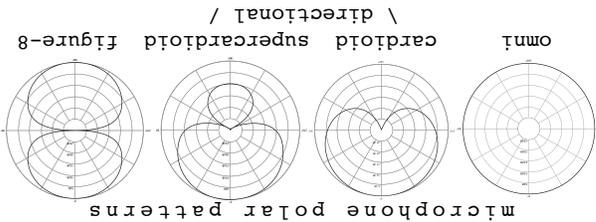


Sound Reinforcement: a creative task! there is no right way!

- resource = Shure publication "Audio Systems Guide for Music Educators"
- when powering up = turn amplifiers (powered speakers) on LAST and off FIRST
- describing sound waves = frequency, wavelength, amplitude, envelope (ADSR), harmonic content

Parts of the system (in order from performer's mouth or instrument ==> audience)



1. mic
2. channel strip (top to bottom = signal path)
 - A. preamp = boosts mic level to line level
 - B. EQ = shapes tone
 - C. auxiliary sends = additional outputs
 - D. fader = adjust channel line level volume
 - E. pan
3. main output

4. amplifier = boosts signal from line level to very high levels designed for passive speakers ONLY
5. loudspeakers (active or passive "main" speakers)
 - active (powered) speakers have amplifiers built into them
 - some mixers have amplifiers built in (called power mixers) and are sold along with passive speakers

Effects processors:

- compressors/limiters = boost quiet sounds and attenuate loud sounds (keep distortion from occurring further down signal chain)
- special effects processors = add ambience (reverb), flange, delay, distortion, etc.

- feedback = mic too close to PA speaker, mic too far from source being amplified, and/or too many mics
- directional mics help minimize feedback by isolating sounds being picked up
- rooms with less hard surfaces have fewer feedback issues ... no or full audience is very different too
- mic placement (requires experimentation and adjustment)
 - get the microphone as close to the source as possible (allows for max sound level before feedback)
 - use a spectral analyzer = identify feedback frequencies and fine tune EQ

Setup system and run sound check (proper gain structure):

1. turn off amplifiers (main speakers and stage monitors)
2. set channel faders and main outs to Unity (0dB) & preamp gain (or trim) knobs to lowest setting
3. with headphones, set proper gain structure for each channel:
 1. press PFL/SOLO button on the channel
 2. engage HPF if source has no low end (always engage for vocals)
 3. slowly bring up preamp gain (or trim) knob as performer sounds into the mic to find "Goldilocks" setting = between noise floor and distortion (clipping) ... usually with the loudest sound peaking on the VU meter around Unity (0dB) or 2/3 of full scale
 - too low requires a boost further down the signal chain (which raises the noise floor)
 - too high allows for periodic distortion (clipping ... going into the "red")
4. after all channels have been setup individually, have everyone perform together
 - with volume knob of amplifiers (main speakers and stage monitors) turned all the way down, slowly turn up volume knobs on amplifiers until you reach the desired volume in the space

Additional concepts to research and work on: mic 3-to-1 rule, using EQ to shape tone and prevent feedback, wireless mics, DI boxes, in-ear monitors, power management,