

Tok Tech

Simplifying the technical jargon about music and sound!

OK, last issue we took an overview of the entire audio chain then looked more closely at microphones – this time, as promised, we’ll explore THE MIXER.

The audio mixer (a.k.a. mixing console or mixing desk) is the heart of any sound system. The mixer is where all of the audio sources like microphone signals, musical instruments and CD players are “plugged in” and their relative volumes are blended to create a pleasant sounding “mix”. The mixing console gives the user a great deal of control over these various sounds via electronics and enables the user to route (send) signals to other devices like signal processors, equalisers and amplifiers. Mixers have numerous “channels” which provide a separate input for each audio signal – typically 4 channels on a small mixer up to 32 or more channels on a concert mixer.

The first control on each mixer channel is the GAIN (sometimes called TRIM) which is a master control over the level of the signal coming into each mixer channel. This is used to compensate for the various strengths of signals – mic signals are low-level “weak” signals and sometimes need a gain boost, CD players produce a “hot” or high-level signal so we reduce gain to prevent clipping/distortion occurring. Setting a good gain structure is critical at this point so that we have plenty of “headroom” left when it comes to blending the various signals on the mixing desk.

Next is our EQUALISER section which gives control over the tone of each sound. Some equipment only offers HIGH and LOW tone controls, allowing cut/boost of the high and low frequency parts of the sound. In professional equipment there is also a MID control which affects frequencies in the mid-range. Creating a pleasant tone balance for a signal using equalisation is an art and one best developed by hands-on practice; sorry, no magic tips or tricks just lots of practice and careful listening required to improve your skills.

Each mixer channel will have a number of routing options to send the signal to various places. These may be monitor sends – used to send the signal to a foldback system for performers to hear themselves, effects sends – used to send the signal to an effect processor (like reverb or echo) or bus sends which are used to group channels in various ways. These routing options allow you to “split” the signal and send it to several places at once.

Once the signal has passed through all these stages on the mixer channel it ends up at the FADER which is a sliding volume adjustment (potentiometer). This is where the “mix” part happens as you combine all the signals coming into your mixer channels and adjust their relative levels to end up with a musical, harmonious blend. The faders allow for

small adjustments in volume of each sound which you can change during a performance – maybe making a solo a little louder or blending backing vocals with the lead.

From the channel fader, the signal travels to the bus outputs (if your mixer has them) and to the MAIN OUTPUT FADER/S. This last fader (or two if it's a stereo mixer) controls the overall volume of the mixed signals going out of the mixing console. This is where you will send your mixed signal out to your amplifier to boost it to the speakers.

If your mixer has bus outputs (2, 4, 8 or more) you can use these to control a group of faders – maybe send all the drum mics to a bus so you can control the whole drumkit sound from one fader. Perhaps you may group all the backing vocals on one another bus to turn them all up and down at the same time. Busses can also be used to send the signal to other amplifiers or even other mixers (maybe for a live broadcast!).

As you can see by now the mixer is really a junction box. All the signals come into the mixer and then you can change them, add effects to them and then pump them out in a number of different directions to other equipment.

Next time you see somebody standing behind a big desk with lots of knobs on it at a venue you will have a better idea of what they are doing – they are really controlling the flow of sound through the audio chain, much like a heart pumping life-giving blood.

We'll take a look at amplifiers in our next issue of Tok Tek, see you then.

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