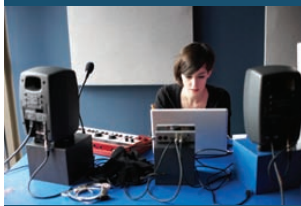


Monitoring sound in the studio

Ask the experts



with Alex Theakston



Why do I need monitors? And why can't I just use my HiFi speakers?

It may sound like the most obvious thing in the world, and it is, but along with your headphones your monitoring system is the only thing in your mix room that actually makes sound. All the decisions you make in relation to mixing, mic placement, balancing and more are coloured by how much truth your speakers give you. Quality studio monitors, properly set up, can lift the veil of muddy uncertainty from your mix decisions and have the potential to make more of a difference to your mixes than perhaps all the plugins money can buy.

It's risky territory to monitor on speakers that flatter the source material. If we're sitting on the sofa watching a film, or listening to a few CDs, then speakers that make things sound 'good', by which we mean 'a little lifted bass and treble' is probably a desirable thing. But we're fallible beasts. A few tiny increases in dB between two sources will almost certainly see us favour the one that's slightly louder. In studio monitoring, to make productions that work on a variety of systems we have to make the most boring decision in the world, and get speakers that don't colour our work, that don't lull us into a false sense of security. Monitoring on HiFi speakers is like painting a picture whilst wearing sunglasses.

The best bit though, is that accurate monitoring actually lets us work quicker. We can hear problems in the mix clearly, and when it's fixed, we can tell, and move on.

What does a good studio monitor do?

Number One, a good studio monitor represents as much of the frequency spectrum as we can afford it to. In an ideal world, it would literally be able to reproduce any frequency in human hearing, which goes from around 20Hz up to 20kHz. But if you're anything over 18 years old, it's likely that you can't hear quite that high anymore. So perhaps number two is a bit more important:

Number Two, a good studio monitor represents the frequency spectrum in as flat a manner as possible. As in, it is not accentuating certain frequencies like HiFi speakers may. This would be a problem due to the simple fact - if your speaker is accentuating bass frequencies artificially, you will likely deliver mixes that play bass-light on systems which do not also accentuate these same frequencies!

Number Three, it gives you an accurate representation of the soundstage. You can hear the snappy transients of drums clearly and actually hear the differing texture and characteristic of details like reverb tails. You should also be able to discern the location of instruments placed on the soundstage accurately - you can hear that the vocal is dead centre and those hi-hats are placed ever so slightly off to the right.

So I just spend a load of money on speakers, stick them in my room and I'm Abbey Road, right?

This is **Number Four**. We don't listen to music in anechoic chamber - a speaker and the room it's in is a marriage. We have to put our monitors in the right place, we will have to be aware of what our rooms is doing to our sound, and a good monitor should be able to be adjusted to counteract the kinds of problems you will find in real spaces. But the room will need some kind of acoustic treatment.

In bright sounding rooms, high frequencies can be tamed with relatively light and inexpensive acoustic foam placed where sound initially reflects off the walls around the listening position. You can locate these spots by sitting in the mix position and having a friend run a mirror along the wall - when you see the speakers in the reflection, that is where sound is bouncing off the wall. But to be honest, high frequencies aren't your main concern - the worst acoustic offender is bass response. Move around your room and hear how perceived bass response changes. What's worst still is that problem bass frequencies are an expensive issue to treat, as only dense acoustic material can actually absorb the problem frequencies here.

Good monitors, however, should be able to adapt to help alleviate a degree of these concerns, and on Genelec 8000 monitors there are switches around the back to help tame the worst of it. But you must still

consider your room carefully, and how your monitors have been set up.

So how do I set my monitors up correctly?!

If you have a Genelec 8000 range speaker, use those switches round the back to control bass and high frequency response. Reducing the bass output when your monitors are placed close to dense walls and corners is essential. If you find yourself setting up for a quick job outside of a treated space, engage the high frequency pad to tame the upper regions.

There's much more to consider - acoustics is a monster of a subject. While some rooms are better than others, certain issues appear in every room and every speaker placement. Genelec publish a document called the 'Monitor Setup Guide' detailing the most common problems and how to set up your monitors to best counteract them - it's a free PDF on their site, and although aimed at the 8000 range, is actually tremendously useful information no matter what speakers you have, so please take a look.

