SECTION 3: GENERAL INFORMATION

Do you need to read this section at all?

Many of you reading this manual have a lot of experience in using large mixing consoles. For you battle-scarred pros, Section 2 and the Block Diagram will probably be all that you need to look at.

Then there are those of you who have worked extensively with smaller mixers such as our CR-1604 — but who have less experience with a larger, multi-bus console with lots of gazintas and gozoutas. For you, we recommend at least adding Section 4 (Recording) and/or Section 5 (PA) to your reading list. These chapters cover some of the more unusual or less familiar features of your new 8•Bus console.

Finally, there are those who are either new to using mixers or just like to read even larger quantities of our glib prose. For you, we have provided this short section that discusses the basic concepts and procedures used in recording, mixing and sound reinforcement work. If you can make some sense of it, you're ready for the next two sections, which relate these concepts to actually configuring and using a Mackie 8•Bus Series mixing console.

Also, if the system Block Diagram does not look as familiar to you as the menu at McD's, spend a little time in this section.

GENERAL INFORMATION

Here is a primer covering a few important ideas you should be on good terms with before you sit down to a mixing console.

LEVELS

Microphones have very low output levels. Power amplifiers have very high output levels. One of the functions of a mixing console is to amplify or attenuate (reduce) these signal levels properly. Since it's easy to degrade the signal by not handling levels well, and since it's your hand on the controls, you should be sure you know how much gain to apply and where to apply it.

Noise

Every electronic circuit produces noise or hiss or hash or buzz, and any noise present on the input of an electronic circuit will be faithfully passed through. Turn it up high enough, and you will hear the noise.

Headroom

Every electronic circuit also has a point of overload — a clip point, where the voltage simply cannot rise any higher, no matter what the input signal and your fader move would like. This overload, or clipping, will show up as tooth-grinding distortion.

Somewhere between the noise and the clipping is an optimum level for your signal: high enough above the noise floor to render the hiss inaudible, and far enough below the distortion point to allow range for loud peaks of music to pass without clipping. This safe operating zone might be called operating level or nominal level or zero or perhaps line level. The range between your operating level and clipping is called headroom, which defines just how tall your signal can be without having to duck for the rafters.

Your mission as a designated Master of the Levels is to get the low-level signals up to line-level as soon as possible and to keep them there as much as possible. But don’t turn them up too loud.

Unity Gain

On a Mackie 8•Bus console, the easy way to do this is to set all the level controls according to the Sensitivity Adjustment procedure detailed on page 1.

Metering

When the meters read 0dB, the level will actually be +4dBu at the outputs (or –10dBV at the submaster outputs, if you’ve engaged their +4/-10 switches). Don't pay too much attention to the meters. A meter is an aid, a window looking onto part of the dynamic range of your signal, and it will tell you if your level is in the ballpark, so to speak.

Try to keep your signals in the middle range of the meters, for the most part. If the signal is always very low, you may not be getting the best noise figures you can. If the meter LEDs are always solidly lit from bottom to top, you are likely distorting both the console and your recording tape regularly. Keep the signal in the middle, with occasional peaks into the yellow.

Remember, the top yellow LED of the meter (+10) represents an audio level of +14dBu, and the Mackie 8•Bus doesn’t clip until +28dBu. Even banging the meters hard, you still have around 14dB of headroom for your peaks. (The L/R meters have an additional red LED segment to show clipping at +28dBu.). There are not
many recorders, and no amplifiers, that can tolerate such high signal levels. Therefore, it’s best that the red LEDs never light up.

But, if your music is sounding good, don’t worry if you’re in the yellow a lot or if some parts of the track hardly read at all. You’ll quickly get a feel for what works for you, when you can get away with really smacking the tape or the electronics too much.

**BUSES**

More often than not, the goal in a mixing console is to mix two or more inputs into one output. Like a coach who has two or more players to get to the same ballgame, console designers use a bus. Even Webster’s Unabridged Dictionary agrees, defining the word bus in electronics as “a conductor serving as a common connector for three or more circuits.”

The Mackie 8•Bus Series has, in fact, many more than eight buses. The eight memorialized in the name are important, but there are also six AUXiliary buses, a pair of L/R Mix buses, the alternate pair of MIX-B buses, and a pair of Solo buses. We will try to be clear just what bus we are talking about when we do talk about buses.

