Digital vs. Analog Summing

by **Alex Oana**

I'd venture to say that I'm not the only mixer who grew up in an analog world who unequivocally loves the convenience of the DAW. Should I care about analog summing? What about all the anecdotal evidence? Am I selling my projects short when I mix in the box?

A year-and-a-half ago I bought what is arguably the most transparent and neutral analog summing, or ASum, system available: 32 channels of passive Folcrom feeding a pair of Millennia HV3s (inside TD-1s) for makeup gain. The frequency response of this setup does not fluctuate more than 0.1 dB from 20 Hz – 20 kHz, for whatever that's worth. So why haven't I used it in over a year?

One answer is it's easier not to use it. Mixing entirely inside the DAW is totally recallable and repeatable, except for when software updates really screw you and render recent and old mix sessions unusable.

In pondering these issues, I decided to do a shootout to answer the following question: Is analog summing worth the trouble or should I just sell the equipment?

A REDUCTIVE COMPARISON

I had recently cut some inspiring live tracks in the studio to Pro Tools|HD with Division Day — an analog-savvy band who had previously only tracked to tape and mixed on consoles to tape. It seemed appropriate I should make an attempt to use my analog summing gear. I printed one mix three ways: digitally summed, 'ASum' via Digidesign 192 D/A converters, and ASum via Apogee DA16x D/A converters.

In each case, the D/As fed 14 channels of Folcrom sparing one pair of outputs for monitoring. The D/As chopped to their own clocks, were gain-matched, and each analog bounce was re-digitized through the Digi 192's A/D. (At this point it is important to note that the mix in question was performed as an in-the-box mix then split out analog for the test.)

Small differences were immediately apparent. The digital mix had a noticeably harsher top end but a nice bottom. The ASum mixes had something distinct in common: both had smoother top end above 2k. I felt that the DA16x was slightly smoother, with more body and tonal clarity for each sound, in comparison with the Digi 192.

I gave these three identical mixes to a trusted colleague for his own blind listening test. LA-based engineer Bob DeMaa has some great ears, and his tastes aren't always the same as mine. In this case he reported hearing identical qualities to the ones I observed.

To anyone who can afford it, the $5,000-plus required to get into this summing game is absolutely worth the improvement. However, most listeners of an ITB mix wouldn't know there was anything inherently lacking (as we truly are deep in the era of the MP3). Regardless, I am relieved by how similar digital summing is to top-quality analog summing… especially because I've been taking the easy digital route lately.

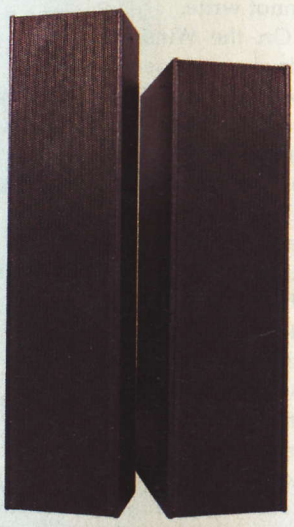
AMS Neve 8816

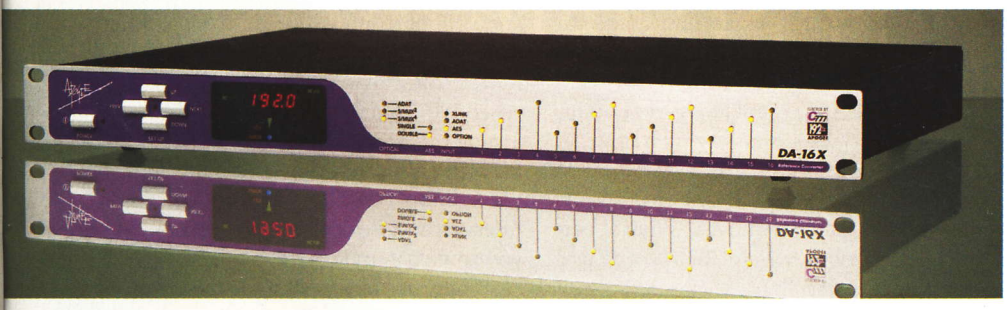
A THOROUGH COMPARISON

If making an informed decision regarding analog summing were just about a simple A-B test through a transparent signal path we could look at the score and the costs and you could turn the page.

