Signal Processors

- Equalization
- Time Based
- Dynamics
- Special Effects

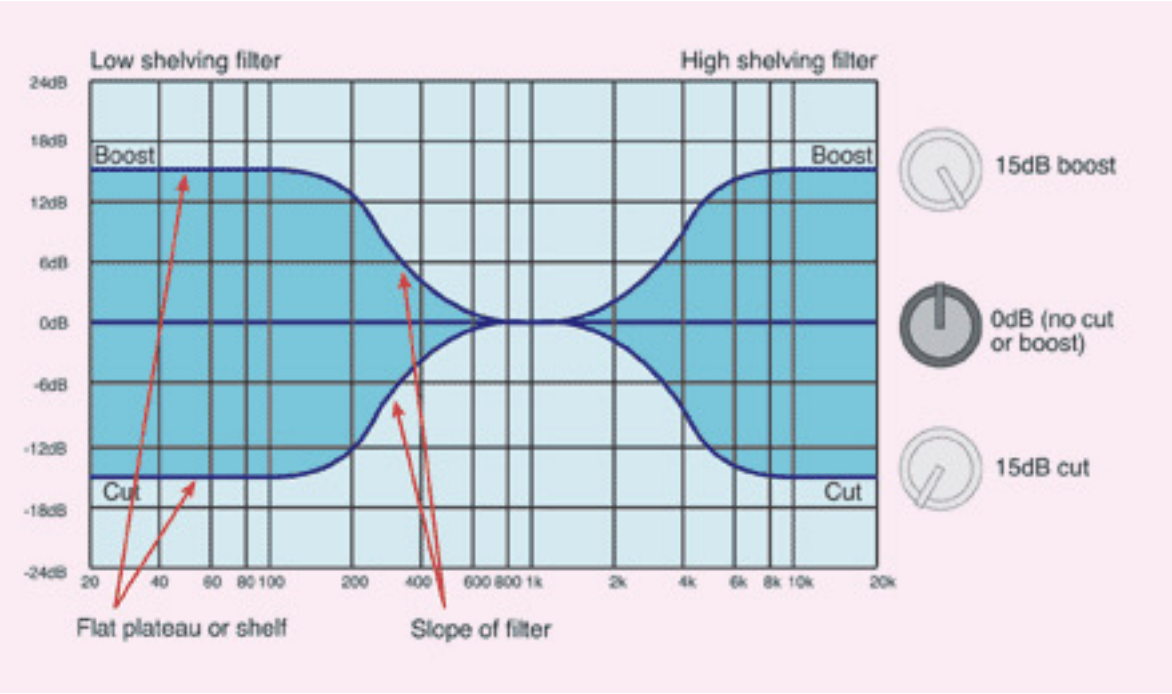
EQ-Equalization

- Changes Tone Color / Timbre
- Enhances or Reduces Specific Frequencies
- Equalizers Parameters = Freq, Gain, Bandwidth (Q)
- The Higher the Q number the narrower the Q (The less frequencies affected)

