750 GB of storage = 2125 hours of CD-quality music

THE BIGGEST MAC

EARLY MUSIC SPECIALIST
Jordi Savall

HIGH-POWER AMPS:
VTL tubes & Bryston transistors

Onkyo, Simaudio, Oppo, & Ayre
DISC PLAYERS

Benchmark's USB
D/A PROCESSOR

Naim's DIGITAL SUPERNAIT
Michael Fremer

Mikey Reports From Milan and Reviews MC phono Cartridges

The 20th edition of Milan's Top Audio Show (www.topaudio.it), held September 13–16, 2007 began with two strikes against it. The first, a nationwide pasta boycott, wasn't a problem; but the second, a citywide public-transportation strike on the first show day, was. A pasta boycott? In Italy? Pasta prices are expected to rise about 20% this year because of a shortage of durum wheat caused by a switch by many farmers to more profitable sunflowers, to provide oil for biofuels. Your Fiat's gain is your stomach's loss.

The public-transportation strike produced opening-day attendance that was shockingly light, and gave Top's venue, Milan's normally bustling Quark Hotel, the vibe of a ghost town. Those of us unaware of the shutdown speculated that Rome's first-ever Top Audio Show, held in the spring, had dramatically siphoned off attendance, and that perhaps one Italian show a year was enough. Learning of the strike late on Day 1 led to hopes that Day 2 would bring the crowds.

That's just what happened for the next three days: in the lobby, on the three main show floors, in the corridors, and in the "Aquarium" convention area, it was back to normal. More than 20,000 people attended.1 I was there to promote the Italian-language edition of my turntable-setup DVD, which meant morning and afternoon seminars each day for a total of eight seminars, with simultaneous moving-coil/moving-magnet phono preamplifier with balanced, noise-canceling AC supply. The chassis appears to be sturdier than that of the Anniversary, which I reviewed here in September, and the adjustability has been simplified. There was a scattering of other new phono preamps, and the new, top-of-the-line Tuscany phono cartridge from Bluenote Audio, but little else new in the analog domain.

For me, the most interesting product at the show was one I encountered last year: the Audiosonica Dragonfly loudspeaker ($6900/pair), an unusual, attractive-looking, relatively small two-box design that's essentially a minimonitor atop a double-woofered bass bin. The mini part features a top-of-the-line ScanSpeak Revelator tweeter-and-midrange unit. The speaker's sound was jarringly clear, clean, and "right" last year, but because it's not exported to the US, I quickly forgot about it, along with the brand name. When I walked into the room this year and saw the Dragonflies again, my sonic memory of them returned. The designer's first question was, "Do you have that CD-R from vinyl you had last year?" I said "No, I have a new one." I sat down. They put it in a Bluenote CD player. I listened in amazement to the disc's entire 80 minutes.

True, they'd treated the room with greater care than do most exhibitors at hi-fi shows, but even so, the Dragonfly's tonal balance was among the most subjectively linear and accurate I've heard, and its overall speed, clarity, and openness resolved an astonishing amount of previously buried low-level detail while producing among the most believable reproductions of the human voice I've heard from any speaker. The bottom end, while tight, fast, and coherent, was good down to only about 38 honest hertz. Someone should consider importing these, though once the sagging dollar and the import costs are accounted for, the price might be prohibitive.

1 For context, this is approximately twice the attendance at Home Entertainment 2007 and 4–5 times my estimate of the attendance of the 2007 Rocky Mountain Audio Fest.

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Curve Tube Stereo Control Center, and EMT's now-completed "banana" JPA 66 Varia...

I also finally got a chance to see the new McIntosh turntable, which has the familiar McIntosh chassis and blue-tinted faceplate, with turntable parts, including a pivoted tonearm, furnished by Clearaudio to McIntosh's specifications. While the design looks somewhat bizarre at first glance, in the context of a rackful of McIntosh gear it makes sense and looks right at home. The display was silent.

Also making its debut at Top was SAP's new three-box DolceVita tube
McIntosh
MS750
MUSIC SERVER

Wes Phillips

It has a fan, it won’t work without a monitor, and it contains a 750GB hard drive—for some audiophiles, that’s a trilectra of reasons not to buy the McIntosh MS750 music server ($6000).

