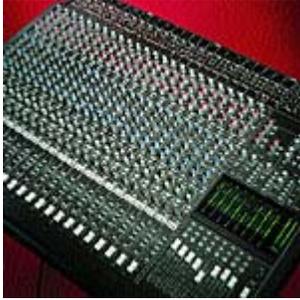


Your Analogue Mixer



New equipment won't always solve your production problems, so here's how you maximise the potential of your existing gear...

Some musicians spend an absolute bloody fortune on samplers, MIDI equipment and mics, and still wonder why they are not getting the sound they should be.

One reason for this is that they are not utilising their mixer properly; they are simply using it to balance levels and take the outputs to a mastering medium such as DAT. This is one way to use an analogue mixer - I do this using a small rackmount mixer to submix keyboards, modules and samplers before taking it into the main desk - but this does not utilise the mixer's full range of features.

This article will concentrate on analogue mixers, as there will be a full article on making the most from digital mixers in a forthcoming issue. Even though I thoroughly enjoy mixing on digital desks, I still find recording on analogue desks gives better results. The reasons for this are many, and most are subjective, but I find that when recording down to digital tape (ADAT, DTRS) or hard disk (Fostex D90, Cubase VST, and so on) using an analogue mixer, I can inject some warmth onto a fairly clinical format.

Analogue warmth

What do we mean by 'warmth', though? Ask five different people and you may well receive five different definitions of what warmth is. I see it as the slight distortion that you get on analogue equipment when you drive the levels nice and hard. With analogue tape, this effect is known as tape saturation. Many software manufacturers have produced plug-ins that recreate this effect (Steinberg's Magneto and Red Valve-It are good examples).

The other advantage of recording with analogue desks is that you can make small changes to the sound by adjusting pots and faders in real-time, and it is easy to see at a glance what the settings for each channel are. The advantage of a digital desk at mixdown is that you have your nice fat, warm analogue signals on your digital recording medium and that you are able to set up and save many different variations of mixes and instantly compare them. This is my way of working, and is by no means definitive, but let's look at the features of an analogue mixer and how to maximise them while recording.

Mixer structure

Your mixer has a huge effect on how your recordings will sound, but what makes a good analogue mixer? With the development of very low-noise digital recorders like ADAT, DTRS, and hard disk systems, setting and using your analogue console correctly has become even more important than the type of mixer you are using. There is no point spending £3,000 on a mixer and £1,000 on a mic if you do not know how to set the gain on the console correctly!

Analogue mixers are not as daunting as they first appear. Most of the features we'll be looking at here can be found on a standard 8-buss console such as a Mackie 8 Bus or Behringer MX8000 (a 4-buss or 2-buss desk is pretty similar, but will obviously have less busses).

Normally, at the top of the desk you will have the gain control (see below) along with buttons to select mic/line input and line/tape input (that allows you to select whether a particular channel is monitoring back a mic/line input or a tape return (from your multitrack recorder). You will also usually have your insert points at the top of the desk (see Insert This section on the following page).

Next, the signal goes through the EQ section, which controls the tone of the sound. On simple desks it allows you to cut and boost fixed frequencies, and on more advanced desks you can select the frequencies you are boosting or cutting. Generally speaking, the more advanced the EQ section of your mixer is, the greater control you will have over your sound.

You should really be using a desk with at least a semi-parametric EQ, with the ability to change the frequency of the high and low-mids. The high EQ on less costly desks will usually be fixed around 12kHz, and the low EQ

between 50 and 80 Hz. Full parametric EQ on desks under £1,500 is rare, but you can supplement it by buying a good quality 19" rack EQ unit such as the TLA3012. Put it across an insert, and you have even greater control over the sound you are recording.

Of equal importance is the bypass switch, which enables you to hear what the sound is like before and after any changes you make to the EQ settings. The EQ section of a mixer should be used to fine-tune the frequencies of a sound to help it sit nicely in the mix, rather than to make sweeping changes. If you do not need to EQ a sound, leave it alone.

As a general rule, you should always aim to get the sound you want at source. Get the microphone in the right position to capture your instrument's sound, or select the required synth sound to begin with. If the sound is wrong, don't spend hours with the EQ thinking it will solve the problem, because it won't. Fixing it in the mix is what bad engineers do.

The most hi-tech piece of equipment for telling you how much EQ is required is your ears. Also, don't forget that whenever you boost a frequency you are also boosting the level of that particular channel. This can really screw up your level balance if you're not careful.

Auxiliaries

Below the mixer's EQ section you'll usually find the auxiliaries, which are normally used for adding outboard effects such as reverb, chorus, and delay. They may also be used as additional outputs for recording to tape or for creating separate headphone mixes. My problem is that I always find that I need more auxiliaries than my current desk has, so it's definitely a case of 'more is better'.

