



MSB Reference DAC and Transport The Knock on the Door

Well, what do you know? I've finally found digital components I can live with! Of course, the MSB Reference DAC and Reference Transport under review here aren't gonna push my record players and tape deck off the equipment stand, but they will occupy a place of honor right beside them. What's changed? The thing that matters most: The MSB Reference DAC and Transport make digitized music sound like the real thing. And, thanks to MSB's optional preamplifier module with multiple I/Os and world-class, constant-impedance, passive analog volume control, the Reference DAC doesn't need to be hooked up to an \$80k outboard preamp to work its magic.

The preamp section with passive volume control is just one of many modules this highly configurable DAC can be fitted out with. In its stock setup (\$39,500), it comes with four "hybrid" DACs (for which, see below), a TosLink and coaxial input module, MSB's Femto 140 clock (once again, see below), a standard XLR/RCA output module, and a dual power base with separate power supplies for the digital and analog circuits—all housed in two elegant, beautifully machined, rectangular (with milled-into-a-curve corners) aluminum enclosures. On the narrow front panel of the DAC section (which sits atop the power-supply enclosure) you'll find a centrally located, easy-to-see 590-pixel display that reads out everything from input source to volume level to sample rate. To the right of the display

is the volume control knob and to its left are three function buttons. On the rear panel four slots accommodate your choice of modules: Pro I2S, standard XLR, SPDIF (coaxial/TosLink), MSB Pro ISL, MQA USB, and MQA/Roon-ready Network Renderer V2—all of which snap in and out of the slots with the throw of a built-in lever—with extra slots for additional RCA, XLR, and Isolated Sub output modules (also lever-installed). Other options include the choice of different clocks (right up to the top-of-the-line Femto 33) and dual-mono power-supply bases. Depending on your input configuration, the Reference DAC supports virtually all digital formats from 44.1kHz Red Book to 384kHz/32-bit PCM, 1xDSD, 2xDSD, 4xDSD, and 8xDSD, DSD via DoP, and MQA. The DAC with preamp module will drive up to four amplifiers.

The MSB Reference Transport is also housed in two elegant, rectangular (with milled-into-a-curve corners), CNC'd aluminum chassis—one for the mechanism and one for the power supply. Like the DAC, the Transport handles just about anything on an audio disc from CD and SACD to multichannel DSD and 24/192 PCM (in AIFF, ALAC, APE, FLAC, or WAV formats), as well as anything on an optical disc from DVD to 4k UHD Blu-ray. USB hard drives and thumb drives are also supported.



MSB Reference DAC

Both the DAC and Transport come with their own battery-powered remotes, but the transport remote will control both products. The Transport remote has all the standard buttons for playing back physical media. There is also a “Pure Audio” button—a legacy of the Oppo transport mechanism that MSB is using in a greatly souped-up configuration—which I would advise you to press. (Among other things it turns off the Transport’s LED display, which, as is usually the case when you turn off displays, improves the sound.) The DAC remote allows you to turn the unit off and on (there is also a button

on the power supply box for this, as there is on the Transport's supply), switch inputs, and control volume. In sum, these sophisticated MSB components are a snap to use or improve.

Now, before I get more deeply into this conversion narrative, let me be honest. The MSB gear doesn't sound real in all the same ways that my Walker Proscenium Black Diamond V turntable does (and vice versa). For one thing, like every other digital source component the MSB DAC doesn't do bloom or the third dimension like the Walker—at least, it doesn't do these things on non-MQA sources. So, if you were thinking that my switch from zeroes to ones is the result of a breakthrough—of the MSB gear bringing something completely new and different to the table that digital has never supplied before—well, that isn't exactly the case. What the MSB Reference DAC and Reference Transport do right, however, they do better than any other digital gear I've heard, which somehow manages to make what they don't do (or don't do as well as analog) seem not to matter. When musicians sounds as uncannily “there” in the room with you as, oh, Harry Connick, Jr. and Branford Marsalis do on “A Nightingale Sang in Berkeley Square” from *We Are in Love*—recorded in 1990 on Red Book CD, no less (or more)—it seems positively ungrateful to hold the few things that this front end isn't reproducing as realistically as vinyl does against it. In fact, the MSB duo kinda makes you wonder how important those things actually are to the illusion of hearing real instruments and real musicians in a real space—or, to put this cart before the horse, what a reviewer, particularly this reviewer, means when he says something “sounds real.”

One way to answer this question is to think about those occasions—and they're extremely rare—when our stereo system fools us so completely into thinking a recorded sound is not recorded but actual that we act upon the sound we heard. Many years ago, I wrote about an amusing experience I had along these lines—and that'll I'll bet some of you have had too. I was watching a movie and using a very fine surround system to reproduce the soundtrack. In the course of the film someone knocked on the closed door of my home-theater room. I got up, walked over, and opened the door, expecting to see my wife outside—only to find that there was no one there. The knock on the door, it turned out, was buried in the mix of the movie soundtrack, but the soundstaging of my theater system was so wide, tall, and deep, and its transient response so lifelike (I was using MBL Radialstrahlers at the time) that that knock was re-located well outside the viewing area—midway up the wooden door of my room.