There are cheaper ways to incorporate a music server into your hi-fi—hello, Slim Devices Squeezebox (www.stereophile.com/digitalprocessors/966slim). And there are whole-system approaches—the Sonos ZP80-ZP100 combo, for example (www.stereophile.com/mediaservers/1006sonos/). The MS750 is aimed somewhere between the two. It doesn’t require as much computer savvy as the Squeezebox does, nor does it require you to buy an entire system. It’s perhaps the easiest way to add digital storage to an existing hi-fi or a whole-house integrated system.

Also, the MS750 is a McIntosh. For McIntosh owners—some would say believers—that would be enough in itself. They buy into the corporate philosophy, which goes deeper than the black-glass front panel and the blue lights. Mac gear retains its resale value, lasts for years, and is supported by the mothership in Binghamton, New York, many decades after it was manufactured.

If you’d invested in an all-Mac system rather than a mortgage in the last five years, you might have come out ahead in equity.

**Built like a Mack truck**

The MS750 is built on an Escent platform (the $4000 FireBall MX752, near as I can figure), but with a few crucial differences, primarily the software interface, CD burner, front-panel display, and the 750GB hard drive, which McIntosh’s product manager, Ron Cornelius, described as a “mission-critical Seagate.”

Huh?

“It’s an industry term that describes the rate of failure over years,” Cornelius said. “Essentially, we had to use something that would stand up for decades of heavy use, because that’s what McIntosh is about.”

However, because McIntosh and Escent are both part of D&M Holdings, Escent’s help line also provides support to MS750 owners—which is a good thing.

The MS750 has a huge amount of connectivity, including RS-232C connectors, video outputs (composite, S-video, and component), analog inputs and outputs (single-ended), digital inputs and outputs (coaxial and TosLink), and Ethernet. The MS750 connects to a modern or WiFi network with the Ethernet cable to automatically download Gracenote metadata for its files. Transferring a CD to the server takes about five minutes; you can choose MP3 at various rates, or lossless FLAC for full resolution “CD quality.” I chose FLAC for my auditioning.

The MS750 is ready to be incorporated into any sophisticated system. It can be controlled by just about any external touchscreen remote-control panel—consumers such as I who don’t have one hardly will need a monitor to set up the system and use some of the more complicated features, such as inputting metadata on discs that aren’t in the Gracenote database. Of the 500 or so discs I loaded into the MS750, I had to manually enter only four. (This can be done—laboriously—with the remote, or much more easily with a computer.)

The MS750’s front panel has an alphanumeric display that will tell you the song title and musical category of the song playing, but for more information, such as finding a specific track or creating a playlist, you’ll need that monitor or touchscreen controller.
The MS750 has analog inputs that allow you to record external analog sources, such as, say, LPs. I'm sure this is a selling point for some, but it's one that I doubt will be used by most Mac owners. It's a bit of a pain in the keister, and you're going to have to really want to rip that analog source in real time, then edit the recording into individual tracks and enter the metadata yourself. And if you want to use the CD burner, you're going to have to feed it royalty-paid CD blanks (not cheap "data" discs).

The MS750 will let you transfer digital files from your computer via your WiFi interface, from either PCs or Apple computers (I almost said Macs, but that would get confusing). It also lets you surf Web radio, which can allow you to sample new music, albeit generally at disappointing data rates.

**What's the setup, Mac?**

Setting up the MS750 was fairly simple, even if it requires an Ethernet connection and a monitor or touchscreen panel. That requirement wasn't immediately apparent until the MS750 helpfully prompted me by displaying the message "CONNECT MONITOR." Once I'd done that, the server guided me through several screens of preliminary settings, shaking hands with my WiFi network, asking how I wanted to rip files, and whether or not it should automatically rip CDs upon insertion—basic housekeeping.

All in all, it was simpler than setting up a Slim Devices Squeezebox, which itself is pretty painless. I give McIntosh an A+ for initializing the system. After that, it was just a matter of feeding the MS750 music to digest. I didn't relish

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**MEASUREMENTS**

To test the McIntosh MS750, I ripped the CD-Rs carrying my assortment of test signals as FLAC lossless-encoded "CD Quality" files to the MS750's hard drive, then played them back as needed. (The MS750's CD drive rips CDs at a rate of about 15x.) Measurements were performed with Audio Precision's System One and System SYS2722 setups (see "As We See It" and www.audioprecision.com).