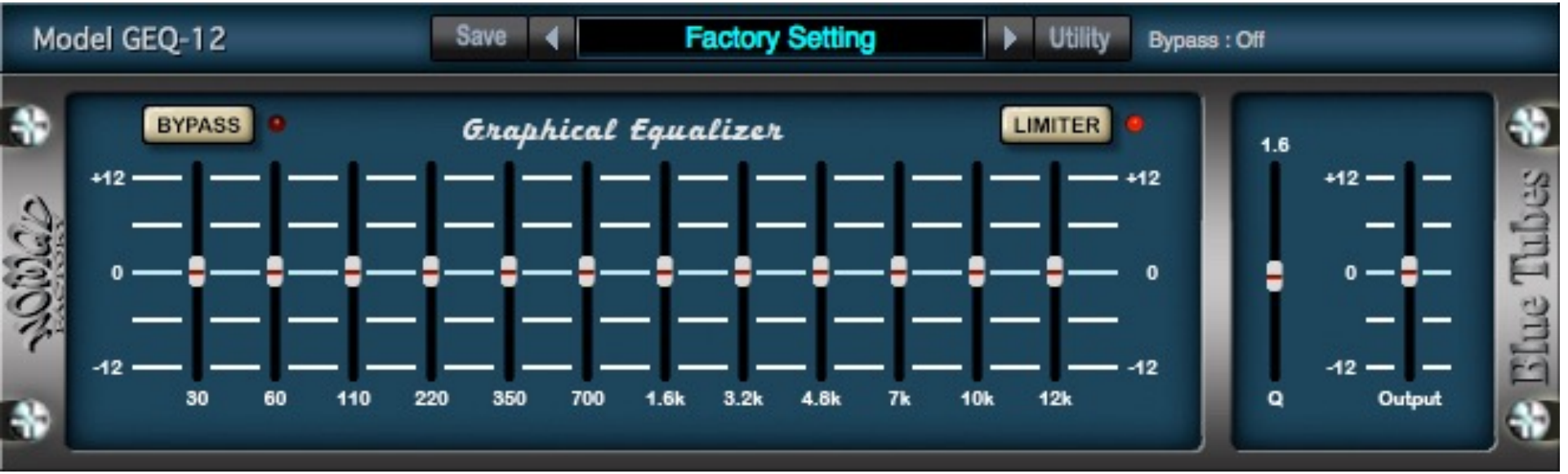
Fixed-Frequency

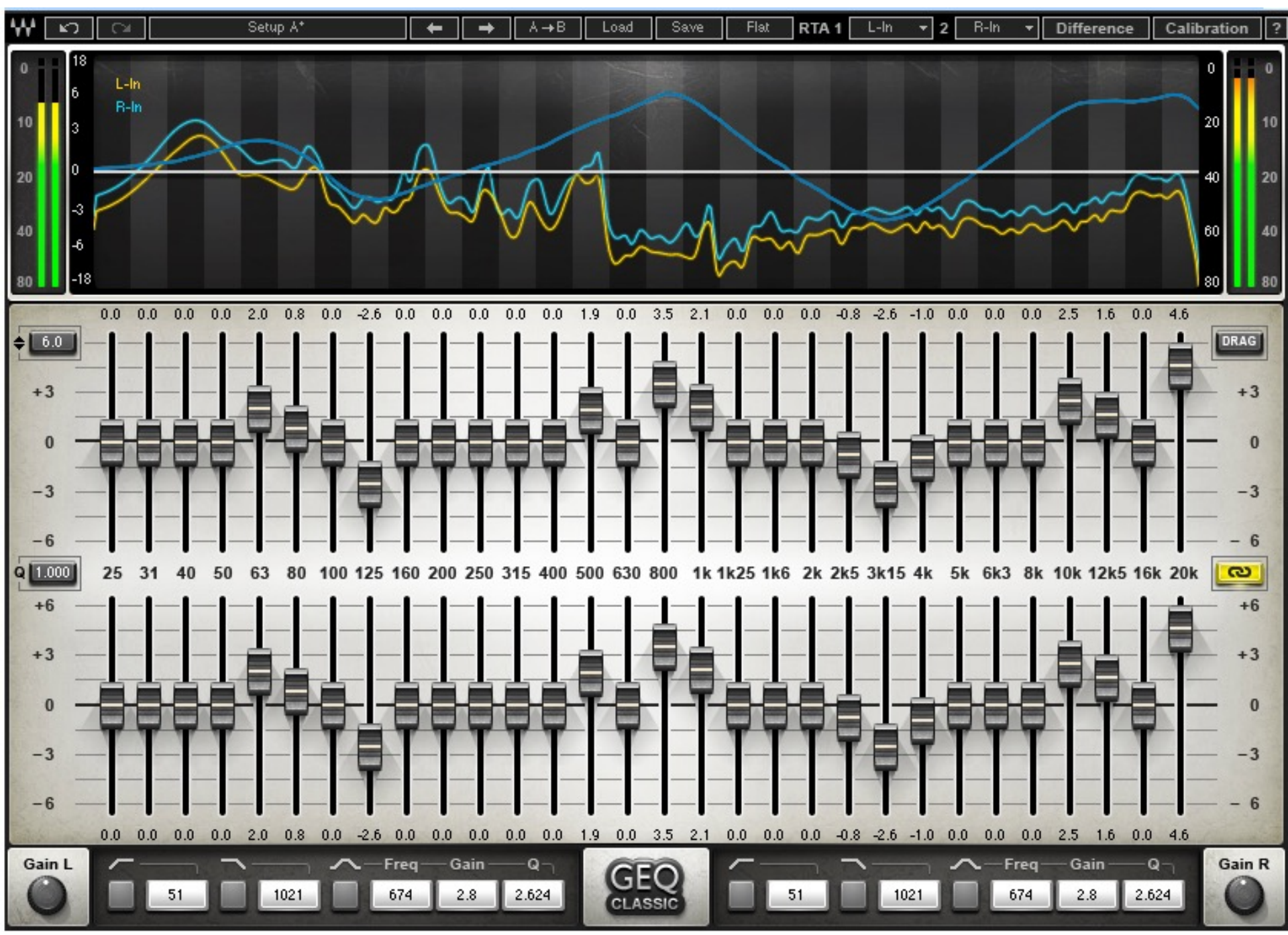
- Tone Controls
- Treble & Bass

Shelving


Low shelving filter
High shelving filter
24dB
18dB
12dB
6dB
0dB
-6dB
-12dB
-18dB
-24dB
Boost
Boost
Cut
Cut
20
40
60
80
100
200
400
600
800
1k
2k
4k
6k
8k
10k
20k
Flat plateau or shelf
Slope of filter
15dB boost
0dB (no cut or boost)
15dB cut

Graphic Equalizer




Setup A*
A→B
Load
Save
Flat
RTA 1
L-In
2
R-In
Difference
Calibration
?
L-In
R-In
DRAG
Q
1.000
25 31 40 50 63 80 100 125 160 200 250 315 400 500 630 800 1k 1k25 1k6 2k 2k5 3k15 4k 5k 6k3 8k 10k 12k5 16k 20k
Gain L
Freq
Gain
Q
51
1021
674
2.8
2.624
GEQ CLASSIC
Gain R

Parametric Equalizer

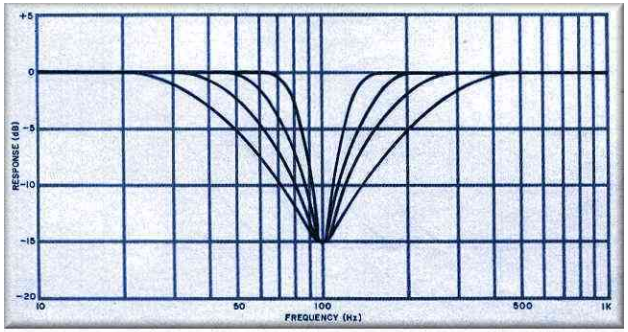


Fig. 4: Response curves showing the effect of varying the bandwidth of a midrange dip.