** SENDS AND RETURNS**

Sends are outputs, and returns are inputs. So why don’t we call them outputs and inputs?

Well, actually, the terms send and return can mean many things, but the way they are generally used in mixing console parlance is to refer to sends, which tap off a little of a signal to send to some effects device (like a reverbencing unit), and returns, which function to return that reverb back into the mix.

Sends are also used to tap some mix of signal from a collection of channels for a headphone cue mix. For that matter, sends can be used as additional mix buses, if needed.

In the same way, if you don’t need them for reverb or effects, returns can be used as additional inputs to your mix.

**SOLO**

Solo is a standard console function that allows you to listen to one or more sources all by themselves (soloed).

You can check EQ, possible distortion or buzz, or just listen to see if a particular mic is open or not. This function can also be handled by each channel’s -20/OL LEDs. See Section 2 “–20 and OL LEDs” for more details. When soloing more than one source, you can listen to the blend of just part of your mix: only the sopranos, for example, or just the tom mics on the drums.

The solo circuits are designed not to interrupt the recording process. The solo bus signal is sent directly to the control-room monitors without affecting any of the inputs, outputs or recording buses.

When you are mixing or monitoring with reverb, remember to not only solo the channel you’d like to hear, but also the AUX Return carrying your reverb. Otherwise, you will hear the channel soloed dry, without its echo.

**EQ**

Everybody knows what EQ is, but just in case you’d like a refresher, we’ll put in a few paragraphs here.

Equalization (EQ) refers to purposely changing the frequency response of a circuit, sometimes to correct for previous unequal response (hence the term, equalization), and more often to add or subtract level at certain frequencies for a pleasing effect.

Bass and treble controls on your stereo are EQ; so are the devices called parametrics and graphics and notch filters.

A lot of how we refer to equalization has to do with what a graph of the frequency response would look like. A flat response (no EQ) is a straight line; a peak looks like a hill, a dip is a valley, a notch is a really skinny valley, and a shelf looks like a plateau (or a shelf). The slope is the grade of the hill on the graph. For instance, if you lived in Texas, you would set y’all’s EQs flat.

Graphic equalizers have enough frequency slider controls to form a graph of the EQ right on the front panel. Parametric EQs let you vary several EQ parameters at once. A filter is simply a form of equalizer that allows certain frequencies through unmo- lested and either reduces other frequencies or eliminates them entirely.

The equalizer on the 8•Bus Series combines several different types of EQ into five different sections.

The HI MID EQ section is a fully parametric equalizer. This means all the significant parameters can be varied, as you can see in Figure 1. The

![Fig.1](image-url)
boost or cut of this section, through a range of ±15dB, is set with the top knob. The center frequency is dialed in with the middle knob, and can be set anywhere between 500Hz and 18kHz. Finally, the bandwidth of the bell-shaped response curve around the selected frequency (also somewhat inaccurately referred to as a ratio known as Q) can be selected with the lower knob. The range is from as wide as 3 octaves to as narrow as 1/12 octave. Leave it at the center detent if you are unfamiliar with the bandwidth feature. This setting will give you a semi-parametric type of EQ.

The 8•Bus console’s set of three Hi-MID controls (boost/cut, frequency center and bandwidth) is VERY powerful in its effects. Rarely if ever will you need more than a few dB of boost and cut or, as noted above, will you want to stray from the NORMAL (2 octave) bandwidth until you gain some experience recording and mixing.

The LO MID EQ section is called a semi-parametric equalizer, because the bandwidth is not adjustable (Figure 2). The frequency range is 45Hz to 3kHz and the bandwidth is fixed at 2 octaves.

Figure 4: Common Connectors
The LO and HI sections of the EQ are shelving equalizers, with a family of curves shown in Figure 3. As you can see, shelving EQs lift or lower the entire range of frequencies above or below a certain point. Most tone controls on stereos are shelving EQs, often set at 100Hz for the bass and 10kHz for the treble. The LO EQ on the 8•Bus is at 80Hz and the HI is at 12kHz.

The EQ IN/OUT SWITCH will completely remove the EQ circuit from the channels signal path when disengaged, and activate the EQ when engaged.

When the EQ section is split between the channel strip and Mix B, the EQ IN/OUT switch will only shut off the HI MID and LO MID bands.

