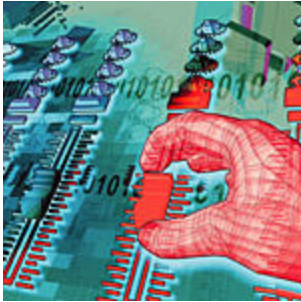## Digital Mixing

It's increasingly popular for both the home and pro studios

If you take a look through the trade ads these days, you'll notice digital mixers take pride of place over any analogue desks which happen to be in production. But what has happened to the business of mixing to make everyone want a digital mixer instead of an analogue one? It wasn't long ago when you could judge a studio's position in the market by looking at the desk. If it was at least six-foot long with a patchbay the size of a filing cabinet, it must be a pretty serious studio.

These days, some of the best studios have desks no bigger than a coffee table and home studios often feature similar desks. Digital mixers have changed the way we work and are changing the way we view the traditional recording studio.

Total recall
Ten years ago, only desks like the revered SSL had any kind of recall facility. Crude by today's standards, it still involved putting each and every pot back to the required position yourself, even if the computer did tell you where that was. Back in the 80s, Yamaha's DMP7 digital mixer offered eight channels of digital mixing with internal effects and motorised faders for a lot less than most equivalent analogue systems, but it was the early 90s before things really took off with the Yamaha Pro Mix 01 (or Programmable Mixer 01, as it was later renamed for copyright reasons). This featured 16 channels with onboard effects, motorised faders and a decent MIDI spec. Using snapshot memories to recall a mix was suddenly a possibility. At this point, several other manufacturers entered the market and soon just about every R&D department in the business was working on an affordable digital mixer.

Over the following years, several models became the main players for the project and pro studio alike, namely the Yamaha 02R, the Spirit 328 and the Mackie D8B. There are plenty of others, especially in the high-end market, but these tend to have the size and price of large analogue desks, so they're not really an option for most of us.

The features we've come to expect from digital desks include full EQ on every channel, dynamics on every channel, internal effects, total recall via snapshots and automation either via a MIDI sequencer or internal. It's a far cry from a 24-input analogue desk with limited EQ on the monitor section, no effects, no dynamic control and no recall other than mutes and possibly fader positions, but that's how far we've come. There will always be a place for analogue desks, but that place is becoming harder to find every day, especially with the prices of the new breed of digital mixers.

Affordability
When it comes to working in pro studios, the desk you use depends on who booked the studio and what you've got to record but, for example, for recording strings an analogue Neve desk would be our first choice for its warmth and good mic amps. Most of the larger studios big enough to record strings are fitted with one. If these really big studios do have a digital desk, it will usually be the likes of the Euphonix or, on rare occasions, the Sony Oxford. The kind of desk we're talking about here however, is the kind we can actually afford, like the Spirit 328 and the Mackie D8B.

The 328 and the D8B are very similar. Unlike the Yamaha range and others, they have more of the feel of an analogue desk. This has earned them many admirers because, being similar to analogue desks, they are more intuitive to learn.

The one big difference between the two is the Mackie is a lot more expensive. Both are great to record with, both use 24-bit converters so quality is high and they both have great EQ. The 328 and D8B use rotary encoders with a segment display that shows the value of a pot. Both use fader switching so you have a different bank of faders at the press of a switch. This means the desks can perform as tape returns, group sends, even MIDI controllers.

This kind of versatile instant switching is one of the best things about these desks, not forgetting the other big

advantage: snapshot store and recall. Restoring all EQ and effects settings on analogue desks involved either lining up the pots back to where they were on a screen, or pages and pages of written settings for all the outboard gear. By using more plug-ins and internal effects built into the digital desks, the need for outboard gear is reduced and switching between songs takes five minutes rather than two hours to get the balance of the mix back. For songwriting this is a fantastic way to switch between songs rather than having to stay on the one song because you don't want to change the desk now you have finally got it sounding good.

Professional sound
People sometimes believe they can't get professional results in their home studios because of their desk, but with these types of digital desks you can. The digital EQ is different and ideally you still need the acoustic environment of a good studio to achieve a great sound, but it's possible as one of Alan Branch's recent projects proves.

"Recently, I got involved in writing with a band from Leeds called LSK. I used two Spirit 328s linked up, which gave me a total of 84 inputs, not including the tape returns! We wrote, recorded and mixed loads of tracks in a little farmhouse using Logic, some plug-ins and the Lexicon effects built into the 328 desks. The album is out now, has had fantastic reviews and topped the charts in Japan, with singles outselling Madonna!"

You may think it's easy for us to say as engineer/producers, but it is possible to get great results from digital desks like these. And with the Recall function there is little excuse to keep you from going back to perfect the mix.

Beware of the hype you read about digital desks. We both remember a few articles by certain non-studio working journalists about how important it is to see the EQ curve and how a mix seemed weird without moving faders (motors off). This is nonsense. Do you really think professional engineers who mix records every day use a screen to see the EQ? No, they use their ears.

A screen might actually put your hearing off, as you're using one of your senses to look at the EQ rather than listening. And as for moving faders, engineers and activists used to joke they were only good for the A&R guy to look at. But seriously, motorised faders can be useful to see what's going on, but not at the price of not listening to the mix. A good tip when programming is to look away from the screen when trying to concentrate on a certain sound, such as checking a crossfade.