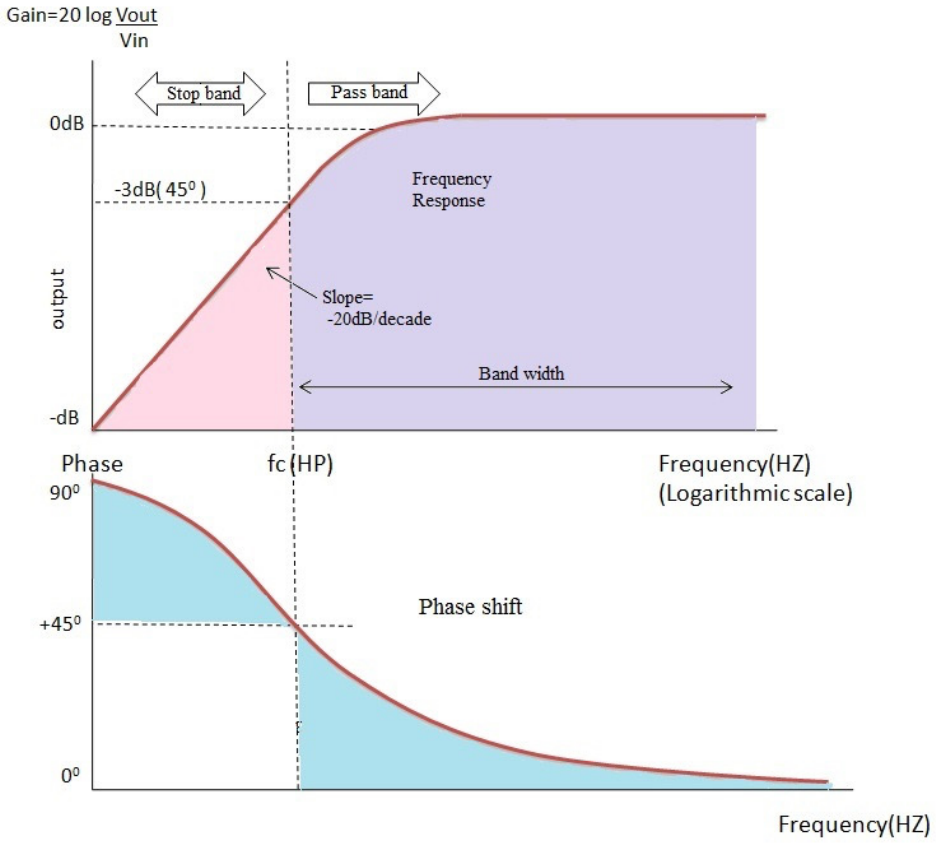
Full Presence Range

- 1,000 to 5,000
- Will help a sound “Come forward” in a mix.
- Start around 2.5K