The LOW CUT filter (also known as a high-pass filter) reduces everything below about 100Hz. 75Hz is -3dB, and the lower the frequency, the greater the attenuation. The slope of the filter is 18dB/octave.

Connectors

If you’ve used a Mackie CR-1604 or MicroSeries 1202, you’re familiar with the various kinds of connectors used with a mixing board. If you’re new to this whole thing, review the drawings in Figure 4 on Page 22. They’re also described in detail in Appendix A on page 48 of this manual.

**A BIT MORE ON MIX-B/ FLIP**

In Section 2, we described FLIP’s use during tracking and mixdown. Before you actually get involved with recording, we’d like to spring a couple of block diagrams on you that may clarify things further.

The switch labeled FLIP selects the input that is actually fed into the channel fader (and the MIX-B control).

As the label indicates, the MIC/LINE input (after Mic/Line preamp) is fed to the channel fader when the FLIP switch is in the up position (Figure 5). When FLIP is up, the channel is fed MIC/LINE and MIX-B gets TAPE. That way, you can use MIX-B to monitor the signal as it comes back from the recorder. This is the normal mode for tracking and overdubbing.

In the down position, the TAPE return (the output signal from the corresponding track of your recorder) is fed to the channel fader (Figure 6). When FLIP is down, the channel input is TAPE and MIX-B receives MIC/LINE. That enables you to use each channel’s MIC/LINE input for another input during mix down. Thus down is the normal position for mixing.

For PA, leave the FLIP switch up.
RECORDING OVERVIEW

The recording process can be as simple as one microphone recorded on a monaural tape recorder. Not much advice needed for that.

But since you've bought such a large mixing console, we expect you'll occasionally be doing pretty big sessions. This section will describe at least one way of approaching a large session—for example, a big drum set, bass, guitar, piano, scratch vocal and horns, with background vocals and synthesizer overdubs. Let's assume there is a 16-track recorder already patched in to the first 16 Tape In and the 16 Tape Out jacks on the 8•Bus Console. There is a set of Master Tracking, Overdub and Mixdown drawings farther on in this section for general reference.

SETUP

Okay, now let's get ready for your session. Make a diagram of your studio setup showing mic positioning. Then assign an input channel to each mic.

Trying to make your microphone-to-input layout sensible now will avoid confusion later. Group similar instruments together. If there is a left-to-right pattern to the mics (like drums mics or a vocal group), keep the same left-to-right sequence on the console. Plan your basic track assignments the same way. It's very confusing to have inputs randomly strewn across a mixing console.

Now, normal your console (also called “zeroing”). This means check the position of every switch and every knob to be sure they are in the normal position. Your normal may be different from someone else's, but generally it means all switches off or up, all knobs either all the way down or at their Unity detent. If you are working in a certain mode, say, for example, all AUX 3-4 SHIFT switches in TAPE, this is the time to set them all.

Lay a piece of 1/2" or 3/4" white paper tape across the top of the input faders and label all your inputs. (By the way, avoid masking tape. It will slime your console. Take the time to go to an art supply store or a recording supply store and get some better-quality “low tack” tape.)

Since your multitrack returns will be coming into the MIX-B inputs on some of the same input strips, you might want to divide your label into multitrack track labeling and input labeling. See TRACKING drawings 1s&2 on pages 26 and 27.

If you have any careful submixing to do during the recording, you might want to lay strips of 1/4" white paper tape alongside each fader slot (bus faders too, if you need them). Then you can mark your place as you rehearse your fader moves.

RECORDING AND OVERDUBBING

Using Buses

If you have to combine two or more inputs into one output (two trumpets on one track, five drum mics panned across a pair of tracks), you must assign the inputs to a common bus or pair of buses.

If you have only one source going to one tape track, you have a choice: you can assign the channel to the bus feeding that track, or you can patch the tape track into the channel's Direct Out.

Rationale for using a bus:
• It's there, it's easy, it sounds great.
• You meet interesting people on the bus.

Rationale for using a Direct Out:
• You've already assigned all eight of your buses to other duties.
• You are a purist and you think you can hear the additional circuitry used in a bus.

