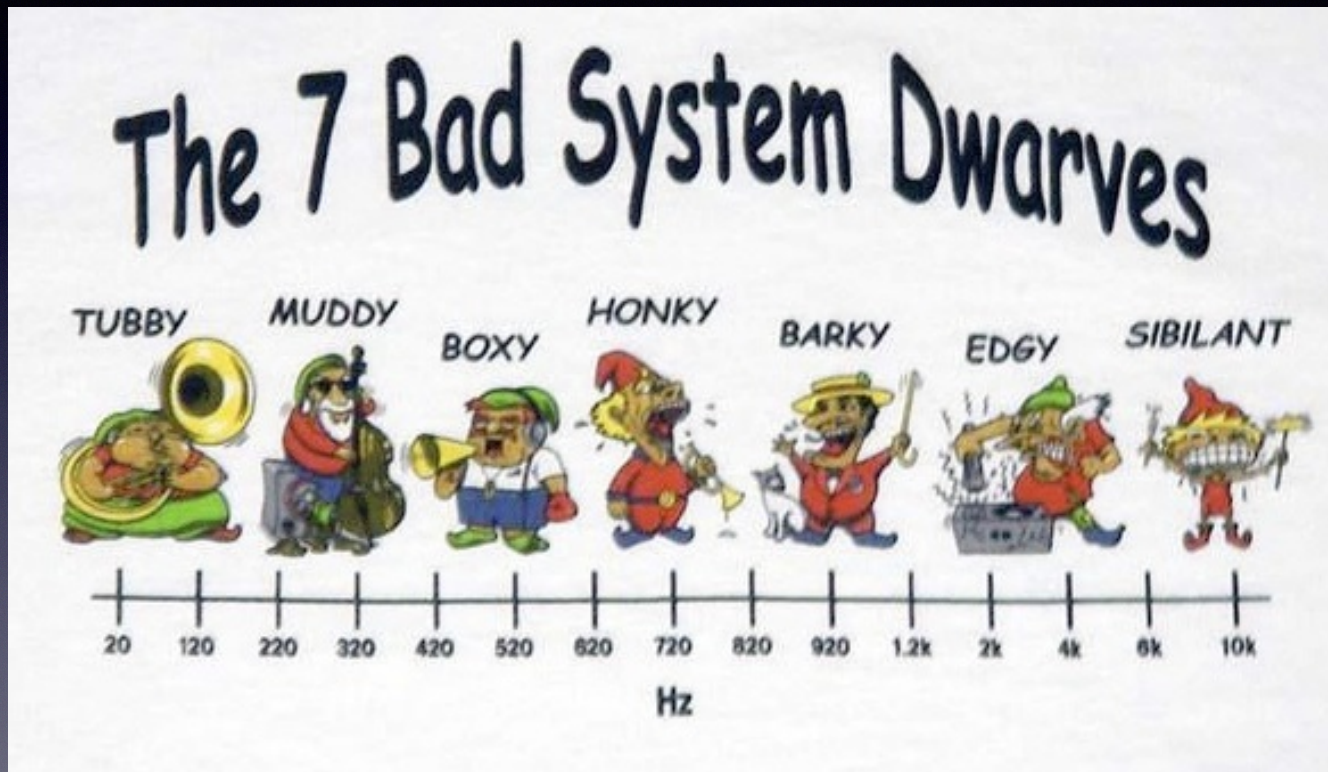
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<http://www.psbspeakers.com/audio-topics/The-Frequencies-of-Music>

MIXING TECHNIQUES

7 Bad System Dwarves T-Shirt



<http://www.rationalacoustics.com/store/goodies/7-bad-system-dwarves-t-shirt.html>

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CONSOLE SETUP PROCEDURE

COMBAT AUDIO

Pulling together the quickest possible mix

Before the band arrives you can.....

