

# MONITORING

## COMPONENTS

Here are a few components that should be taken into account when monitoring:

### THE COMPUTER/DAW

The computer and the software will be the centre stage of your studio setup. We recommend using a computer with fast CPU processing power and large monitor.

### THE DAC

(Digital to Analog Converter) this will often come in the form of a soundcard.

### AMPLIFIER

Many speaker systems will have active monitors, so we will not need an amplifier; however, in the case of passive speakers, one will be required.

### MIXING CONSOLE

We may be routing our audio through an analog or digital mixing console of some sorts, from here the signal will be split, or routed to different speakers for monitoring playback.

### THE ROOM

The room's size, dimensions, and materials within it, will all play a key part in how we hear and interpret a sound.

### MONITOR SPEAKERS

When mixing a track, it is crucial that we are monitoring in a good environment, through a decent set of speakers. Most studios will have nearfield monitors, from companies such as KRK, Yamaha or Genelec.

When buying studio equipment, speakers should be right at the top of the priority list. Everything we hear and do will have a heavy dependency on the quality and positioning of our monitoring system. To that end, its important to make sure we save our money for a good set of nearfield monitors with a flat frequency response.

The frequency response needs to be as flat and as true to the actual audio coming out our soundcard as possible. Any colouration, or warming of the signal at this point, would trick us into thinking our mix sounds much warmer & richer than it actually is. This will often result in a colder sounding mix. We may also want to buy a subwoofer as well, for sub-monitoring.

Generally if our studio is a bedroom environment, and our nearfield drivers are around the 8" range, then we probably won't need the subwoofer. We also advise to get a few other monitoring systems. Having a set of headphones at hand for when we want to reference our mix through other sound sources can be really useful. Any set of DJ headphones work fine for this such as Pioneer or Sennheiser's.

We aren't necessarily going for crystal quality here. What we are trying to achieve, is a well-rounded idea of how our mix sounds on different mediums, to aid our objective decision making during the mix.



*KRK Rokit frequency response graph*

Finally the last monitoring source, and also one of the most important sources, is to invest in a lower quality speaker. We don't mean that it's falling apart. Its cones etc. should still be in good condition. What we mean here is an old radio-type speaker.

We are looking for a cold, flat, and true speaker, which will reveal any mid range flaws within a mix, it should be fairly small and only have one cone. (This negates any issues with crossovers.) It should also not be ported which may cause resonances. (Nearfield monitors often use ports to extend the bass range, which will suddenly drop off at around 40Hz, we don't want a ported design because this will ensure a more even low frequency ramp) We also want to be able to send an auxiliary or Phono cable to it.

If this has any form of bass/treble EQ settings on it, make sure they are set to neutral so as not to affect the signal.

Do not use computer, or iPod docking-station speakers, as these often employ psychoacoustic technologies to enhance the warmth, bass, and stereo image of our mix.

Ideally we should be doing the vast majority of our mixing on the rubbish speakers. Try to do this at the lowest possible volume. (We should set certain reference volumes that we use consistently; this can be achieved using a 'dim' switch, which allows us to switch between set levels.)

Generally a good volume is so that we don't need to raise our voice to hold a conversation over the sound of the speakers. This will be around 70dBs. Any louder than this level and we will start to induce ear fatigue and hearing loss at long exposures of 8 hours or more.

Once we have done the majority of the mix on the radio speaker, we can then move onto our nearfield monitors. We will find that we have a lot less work to do, than if we were to do this the other way around.

## **A NOTE ON EAR FATIGUE**

The best way of describing ear fatigue is when we can no longer make accurate mix choices or decisions. This is because our ears are very good at adapting to sounds. When listening for long periods of time they can often lie to us, and give a false representation of what we are actually hearing.

The louder a signal is, the faster the onset of ear fatigue. This can be affected by a number of other variables as well, ranging from how much sleep we have had, right through to the type of audio, and room conditions we are working in.

Listening at high volume levels for a long period of time can lead to hearing loss, and ear fatigue, so look after the tools of your trade carefully!

A good example of ear fatigue is a situation that many producers will have come across: We've been pulling an all night session on a track, to get it finished in time for a deadline and have got it sounding amazing. We go to sleep and wake up the next day. We give the track one last listen before bouncing the audio down, only to find out that it now sounds horrendous. This is ear fatigue in all its glory.

## **MONITOR TYPES & USES OVERVIEW**

We can utilize different types of monitors for different purposes when mixing.

### **1 – THE MID RANGE RADIO SPEAKER**

This is going to be how the vast majority of listeners will hear our mix. Think of this as an 'average Joe' of all of the different speakers and methods of listening to our track combined into one neat, well rounded speaker. Whilst this speaker won't sound as good as our main nearfield monitors, it's of just as much importance. This is due to how it will really highlight any mid range issues in our mix that would be much less obvious on the nearfields. If we can get our mixes sounding good on this, then we're well on our way to a decent, final mix-down.

We should be able to mix on these speakers for a full 8-hour session without experiencing ear fatigue, the majority of our big decisions, and balancing should be done on these.

Our radio style speakers should not be placed directly towards our ears, as this will give a clearer sound. We want a listening environment that closely replicates how the end consumers are likely to hear our music when listening back to it. This little trick, of listening to the audio from a distance helps us to listen to our mix objectively, instead of getting over involved.

Due to their small size, they are also not going to be affected by our room's acoustic properties as much, because they will have considerably less low-end. Because of this, these speakers aren't suitable for any mixing decisions under 60-100Hz.

For monitoring below this range, we will need to use nearfields and possibly a subwoofer. The small radio speaker is also not suitable for adjusting the 12khz + range of our mix, due to not being able to reproduce the high-end frequencies efficiently.

Try to split the mixing time, so that roughly 50% of the mixing session is done using these speakers.

Many producers will choose to use just one radio type speaker rather than two. This allows for quicker mono compatibility testing as well as balancing. An iconic speaker that was used for this purpose was the Auratone 5C. Whilst this speaker was certainly not the first choice for a full and non-biased frequency spectrum, It was perfect for highlighting those difficult, muddy, mid-range frequencies, which many people believe can make or break a track.

The Auratone speakers are now no longer in production however good alternatives are the Avantone Mixcubes, the Behringer C5A's, or C50A's. These have been built to replicate the properties of the infamous Auratone speakers.

Take the time to listen to plenty of reference tracks on the portable speakers, also remember to switch between the nearfields and the radio speaker whilst listening to the same track, so we can really hear the difference in sound quality.

Monitor switching controllers can be really useful for flicking between different speaker types as well as setting reference levels for our different speakers and stereo/mono checks.

A well-respected monitor controller worth investing in is the M-Patch 2 from JBL. This allows for switching between two inputs and outputs, and a handy stereo/mono switch.

A good test, to reference the low-end on our portable radio speaker, is to play a reference track and push the volume till the track distorts. Take note of how loud it is. Now do the same with our own production and see if this goes louder or quieter before distorting.

The distortion is usually caused by the high-energy, low-end Frequencies eating up headroom. So if our mix gets a lot louder without distorting, then this is usually a good sign that our mix doesn't have enough low-end. And likewise, if it distorts earlier than expected, then we may have too much low-end in our mix.