Monitoring

The most straightforward way to monitor during a recording or overdubbing session is by listening to the output of the recorder, played through MIX-B. Properly configured, your recorder will automatically switch between source and playback as you put the deck into stop, play, fast wind, record and so on. That way, you're always hearing your instruments after they travel through the multitrack deck, regardless of whether or not the tape is rolling.

MIX-B allows you to set up a custom mix of the tape tracks, independent of your recording levels. You can set level, pan, reverb and even EQ in your monitor mix while you record. You can even patch a cassette recording into the outputs of MIX-B for a rough mix of the session.

Both the FLIP and MIX-B SOURCE buttons should be in their up positions. This connects the Tape In amplifier to the MIX-B level control, and MIX-B will monitor the recording machine.

Cue Mix

Initially, as you are setting up, set the Phones source to the MIX-B selection. This way, the musicians will at least have something to listen to.
right away so they can tune up and rehearse, providing all your chosen tracks are in record mode and auto-switching to input when tape is not rolling.

Keeping the Phones on MIX-B may work for the entire session, but usually the musicians will want one or even two custom mixes. The bass player and drummer may want bass and drums featured very loud in their cans, which may be killing the vocalist. Likely, as soon as you are close, you will be required to come up with some new cue feeds for the players.

AUXiliary Sends 3-4 and 5-6 are designed to set up two different cue mixes from the same source as MIX-B, which should be the signal from your recorder. Simply push the SOURCE button by Sends 3-4-5-6 down to the MIX-B position, and push the PRE button down (to bypass the MIX-B level control). With the system configured like this, you will be able to send a custom mix from each tape track to either Sends 3-4 or Sends 5-6, depending on the position of the AUX SHIFT switch. It's like having an extra Mix B section.

Sends 3 and 5 are set to feed the left headphone, and 4 and 6 the right headphone. An equal setting on both knobs will place the sound in the center of the image.

Additional Note: By using modification V (Aux 1/2 source mod, page 55) an additional 2 Aux sends can be used as cue mixes from Mix-B (tape returns). This would allow all 6 Aux sends to access Mix-B during tracking or overdubbing for cue mixes as well as effects.

Wet or Dry Monitor?

Usually, you will not record wet (with reverb) onto your multitrack master. You can't undo it later. However, it is nice to hear a little echo on the tracks as you are working, and with the 8-Bus Series, you have the option of wet monitoring.

Since you are using MIX-B as your monitor submix, you should derive the reverb send from the same source. When the SOURCE button next to Sends 3/4/5/6 is depressed but the PRE button is not, the sends are connected after the MIX-B level control and make great wet monitor reverb sends.

Once you have your sends happening, you can assign the return from your reverb into the headphone cues by using Stereo Returns 3 or 4, which can directly assign into the phones. (Even if you are using Send 6, there is no reason not to patch the output of the reverb into Returns 3 & 4. The Send and Return numbers do not have to match.)

Text continued on Page 28
Getting reverb into the monitors is a little more involved, since there is no return assignment switch to MIX-B. You have three choices:

- Assign MIX-B to L/R Mix in the MIX-B master section. Then, select L/R Mix as your only source in the monitor section. Finally, use Stereo AUX Returns 1-6 to bring the reverb into the L/R Mix buses. Make sure that none of the channel L/R switches are engaged. There is no disadvantage to this patch, unless you are already using the L/R Mix buses for some other function.
- Patch the returns into unused tape returns, using the Tape In jacks on the rear of the console. Then route them into MIX-B, just as if they were additional tape tracks.
- Patch the returns into unused channel strips, using the Line In jacks. Then you can route the reverb anywhere your heart desires.

**Let's Record!**

Here's one way to set the board up (another option is shown in the hook-up drawings... either works just fine):