Use colors in labeling console

Bass	Kik	Snr	Hat	Tom1	Tom2	OverL	OverR	EGtr1	EGtr2	Acous	KeysL	KeysR	B3Lo	B3Hi	BG1	BG2	Voc
------	-----	-----	-----	------	------	-------	-------	-------	-------	-------	-------	-------	------	------	-----	-----	-----

Assign inputs by group/vca/color

Set to stereo and/or matrix outputs

Set high/low pass filters

Set pan positions

Preset EQ per channel

Check all insert patching, buttons and then devices

Set input trim (estimate)

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SOUNDCHECK PROCEDURE

Drums first

Bass Drum, Snare, Hat, Toms, Overheads

Bass Guitar

Check Bass Guitar level along with bass drum

Instruments

Guitars

Keyboards

Backing Vocals

Individually then a cappella

Duck when not in use

All instruments play together-Listen without vocal bleed

Lead Vocal

Add BG's and then main vocal

An example of a soundcheck procedure

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SOUNDHECK PROCEDURE

Drums first

Bass Drum, Snare, Hat, Toms, Overheads

Bass Guitar

Check Bass Guitar level along with bass drum

Instruments

Guitars

Keyboards

Backing Vocals

Individually then a cappella

Duck when not in use

All instruments play together-Listen without vocal bleed

Lead Vocal

Add BG's and then main vocal

Start with Vocal first?
Start with Bass Guitar first?

Well worth considering!

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MICROPHONE TIPS

MICROPHONE TIPS

MICROPHONE CHOICE AND PLACEMENT

Listen first!

