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# The EQ Strip: Getting Down to What You Need vs What You Want

Frequency equalization has come a long way in mixing consoles for live sound. Also known as bass and treble, or low/mid/high controls, today's high-end mixing consoles offer near full parametric adjustments on four or more bands for each channel strip. The big question is, "Do you really need all that equalization flexibility?"

## Uphill, Both Ways

Being an ancient analog mixing console curmudgeon, it is easy bring up the attitude of "Walking five miles to school each day, uphill, both ways" to EQ history. It's easy because, in fact, most early live sound systems did not have channel equalization, and equalization in its most primitive form was considered a luxury feature to be added at the output mix. My first "band" P.A. system was an early 1950s Rauland four-channel, 35-watt all-tube box with four channel volume knobs and single bass and treble knobs for "tone" adjustment.

My first "real" sound system was an early 1970's four-channel Kasino (entry-level Kustom) that had individual-channel bass, treble and reverb controls, plus the required channel volume control. Obviously not much help on feedback rejection, but it allowed different vocal mics to be adjusted to sound more or less the same. It was not until the late 1970s that serious three-band equalization was introduced, with some flexibility in "sweeping" the mid-range center frequency in the top of the line consoles.

The last two decades of the 20th century saw an explosion of mixing console equalization features. Slowly, the tour grade consoles started growing a second swept midrange, and then a high-pass/lo-cut switch at around 80 to 100 Hz to knock out rumble on console channels not requiring extended low frequency response. As competition and user feedback continued, the lower-end consoles acquired the better console EQ sections, higher end consoles went to swept high-pass filters for sub-low frequency control, and mid-range controls received switches for dual-Q selection of swept bandwidths.

Today, even mid-market consoles have swept high-pass filters, plus fully swept four-band equalization sections. And the high-end analog and digital consoles implement fully parametric filters in each channel strip with sweepable Q controls. And if you can't get enough equalization, then you can insert other parametric or graphic multi-band equalizers for precision frequency response control.

## Flavored EQ

But all is not well in the mixing console EQ strip world. As we have gone from luxury to necessity on channel EQ strips, discerning ears have noticed that the more sophisticated EQ circuits have "good" or "bad" attributes when used. Suddenly, well-respected live sound engineers started to notice pleasing or displeasing phase response or circuit molestation of audio signals passing through EQ strips. And the audio signal attributes did not just stay confined to certain brands, as some "British EQ" fanatics would like to think. But certain models, having different cost points, had different EQ circuit topologies to be loved or hated.

To bring us back in history, in the early days we were happy to have boost or cut tone controls, or move up to Peter Baxandall's feedback controlled bass and treble controls. Even now, basic mixing consoles still use resonant filter feedback EQ sections to keep the parts count and costs low. But now we have elegant "secret recipe" EQ strip circuitry from various manufacturers that are used as strategic marketing weapons to get you to buy their consoles.

## Applications

Many miked-up instruments will do well with simple EQ section tweaks. Instruments like keyboards, guitars or toms might work fine with three-band, swept mid controls where a little high- or low-frequency cut (or boost) is all that is required. And with enough flexibility, even the kick drum can get its 400 Hz cut and still sound acceptable with the right bass drum microphone.

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However, a nice four-band, swept mid is much better on kick drums; especially when facing multiple drummers, different mic types and trying to get the desired kick sound balancing the 80 Hz "boom" with the 3 kHz "click." And having a swept HPF control to wipe subsonics below 40 Hz, one can go for the ultimate balance by boosting the 40 to 70 Hz a few dBs for the modern hifi kick sound, use the "swept" low frequency control to tweak the boom amount, then trim in the low-mid notch and upper-mid click amount. As you can see just on the kick drum, the EQ flexibility of better console EQ sections is not wasted.

And then are problem children inputs like bass guitar and diva vocals. Having at least four band EQ with swept mids is almost a necessity, as the bass can require multi-band adjustment to counter string/finger noise issues, low-mid peaks or valleys (150 Hz to 500 Hz), and too much/too little girth in the all important 40 Hz to 100 Hz sub-low bands. Vocals are a touch better, but sometimes require a lot of counter-equalizing the microphone's frequency response for feedback rejection, out of vocal range rumbles, hisses and dealing with the occasional 100 Hz to 300 Hz proximity effect boom or artist mumbles.

### General Requirements

If you are considering a console purchase as an upgrade, or to attain a certain capability for your client market, here's some EQ strip feature advice. If you are beyond anklebiting and want to be taken seriously as a local soundco provider, then having at least a quality three-band EQ with a switched or swept high-pass filter is demanded. The exception might be if you are doing quiet corporate speeches and non-live music events.

For regional soundcos, the A or B rigs probably should have at least four swept EQ bands and a swept high-pass filter. For the C rigs, I could see backing down to four-band with only swept mids due to bid/cost considerations. And, of course, national/touring rig consoles will have the full monty of respected brands and great sounding EQ strips with full parametric flexibility. And if you have rap acts, keep a supply of insertable parametric or graphic equalizers handy for the inevitable mic cupping technique by the artists.

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