The Price of Progress

An acquaintance brought some CDs to listen to on my system and was greatly disappointed in the sound. I had to agree with him; the sound was hard, glassy, gritty, compressed, and simultaneously bright without treble definition or extension. All his recordings were of popular music or rock from the 70s and 80s. I then played a sampling of older recordings—Muddy Waters' *Folk Singer* (1964) and Sonny Rollins' *Way Out West* (1957)—and he was floored by the indisputable fact that these mid-twentieth-century records far eclipsed the sound quality of albums created with vastly more sophisticated recording technology. I could have played any number of pre-1970 recordings and his reaction would have been the same.

Why do so many older recordings sound better than so many modern ones? What happened in the 1970s that resulted in a general decline in sound quality? The answer is that sound quality took a backseat to convenience, commercialism, and the ability to exercise ever-increasing control over audio signals, all precipitated by the rapid advancement of recording technology beginning in the late 1960s.

Let's compare the recording process on a record like *Way Out West* with that of a rock album created in the 1980s or 1990s. At the *Way Out West* sessions, the electronics in the signal path between musicians and the analog tape machine consisted of perhaps three or four tubed gain stages. The musicians played live in the studio to a two-track tape machine—and the record was finished.

The creation of a 1980s-era rock or pop album couldn't be more different. The simple vacuum-tube mixer was replaced by a behemoth recording console that imposed as many as 15 op-amps in the signal path between the microphone and tape machine. And these were crude late-70s op-amps (mostly 741s), not the high-speed devices we have today. Consoles also introduce multiple transformers, switches, circuit-board traces, and potentiometers into the signal path. The 24-track tape machines of the era had narrower track widths than ¼" two-track recorders, further compromising sound quality. The signals recorded on the multitrack master then passed through the recording console again for mixing, with its 15 or so op-amps in the signal path. Add the electronics in the two tape machines, outboard signal-processing devices, another tape generation (the two-track master), and you've got perhaps 40 or more grungy op-amps, countless switches, a dozen potentiometers, and two tape generations between the musicians and the two-track master. Moreover, the 1980s saw primitive digital recorders replace the mature technology of analog tape, adding injury to insult.

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But it wasn't just the technology that changed; the aesthetic shifted as well. The quest for natural sound was subsumed by the drive to create more marketable "product." The act of making a record shifted from documenting an organic musical performance to a techno-centric exercise in which the music was dissected, processed, manipulated, and put back together again. Recording technology went from being a facilitator of artistic expression to a central component of the artistic expression itself. The explosion of multitrack recording and mammoth recording consoles coincided with the rock 'n' roll boom and the mass commercialization of the record industry. It was a gold rush, with producers, artists, and recording engineers thirsting for greater control over audio signals, and with that control the ability to shape the "product" into a more marketable form. Once record producers, artists, and recording engineers tasted the power of 24 tracks (or synchronized 24-track machines for 48 tracks) and consoles half the size of a garage door, there was no going back.

Consider a Donna Summer album recorded at the height of the disco boom in the late 1970s. At the first session, the

drummer listened to a click track through headphones and played only the kick-drum, recorded to one track of a multitrack tape machine. On the next pass, he added the snare drum, recorded to another track. Tom fills were created by playing one tom-tom and then overdubbing the next tom-tom, and so forth until the complete drum performance was created. Why go to this time and expense? So the producer could have complete control over the drums in the mix including the ability to remove, for example, a hi-hat beat, without worrying that other drum microphones picked up leakage from the hi-hat. This technique also allowed the drums to independently trigger tunable sinewave generators whose outputs would be mixed with the sounds of the drums themselves. It was hubris, empowered by technology, taken to an absurd extreme.

Other techniques employed in the quest to create a marketable "product" include something called "frequency stacking." This involves equalizing an instrument or instruments by grossly boosting the energy between a certain band of frequencies. The process is repeated with different instruments at the next higher band of frequencies, and so forth. The goal is to create a sonic impact that will be impossible for listeners to ignore.

Sacrificing natural sound for a more "commercial product" continues to this day with the "loudness wars." This term refers to the common practice of compressing all the dynamic range out of a recording so that it sounds "louder" when compared with recordings not subject to such compression. (The ear judges loudness by the average signal level, not the peak signal level.) Producers don't want their "product" to sound less "competitive" when juxtaposed with other music, and are willing to forfeit the musical expression and listener involvement conveyed by dynamic contrasts.

As recording technology became more powerful, the record producer's role was transformed from coach and business liaison between the artist and record company to full-fledged *auteur*. In fact, some pop records can be considered creations of the producer, not the putative musician whose name is on the album cover. The producer conceives of the album, selects the artist to front the effort, chooses the songs, picks the musicians, often arranges the tunes, sometimes engineers or co-engineers the record, and is in the studio directing every note that's played. This phenomenon would have been impossible without modern recording technology at its heart.

Not all multitrack records were made without regard to sound quality. Many engineers replaced the console's op-amps with modules made from discrete transistors, and employed techniques to improve the sound. For example, when overdubbing a vocal, the engineer would use an outboard microphone preamplifier (rather than the preamp built into the console) and run the preamplifier's output directly into the tape machine to bypass the console entirely. Some studios went to extreme lengths to achieve good sound, and it shows in the exceptional recordings from the era. Moreover, the late 90s saw not only better-sounding recording gear, but greatly improved analog-to-digital conversion that brought us out of the "dark ages" of the 1970s and 1980s.

There's no question that the evolution of recording technology from its direct-to-two-track roots to sophisticated multitrack capability and the power of modern consoles and signal-processing devices fueled a creative burst that gave us many masterpieces that would not have otherwise existed. But as with any technological "progress" there's often a price to pay. Five seconds after dropping the stylus on *Way Out West* you realize just how high that price has been.

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