- Kick Drum \( \rightarrow \) Channel 1 \( \rightarrow \) Direct Out to Track 1
- Snare Drum \( \rightarrow \) Channel 2 \( \rightarrow \) Direct Out to Track 2
- Cymbals Left \( \rightarrow \) Channel 3 \( \rightarrow \) Bus 3 to Track 3
- Cymbals Right \( \rightarrow \) Channel 4 \( \rightarrow \) Bus 4 to Track 4
- Tom 1 \( \rightarrow \) Channel 6 \( \rightarrow \) panned between Buses 3 & 4 to Tracks 3 & 4
- Tom 2 \( \rightarrow \) Channel 7 \( \rightarrow \) panned between Buses 3 & 4 to Tracks 3 & 4
- Tom 3 \( \rightarrow \) Channel 8 \( \rightarrow \) panned between Buses 3 & 4 to Tracks 3 & 4
- Bass Direct \( \rightarrow \) Channel 10 \( \rightarrow \) Bus 5 to Track 5
- Bass Amp \( \rightarrow \) Channel 9 \( \rightarrow \) Bus 5 to Track 5
- Scratch Vocal \( \rightarrow \) Channel 11 \( \rightarrow \) Direct Out to Track 11
- Guitar near \( \rightarrow \) Channel 12 \( \rightarrow \) Bus 6 to Track 6
- Guitar far \( \rightarrow \) Channel 13 \( \rightarrow \) Bus 6 to Track 6
- Piano L \( \rightarrow \) Channel 14 \( \rightarrow \) Bus 7 to Track 7
- Piano R \( \rightarrow \) Channel 15 \( \rightarrow \) Bus 8 to Track 8
- Trombone I \( \rightarrow \) Channel 16 \( \rightarrow \) panned between Buses 1 & 2 to tracks 9 & 10
- Trombone II \( \rightarrow \) Channel 17 \( \rightarrow \) panned between Buses 1 & 2 to tracks 9 & 10
- Flugelhorn \( \rightarrow \) Channel 18 \( \rightarrow \) panned between Buses 1 & 2 to tracks 9 & 10
- Trumpet \( \rightarrow \) Channel 19 \( \rightarrow \) panned between Buses 1 & 2 to tracks 9 & 10

Your monitoring and cue signals come from the MIX-B inputs corresponding to the tape tracks:

- Kick \( \rightarrow \) Track 1 \( \rightarrow \) Tape Return 1 \( \rightarrow \) MIX-B
- Snare \( \rightarrow \) Track 2 \( \rightarrow \) Tape Return 2 \( \rightarrow \) MIX-B
- Drums L \( \rightarrow \) Track 3 \( \rightarrow \) Tape Return 3 \( \rightarrow \) MIX-B
- Drums R \( \rightarrow \) Track 4 \( \rightarrow \) Tape Return 4 \( \rightarrow \) MIX-B
- Bass \( \rightarrow \) Track 5 \( \rightarrow \) Tape Return 5 \( \rightarrow \) MIX-B
- Guitar \( \rightarrow \) Track 6 \( \rightarrow \) Tape Return 6 \( \rightarrow \) MIX-B
- Piano L \( \rightarrow \) Track 7 \( \rightarrow \) Tape Return 7 \( \rightarrow \) MIX-B
- Piano R \( \rightarrow \) Track 8 \( \rightarrow \) Tape Return 8 \( \rightarrow \) MIX-B
- Horns L \( \rightarrow \) Track 9 \( \rightarrow \) Tape Return 9 \( \rightarrow \) MIX-B
- Horns R \( \rightarrow \) Track 10 \( \rightarrow \) Tape Return 10 \( \rightarrow \) MIX-B
- Scratch Vocal \( \rightarrow \) Track 11 \( \rightarrow \) Tape Return 11 \( \rightarrow \) MIX-B

At this point, your recording should pretty well take care of itself. Keep on top of the players: be sure they're in tune, keep them tight. You'll have great tracks before midnight.

**Overdub, Anyone?**

See the OVERDUB drawings on page 30 and 31.

Once you've got your basic tracks down, take a moment and log all your settings, right down to headphones sends and outboard compressor thresholds. You may be back next week doing it all over again, and you won't remember it all. It seems some engineers use a camera for this step, but our Polaroids never come out that well.

One easy way to do this is to copy the 8•Bus panel layouts from the end of the manual and mark your settings on them in color.

Now, normal all the channel inputs and Qs and sends—anything that does not affect your MIX-B monitor and cue submix. Do not change the FLIP switch settings yet.

Then, pick a convenient input channel or two and use them as your input for overdubs. As you record on different tracks, just reassign the bus outputs from the channels, no sweat. Remember, with the triple busing feature, explained in Section 2 ("Submaster/Tape Outputs"), you won't have to repatch anything to feed up to a 24-track recorder. And your monitor mix and cue mix haven't changed. At the end of the night, you can run the monitor mix into a cassette or DAT and take a rough mix home.