The MS750 offers only unbalanced outputs. These turned out to invert signal polarity, but offered a very low source impedance of 1 ohm. The maximum output level was 2.07V RMS. The McIntosh's frequency response was basically flat, with negligible rolloffs at the top and bottom of the audioband (fig.1). Channel separation (not shown) was only moderate, but the measurement was somewhat compromised by low-frequency analog noise. (The MS750 was very sensitive to grounding issues between it and my test gear; floating its power-cord ground gave the lowest level of AC supply noise.)

This noise reduces the player's dynamic range, as can be seen in fig.2, which analyzes the MS750's output with a swept ½-octave bandpass filter as it decodes data representing a dithered 1kHz tone at −90dBFS. The spectrum peaks at −90dB, and above that frequency the measured noise floor is that of the recorded dither. But below 500Hz or so, the noise floor is that of

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![Fig.1 McIntosh MS750, frequency response at −12dBFS into 100k ohms (right channel dashed, 0.5dB/vertical div.).](image1.png)

![Fig.2 McIntosh MS750, ½-octave spectrum with noise and spuriae of dithered 1kHz tone at −90dBFS, 16-bit data (right channel dashed).](image2.png)

![Fig.3 McIntosh MS750, FFT-derived spectrum of 1kHz sinewave at −90dBFS, 16-bit data (linear frequency scale; left channel blue, right channel red).](image3.png)
feeding the MS750 one disc at a time, but fortunately it has an S-Link connection, which allowed me to connect it to my S-Link-controlled Sony CDP-CX400 carousel CD player via the Sony’s TosLink output. (Or you could use any RS-232-controlled disc changer via one of the MS750’s RS-232 ports.) The Mac then ripped all the digital signals and metadata automatically, though it took some 350 hours (two weeks) to load all 400 discs—the Sony plays CDs only in real time.

It might be worth asking your dealer if he offers a CD-loading service. Apparently it’s a growing market. Me, I’m cheap, and I had the Sony, so I loaded it myself and twiddled my thumbs for two weeks. McIntosh’s Cornelius had another suggestion: teenagers. “For the same money you’d pay for a babysitter, hire a kid to feed a disc into the 750 every five minutes or so. Unless you have a huge collection, it won’t take that many sessions.”

Maybe, but I’m of the opinion that music servers make the most sense for those of us who do have huge collections. At FLAC resolution, the MS750 can store about 2700 CDs, which is an unwieldy collection of physical discs—but when those discs’ contents are stored on a hard drive and organized by title, genre, artist, and playlist, it’s a different story. That, to me, is the glory of a music server. I want it stuffed to capacity, because I’m tired of filing—or, more commonly, not filing—my CDs.

**FYI, Mac**

There are two minor usage points I feel compelled to make about the McIntosh—neither of them a cavil, really; simply observations. One concerns the cooling fan, which is generally unobtrusive, unless you sit nearly on top of the MS750. Periodically, however, it revs up and really goes to town, whether or not you’re

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**measurements, continued**

RME soundcard that resides in my test-lab PC and recorded the data to the PC’s hard disk using Adobe Audition. A bit-for-bit file comparison with the original test-CD data indicated that I had correctly ripped the CDs at “CD Quality,” and that both the ripping and the FLAC encoding/decoding were transparent. The lack of lower-frequency resolution was indeed characteristic of the MS750’s analog outputs.

The higher-than-usual noise can be seen affecting the

McIntosh’s plot of linearity error against absolute signal level (fig.4). Although the error is vanishingly small down to -100dBFS, it becomes increasingly positive below that level due to the presence of noise. It also obscures the waveform of an undithered tone at exactly -90.31dBFS (fig.5), which ideally should comprise just three clearly defined DC voltage levels. (See the review of the Onkyo DX-7555 CD player elsewhere in this issue for an example of good performance on this test.)