Example:
Pro Tools "bounce to disk" = good
Analog summing via Digidesign 192 = better
Analog summing via Apogee DA16 = best

But there are two reasons to dig a little deeper for outcomes this test could not reveal.





Apogee DA-16x

One, my gain structure was set up to work for internal digital summing — levels much lower than I could get away with hitting the analog summing — and two, my analog summing equipment is about as uncolored and undistorted as it gets, which might be missing a range of tonal opportunities available exclusively in the analog domain.

If your DAW uses fixed-point math (like Pro Tools) it will blossom when you get those faders closer to zero. I took my test mix and increased the output gain of all the faders (or output levels of the last plug-in on each channel) by eight dB over the gain structure appropriate for the digital bounce. This put most of the faders near unity and resulted in output levels at the D/A converters up near the top with a few dB of headroom to spare. Subsequently, I decreased the analog makeup gain at the preamp by 8 dB. The summed mix was at the same level; but, boy, did it sound different!

THE IMPORTANCE OF DISTORTION

At a recent recording engineer's conference in Tucson, Arizona, one of the seminars was devoted to distortion in recording. It was one of the most spirited panels, with over the top adjectives flying left and right about everyone's favorite ways to mangle and blow up tracks. I had been thinking a lot about distortion in recording and was getting back around to the idea that the digital age trend of higher fidelity through lower distortion wasn't making better music.

Crane Song Phoenix and Massey Tape Head

I work really hard every day to find ways to inject distortion into my mixes using tools like Amp Farm, Tape Head, Phoenix, Analog Channel, Sans Amp and random, cheesy VST plug-ins. More germane to the summing discussion is the subtle, naturally occurring distortion missing in digital and inherent in the analog domain. Without getting into a lengthy technical discussion, transformers, tape, discrete circuits and tubes found in high-quality signal paths create harmonics that increase the tonal density of sounds, making them thicker, warmer, more vibrant or all of the above. The proliferation of vintage equipment modeled or cloned as plug-ins underscores the importance of distortion in making recordings sound better.

REAL WORLD PROCESS

For an album I was hired to mix a year-and-a-half ago, the producer and I had talked about taking the finished mixes to an SSL room here in LA in order to split out the tracks and sum through the desk. I reasoned if I bought analog summing gear I could theoretically do a version of the same, reaping the benefits of analog summing at my own studio, saving the client thousands … and then I'd own the gear. The client agreed.

There are many great analog summing options out there, such as the Neve 8816 reviewed by Russ Long in the December 2006 issue of *PAR*; it offers an affordable version of a time-proven mixing system. I was hesitant to commit to one summing flavor, so I invested in the flexibility of the Folcrom. Then I faced the tough choice of what type of make-up gain I would want for raising the output the fully passive Folcrom to line level.

There's virtually nothing inside the Folcrom, which makes it devoid of coloration. What might at first seem like a pain in the ass is truly where the genius of the Folcrom lies: determine the tone color of the mix with the mic pre you choose for the make up gain. In a studio chock full of mic pres — which would otherwise lie dormant during the mix phase of a project — one might have a lexicon of classic tones to impart to a mix. Hook up a pair of Neve,

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API, Helios, Telefunken, Trident or whatever pres that you have available, then think of how radically different the mix would sound through each of those.

My studio happens to be a dedicated mix room; so, unlike lions at a zoo, I don't have a pride of bored mic preamps licking their chops from across the hardwood moat. I decided that in my first venture I wanted most to hear my mix as-is, but with the benefits of summing happening in the analog domain. This meant I needed a clean pre — a Millennia.

Universal Audio 2-610

I purchased a pair of super transparent TD-1 pre-amps, knowing they would also work well as a DI and mic pre for the occasional mid-mix overdub. I'm glad I did. It turns out that not only do they spit out exactly what you put in, but the built in two-band parametric EQ is unbelievable: the best high frequency analog EQ I've ever heard … simultaneously sweet and exciting. The other mic pre I have available for make up gain is a Universal Audio 2-610, which supplies delicious tone coloration from the opposite end of the spectrum.