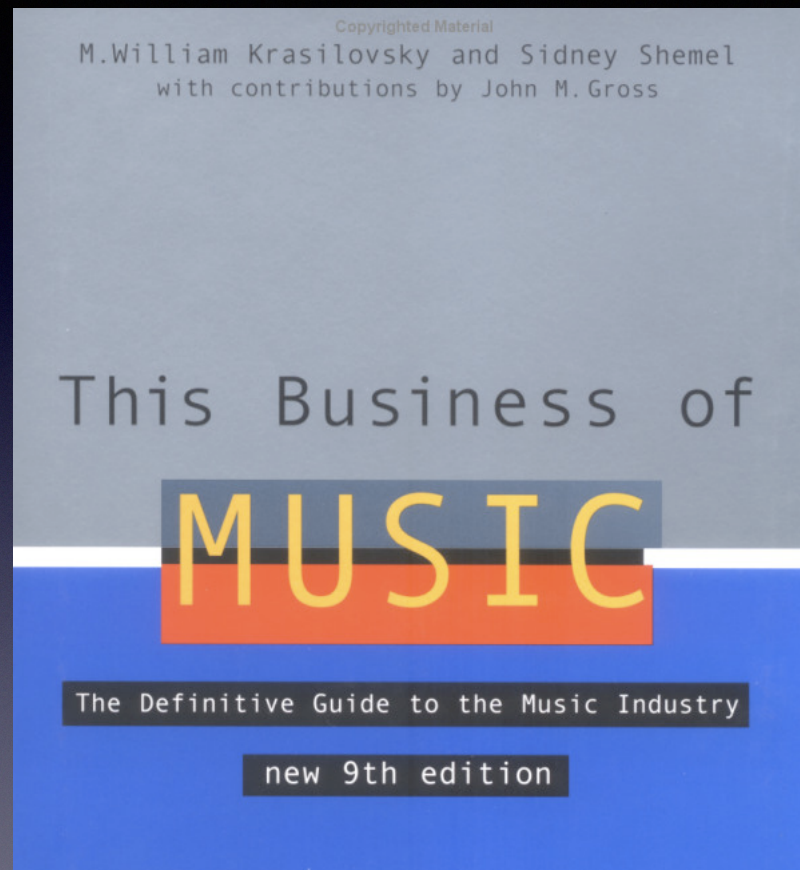
Learn your microphone choices

Experiment with mic placement

COMMUNICATION WITH THE ARTIST

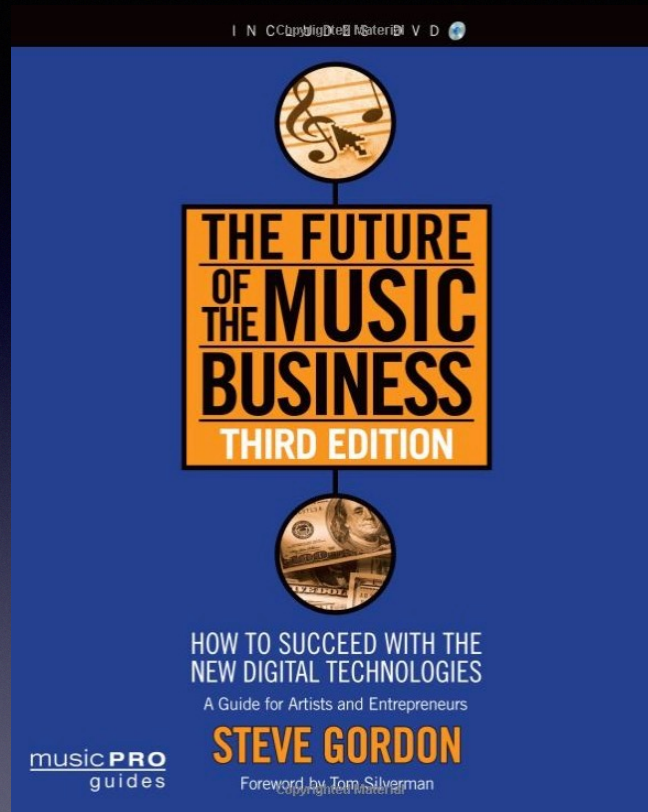
Something that is absolutely essential if
you would like to keep working!

BUSINESS EDUCATION



This Business of Music!

BUSINESS EDUCATION



This Business of Music!

Things that important to know if you
work in the music business!

