

HOW TO OPERATE A MIXER FOR A BAND

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This beginner's guide suggests some methods to run a sound mixer to get a clean, natural sound.

First determine if the band even needs a sound system:

Set up a band in a room and listen to them play unamplified. If you can hear everything in a good balance, no sound system is needed.

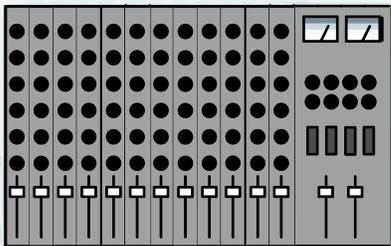
If the vocals are too quiet, just mike the vocals and amplify them through the sound system, balancing them with the unamplified band.

If all the band and vocals are too quiet, you will mike all the instruments and vocals, and amplify them through the sound system.

MIXERS

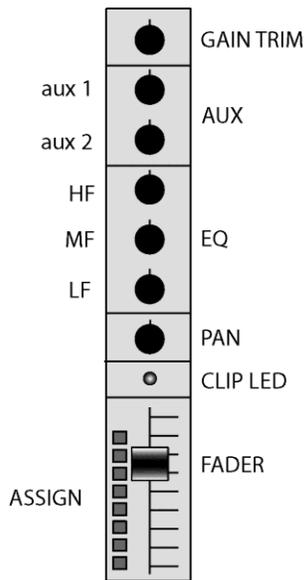
A mixer is a control center that provides several functions:

- Amplify the mic signals.
- Control their volume and balance in the house speakers.
- Add effects.
- Adjust the loudness of each mic in the monitor speakers.
- Adjust the mics' tone (bass, midrange and treble).
- Provide phantom power for condenser mics (in most mixers).



Mixer

A TYPICAL MIXER INPUT MODULE



Each mic connects to an XLR mic input on the mixer, and the mic signal goes to its own input module in the mixer. The controls in the input module affect the sound of that mic. Several modules are side-by-side in the mixer, one for each microphone. The controls are described below:

Gain or Gain Trim: Lets you set the mic signal level to prevent noise and distortion (clipping).

Fader: Volume control.

Assign buttons: Press one to send that mic's signal to the desired output channel.

Clip or overload LED: Flashes if the mic signal is too strong - turn it down with the gain trim knob.

Pan: Controls how much of that mic's signal goes to one channel or another. Usually leave it straight up.

EQ: Tone control (bass, midrange, treble).

AUX: Controls how loud that mic's signal is in the monitor speakers. Another use for an AUX knob is to control how much effects (reverb, echo) are heard with that mic's signal.

SOUND CHECK

1. Turn the mixer and power amp off. Using mic cables and mic snake, plug all the band's mics into the mixer. Using a strip of masking tape and a Sharpie, label the faders according to the instrument or vocal that each fader affects. For example: bass, guitar, vox 1...
2. Turn all the faders down. Set all the aux knobs all the way down (counter-clockwise). Set all the EQ knobs "flat" (at 0 dB, or 12 o'clock, straight up).
3. If you have a separate power amplifier, set its volume controls 1/4 up. That applies to the house amp and the monitor amp.
4. Turn on the mixer and phantom power (if needed), then turn on the power amp.

5. Turn up the mixer master faders to "0", about 3/4 up.
6. Ask a musician to sing or play loudly. Find the input channel on the mixer for their vocal or instrument. In that channel, slowly turn up the GAIN knob until the CLIP or OVERLOAD light flashes. Then turn down that knob by about 10 dB. Now the CLIP light should not be flashing.
7. Repeat step 6 for all the instruments and vocals. You might write down the gain settings so you can duplicate them at future gigs, using the same mics into the same channels.
8. In the mixer channel for one instrument or vocal, slowly turn up the AUX (monitor send) knob until the sound is as loud as the musician wants it in the monitor speakers -- but watch out for feedback.
9. In the mixer channel for that same instrument, turn up the fader to 0 (about 3/4 up). If the amplified sound is too quiet, turn up the power amp volume controls a little until the sound is as loud as you want it. If feedback is a problem, see the section in this article on preventing feedback.
10. Repeat steps 8 and 9 for all the instruments and vocals.

Some engineers prefer to have the entire band play a song while setting gains, monitor sends, and faders.

MIXING

1. Using the mixer faders, set up a good balance among the instruments and vocals. You should be able to understand the words that are sung. The mixer's meters should read near 0 on the loudest peaks.
2. Using the mixer EQ knobs, adjust the bass, midrange, and treble for the desired tone quality on each instrument and vocal. The bass is LF EQ (usually around 100 Hz), mids are MF EQ (sweepable frequencies), and treble is HF EQ (usually around 10 kHz.)

Some examples: If a vocal sounds more bassy than an unamplified voice, turn down the vocal's bass (LF EQ) on your mixer until the sound is natural. If a guitar sounds more trebly than an unamplified guitar, turn down the guitar's treble (HF EQ) on your mixer until the sound is natural. If a banjo sounds natural, don't change its EQ -- leave it flat.

3. With the entire band playing, touch up the mix and the aux sends (monitor sends).

Use effects sparingly or not at all. In most venues, the room provides reverb, so you don't need to add any reverb at the mixer. Adding reverb usually just makes the mix muddy. Also, delay effects create an echo, but they do not prevent feedback. If the delay-time setting is very low (under 50 msec), the delay creates an unnatural tone quality similar to flanging. In general, delay units just muddy up the mix.

During the mix, make sure you can hear everything, and you can understand the words. Try to match the sound of good CDs **of the same genre as the band**. For example, do not create a rock mix of a bluegrass group. Use a bluegrass CD as a reference when you are mixing bluegrass music. Use a folk-music CD as a reference when you are mixing folk music.

HOW TO PREVENT FEEDBACK

Place mics close to instruments, about 4-to-6 inches away or less. Cover the vocal mics with foam pop filters, and ask the singers to sing with lips touching the foam (or very close). The closer the mics are, the more you can turn down the gain on the mixer, and that reduces feedback.

If a musician is too quiet in the house, see if they are far from their mic, and ask them to move in closer.

Place loudspeakers close to the audience and well behind the mics. For example, place the speakers on stands a few feet in front of the stage. The goal is to reduce the amount of loudspeaker sound that is getting back into the mics. Most live-music mics reject sound from behind them, so the speakers should be behind the mics in general.

If you have a graphic equalizer, turn down frequencies that feed back, just to the point where feedback stops.

If you don't have a graphic equalizer, and the feedback is a low-pitched tone, turn down the bass (LF EQ) a little. If the feedback is a high-pitched squeal, turn down the treble (HF EQ) a little.

Note where the feedback point is on each fader, and mark it with a grease pencil. Don't exceed that fader level during a show.

I hope that these tips will let you create a clean mix with natural sound that suits the genre of the music.

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About the author: Bruce Bartlett has been a sound engineer and audio educator for 40 years.