The science of sound is vast and complex. Fortunately, there is help at hand for our FOUR MASTERS in the form of a piece of equipment called a Real Time Analyser (RTA) We explore some of the reasons why they are a good idea.

The Sound Curve

The human ear has a maximum frequency range of 20 Hz to 20 KHz. This is at its optimum but from the day we are born, this range starts to reduce. By adulthood the upper limit will have reduced to something like 16Khz but hearing is not simply a mechanical process as much processing happens within our brain, which can help to compensate for the deterioration of our aural organs. Because of this we are very good at getting used to substandard sound as our ears compensate in part for bits of information we may miss. However, getting used to bad sound and being engaged by good sound are polar opposites and in order to reach for perfection, we all sometimes need the support of science.

An RTA offers an audio installer a visual representation of the way sound behaves in any specific vehicle. It consists of a box containing some very sophisticated electronics and is able to look at the audible frequency range (20Hz to 20Khz) plotted against amplitude or level (measured in Volts or more typically dB) in tiny detail and displays results on a LED digital display on the front of the unit. More specifically, each of around 30 specific frequencies across the audio spectrum is given a level value when listened to by a microphone attached to the RTA and those values are each displayed allowing installers to know which frequencies need adjustment. The sound the RTA is listening to is generated from a CD that contains different sounds from frequency sweeps

(20Hz to 20Khz at a fixed amplitude or level) or other test tones specifically designed to help point out any deficiencies in the system, such as pink noise.

However, it is not simply a matter of tweaking equaliser controls to obtain a flat response as although this may be technically correct, the human ear has it's own response curve which is not flat. For example, our ears tend to be more sensitive to sounds around 1KHz and 3Khz, which is why we are quite good at hearing a baby cry. As we age, the response of our ears will be subject to change and also we will grow to prefer one sound to another. Therefore, even the most talented FOUR MASTER may ultimately need the listeners input in order to get a car to sound perfect.

Through experience, many sound experts are able to get pretty close to good sound using their ears alone however, we all have off days and it is good to have an absolute reference for any adjustment. A RTA offers this and is an invaluable tool in the hands of a FOUR MASTER.