The New York Times

PERSONAL TECH

Low Cost and Hi-Fi: Building a Player

By ROY FURCHGOTT   JUNE 8, 2011

Back when my music was on vinyl or CD, I had a stereo in the living room where my music-loving friends would gather to listen, chat and argue. But now that I, like most of the world, buy digital downloads, my music resides on my main computer. So when my friends come by, we end up awkwardly crowded around the computer in my office, clicking on songs. This is not gracious entertaining.

I considered linking my computer to the stereo, but most digital music is in a format like MP3, which removes some musical information to save space. The computer rebuilds the music when you play it back by making a best guess of what it should sound like. These files are fine for the car or gym, but on a good system the flaws of audio compression are easy to hear and annoying.

The answer was a music server, a special computer built to store and play high-fidelity music. The problem is that they are costly — the better ones start at around $1,000 — and I am cheap.

But then I realized that a music server is just a hard drive and processor. Why not use an old computer to build a low-cost, high-fidelity music server?

I started with an old Mac laptop I was sentimentally attached to despite its age, its slowness, its meager 80-gigabyte hard drive and a case that was irreparably dented on a motorcycle trip.

First task: Clear anything not needed for music from the hard drive. Most of it — 65 GB of the available 75 GB — was full. What could I toss? The disk turned out to be full of

mystery programs. Shawn Stringfield of Premier Mac, a repair service near Baltimore, supervised my cleanup, although he said "in most cases the system won't let you trash what it needs."

In fact, it often wouldn't let me trash things I didn't need. I could throw away a program and miss all kinds of ancillary files that might wreak havoc later.

Mr. Stringfield recommended AppCleaner, a program that found files associated with anything I put in the trash and then removed them, too. For instance, when I threw away the 900-megabyte GarageBand folder, AppCleaner found another 2.4 gigabytes of files to go with it. With a little digging, a total of 44 gigabytes were cleared.

To get more room, I considered adding an external hard drive to the machine. At less than $100 a terabyte — a terabyte, by the way, is more than a thousand gigabytes — such a drive would be affordable, but it could wait until I filled the disk I had. Now I had to address the problem of fidelity. Music servers have processors dedicated to making music sound good. Computers have processors built to handle not just music but video, documents and pictures. To keep the computer prices down, compromises are made.

But I could add an "off board processor," known as a DAC, for Digital-to-Analog Converter, made especially to handle music. They generally cost several hundred or thousands of dollars, but there are exceptions. I tried two, the High Resolution Technologies Music Streamer II for $150 and the NuForce uDAC-2 for $130.

My plan was to copy my CDs in a high-fidelity, "lossless" format, which meant the music should sound as good as when played as a CD, but would take up less disk space.

There was another wrinkle though. Online music purchases are generally not compressed in the lossless format, but in a lower-fidelity format, like MP3s or MP4s. You can find music in the lossless format online, from places like HDtracks and Rhino, but the tracks are more expensive and selection is limited. So considering the cost, I decided to not put my online purchases on the server yet, but to start with the 500 or so CDs I already owned.

Problems started when I ripped my first CDs. I had been a little too eager in clearing my hard drive and had trashed the Safari Web browser, which I needed to download the artwork

to my CDs. Oops. Reinstall.

With Safari fixed and some music loaded, I was ready to wire the computer to the DAC processor and the DAC processor to the stereo. With anticipation I hit Play, and ... silence.

Panic.

Had I thrown away more critical software? Maybe the dented computer was broken in a way I hadn't spotted. I called High Resolution Technology's chief executive, Michael Hobson. As soon as he said "preference settings," I felt like an idiot. Don't forget to reset the "Output Device" preference to your DAC.

I held my breath and pressed the button again. Voilà! Music!

Before I became too ecstatic, I did a comparison listening test. My goal wasn't just to have the server sound as good as a CD; I wanted it to sound better.

I set it up so that I could compare the sound straight from the computer, from each of the two DACs and from a CD. There was no question that the DACs sounded richer and more detailed than music straight from the computer. But up against the CD player, it was a tougher call.

Both DACs improved complex music, like symphonies and progressive rock. Background instruments and vocals were more discernible, acoustic instruments had more resonance. But when it came to fist-pumping rock standards like Free's "All Right Now," the CDs sounded more lively. After listening through a DAC for a few days, though, bass on the CD sounded a bit sloppy, so it is a matter of taste.

As to which DAC was better, both the H.R.T. Music Streamer and the NuForce uDAC-2 improved a wide range of music. The Music Streamer was more pleasing on symphonic music, but whether you like it for rock depends on how controlled you like your bass. The uDAC-2 was set apart by its compact size — less than half that for the H.R.T. — and it has a headphone jack with a volume control, for listening to your laptop on the road.

As a final touch to the system, I added an app called Remote to my iPhone. Now I can see every song on my server and control it from my phone. I can play D.J. from anywhere within Wi-Fi range — even the outside deck. No more awkward listening parties around the

office desk. Debates about music can be held where they belong, over drinks in cushy chairs.

A version of this article appears in print on June 9, 2011, on page B5 of the New York edition with the headline: Low Cost And Hi-Fi: Building A Player.