

Music mastering: art or science?

Paul Abbott

While music is an art form, much of it, from how instruments resonate to the way microphones convert sound into electrical signals, is rooted in science. Making great-sounding recordings requires both a love for the art of music, as well as understanding and respect for the technical forces behind it.

The dictionary defines the scientific method as 'principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem'. The key phrase here is 'systematic pursuit of knowledge'. For something to be considered scientific, it must be systematically verifiable and repeatable when referenced to recognised standards. This has become the base for establishing scientific knowledge, and I believe similar standards are important for the continuing advancement of music production.

In recording, there are many examples of this theory at work. Consider terms like Blumlein, Decca Tree and ORTF. They're all stereo microphone configurations whose mere names recall a visual and sonic image to most audio engineers. These configurations are based on known principles,

and deliver recognisably consistent, repeatable results: a solid stereo image, believable depth and height representation and good mono compatibility. It's why they've been accepted and used by the recording community for decades.

In mixing, the design of tools such as equalisers, compressors and limiters follows a similar course. In the case of equalisers, Q values and shelf shapes offer established parameters to achieve a standardised result. In short, universal standards have been established that allow the user to attain consistent, proven results. This doesn't discourage the discovery or use of new techniques, it simply facilitates consistency.

Should the standards be any less systematic in mastering? Distortion and coloration that affect the perception of a recording can be greatly minimised (or even removed) by utilising audiophile-grade equipment: efficient speakers with a flat frequency response, high-headroom/low-distortion amplifiers, sonically transparent cables and high-resolution converters. Placing these components in an acoustically balanced listening environment — created and optimised by a knowledgeable acoustician — guarantees a stable audio image, minimising the sonic non-linearities that cloud both our judgement and the decision-making process. Then, after the listening environment

has been optimised, the subjective aspect of mastering comes into play. Depending on the style of music and artist's preference, the engineer decides how to process the final mix.


One contrary opinion I have heard from people interested, but inexperienced in mastering is: 'I don't need to go through all this effort, because I have a pair of speakers, typical of what most people listen to music on, that I can use as a reality check'. This rationale's flaw, aside from the limitations of consumer-grade speakers, is that there is really no such thing as a 'typical' listening system. There are endless boom boxes, car stereos, computer speakers, and iPod-like devices on the market, and they all colour sound in different ways. Probably the only thing they share is that they all exhibit design compromises to keep their cost down. Rather than offer an accurate point of reference, they only obscure the decision-making process by introducing one more variable. The result of working like this is similar to what is achieved by randomly placing mics in a recording session or blindly turning knobs when mixing: possibly interesting, but not based on anything verifiably accurate or repeatable. While this may work in recording or mixing, where randomness, spontaneity and subjectivity are all part of the creative process, mastering exists, ultimately, to optimise and verify the sonic balance of a recording for consistent results in



About The Author

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all playback environments.

The phrase, 'if it sounds right, it is right' — attributed to the enigmatic recording mogul Joe Meek — is a credo no one can argue with. But don't infer it to mean 'do whatever you like, with no regard for method'. The concept of sonic neutrality in mastering applies the same scientific concepts of consistency and repeatability as in other well-established aspects of successful music production. And by design, it offers the most leeway for all playback environments, because, if done properly, decisions are made from the most objective and verifiable position possible. 

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