If you're going to do your final mix right away, you have another option during overdubbing. First, pick an input channel for your overdub mics beyond the number of tape tracks you have. If you have a 16-Track, choose channels 17 and 18. These will be your inputs, which you will then assign to open tape tracks for the overdubs. Now, push the FLIP buttons on channels 1-16. This will bring the Tape Inputs into the main channel faders, and you can begin working on your mix while you monitor on the L/R Bus. Headphones can still be fed via the AUX Send of your choice, or by assigning monitor to the phones. When you're done overdubbing, your mix is ready.

**Mixing Overview**

See the MIXDOWN drawings on pages 32 and 33.

Recording and overdubbing require care from the recording engineer, but the focus really has to be on the performances. It's important to get a good sound, but it's more important to keep the musicians really in it, keep the pace up, be ready to snap that killer track when it happens.

Good mixing, however, focuses solely on the engineer and requires an emphasis on precision and meticulous setup. Creatively, you must blend the tracks so they at least sound like music again; technically, you must take into account the sound of home and car speakers, mono com-
compatibility, human perception changes under different listening conditions, matching similar product in your market, not to mention tonal and level balance between songs, and meeting the criteria for tape and disc mastering.

**MIXING SETUP**

Clean and align your mixing machine according to the manufacturer's instructions. If it's a digital machine, sacrifice a full floppy disk in its presence to ensure smooth operation during mixdown.

Group all your inputs in some sensible way, keeping drums, vocals and synths next to each other.

You'll probably have to repatch some of your tape returns to do this. Lay a strip of 1/2" white tape across all the console input channels for labeling. Put 1/4" strips of tape vertically along each fader to mark levels.

**Pick a Model**

Get copies of music you'd like to approximate in your mix, and patch the CD or DAT machine into the external jacks on the console. Then you can A-B your mix against your model at the flick of a switch to see if you're really getting that snare sound or not.

**Consider Compression**

You can mix an entire project without a lick of compression; many engineers do. The dynamic range of a CD can certainly handle it. But consider: most people listen to what you mix under less than ideal conditions. There is background noise and road noise, and most people don't listen as loud as you mix. A little gentle compression, whether on individual tracks or on the entire mix, can reduce the dynamic range a bit and pull your mix together. Also, if you want to simulate what your mix will sound like over the airwaves, you can compress the heck out of it, like they do. They use very fancy compressors, but any compressor will give you an idea of what will happen. This is good for checking things out, but not for your final mix.

**DOING THE MIX**

Assuming the console has been normalled, all you have to do to get ready to mix is to engage the FLIP and L/R MIX switches (unless you are using the submasters to group channels) on each of the input channels and select L/R MIX as your Monitor Source. Pull all the channel input faders down.

There is a tendency for levels to creep upwards as you add more and more tracks to your mix. One way to keep a handle on this is to set the L/R master fader a few dB above unity, and to set your initial monitor levels pretty high. As you get closer and closer to your final, you can ease the monitor levels down and easeup the master fader to unity, which is where it should be.

If your multitrack tape machine will do it, put it in the loop mode so it will just play the song over and over. Start mixing a group of tracks that run throughout the song, maybe drums or the rhythm section.

Set the panning, level, EQ, reverb and delay, and bring in more tracks as the mix begins to jell. Don't make any level marks on your fader tapes yet, but as the mix comes together, try to note which sections work without a lot of fader moves. Look for what appears to be the loudest part. Sometimes turning the Control Room Level way down, so the mix is very quiet, will reveal what sounds are clearly louder than others.

Now take a listen to your model on CD or DAT. Make some adjustments in your mix to put it closer. When you think it's getting reasonable, find that loudest section that you located, and pull the master fader back to get the levels close to normal on the main meters. Then go to the section that works by itself and start making little marks on the fader strips. You're getting close.

Listen to the model again. Start making more marks for the moves. Repeat until it sounds like a hit. Serves four adults.

**Using External Processing**

Compressors, gates and equalizers are generally inserted into the signal path. They are referred to as “serial devices,” used in series with the signal path. All the signal goes into the device, then out and back to the mixer's signal path. Reverb, echo, delay, aural excitement and spatial enhancement are usually set up as send/return devices. These are referred to as “parallel devices.” Some amount of signal is “borrowed” from a channel via an AUX Send, sent to the device, processed and returned to the mixer as a new, wet signal via the AUX Returns, to be mixed with the original, dry signal.