So how does a speaker counteract these acoustic problems you've been talking about, in terms of design?

No speaker will completely replace the need for a sensible choice of room, base-level acoustic treatment, and the talent of a mix engineer who knows their craft and mixes while taking into account the weaknesses in their environment.

With that said however...within the bounds of analogue design, we do think Genelec have put together a special system. And if you consider the 8200 range DSP-systems, their ability to automatically compensate for bass problems is very advanced indeed. Let's go back to those points in question two and see how Genelec deal with these design concerns.

“Number One: Broad Frequency Response.”

It's relatively easy to make a speaker that tweets all the way up to 20kHz, but physical cabinet size is one of the primary factors that determine deep bass response. Genelec make their cabinets from aluminium which is both light and stiff, and which can be made thinner than would be possible with MDF (the walls of Genelec 8000 speakers are only 4mm thick, but they are tough hombres). This means you can have a large internal volume in a small cabinet, meaning surprising bass response despite appearances. There is also an exit port for a long and efficient internal bass reflex tube system, which contributes to the bass response. Couple a pair of Genelec 8020's with a 7050 sub, and you can get 25kHz-20kHz system for a street price less than £1500 (that's rather good!).

“Number Two: Flat Frequency Response.” & “Number Three: Accuracy and Soundstage.”

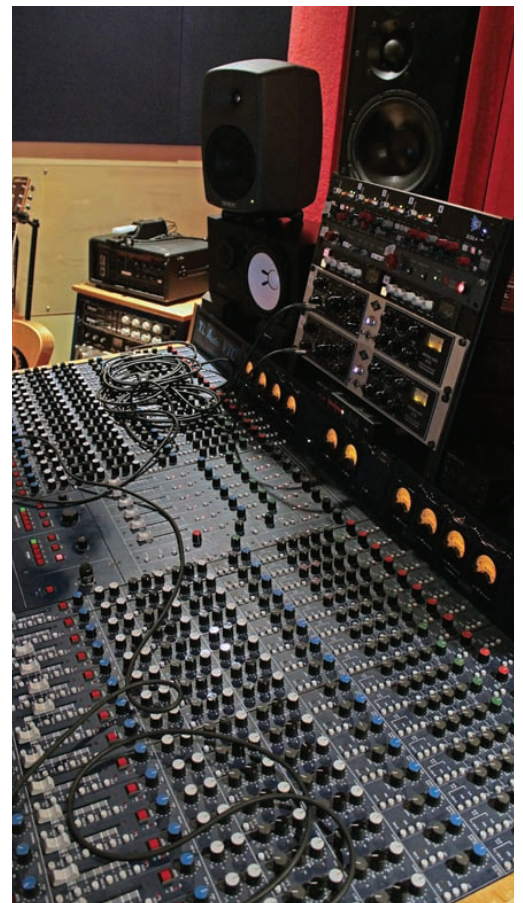
The curved 8000 range cabinet is called the minimum diffraction enclosure. On boxy speakers with sharp edges, diffraction is a phenomenon that causes the edges themselves to act not unlike “phantom tweeters”. Sound is radiated in multiple directions unpredictably, causing comb filtering and other interactions which end up in a bumpy and unpredictable frequency response.

The curved shape of the Genelec 8000 range hugely minimises this effect. The directivity control waveguide, which is Genelec's name for the sculpted exit port around the tweeter, also contributes to a flattened frequency response, clearly defined soundstage and an extremely wide sweet spot. If you happen to demo a set - Notice how far off-axis you can go from the listening position and not experience a profound frequency roll-off. For folks moving about a large mixing console and still wanting to make informed mix decisions, this can be a real blessing.

“Number Four: Reliability.”

In the professional field monitors are relied on in order to deliver work on time, breakage through accidentally high volumes or wild feedback is simply unacceptable. The 8000 range all feature active protection circuitry to protect the drivers from damage caused by errant frequencies and accidental volume boosts. In practical terms this means 8000 range monitors can be relied on for pro work. This isn't lip service, Genelec give an extended warranty on registration of 8000 Series models to provide a total of four years cover.

There's a lot of technology at play here, but the net result is a speaker which is easy to set up, reliable, forgiving and true. It's not unusual for Genelec (and for us here in the UK servicing department) to receive 25 year old speakers for repair - planned obsolescence is not part of their plan. And we think this is why the 8000 range continues to endure - Genelec got it right.



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