MIXING IN SURROUND

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MIXING IN SURROUND

**DON'T FEEL SURROUND SOUND
IS TOO EXPENSIVE OR IMPRACTICAL**

MIXING IN SURROUND

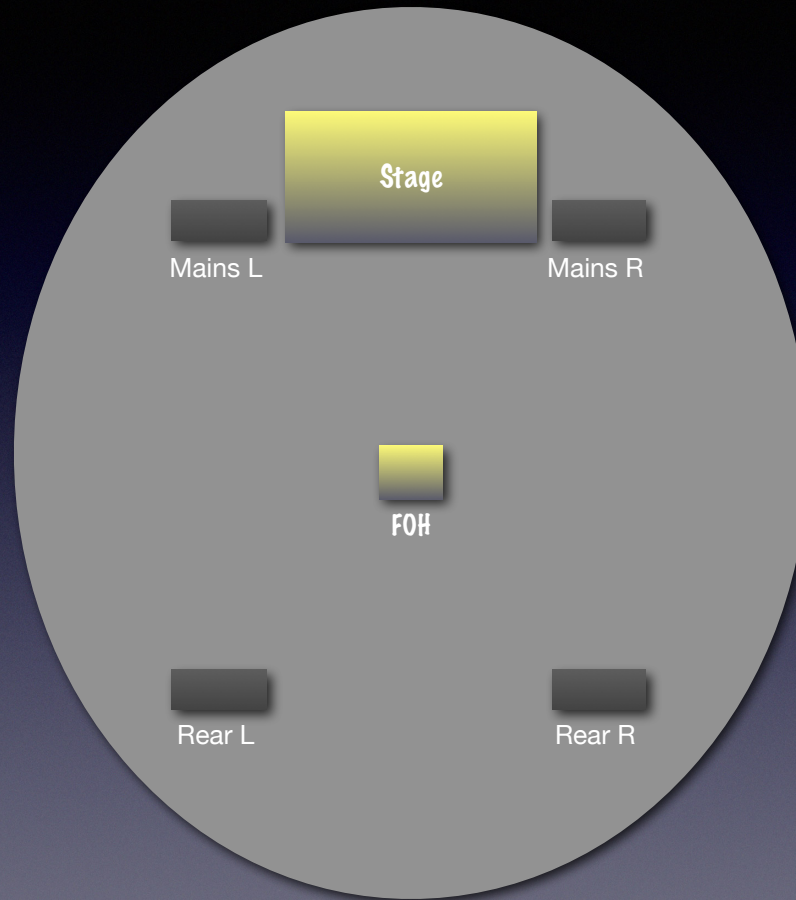


Pink Floyd "Momentary Lapse of Reason" Tour 1987-89

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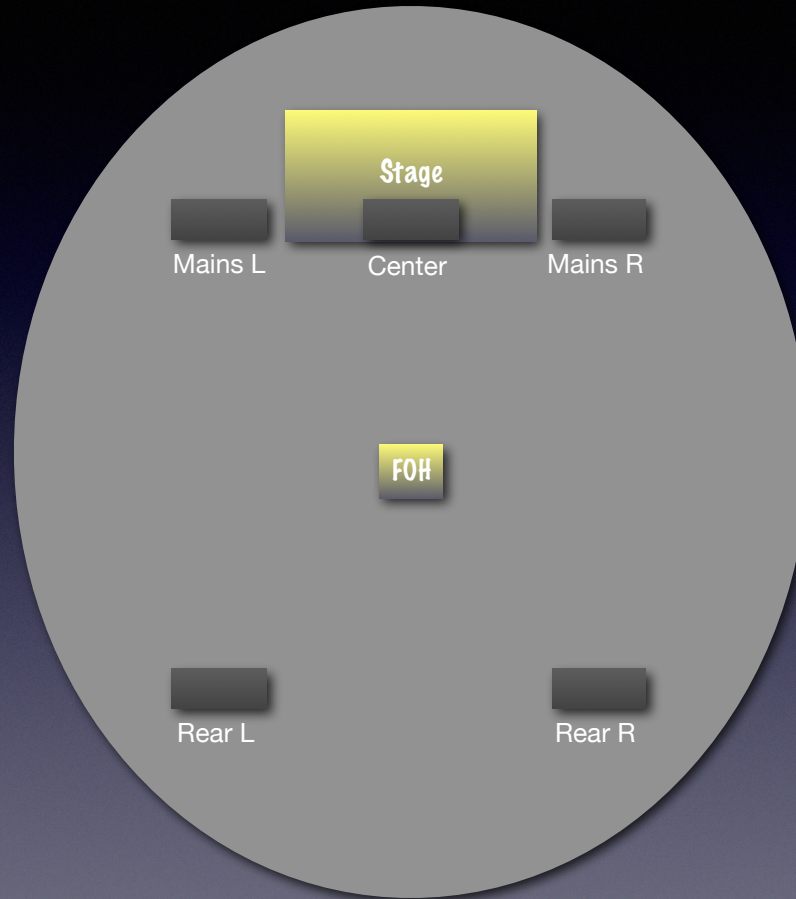
MIXING IN SURROUND



