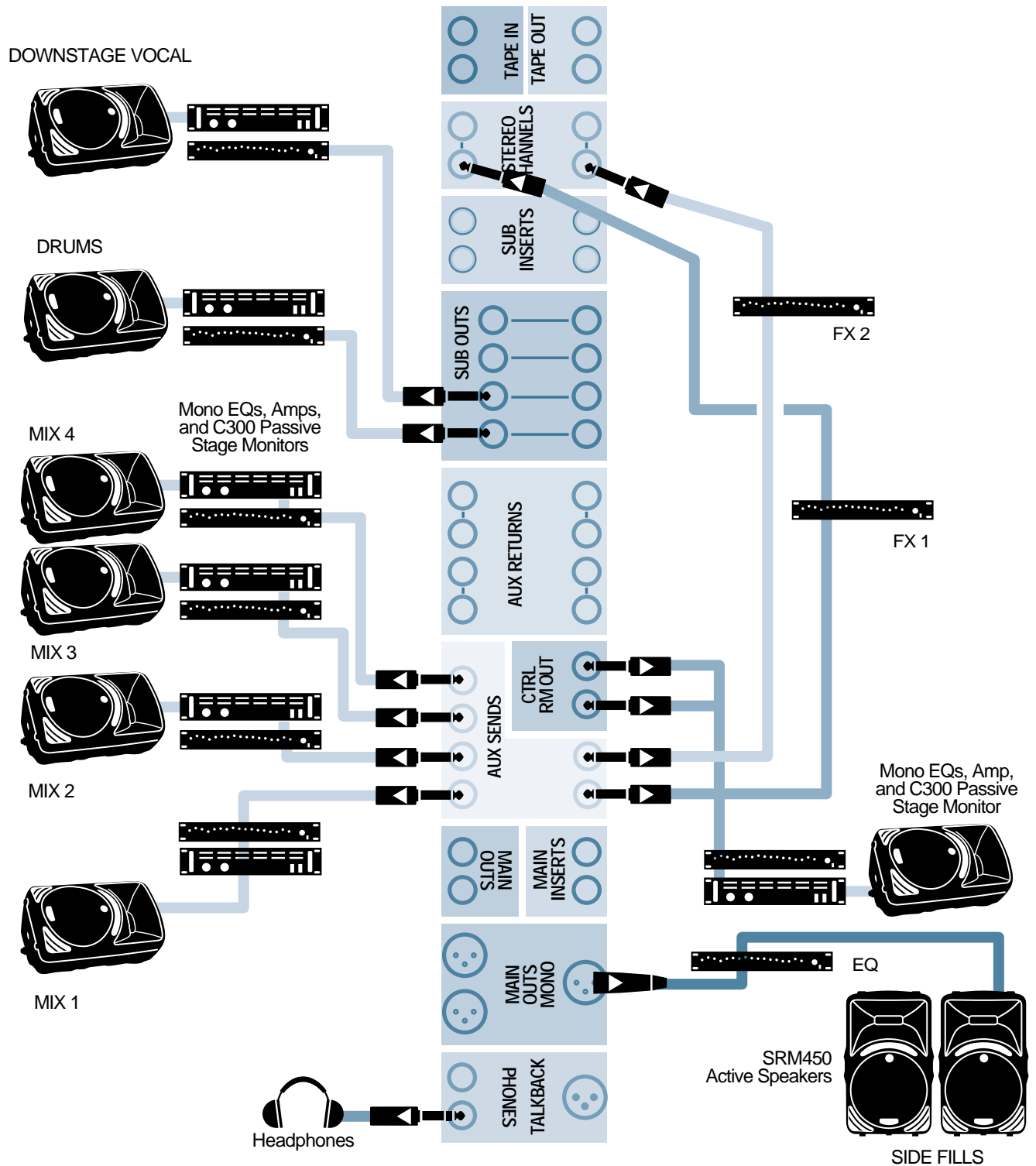


SR as a Stage Monitor Mixer



The purpose of a monitor mixing console is to provide a large number of different mixes from the same set of sources – the performers' mics or instruments. Some of those mixes may be quite similar, differing mostly by what's not included in one mix or the other. Others mixes may be really minimal – just the singer and kick drum to keep him in time.