The first time I broke out a mix into the Folcrom the producer and I heard the difference immediately. Track-by-track things seemed to get simultaneously clearer and wider as I routed incrementally away from Master to each of 16 analog outputs. I distinctly remember my producer friend Sandy Chila grabbing my arm and exclaiming, "I hear that!"

At the time, to be honest, the difference was apparent but didn't seem to merit all the trouble. Then I started revising those same mixes. My process was to get the mix 95-percent of the way there, then break it out to do the fine-tuning. You know that you have your mix pretty much dialed in when you're patting yourself on the back that it is peaking at -0.1 dB. Then you want to make some rides, or you realize the kick isn't loud enough.

Just as you finesse that final five percent of magic into the song, you have to put your engineer's cap back on and bring each individual track down by 2 - 3 dB without messing up your compressed busses, effects returns and automation moves. What a perfect time to get out the old fluoroscope and watch the neurons light up the left hemisphere of your skull while the right side goes dim. Honor your mix as a musical performance and create an environment to enable your flow.

Don't bring all your faders down, push 'em up! The first time I felt this way, I had been mixing ITB for so long that I forgot that analog is headroom heaven. When I did my initial shootout discussed at the beginning of this article, I was able to bring each channel up by more than 100 percent and still maintain a minimum 3 dB of headroom on each at the converter output. This may be an obvious reason of why analog summing sounds better. Not because it's analog but because it saves each DAW track from the abusive process of gain reduction via the D.A.E. (Death to Audio Effervescence) engine. [Go ahead, make up your own acronym — it's fun!]

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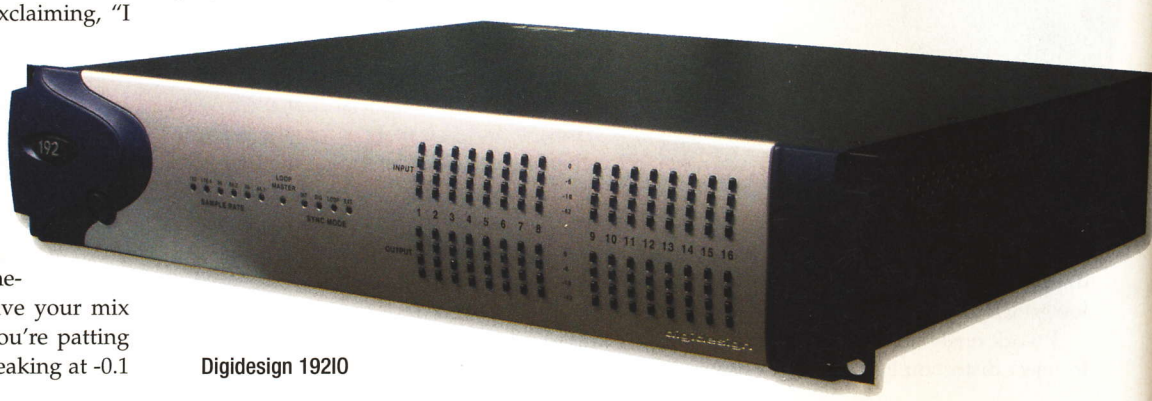
Today, my faders sit a lot closer to unity and I like it. Remember how people would say, "Oh, the higher your track count the worse your mix sounds in the box?" That concern is moot with analog summing.

SUMMARY

It's not just about the sound when it comes down to determining the value of analog summing; it is also about how the sound affects your mixing process and where that might lead you. Digital summing can be great If productivity and having frequent recalls are key and you're not mixing lots of dense arrangements with high track counts.

With analog summing, more choices become available, such as the type of D/A converters and the ability to incorporate other outboard gear. Striving for audio bliss involves compromises such as parting with lots of money. Another compromise can be process. To some, it may be more valuable to have quick and easy mix recall. I can now safely release a portion of the guilt I've been feeling over mixing in the box lately because the current state of fidelity Pro Tools offers isn't bad. But I've been reminded that worthwhile sonic improvements are within my grasp via analog summing and the process might inspire me to make better mixes that transcend esoteric audio quality debates.

Alex Oana is an 11-time Minnesota Music Award winner, including three for Producer of the Year. So he got too big for his britches and moved to LA, where they slapped some sense into him. Contact him at www.alexoana.com.



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