The MS750 produced relatively high levels of THD. Fig.6, for example, shows a spectral analysis of its output while it reproduced a 50Hz tone at 0dBFS into 100k ohms. The third harmonic is the highest in level, at -66dB (0.06%). Although this is low enough to be inaudible by itself, it is accompanied by a regular series of higher-order harmonics, both odd- and even-order. This behavior was unaffected by a drastic reduction in load impedance, however.

The MS750 also offered disappointing performance when I looked at how it handled an equal mix of 19 and 20kHz tones, the combination's waveform peaking at 0dBFS. Fig.7 shows the spectrum of the player’s output when loaded by a high 100k ohms. Again, this behavior didn’t change significantly into low impedances; although the 1kHz difference product lay at a moderately
using the Mac at the time. Keeping the hard drive cool is essential to its longevity, so I guess it’s a good thing, but sensitive listeners (and/or those with small rooms) may wish to place the MS750 where fan noise won’t bother them. Because its interface lets you use virtually any touchscreen controller (or a WiFi-connected laptop), this shouldn’t be a problem.

Also, classical listeners need to acknowledge that they’re going to have to rewrite 90% of the metadata tags they harvest from Gracenote (AMG is no better). This is a legacy issue that goes back to the early days of the Schwann catalog, in which artist could mean several different things, from composer to soloist to orchestra.

**Mackin’ around**

If you’ve ever used an iPod or personal digital player (PDP), the MS750’s learning curve will be almost flat. You can choose music by album title, genre, or artist in just a few keystrokes. I enjoyed exploring my library with the random-play feature, but you can also structure your listening a tad by specifying random play within a genre—a feature my wife, who doesn’t like surprises, enjoyed.

Me, I delight in strange juxtapositions—as did many of my guests. John Atkinson asked, “What criteria did you establish to get some of those segues?” As people’s eyes lit up in recognition, it almost became a game. Oh, what will the MS750 play next?

The real question is **How good did the MS750 sound?** As I said, I ripped all the music I stored on it as full-resolution FLAC files—results with lossy formats will necessarily suffer in comparison. In FLAC, I found it virtually impossible to detect any difference between the original CDs played on the MS750 and their stored FLAC versions. Well, I say virtually to save my wounded pride. I wouldn’t wager large amounts of cash on my consistent ability to discern the originals from the ripped copies.

**measurements, continued**

high -75dB (0.02%), and the higher-order products at 18 and 21kHz at -69dB (0.04%), there are many other products visible. More unusually, a considerable amount of spectral spreading is evident with respect to the fundamental tones, something that tends to indicate high levels of random word-clock jitter.

To be sure that I hadn’t inadvertently done something wrong, I reid the measurement, using the MS750 to play back the original test CD. There was no change in the result. I then abandoned the regular test systems and recorded the McIntosh’s output on my laptop using a Peak Indigo PC card running at 24 bits and 96kHz. FFT analysis of the data file gave the same spectral spreading as before. (Repeating this test with a player with known low IMD gave an excellent result, validating the Indigo’s A/D performance.)

Looking at the MS750’s word-clock jitter using the Miller Audio Research Analyzer and the diagnostic tone that I’d confirmed I had ripped at “CD Quality” gave a very high measured level of jitter: nearly 14 nanoseconds, or two orders of magnitude higher than the best players I have measured. Fig.8 shows the spectrum of the McIntosh’s output, derived using the Audio Precision SYS2722 set to the same FFT analysis parameters as the Miller Analyzer. Again, the significant spectral spreading can be seen, as well as pairs of sidebands at high levels and low frequencies, and at higher frequencies but lower levels.

Overall, this is very disappointing measured performance, and not what I had expected from a product bearing the McIntosh label. Audiophiles might argue about sound quality, but until now, my experience of the veteran Binghamton’s technical performance had been universally impressive. To take advantage of its superb features, the MS750’s owner will need to use its digital output to feed an A/V receiver or a separate D/A processor (such as McIntosh’s own MDA-1000, which Sam Tellig raved about in July 2005).