Now that was quite literally fool-you realism. Of course, I don't think I've ever achieved the same level of fidelity with anything that wasn't almost a pure transient—like a knock or a doorbell or a ringtone. The goosebumps that “Nightingale in Berkeley Square” raised were a different order of “real.” Yeah, Connick and Marsalis (on sax) sounded “there,” but unlike the knock on the door I knew that these musicians weren't actually in the room with me—I was just surprised and delighted by the degree to which they seemed to be. I would argue that this surprise and delight are always part and parcel of stereophonic realism, because in spite of our magazine's mantra—that things should sound like the same things do in real life—we don't really believe we're going to get the full measure of equivalence on a stereo. We rightfully believe we're going to get a fair measure of it. Thus when a system exceeds that “fair” measure, we are surprised and pleased by the unexpected completeness of the illusion.

I'm not at all sure I can adequately explain why this magic trick happened with the MSB Reference gear—and happened repeatedly. As I just said, it wasn't as if Connick and Marsalis had developed the body and bloom of an LP on voice and sax. And yet, in spite of this, the MSB gear reproduced both singer and sax with such supernaturally lifelike immediacy, resolution of performance detail, neutrality of tone color, and dynamic range that they sounded “there” enough to astonish me.

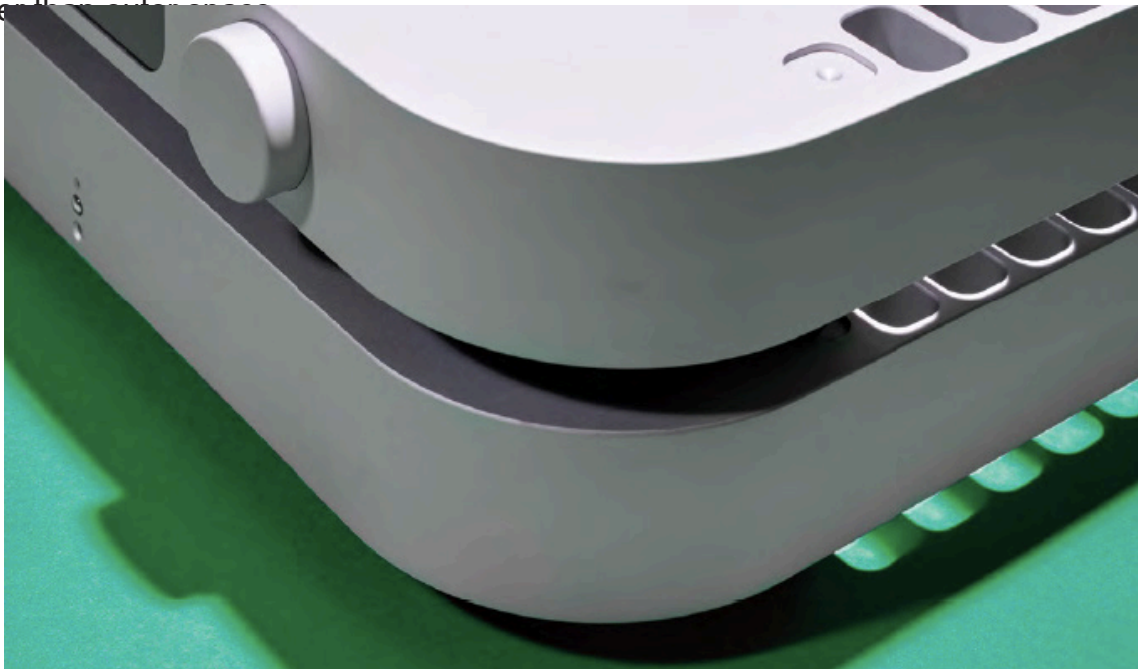
MSB Reference DAC and Transport

As I've said, this trompe l'oreille trick hasn't ever happened to me as regularly or as convincingly with other digital sources, even though I confess that my hands-on experience with top-rank digital gear has been limited to a dCS stack I reviewed some years ago and an older-gen Berkeley Alpha DAC (not counting the stuff I hear on a fairly regular basis at trade shows). To be frank, when it comes to digital sources, I ain't no Robert Harley. Still, I know real when I hear it, and with the Reference DAC/Transport I heard it to an extent I wouldn't have thought possible the day before this MSB gear arrived—and I heard it on CD, SACD, hi-res streaming, and (par excellence) MQA streaming.

So what the hell is MSB doing right?

