Headphone Essentials 0:

Introducing the Headphone Essentials series

The **first three** (*Basics)* units in this series should be useful if you're coming at audio and/or the world of quality headphones without a lot of background. The **units 4, 5 and 6** take a deep dive into the single biggest problem area in headphone audio, called frequency response. Then **units 7, 8 and 9** cover a tool called equalization that can be used to solve frequency response problems. But this whole frequency response focus may be a waste of time, depending on your audio focus.

Consider the following two scenarios:

1. Energy

Fig. 1: Queensrÿche live at Metal Heart Festival 2007, (Photo by GoogleMe, Wikipedia Commons)

In Fig. 1 the photographer captures a moment at a live concert. We do not expect that the singer has livid orange-pink skin, nor that the guitarist actually had pale purple hair. I might use image editing effects to make my own "enhancements" as dictated by a momentary whim:

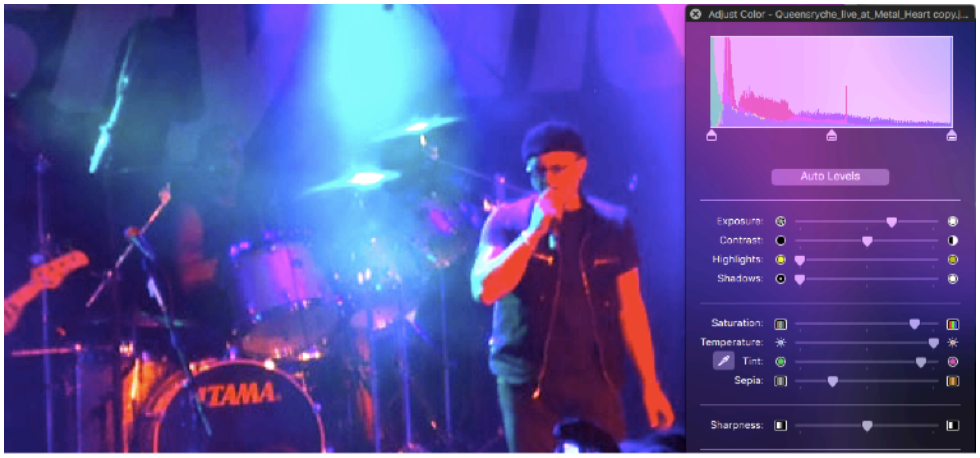

Fig. 2: modified version of Fig. 1

Here I've jacked up brightness (Exposure), colour vividness (Saturation), colour temperature, and tint to arbitrarily high values. The result hardly seems an insult to the aesthetic intent of the stage manager of that concert.

If the majority of your focus in music is on the music of raw power, I don't know that you'll get much benefit from digging into the units after the first three. Instead, I'd recommend a more hands-on approach. Watch some YouTube headphone reviews, ask some questions on headphone forum, then buy the headphone with the particular sonic flavour you think you'll enjoy. That may be bass cannon, optionally with relaxed upper mids, or it may be what's called a fun or v-shaped tuning that combines both boosted bass *and* boosted highs, or anything else.

2. Art

Now let's try a different picture:

Fig. 3: Edward Burne-Jones, The_Love_Song (1868-77) (source: Wikipedia Commons):

If you're ever at the Metropolitan Museum in New York City, you might be lucky enough to catch this exquisite Pre-Raphaelite painting on display. Let's zoom in on one section of it:

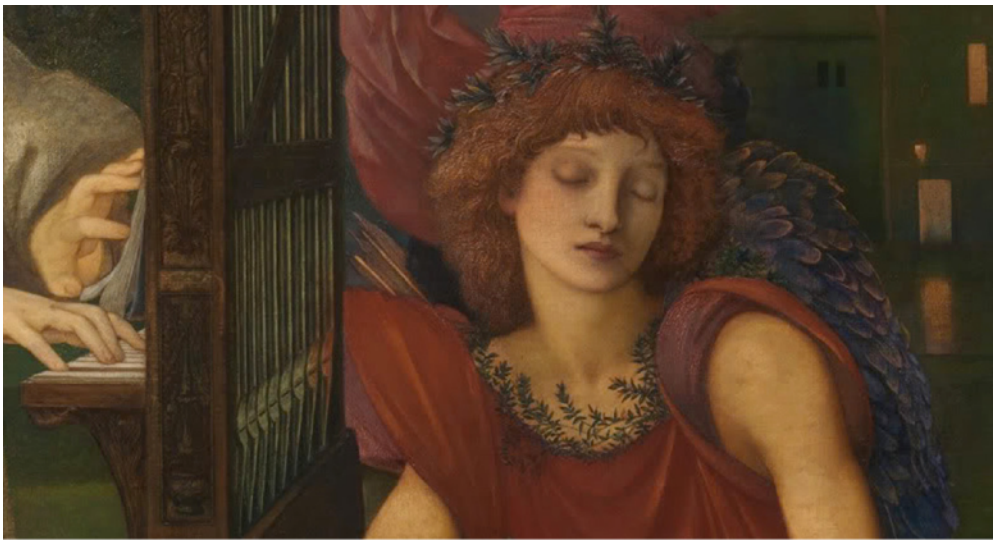

Fig. 4: detail from Fig. 3

Now let's "enhance" using some photo adjustments:

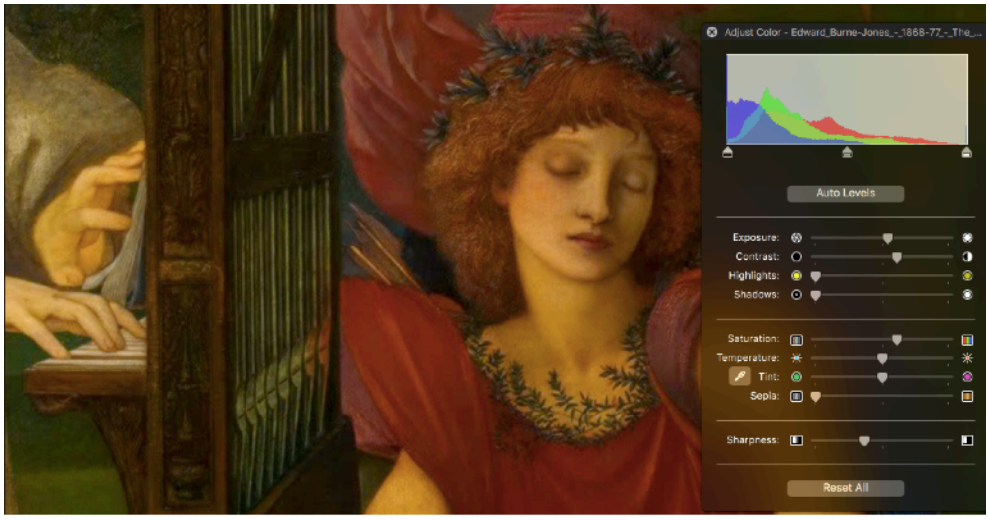

Fig. 5: modified version of Fig. 4

For Fig. 5 I brightened, increased light/dark contrast, added saturation and blurred by a moderate amount. These changes are typical of what's routinely done to create instant grab visuals.

But the Metropolitan did not pay millions of dollars for the "enhanced" version of this painting. The artist at the peak of his craft did not see fit to goose up colour and contrast, although he could easily have done so. Nor did he likely wish it to be viewed framed behind a smudged and hazy piece of glass (blurring). The particular degree of brightness, contrast, saturation and sharpness the artist employed work together to create the atmosphere/ambience he intended as being appropriate for the subject matter and emotional intent of the picture.

The audio equivalent of Fig. 3 is what the six frequency response units of the Headphone Essentials series are aimed at.

In today's electronic music playback technology the headphone or room loudspeakers are typically and by a huge margin the most compromised element in the signal chain. You can pay a fortune for amplifier and DAC, you can use a lossless 32/192 FLAC copy of the best engineered recording of a particular track available. But a typical headphone introduces 5, 10, even 20 percent distortion in various portions of the frequency response. The kind of distortion that amp and DAC enthusiasts obsess over is called total harmonic distortion plus noise. THD+N has only a veering relation to the gross FR deviations a headphone (or room loudspeaker) introduces to an audio playback system.

I own a sub-$100 Sennheiser HD 579 over-ear headphone and a over-$500 beyerdynamic DT 1990 Pro. For accurate playback of music, I find the HD 579 almost unusable and many find the high frequency spike of the DT 1990 makes it actually unusable. But apply an appropriate EQ correction and both are suddenly transformed into exceptional performers, well above what's typical at their price points.

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Overall, the purpose of the Headphone Essentials series is to provide factual information in the areas I have some competence in to aid in headphone pre-purchase research and post-purchase utilization and enjoyment. Enjoy!

Back to the Headphone Essentials series. You've been warned, grin.