—John Atkinson

![Fig.7 McIntosh MS750, unbalanced HF intermodulation spectrum, 19+5kHz at 0dBFS peak into 100k ohms (linear frequency scale; left channel blue, right channel red).](image)

![Fig.8 McIntosh MS750, high-resolution jitter spectrum of analog output signal (11.025kHz at -6dBFS, sampled at 44.1kHz with LSB toggled at 22.9kHz), 16-bit CD data. Center frequency of trace, 11.025kHz, frequency range ±3.5kHz (left channel blue, right channel red).](image)
Just a few days ago, I received a CD-R from Stephen Mejias, on which he'd compiled 17 of the classic salsa songs that have obsessed him lately (http://blog.stereophile.com/stephen/mejias/101807mix/). Su obsession est mi obsession, Estebar—I just can't stop listening to those tracks. Of course, inputting the music from a CD-R meant I had to enter the metadata myself, but it was worth it.

The fat brass blats that open Willie Colón and Héctor Lavoe's "La Murga" are followed by an atomic rhythm section. What power, what precision—what fluidity! The call and response between Lavoe and the band had this decidedly gringo-hopped nod up and dancing across the room. Well, in my mind, anyway. The MS750 handled the ritmos with greater delicacy than I did.

The MS750 sounded warm, rhythmic, controlled, and exciting. And clean, don't forget its clarity—Celia Cruz's regal "Todos Somos Igualares," with Willie Colón, allowed me to hear the curl and burr of every magnificent r she sang.

With McCoy Tyner's new, reference-quality Quartet (CD, McCoy Tyner Music 4533), the MS750 delivered the power and depth of Christian McBride's double bass, while burnishing Joe Lovano's tenor saxophone to a brassy sheen. The McIntosh was fast, clean, and powerful.

There was a downside to that. Load nearly 400 CDs in the MS750 and you'll regularly be reminded that not every recording is recorded to be a classic. However, this has been the curse of the audiophile music lover since time immemorial. You have a choice: You can always delete the recordings that jar you out of your comfort zone and reserve the CD for playback only when you must hear that piece, or you can suck up the bitter with the sweet.

As attractive as I find the idea of having all of my music digitally archived and at my fingertips, I find still need a discrete disc player. For one thing, I have hi-rez SACD and DVD-Audio discs that I haven't been able to digitize yet—the MS750 is CD only. That alone dictates that my Ayre C-5xe universal player still has a place in my system.

**Something in the Ayre**

But even without the hi-rez formats that can't be stored on the MS750, I'd keep the Ayre for serious listening. This might not surprise longtime McIntosh fans—one of them went so far as to predict, on www.audiokarma.org, that "audiophiles" would find the MS750 too "good sounding" to be a reference. He thought audiophiles prefer relentless resolution over good sound.

I think he's partly right. No, I don't think we audiophiles would rather hear the warts and spots on recordings, but those last little smidgens of air, delicacy—and, yes, even power—are audible through the Ayre not just with DVDs and SACDs, but with "Red Book" CDs as well.

Christian McBride's bass dug deeper through the Ayre—not deeper into the bass, but deeper into the groove. Lovano's tenor sax bit harder, and the sound of the room was more evident in the recording absolutely sounded as if it was in the house.

The Ayre did capture with more authenticity the overtone bite of Yomo Toro's cuatro on "Que Bien Te Ves," though not by a lot. But in critical listening, that little bit extra can mean the world.

Horses for courses, of course. For the same money, you can buy a single-play, multiformat player, or a music server capable of storing an immense amount of music at your beck and call.

**Jump back, Mac!**

After he measured the MS750, John Atkinson asked me to add some notes on using the music server, via its digital outputs, as a source for a D/A converter. He suggested a known quantity: the $2495 Bel Canto e.One DAC3, which he'd reviewed in the November 2007 Stereophile.

I added the e.One DAC3 to the system, connecting its single-ended outputs to the Krell Evolution 202's S2 input via a 1m run of Shunyata Research Altaire interconnects identical to those I was using with the MS750. I connected the MS750's digital output to the Bel Canto's BNC connector with a short run of Stereovox VX2 digital interconnect. Then I powered everything up and let it settle for 12 hours or so, having read in the Bel Canto's owner's manual that it would sound best after 48–72 hours of warmup.

