Stereo Monitoring

Our guide to buying, setting up and using monitors...

With one speaker on top of the wardrobe and the other behind the sofa, it's no surprise your mixes sound odd. Don't panic, let pro engineer Mick Williams guide you through buying, setting up and using monitors...

Some people say the only valid excuse for a bad mix is bad monitoring. While the level of expertise of the person mixing is an obvious contributing factor, even experienced engineers would be hard-pressed to do their optimum work when faced with a monitoring system that doesn't accurately reproduce the frequency spectrum. In a nutshell, if you can't hear it properly you can't mix it properly, so accurate and effective monitoring is essential for any studio.

But the complexities don't stop there. Having decided to buy some studio monitors, which do you choose? The point of having good quality monitors is so you can hear your music accurately enough to mix it so it will sound good on whatever system it's played back on. Since music can be played back over various different speaker systems, from large club sound systems to domestic hi-fi equipment or pocket-sized transistor radios, what you need are monitors that can accurately represent these myriad playback systems.

However, there is no such thing as a standardised monitor, as all monitors sound different. Even two sets of the same type of monitor can sound different from each other in different rooms or when being driven by different amplifiers, so it's a case of buying a decent set of monitors and getting to know and trust them.

The pros of a pro

Professional studios usually tackle mixing by having several sets of monitors to switch between. There will be large monitors, usually soffit mounted (that's fixed in the wall to you and me) which represent the full sound spectrum including the bass end. And there will be smaller nearfield monitors placed closer to the mixing position which, due to the limitations of cabinet size, have a more limited bass response. Nearfield monitors simulate playback conditions comparable with your home listening environment, reproducing the quality of sound played back on, say, a standard hi-fi system.

As few of us have the budget or space for huge monitors, it's nearfields that must be the speakers of choice. So, the first question must be, if nearfields are meant to sound like domestic hi-fi speakers, why not use your existing hi-fi speakers and save some money? The truth is, hi-fi speakers are often deliberately designed with 'colouration' that flatters the music, rather than reproducing it, warts 'n' all. Nearfield monitors reproduce the entire frequency range as accurately as possible with a minimum of distortion and colouration, so they're much truer to the real sound.

If you mix music on hi-fi speakers tuned to make the bass sound louder, you might not add enough bass to your mix, so it'll sound lightweight and lacking in bass when played on other systems. Studio monitors are also built more robustly to take higher sound levels; useful when you want to solo a particularly raucous sound at high volume.

Passive and active

When looking for monitors, you have a choice between passive and active systems. Passive speakers need a separate power amplifier whereas active speakers have the amp (or amps in the case of bi-amped systems where the tweeter and bass drivers have separate amps) built into the speaker enclosure. Active speakers mean you can't choose your own power amp, but their built-in amps are specifically designed to work with their speakers, creating an efficient, matched system.

Most nearfield monitors have little bass reproduction below, say, 80Hz, so you won't hear the real low end. Still, if you need to hear these frequencies, the bass response can be extended with the addition of a sub bass unit, which can sit out of the way under your mixing desk.

Monitor placement
When it comes to setting the position of your monitors, following a few basic rules will result in an accurate stereo image and reproduction of the frequency spectrum from your mixing position. Firstly, both speakers should be at the same level, and they should preferably be placed on a level with your head, when you're at your favoured mixing position, with the tweeters around ear height. It's not always physically possible to place speakers at a height level with your head so it's quite acceptable to mount them higher up, but in this case tilt them down so they're pointing at your head.

Secondly, the speakers should be angled slightly towards your listening position so the sound focuses towards your head. The recommended textbook starting position is usually to have the speakers positioned to subtend an angle of 60 degrees to the listener. Basically, you sit at the apex of an equilateral triangle formed by yourself and the speakers; this is the 'sweet spot' where you'll find the most accurate representation of the sound (see diagram above).

It's usually better to mount monitors vertically so the sound from the tweeter and the bass driver arrives at the ear at the same time, although some monitors, such as the Yamaha NS10Ms, are designed to be placed horizontally. Also, the distance between the speakers shouldn't be more than about two metres or the central stereo image may suffer. You could also run into problems if the distance between the two speakers is greater than the distance between the speakers and the listener.

Position in the room
Unless you monitor solely on headphones, it's a fact of life that the room you're in will affect the sound you hear. The size and shape of the room, together with the materials on the walls, ceiling and floor, can all exert an influence on the sound, as can any objects in the room. Sound from the speakers will be reflected from and absorbed by the various surfaces and objects which can result in distinct echoes, reverb and certain frequencies being cancelled or reinforced.

All these things, if they present a problem, can be tackled by acoustic treatment such as bass traps or heavy fabric draped on the walls, but any room influences can also be minimised by using nearfield speakers positioned correctly. Nearfield speakers tend to reduce any room effects, as they are closer to the listener, so the direct sound from the speakers dominates rather than any reflected sound.

Whatever speakers you use though, it's always useful to minimise the effects of reflected sound as much as you can. Symmetrical positioning of the speakers in relation to the room is important. If the distance between the speakers and their adjacent walls is not identical on both left and right then any reflections from the walls will be different and may disrupt the stereo image.

By the same token, any nearby racks of gear could cause reflections, so, if possible, try to arrange the two monitors on both sides of your mixing position rather than on just one. Reflections can also come from the surface of your mixing desk, but placing your speakers on stands behind the desk rather than sitting them over the meter bridge can minimise this problem.

Monitoring tips
Now your monitors are nicely set up, here are a few practical tips to help your mixing. The first one is don't monitor too loud for extended periods. Protracted listening at high volume can not only cause permanent ear damage but it can also wear out your concentration more quickly and dull your perception of top-end frequencies.

There is always a temptation to turn things up because, let's face it, music usually sounds more exciting that way, but you may soon get immune to the constant high level. It's far better to monitor at a reasonably low level and just turn it up occasionally for a quick high volume check. Monitoring at different volume levels is good practice anyway, as turning the level right down allows you to hear if things are jumping out of the mix. It's also a good way to check if, for example, the vocal or snare is too loud. Also - and this may seem a bit strange - listening to the track while standing outside the room gives you a different perspective that may prove useful. Try it and see.

As there is no such thing as a standard monitor speaker, each speaker design provides its own version of the truth, so it stands to reason that, to get the best results, you need to know your own speakers inside out and to trust what they're telling you. The easiest way to get familiar with them is to play your favourite CDs through your monitors, both in isolation and while mixing your own tracks, and compare the sound. Presumably you'll have some music in your collection mixed in a professional studio on a top-class monitoring system, so comparing this to your mixes in progress, checking not only the overall sound but also specific areas, will do no harm. I'm not talking about making slavish copies here, but it will help check things like if there is enough top end, if the bass is too boomy, if the mid range sounds too harsh, if you've added enough reverb, if the vocal sits well with the music and if the drums are too loud.

If you have access to several sets of speakers so much the better. Switch between them from time to time to see

how the music sounds on each set and occasionally check how things are sounding on headphones. If you have just one set of studio monitors you can always run off mixes in progress every so often to play back on a ghetto blaster, domestic hi-fi system, car stereo or personal stereo. If you can get your mix to sound good on really crap speakers as well as decent ones, then you must be doing something right.

Mick Williams