Monitor mixes are rarely for anyone's enjoyment. They're to allow the players to hear what they need in order to give the best performance. This is usually an unbalanced mix, favoring either one's own voice or instrument, or a voice or instrument with which the performer needs to blend or get the song's timing.

About Monitor Mixing

A successful monitor mix engineer anticipates, or better yet, learns what each artist wants to hear in his monitor mix. It's equally important to know what they don't want to hear. A singer needs to keep time and hear pitch, so he'll probably want a little kick and snare drum in his monitor, but not the drum kit at full blast. It's really difficult to hear pitch with a chorused keyboard as a reference, so most singers just trust that the keyboard player will do his thing when it's time and get their pitch reference from a bass or rhythm guitar.

As we've seen in the general PA applications, monitors are usually fed from pre-fader AUX SENDs, allowing you to create several completely independent mixes. The SR series consoles are equipped with up to four pre-fader sends (two are permanently post-fader). In this application, we've employed those for four of the monitor mixes, plus we've made two additional monitor mixes using the channel faders routed to the SUB outputs. You'll notice that in this application there's no output for a main house mix – that's someone else's (and another mixing console's) job.

Inputs

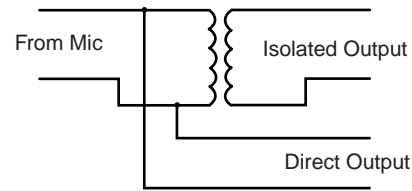
In nearly all cases, the inputs from the stage are shared by the monitor and front-of-house (FOH) consoles by using an outboard splitter. For this application, we'll assume that's the case.

Mic Splitting and Phantom Power – Who Supplies It?

It's becoming fairly common to use condenser mics on stage, so phantom power for those mics has to come from somewhere. You (as the monitor guy) and the FOH engineer will have to agree on who's supplying the power for the mics and connect the splitter

accordingly. The splitter system may be designed so it can be wired only one way – that makes the decision easy.

Most splitters isolate the two consoles with a transformer to eliminate ground loop problems.



DC won't pass through a transformer, so only the console that has the direct connection to the microphones can power them. With a transformer-isolated splitter, it doesn't hurt if both consoles have phantom power turned on, but only one console will actually power the mics. If that console, or its phantom power supply fails, both the house and monitor systems lose those mics. (but of course this won't happen with your Mackie)

Some inexpensive splitters are nothing more than Y-cables, occasionally with resistors in-line to provide some protection if there's a short circuit in one branch. Those should not have phantom power applied from both consoles. Slight differences in voltage between the two consoles can cause one console to draw current from the other, and may not leave enough juice for the mics.

Outputs

AUX SENDs 1-4 feed four stage mixes. Engaging the PRE buttons make AUX 3 and AUX 4 pre-fader, the usual preference for monitor mixing.

We're using two SUB outputs for additional monitor mixes. Those are by nature post-fader, but changes that you make to these mixes using the faders won't affect the other (pre-fader) mixes. It does mean, however, that those two mixes aren't completely independent. In this application, we're using one SUB mix for drums and the other for a downstage vocal monitor so the lead singer can hear himself when he struts out to the edge of the stage.

Sidefills, which generally have a fairly well balanced mix, are fed from the MONO MAIN output. There's rarely room (or requirement) for stereo in monitor mixes except for some very fussy performers, so all the monitor mixes in this application, including the sidefills, are mono.

Powering the Monitor Speakers

Each mix output gets its own graphic equalizer and power amplifier. The equalizer serves several purposes. It fine-tunes the frequency response of the speaker, it serves to notch out feedback frequencies, and it also is used to adjust what's coming from the monitor speaker to blend it with other sound on stage. A performer who's standing close to the back of the main FOH speakers will hear a lot of low frequencies coming from them, so you'll need to take a lot of lows out of his monitor so he doesn't hear an over-bassy mix.

In Your Ear

In-Ear-Monitors (IEM), that is, monitoring through earphones rather than loudspeakers, are becoming more popular. With an earpiece in each ear, stereo monitoring is quite feasible and many performers are requesting it these days. The subs are a good place to take a stereo mix. You have to be very careful that you don't blast the artist with too much level, particularly. It's painful enough coming out of a speaker in front of you, but can cause temporary or even permanent hearing damage when shot directly at the eardrum. IEM systems almost always have a limiter in the signal path as protection from excess level.