How they work
To understand the advantages of a digital mixer, you need to know the principles behind their working methods. In basic terms, once an audio source enters the desk either via an A/D (analogue to digital) converter or digitally via one of the many digital formats, everything is done in the digital domain. Zeros and ones are the language of digital gear and no matter what you do to the signal, all that is really happening is the information is being modified. Due to this process, no noise, crosstalk, distortion or unwanted degradation of the signal can occur.

Obviously, all this depends on the bit depth of the internal processing and more importantly, the quality of the A/D and D/A converters. With more and more studios using digital multitracks or DAWs, the connections between the desk and 'recorder' are often also digital. All this helps keep noise out and sonic integrity to the fore.

As anyone who uses an analogue desk will know, switching between projects is a time-draining and tedious exercise involving making notes of settings,
chinagraphing channel strips and storing effects settings on all your outboard. I've even seen engineers take Polaroids of the desk to help assist with resetting the mix later. With snapshot recall, all that is a thing of the past. Just hit the Store button and name the file. With the press of a button you can recall absolutely everything on the desk including levels, EQ, effects, compression, gating, expansion, routing and synchronisation settings. As most project studios revolve around MIDI set-ups, you can easily recall your entire studio's 'status' with a digital mixer and a SysEx message from your sequencer.

The advantages of recall for a small studio are enormous. You can work on many projects at the same time and switch between them. If the band you recorded last week wants to come and do a mix half an hour after you finish another tracking session, you can do it. In a writing studio, if you're recording vocals on one track, then you suddenly decide you have a great idea for another track you're working on, no problem. It's easy with recall. Anyone working with sound to picture projects for various clients can instantly recall a mix when they drop in to see how it's going. It makes life easy when the client wants that snare just a touch louder than when you mixed the track a week ago and have used the desk for something else since.

Another obvious advantage is price. For under five grand you can get a 40-channel desk with two effects processors and proper EQ with all the other advantages of digital. Try getting an analogue desk with that spec,

then add the cost of all those compressors, gates, effects and an automation system. No chance. With so many big name producers using these desks for some of the biggest records you've heard lately, there's obviously not a problem with quality either, so it's almost daft not to go digital.

The last advantage is the size. The footprint of most digital desks is tiny compared to an analogue equivalent. This means you really can have a pro studio at home. You don't need an enormous desk to get a pro quality sound. Also, some of these desks are easily portable. Taking them to locations to record or even onstage is not half as daunting as humping a 40-channel analogue desk up a flight of stairs. Trust us, we've tried it.

And the down side?
It all sounds too good to be true, doesn't it? Well it's not all good news. Digital desks aren't as hands-on as their analogue forebears. An analogue desk has a button, fader or pot for every single function. There are no menus, no shared virtual controls and no real difference between operation on any two analogue desks. If you can work one, you can probably work them all... eventually; it's just a case of finding your way around. Digital desks rarely have that luxury. They all have different operation systems and often require a lot of 'playing with' before you get to grips with them. It's not unusual to discover functions you never knew existed on a digital desk, months after you got it.

Being able to hear something that needs adjusting, then doing it, is pretty much instantaneous on an analogue desk, but with digital it can take a few button presses before you get there. This might not bother you, but it's the main stumbling block for many brought up on analogue desks. Then there's maintenance. Digital desks don't require half as much, but when they go wrong, you really are shafted. It's often a case of back to the manufacturer. At least with analogue you can work on if a channel goes down or a fader dies.

Last (but certainly not least) there's the sound itself. Analogue desks are often warmer sounding due to their analogue circuitry. Digital desks, in theory, add no characteristics to the sound whatsoever. A common practice is to overdrive desk channels for subtle distortion, but with digital it just sounds nasty. This is one of the reasons for the popularity of valve outboard and channel strips at the moment. You can add that warmth to the signal either via a mic amp before the signal reaches the desk or via an inserted channel during the mix.

Digital domain
Love it or loathe it, digital mixing is here to stay. The advantages are just too numerous for digital desks not to catch on, big time. As it is, many home studios are based around HDRs with built-in digital mixers, so the newcomer to recording is more likely to understand the concepts of a digital mixer than an analogue.

Sean Vincent has seen this first hand: "I remember working with an engineer once who was freaking out because he had to use a 32-input analogue desk and he'd never used one before. He'd only ever used a Yamaha 02R at college. All those hands-on controls led him to believe it was going to be a nightmare. The strange thing is, we had to explain how to use it by comparing the bits of the analogue desk to screens on his digital one. Is it just me, or is that weird?"

Coming from an analogue background gives you a good insight into signal flow and routing, and we believe that's where you should start. How else are you going to appreciate the advantages of digital?

The big threat to digital mixers isn't analogue now anyway, it's software. Pro Tools users using something like ProControl or the Mackie HUI don't need a mixer at all. Even the latest version of Logic has 'live inputs' so you can feed your audio directly into the mixer within the software. Working this way, you only need to get more analogue inputs on your soundcard, and systems like the Digi 001 are making this cheaper all the time. The new Control 24 for Pro Tools from Focusrite is another take on the future of mixing, a control surface for the software as well as analogue inputs for your external gear. The best of both worlds or just a compromise? We'll have to wait and see.

Whatever mixer you choose, make sure you use your ears. Mixing is about music, not technology.

Sean Vincent and Alan Branch