**Insert Devices**

A compressor/limiter after EQ will compress differently than one inserted before the EQ. A compressor/limiter inserted before a master fader will limit consistently, but one after the same fader will effectively have its threshold moved by the fader level. None of these choices are right or wrong, they just have different effects.
Assign channels and adjust panpot to the appropriate bus for the desired tape channel input.
There are three common points for inserting processing devices in the signal path during mixing:

- In a pre-EQ channel insert point (for one channel only)
- In a sub-master bus insert point (for a subgroup)
- In the L/R Mix insert point (to affect the whole mix)

### Send / Return Devices

Since you're not setting up custom phone cueing while you’re mixing, you will normally have all six AUXiliary sends available. Use a couple as your primary reverb sends, perhaps one for a bright plate and the second the same with a slap or pre-delay. That leaves you four for special effects. You can also use the MIX-B outputs or an unused 8-track bus as additional sends. If you only need to put the effect on one channel, you can use the channel Direct Out as a send (and the effects input level as the send level).

Lots of options at this point. Post-fader is almost always the preferred mode for reverb sends. Keep the sends in post unless you don’t want the reverb to follow the fader moves. If you want the “wet” sound (lots of reverb), turn the fader down a bit, and turn up the appropriate AUX Send to compensate. Now you have less “dry” signal and more “wet.” Dreamy!

Patch the output of the reverb units to the AUX Return inputs, which offer level and pan controls, and assign switches to put your effect where you want it. Notice that each of the six returns has two inputs, for a total of twelve. This allows you to send and return to six stereo effects units and bring all the reverbs and echoes back in.

Also note: There is no rule against sending on 3 and patching the returns into 5 and 6. If your reverb has stereo inputs, try feeding a mono signal, using just one AUX Send, into its “mono” input. Most reverbs are not true stereo, input-wise. You'll lose nothing and get back an AUX Send.

If you are using a mono effect or only one channel of a stereo effect, using only the Left input jack of a return will place the effect in the center of your mix. If you use the Right jack, the effect will be placed on the right side in your mix. To put the effect on the left side only, patch the return into the Left jack, and place an unwired dummy plug into the Right jack. That will defeat the left-goes-to-center normalling and allow the signal to remain on the left in the mix.

As mentioned above, you can use the AUX Return inputs as additional inputs to the console if you wish. You can also use channel input strips as reverb returns. Simply patch the return into a Line Input, if you have enough inputs to handle this. (Bonus: you now have console EQ available on your reverb return. Be sure the AUX Send feeding that reverb is turned fully down on the channels being used as reverb returns. If you don’t, every dog in the neighborhood will want to hump your leg.)

### Using Subgroups

There will be many times during mixing that you will want to set up subgroups within your mix. A subgroup allows you to use just one or two stereo faders on a larger group of tracks (say, drums or horns or background vocals). This makes for easier control (especially if you do not have automation), and also allows you to patch a single (or a matched pair for stereo) EQ or compressor on the set of tracks.

The Mackie 8-Bus console offers you several options using subgroups, depending on the situation.

- To assign channels to a subgroup during mixing, first de-assign the channels you want to subgroup from the L/R MIX. Then choose the bus or pair of buses you'd like to use as a subgroup and reassign the channels to that subgroup. The channel pan controls the selection of buses for a mono subgroup, and the position between buses for a stereo subgroup. For example, if you want a mono subgroup using Bus #1, select 1/2 assign and pan those channels fully left. Now, in the Assign area above the submaster faders, select the combination of L MIX, R MIX and MONO L+R switches that suit you. The L MIX and R MIX switches are upstream of the MONO L+R switches, and must be engaged to make the Mono switches work. Compressors or EQs can be inserted into the Submaster Insert jacks at the top of the Output section.

- Another option is to bypass the bus assign switching above the 8-Bus masters and instead patch the output of the bus(es) back into the inputs of a channel fader or two. Then assign those channels only to the L/R MIX to reinsert the subgroup into the mix. If you have enough input channels, this configuration gives you console EQ and Sends on your subgroup, which may be handy.