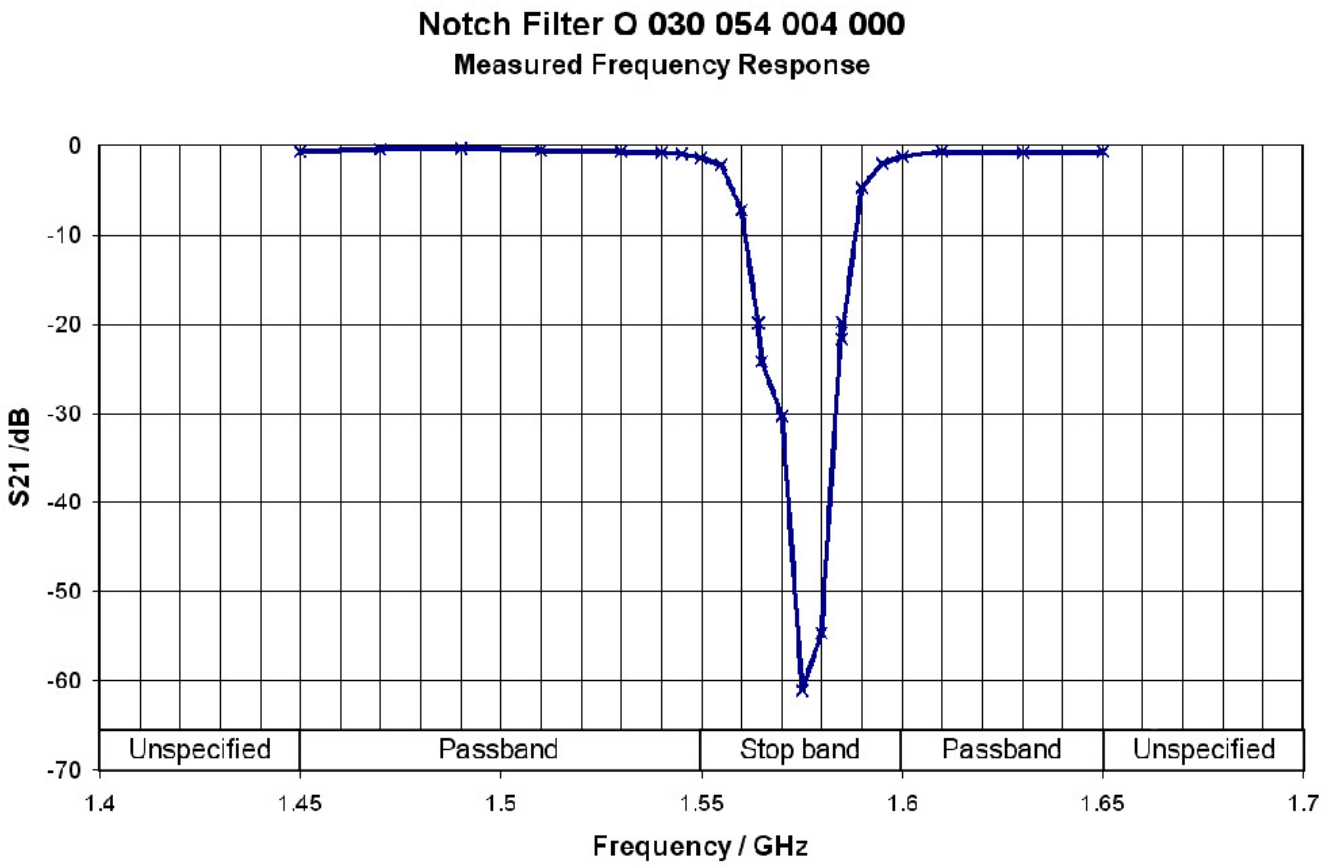
Filters

- Equalizers attenuate or add gain to frequencies
- Filters attenuate (usually very sharply) frequencies

High and Low Pass Filters



Notch or Dip Filter



Time Processors

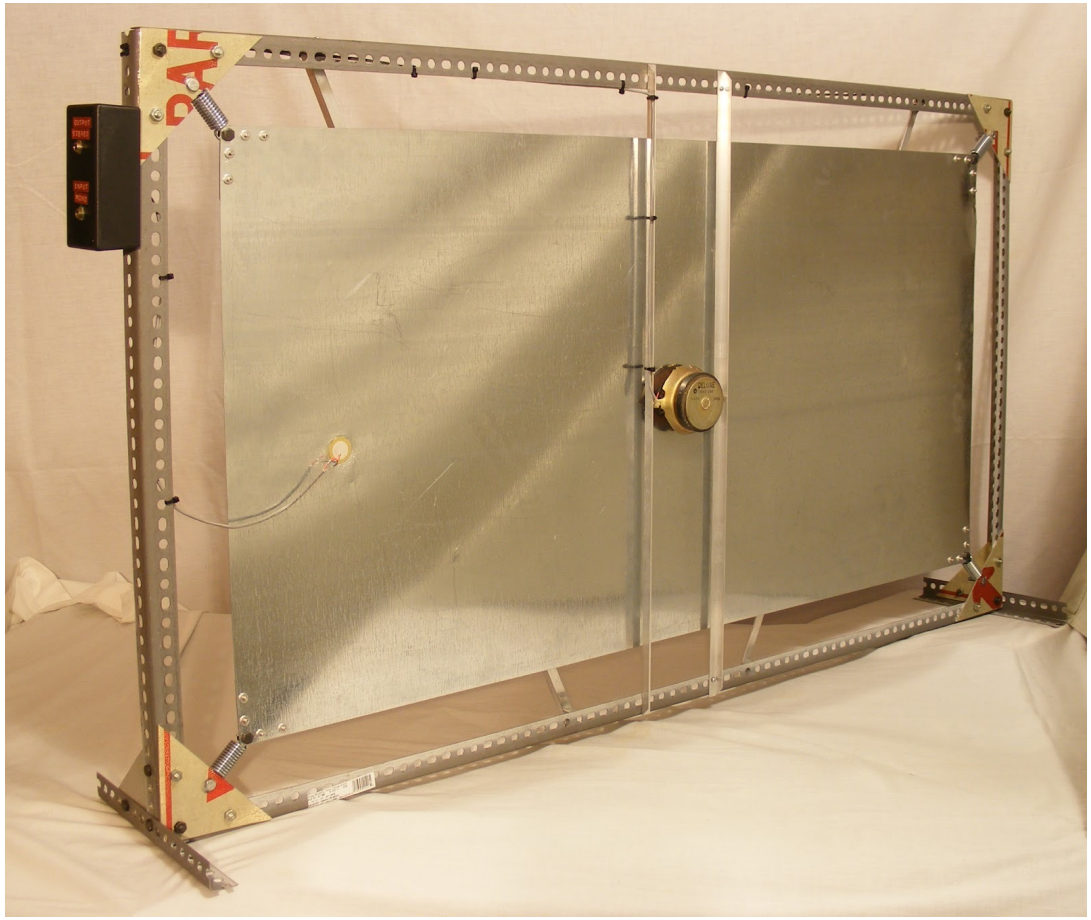
- Reverb
- Delay (Echo)
- This effects is usually put on an AUX BUS
- Sound is sent to bus DRY and returned WET (after reverb or delay is added)