Naturally, I was in too much of a hurry to wait that long, so bright and early the next morning I began comparing the two in level-matched auditions. At first, I was impressed by how strikingly similar they sounded. But as time went on—and as, I presume, the DAC3's circuits settled down—this changed. Increasingly, I heard the Bel Canto as more articulate, clean, and quiet. I could hear more of the acoustic, especially in recordings such as the Tallis Scholars' performance of Tompkins' Third Service (Gemell 54294). Switching back to the McIntosh made individual voices sound less distinct from each other, and lost much of the precision of attack that distinguishes the Scholars from lesser choirs.

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**LOAD NEARLY 400 CDs IN THE MS750 AND YOU'LL REGULARLY BE REMINDED THAT NOT EVERY CLASSIC RECORDING IS RECORDED TO BE A CLASSIC.**

Tyner's piano sound—not a lot, but enough that when I paid attention, I could hear it.

That said, the pace and timing of Stephen's salsa mix was magnificently presented by both the McIntosh and the Ayre. If you thought I was going to say that the Ayre aced the Mac in delivering that salsa beatitude, I have to surprise you. It sure surprised me. *Stirred* me is more like it—through the MS750, that complex cowbell syncopation absolutely sounded as if it was in the house.

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**ASSOCIATED EQUIPMENT**

**DIGITAL SOURCES** Ayre C-5xe and Muse Polyhymnia universal players, Sony CDP-CX400 carousel CD player.

**PREAMPLIFIERS** Ayre K-1xe, Krell Evolution 202.

**POWER AMPLIFIERS** Krell Evolution 600, Portal Paladin.

**LOUDSPEAKERS** Hansen Audio Prince, Vandersteen Quatro Wood, Wilson Audio Specialties

**WATT/Puppy 8.**


**ACCESSORIES** Ayre L-5xe line filter, Furutech eTP-609 distribution box, APC APCS15 AC line conditioner, Furutech RDP panels, RealTraps Mini & Mondo Traps. —Wes Phillips
I went back and listened to the first recordings I'd compared: Acoustic Guitars’ Gajos in Disguise (STUCD 19001) and Chanticleer’s A Portrait (Teldec 104743). Sure enough, now it was the differences that were striking. If I auditioned the straight MS750 first, then switched to the e.One DAC3, several layers of fuzz fell away. If I auditioned the Bel Canto first and then switched to the Mac, I wanted to switch back immediately. It wasn't so much the clarity, frequency extension, or depth; it was that the DAC3 compelled me to care about the music, and the MS750 didn't, particularly.

Thinking that it was possible I'd reached my limit of attentive listening and was starting to get cranky, I took a rest. After lunch, I cued up Bennie Wallace’s “Sainte Fragile,” from Twilight Time (Blue Note CDP 7 46293 2). The Bel Canto caught Wallace's tenor squonk brilliantly. More important, it captured the gutbucket precision of the rhythm section's boogie slop shuffle. When I switched to the Mac, that atomic precision became a lurching stumble.

I couldn't escape the conclusion: by itself, the Mac was a letdown.

**Mac factor**
I so wanted to become a McIntosh convert. I did find a lot to love about the MS750 and the McIntosh experience. The MS750 was far and away the easiest music server to use that I've incorporated into my system. Its dead-simple user interface should appeal to the computrophobic audiophile, while being sophisticated enough that the computer-savvy can make the MS750 do just about anything they want.

It's true that you pay a premium for that McIntosh faceplate, but you get more with it, too. A three-year warranty, for one thing (the Escent model it's based on comes with only one year). You also get that faceplate, with a larger, easier-to-read alphanumeric display than the Escent's, and that “mission critical” hard drive—not to mention McIntosh's legendary support and resale value.

However, my experiences with the Bel Canto e.One DAC3 make me question the "mission critical" aspect of the McIntosh's D/A conversion—which is, presumably, the part of the MS750 that McIntosh enthusiasts expect to be built “Mac tough.”

There are still logical reasons why a consumer might buy a McIntosh MS750, especially if cost is no constraint. In that case, go ahead and get the Mac and the digital processor of your choice. But a little bit of computer savvy, a $300 Slim Devices Squeezebox, and that same processor will get you to the same sonic place for significantly less.