Typical Quad Setup

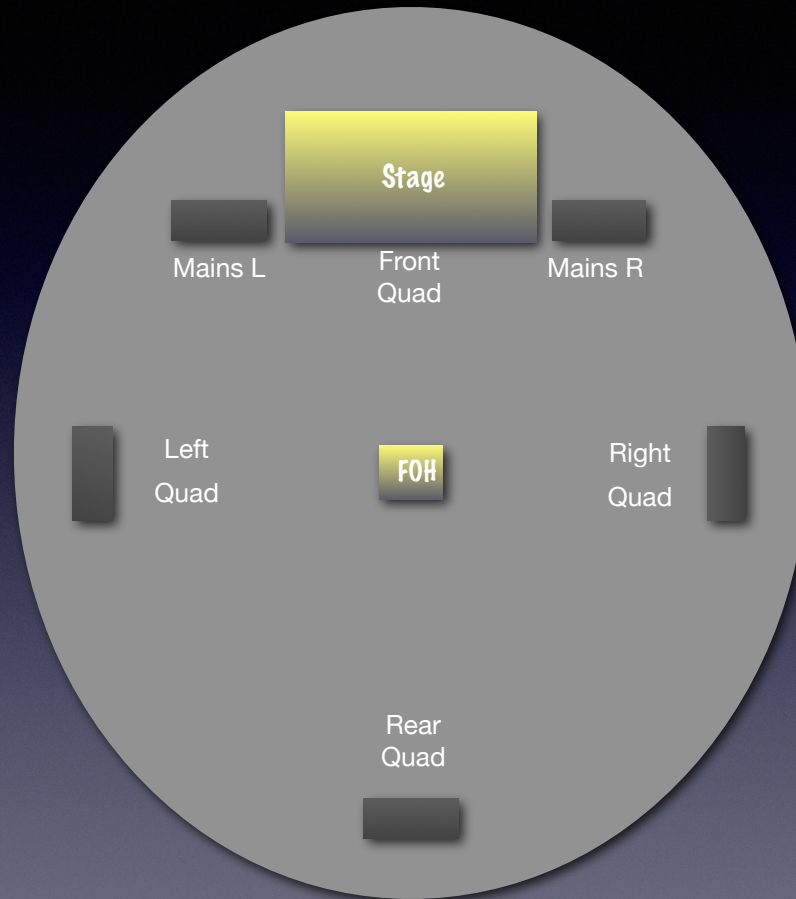
MIXING IN SURROUND

Typical 5.1 Setup



MIXING IN SURROUND

FLOYD.1 Setup



IN THE STUDIO

IN THE STUDIO

Your still mixing music!!!

Whether in a controlled environment or on the road,
we are balancing a musical formula created by the artist!

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MIXING IN THE FUTURE

Necessities for modern touring

Systems must be very high quality, quick and easy to setup and reliable

Self-powered systems are a tremendous advantage

Large productions take time from soundcheck and system tuning....

Know your smartest options!

Some Final Thoughts...

IN CLOSING

Some Final Thoughts...

Continue Your Education!

IN CLOSING

Some Final Thoughts...

Positive Attitude

Remaining Calm During A Crisis

IN CLOSING

Some Final Thoughts...

Don't mix with your eyes, mix with your ears!

IN CLOSING

Some Final Thoughts...

Constantly Increase Your Industry and Product Awareness!

IN CLOSING

Some Final Thoughts...

Protect Your Hearing!!!!

Better Hearing Institute

House Ear Institute

H.E.A.R. Hearing and Education Awareness for Rockers

<http://www.betterhearing.org/index.cfm>

<http://www.hei.org/news/facts/nihlfact.htm>

http://www.hearnet.com/at_risk/

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IN CLOSING

Some Final Thoughts...

As quoted by Bill Evans of FOH Magazine:

**“Touring is, by it’s nature,
moments of intense stimulation and reward
surrounded by hours and hours of mind-numbing boredom.”**

IN CLOSING

Some Final Thoughts...

Manage your time wisely while on tour!
Take care of your mind and body!

IN CLOSING

Some Final Thoughts...

Pursue your dreams! They can happen!

THANKS TO:

***My Family-Marianne, Hana and Cooper Jones
Gavin Canaan-Meyer Sound/Education Director
Jason McCarrick-Education Event Coordinator
Christian Jung-Meyer Sound/Education Department Europe
Ryan Smith-Shure Microphones Nashville
Matt Larson-Group One/DiGiCo
Ryan Shelton-Group One/DiGiCo***

***Showco-Rusty Brutche, Jack Maxson, Jack Calmes
and all the ARTISTS I have been so fortunate to tour with.***

Thank You!

Special Thanks
to
John and Helen Meyer

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REFERENCES:

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Roy Osborn, "The basics of live sound" www.audiopro.us/live-sound-basics

Curt Taipale, "Maximizing Your Console", www.churchsoundcheck.com/myc

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