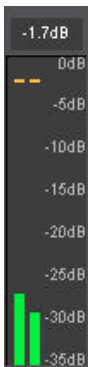


# Why bother with an analyser?

**“If you don’t use an audio analyser  
you are taking chances with your sound,  
because the rest of your set-up can easily fool you!”**

There are a large number of audio analysers, monitors, phase scopes, fft viewers, level meters etc. on the market today, some of which are very expensive and complicated indeed. Often they are seen as belonging in the domain of the mastering engineer, and as such are overlooked by the project studio or home enthusiast. If you don’t take the time to understand and use these tools as a musician, you are denying yourself access to a host of helpful and potentially essential information. In an ideal situation, your ‘golden ears’, listening with perfect attention to sounds through your perfect speakers in your perfect acoustic environment would do away with the need for analysis tools, unfortunately most of us don’t get to work like this. If you don’t use an audio analyser you are taking chances with your sound, because the rest of your set-up can easily fool you! You are also missing out on valuable opportunities to learn from highly skilled professionals who openly display the tricks of their trade in the music they produce - if you are able to analyse and interpret what you find.

**Getting Started.** As with any process, it is important that you choose the correct tools for the job. There are many different analysis tools available, displaying an abundance of data in so many different ways it can all seem rather daunting to the novice looking to get a foot hold. To begin with we will take a quick look through the more common types of tools available and what you might do with them. Some of which you will already be familiar with, others although at first glance look complicated are actually quite simple, once you understand what they are representing.



**Level Meters.** Most of us are familiar with the concept of a level meter, as they are present in almost every sequencing program and mixing desk available. Level meters, as the name implies, tell you the level of the signal being measured. There are several different ways to present this information, especially within analogue recording systems, but in today’s digital systems the most common is the PPM – Peak Program Meter, which reacts quickly and shows when the signal level is likely to cause distortion. Because digital clipping can be as short as one sample in length, many meters incorporate a peak hold option, which displays the highest level reached for a longer time so that you don’t miss reading it as the meter continues to respond to the input.

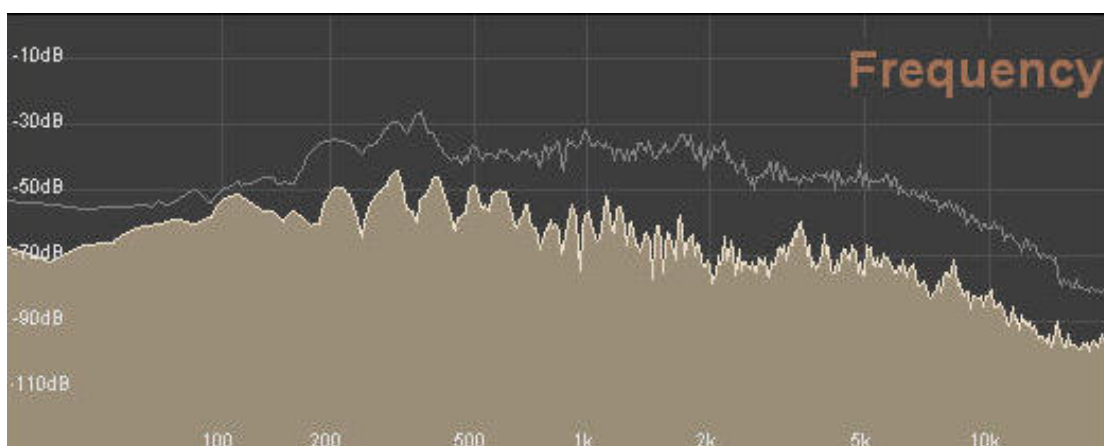
## Preparing for mastering

Digital systems cannot handle overload, so it is essential to avoid this. To help, some meters also incorporate clip warning lights, which light if the meter detects several maximum level samples in a row – a good measure of the likely hood of the signal having clipped audibly. Better still are those meters that display the margin remaining before clipping takes place. Once a signal has been played through a meter that displays the margin, you can confidently raise or lower the input and predict the resulting margin, and hence the maximum level of the program material. When preparing a track for mastering it is common to mix to a

maximum level of  $-0.1\text{dB}$  to avoid the possibility of clipping all together, this can easily be achieved by using the margin to determine how much to adjust the overall level after an initial run through.

### A spectrum analyser will allow you to see what is really going on in your mix

**Spectrum analyser.** Perhaps the second most familiar kind of visual display, common on in-car hi-fi and home audio equipment. Like an overall level meter, a spectrum analyser (or FFT Analyser) shows the level of your audio, but this time with respect to frequency. Play some familiar music through one of these and you will soon understand the concept. This kind of display can be extremely useful in a number of ways, especially in the context of home or project recording, where room treatment and monitor speakers are not always what they could be.