Convolution Reverb

- Sample based
- Acoustic space
- Impulse response (IR)

Acoustic Chamber Reverb

Plate Reverberation



Delay (Echo)

- Often used to add ambience
- Doubling (fatten sound)
- Chorus (one voice like many)
- Slap back echo (distinct echo)
- Preverb delay (signal is delayed before it reaches the digital reverb unit or plugin and sound is usually more natural.

Special Effects

- Flanging
- Phasing
- Morphing

Dynamic / Amplitude Processors

- Compressor

- Compression Ratio
- Compression Threshold –Knee(Hard/Soft)
- Attack Time
- Release Time

Compressors

- A fast release time combined with low compression ratio makes a signal seem louder than it is.
- A longer release time smooths a fluctuating signal

- Bus Compression

Limiter

- Compression without compromise
- A compressor whose output stays at or below a preset point regardless of input level.
- Any compression over a 10:1 ratio is limiting.

Some uses of Compression/Limiting

- Compression minimizes the wide changes in loudness levels caused when a performer fails to maintain a constant mic-to-source distance.
- Compressing speech or singing brings it forward and helps it jump out of the overall mix.
- Limiting prevents high sound levels from recording at too high a level.

Continued

- The combination of compression and limiting can add more power and apparent loudness to sound

- Compression in commercials is used to raise average output levels and thus sonically capture audience attention

Expander

- Opposite of compression
- Gets rid of low frequencies

Noise Gate

- Is to Expander what Limiter is to Compression
- Gets rid of sounds below a set level

Side-Chain Processing (Key)

- Lets one channel control the signal processing of another.

Pitch Shift

- Using both compression and expansion to change the pitch of the signal.

- Auto-Tune (Antares)

Some Other Processors

- De-esser (hissy consonant sounds – s,z,ch,sh)
- Noise Processors

Audio Plugins

- Three basic functions:
- 1) Analyze existing audio samples.
- 2) Generate new audio samples:
- (Virtual Instruments)
- 3) Those that transform existing audio samples.

Most Popular Plugin Formats

- 1) VST
- 2) AU
- 3) RTAS
- 4) AAX

VST

- Virtual Studio Technology
- VST 2 and VST 3
- Steinberg
- Transformative and Synthesis
- Mac OS X and Windows

AU

- Audio Units
- Apple
- Transformative and Synthesis
- Mac OS X

RTAS

- Real Time AudioSuite
- Avid
- Transformative and Synthesis
- Mac OS X and Windows

AAX

- Avid Audio eXtension
- AAX DSP and AAX Native
- Avid
- Transformative and Synthesis
- Mac OS X and Windows

Initials

- DAW – Digital Audio Workstation
- DSP – Digital Signal Processing (Plugins)