When using an aux send to add reverb to a channel, you also need a stereo return to hear the effect being applied. Most desks have dedicated aux returns or stereo returns that can be used for effects processors, but on some desks you may need to bring back the aux return on two input channels.

The other reason for wanting to bring it back on input channels rather than a stereo return is that some analogue desks do not have any EQ on the dedicated stereo aux returns. By bringing it back on input channels you can use the EQ to fine-tune the reverb, or even add another effect to the reverb. You can get some great effects by doing this - try it out just for the hell of it.

The auxiliary controls are either designated pre- or post-fade (they may also be switchable between the two). The pre-fade aux is a level control that acts separately from the channel fader. This feeds the signal onto a mixing buss, where it is combined with the pre-fade auxiliary from the other channels. The combined aux signal is then placed under the control of a single aux master control.

Post-fade auxiliaries are very similar to pre-fade, but these are affected by the channel fader settings. This makes them ideal for use as effects sends, because when turning down an instrument using the channel fader, you'd ideally want the effect level to drop as well, unless you are after a particular sort of special effect...

Another use for the auxiliaries is to create a headphone mix for vocalists and other musicians.

Even if you have a very modest studio, the chances are that you will at some point want to work with a vocalist or other live musicians (but watch out for drummers - they will drink your beer fridge dry!) and it can be very frustrating for them to have to record with a crap mix in their cans. More often or not it will also detract from their performance, and then no-one will be happy.

The easiest solution to this problem is to use an aux send to set up a separate level balance for the musician. For example, your control room level might have the harmonic content (the chords) down in the mix, but the vocalist may need it louder to enable to track the pitch more accurately.

A simple way to do this would be to take aux send 3 out to a headphone amp, and then adjust the levels of the channels that the vocalist requires using the individual channels' aux send 3. Using this technique, it is also possible to set up reverb levels as required by the vocalist (most vocalists like to hear some reverb when recording).

Gain setting

I witness many would-be producers setting levels on their analogue mixer using the channel faders, rather than at the gain stage. The signal set at the gain stage determines how clean it is through its path. If the gain is not set correctly, then the preamps will not work efficiently and you could introduce noise or distortion, both of which are difficult to remove once they have entered the signal path.

At the optimum level, distortion and noise become negligible. (why?) The use of visual meters can assist you in this level-setting process, but the most successful technique is to use your ears. When you are setting the input gain on your analogue desk, it is important to PFL (pre-fade listen) the channel you are working on and use the gain pot to help adjust it to the point where there's no distortion/noise.

I always start with the fader at its normal operating position (0dB on most desks) to ensure I then have the scope to bring the levels up or down as required.

I have often seen many people starting with the fader all the way up to the top of its travel, meaning that it will be virtually impossible to mix properly.

Also, remember to switch out any EQ when setting levels, as cutting or boosting frequencies will affect the levels of a particular channel.

Patchbays

I currently use a digital mixer with an analogue mixer, and have a very extensive patchfield to enable me to easily change routing from one piece of equipment to another.

One of the most noticeable aspects of this patchfield is that the analogue mixer I/O takes up three quarters of the whole thing.

A standard 8-buss mixer has at least 24 channel inputs, 24 group outputs, 24 direct outputs, 24 tape returns, 24 insert send and returns, 8 group outputs, 8 group inserts 6 aux sends, 6 stereo returns, 2 track inputs and 2 track outputs; by anyone's imagination that is, er, quite a few ins and outs.

You have two choices when wiring up your analogue mixer. The first option is to use the 'idiot technique': blow obscene amounts of money on some great pieces of gear and only leave enough money for two pieces of bell wire and some dodgy jacks. Then whenever you need to take the output of one piece of equipment to the input of another you'll have to pull your mixer out to re-patch leads.

The second option is to invest in at least five Behringer Ultrapatch Patchbays (£49). These are the best patchbays I have seen for under £100. You'll also need to spend about £125 for 24-way multicore and mono/stereo jacks from Studio Spares. So for about the cost of a decent GM module, you can have a pro system that eases stress and looks flash.

Mix heaven

If you follow the above guidelines, you will be using your mixer more efficiently, which should result in cleaner, stronger and more professional recordings. Most of us are quite happy to sit down with the manual in order to use our latest sampler (just go with me on this one, alright?) but we just assume we know how our mixer operates. Reading your mixer's manual thoroughly will enlighten you on such subjects as the correct leads to use and the EQ specs, and it will also help you to understand the routing options available.

If you are purchasing a mixer, don't choose one that just about accommodates your current requirements, as you will undoubtedly be adding to your system at some stage. Buy a mixer with as many channels, aux sends, busses and inputs/outputs as possible, a comprehensive EQ section, and preferably, a meter bridge.

Otherwise, you may find yourself having to replace the mixer shortly down the line, and this could end up being more costly than buying a well-specified one in the first place.

A good analogue desk will last years, and will provide a speed, flexibility and control over your sound that no amount of DSP power has yet emulated at an affordable price.