Effects

It's nice to be able to send some reverb or other effect to the monitor speakers, particularly for singers, so we've included two effect processors, fed from post fader AUX SENDS 5 and 6. By returning the effect processor outputs to channels rather than AUX RETURNS, we have the flexibility to assign (or not assign) the effect to any individual monitor mix. Since we're not mixing stereo monitors here, there's no point in taking a stereo output from the effect processor, or for using both sides of a stereo input. By connecting to the Left channel only, the effect return input becomes mono and feeds the left and right mains equally.

Cue Speaker

With all the commotion on stage, all the amplifiers turned up to 11, the drummer torture-testing his sticks, and everyone shouting "MORE MONITORS" at you, you won't be able to hear a doggone thing in the headphones. Give it up. There's hope, however, since the CONTROL ROOM OUTPUT duplicates the headphone output. By connecting it to a power amplifier and speaker, you can compete with the din and hear what you're sending to the monitors.

The CONTROL ROOM output normally carries the MAIN L-R mix, but pressing any SOLO button interrupts that feed and sends the SOLO bus to the CR outputs. Want to hear what the snare drum sounds like? SOLO the snare channel. Want to hear what Monitor Mix 3 sounds like? SOLO the AUX 3 MASTER. To check one of the mixes fed from a SUB, SOLO that subgroup.

You'll get the most accurate picture of the monitor sound if your cue speaker is the same type as your stage monitors. You'll never exactly re-create the stage sound in your cue mix since there's a lot of other sound in addition to your monitor mix going into the artist's ears, but by hearing what you're sending to the monitors, you can anticipate an artist's needs and hear the effect of your adjustments.

Assigns

Here's where you need to get creative. Of course any channel can be sent to any of the pre-fader AUX SENDS, but since we're using the MAIN and SUB outputs for additional mixes, we need to assign channels to those busses.

Start with the sidefill mix (the MAIN MONO output), which is generally a fairly well balanced full band mix. Assign anything that you want in the sidefills to the L-R bus. The position of the PAN pots is arbitrary at this point since we're feeding the sidefills in mono. Set the channel faders for a well-balanced mix. Don't be afraid to use the channel EQs to help balance and clean up the mix.

Since SUB 1 is a drums-only mix, assign all the drum channels to 1-2 and set their PAN pots full left. Now SUB 1 will contain the drums, mixed as you mixed them in the sidefills. You may have to make a compromise here if the drummer wants more kick in his monitor than the rest of the band can stand in the sidefills. Before you raise the fader on the kick drum channel, try using the graphic EQ in the drum monitor signal path to emphasize the bottom end and the beater attack frequencies. That will usually get the job done without changing the balance in the sidefills.

Assign the channels that you want in the down-stage vocal mix (SUB 2) to 1-2 and pan them fully right. You can add a little of the drums to this vocal mix by turning the PANs on the drum channels slightly toward the center from their full-left position. And if the drummer wants to hear some vocals, turn some of the PANs on the vocal channels a bit toward center from full right. Adjusting the mix with the PAN pots! What a concept!

Talkback

The talkback mic input allows you to talk to AUX 1-2 and the MAIN mix (sidefills). If that gives you enough coverage so that you can yell at whoever you need, use it. If you want to be heard in all the monitor speakers, plug a mic into a spare channel. You can then send it to any (or all) mix outputs by using the AUX and ASSIGN controls on that channel.

Protocol

While this isn't exactly about mixers, here's a good place to mention that, as the monitor engineer, you're the one the band is going to glare at if things aren't right and they'll love you if the sound on stage is great. If you cooperate with the band, they'll help you to do your job. If you fight them, they'll fight back.

You also need to make friends with the FOH mixer, because what you do with the stage monitors can affect what people hear in the house. Remember, since you're sharing mics, your feedback is also his feedback.

Because of the high sound levels involved, with everything running right on the edge of both feedback and clipping much of the time, mixing monitors can be the most stressful job in the sound business. But if the monitors are great, you'll be the first one the band pats on the back when they leave the stage after a great set. That's a nice feeling.