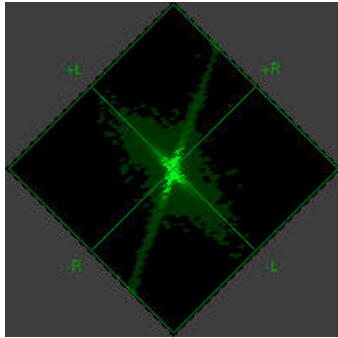


A spectrum analyser will allow you to see what is really going on in your mix. Accurately monitoring bass is notoriously difficult, poorly shaped rooms can cause reinforcement and cancellations that distort the true sound which is often not being represented correctly by the monitor speakers in the first place. A Spectrum analyser is not affected by any of these limitations and allows you to make A/B comparisons with professional mixes, which may not otherwise be practically possible.

### Its not usually difficult to hear that the lower frequencies have lost focus, but working out what to do is where the analyser comes into it's own

Spectrum analysers are not just limited to checking the properties of a full mix, they can be equally as useful when used to examine individual tracks. Unnecessary sub-bass in a vocal recording (e.g. rumble from traffic outside) or deep thumps in a double bass recording that cannot be heard, may not actually affect the listening experience, but it will use up valuable headroom in the recording. Perhaps you are struggling to get a couple of sounds to sit together in the mix. Checking them with a spectrum analyser will quickly show you where the problem frequencies are, giving you pointers as to where to begin with EQ. Kick drums and bass lines should ideally occupy different parts of the frequency spectrum. Using Spectrum analysis you can visually see what is happening with aspects of your sound that can be difficult to isolate using your ears alone. It's not usually difficult to hear that the lower frequencies have lost focus, but working out what to do is where the analyser comes into it's own - information that will help you to train your ears for the next time you come across the problem.

## This is the one that looks like some kind of crazy scientist's experiment

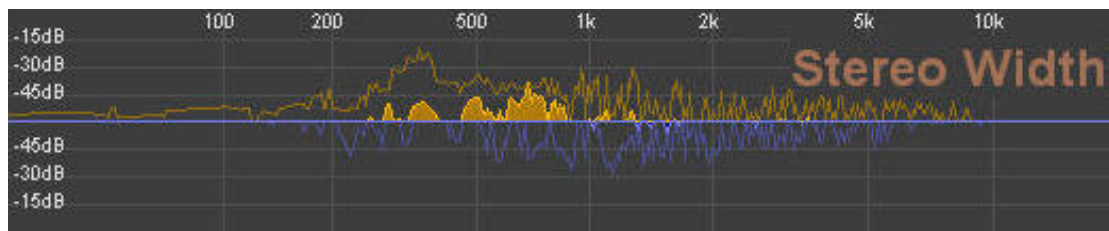


**Phase/Vectorscope.** This is the one that looks like some kind of crazy scientist's experiment, probably because it is derived from one, essentially representing the same view that you would get from an oscilloscope if you were to hook it up to show the same data. If you have ever been to a professional mastering house you will probably have seen a vectorscope and decided that you would be perfectly happy if you never saw one again. Whilst upon initial inspection a vectorscope may seem daunting, it is not too difficult to understand the general concept, although getting a feel for the display

may take a while. Once you have 'got your eye in' a vector scope can reveal a great deal of detail about the stereo image and phase characteristics of your audio. This is important for mono-compatibility and mastering to vinyl. Again, using a vectorscope can help make the process of A/B comparison of your tracks with professional mixes much easier, as you can see things that are difficult to pinpoint accurately by ear.

### Very useful for checking the solidity of your bass

**Stereo Analyser.** These range from simple left/right 'swing-o-meters', to comparative spectrum analysers. Stereo Analysers that are capable of differentiating the frequency spectra are very useful for checking the solidity of your bass. Centred bass is important for a tight, punchy sound. Sub-bass in particular appears to be omni-directional, in that the human ear cannot determine the direction of source. Spreading this energy around the stereo spectrum does little other than smear the sound and confuse the sense of focus.



Stereo analysis will let you see what you can't hear – where your sub bass is in the stereo spectrum. This is also important for when music intended for vinyl, as vinyl is not able to reproduce heavy bass that is not centred. Used in conjunction with a spectrum analyser, stereo analysis can be used to pinpoint frequencies in a mix that need 'opening up' to let another sound sit in. Other uses for stereo analysers include checking the overall balance of a mix (more A/B comparisons) and lining up physical inputs in stereo pairs with individual trim controls, as the analyser will quickly show up a leaning to the left or right that might be very difficult to hear.

**Spectrogram.** A spectrogram, like the spectrum analyser, displays frequency against level. This time however, level is indicated by colour, and the display is updated and scrolled continuously to reveal a history of the levels against time. This kind of dynamic view can be very useful in understanding how dynamic processing (eg. Compression) is affecting a mix.

Hopefully this brief introduction to the world of audio analysis software will have shown you that these tools can be of great worth in the studio, helping you to

better define and present your sound. If you wish to learn more then I can think of nothing better to do than head towards your nearest software developer, download a demo and begin experimenting.

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