### Finding More Inputs: MIX-B to L & R Buses

There are never enough tracks on your recorder, and there are never enough inputs on your console. It’s always the case. Your unbridled creativity will find ways to use up everything, whether you are routing the vocals through a
pair of Leslie speakers or keying a gated set of reindeer bells with the snare signal.

The Mackie 8-Bus consoles can't give you the infinite number of channels you dream of, unless you buy an infinite number of expander consoles, but you can very easily double the number of inputs by using the MIX-B buses.

If you are mixing off tape as we set it up a few pages ago, you have engaged the FLIP switch to put the tape returns into the main channel fader and EQ. The FLIP switch also switches the Line Input to the MIX-B circuitry, and that provides your extra inputs. You can get an AUX Send for the extras using the SOURCE switch in the AUX Send 3/4/5/6 area, and you can SPLIT the EQ if you need to.

Check over in the MIX-B/MONITOR section above the Sub meters and you'll see the MIX-B TO L/R MIX ASSIGN button, which will bring all your MIX-B inputs back into the main mix. Voila! Twice as many inputs!

**Monitoring and Levels**

Check your speakers and amplifiers to be sure that they’re balanced left-to-right and mounted symmetrically to your mixing position. A 2dB shift in monitor balance will produce a 2dB shift in the opposite direction in your mix.

Also, check your speaker polarity (sometimes inaccurately called phase). This is a basic thing we all know about, but it's amazing the times we've found studio speakers (especially near-field monitors, which are often plugged and unplugged regularly) connected with opposing polarity. You should train your ears to notice out-of-polarity conditions instantly. It’s easy to hear (to us it sounds like a combination of not hearing enough bass and feeling like our eyes are slightly crossed), and getting polarity right will save you much grief in mixing.

Remember that you need to mix so that your music or program sounds good on anybody's system. Be sure you have some real-world monitor speakers in addition to the monitors you like so well, and check back and forth frequently. See Section 2 ("Studio Output"), for details on how to use two sets of control room monitors. Check at different monitoring levels, too. A mix that sounds great loud will not necessarily sound good at low volume. Listen at a barely audible level from time to time. You should still be able to hear the essential pieces of your mix.

Also, check your stereo mixes in mono regularly during your mix. Much television and radio is still heard in mono, and your mix has to sound its best both ways.

Take a hint from the film mixers and set your dialog or lead vocals to about 85dB/c at the mixing position. This is a moderate, normal volume; not quiet but definitely not thundering. If you have a sound pressure meter available you can take a measurement to get a feel for how loud 85dB is. If you don’t, run down to Radio Shack and say: “I want #33-2050 or #32-2055. Here’s $31.99 or $59.99 plus applicable taxes.” Every set of self-respecting ears should own one.

This monitoring volume will keep you honest, and keep your mixes balanced for playback. Sure, listen at very low levels, too, and crank it from time to time to remember why you’re in this line of work, but stay at the moderate 85dB/c setting most of the time. You will save your hearing and also make better mixes.

**A Word About Automation**

There is an optional MIDI automated mixing capability that will be available for the Mackie 8-Bus Series Consoles, so we won’t talk about automated mixing here. That’s in the manual that comes with the automation components.

For those of you without automation, there is hope. Billions and billions of great mixes have been done on non-automated consoles. Here are a few tips:

- Use subgroups, discussed earlier.
- "Mult" tracks that need drastic EQ or reverb changes to two channels, and alternate between them with the MUTE switches. (Multing means connecting one output to two or more inputs by simply paralleling the connections. Some patch bays have paralleled mult strips available. You can also make mult boxes or just use "Y" adapters. Note: Never mult two or more outputs into one input. That’s what mixers are for. Only mult one output into two or more inputs. See Appendix A: Connections.)
- Enlist several sets of hands.
- And last, most terrifying, but most powerful and effective: edit between sections of your mix. It would be wise to make two passes of your mix before you chop up your only one. If you’ve been wildly editing mixes for years and years, you know what we’re talking about. If not, learn to do it. Whether you do it digitally or you use a razor blade, you can fix that tiny detail in an otherwise perfect mix; you can mix a complicated track in sections rather than like a marathon; you can go from 200 instruments to a single whispered vocal and back again in a heart-beat; you can even fix a mix weeks later without losing the original magic—you just remix the one chorus that needs fixing and cut it in.
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