Well, on a technical level MSB has been making (and improving) its own high-precision ladder DACs for 19 years. In the Reference (and other) models, it now uses what it calls a “hybrid” version of this ladder DAC—a true balanced design, automatically switchable and optimized for PCM and DSD “with zero compromises for each format.” In PCM mode these ladders become extreme-precision multibit DACs. In DSD mode they become a huge number of single-bit DACs, all doing the exact same parallel processing for the “ultimate in DSD reproduction.” This proprietary hybrid DAC design allows for processing speeds of up to 6MHz for PCM and 50MHz for DSD, ensuring lower noise floors than have “ever before been achieved in audio reproduction.” The lower the noise floor, MSB says, the better the dynamics and the better the “musical delicacy and overall resolution.”

Of course, you hear a lot of these “never-before-achieved” claims from manufacturers of digital gear and are often left wondering what such engineering boasts have to do with the sonic end results. But as I just noted vis-à-vis the Harry Connick, Jr. CD, the resolution and dynamic range of the MSB Reference DAC really were audibly superior—and (in spite of what digital doesn't do as well as vinyl) the MSB Reference DAC/Transport really did sound more natural and realistic. Moreover, this resolution applied equally to the silences among notes and within concert halls and recording studios, which, for once, didn't sound like dead air but had the slight texture that even the quietest quiet has. I assume that this has something to do with the MSB gear's own noise floor, which is (or must be) lower than that of the recording environment, making instruments sound as if they're playing in real space rather than in a recording studio.



MSB Reference DAC

Not only does MSB make its own ladder DACs; since 2011 it has also been making its own Femto Clock, optimized for and switchable between 44.1kHz and 48kHz and their direct multiples. (“Femto” in this context means femtosecond, which is a second multiplied by a factor of 10⁻¹⁵.) Since all formats, including DSD, are based on one of these two frequencies (and their multiples), no cross-conversion is needed.

As you probably know, the goal of a digital clock is to keep timing variations (jitter) as close to zero as possible. To understand the difference between clock accuracy and jitter, MSB draws an analogy to soldiers on the march: The speed at which the soldiers march is the sample rate of the clock; the distance between them from moment to moment is jitter. “If you imagine the soldiers bunched up here and stretched out there, you start to get a picture of how jitter affects the analog result,” says MSB. Even worse, in the real world, clock jitter has a shaky chaotic component, so harmonics get scattered in time and smeared. The lower the jitter, MSB contends, the lower the harshness we hear and the better the micro-details, micro-dynamics, overall definition, and soundstaging.

Once again, these are the sorts of claims that virtually everyone in the digital world has been making since the dawn of Perfect Sound Forever. But, as was the case with its ladder DAC, MSB’s Femto Clock does seem to be doing something very like what the company says it is doing—lowering “harshness” (one of the very things that makes digital sound “digital”) and improving micro-detail, micro-dynamics, overall definition, and soundstaging. What is more, the MSB clock (in combination with the ladder DAC) seems to be doing these things in a mutually beneficial way, changing not individual attributes one by one but the entire gestalt of the presentation all at once. Indeed, the notion that something a bit “chaotic” (to use MSB’s word) has been made orderly is one way to explain why the MSB DAC and Transport sound so real. With the noise floor lowered (and most of the “digital” sound of digital sources eliminated), with focus made so lifelike and immediate, with timbre made so neutral and natural, with ultra-fine dynamic gradations (like Connick’s light fingersnaps and Marsalis’ blowing into the mouth of his sax as he holds a note at the end of “Nightingale”) made so clear and unmistakably present, it really is as if things that were not timed quite correctly (like a voice track on which the actor’s voice lurches a bit ahead of or lags a bit behind the movement of his lips) have suddenly been made perfectly coincident.

Everything else about the MSB Reference DAC has been designed to preserve the virtues of resolution, timing, and lowest possible noise. The motherboards in the DACs are optimized for keeping jitter as low as possible from the clock to the ladder DAC. The core digital engine is format-independent and completely upgradeable. The processing card is built by MSB—an enormous project in miniaturization, incorporating thousands of lines of software code. Input modules can be installed or removed with the flip of a lever. And the constant-impedance, passive analog volume control is exceptional, even by the standard of this exceptional piece of engineering.

I’ll let MSB explain its preamp module (and if you hear an echo of MBL’s LASA 2.0 White Paper it’s because, well, great minds think alike): “It has been MSB’s dream for many years to allow its ladder DACs to drive interconnects and amplifiers directly. By definition, a conventional preamp takes in the audio-industry standard signal and boosts it up to full volume for the sole purpose of turning it down again! MSB’s ladder DACs put out full volume, so no such gain is needed. The signal of the hybrid DACs only needs to be attenuated (turned down), and this is accomplished using MSB’s preamp module with its newly invented passive attenuator—a constant-impedance, passive volume control with no active circuitry in the analog path.”

MSB Reference DAC and Transport

This “minimum parts” preamplifying scheme, which eliminates the need for a costly, separate, signal-degrading component full of active circuits (and a costly signal-degrading interconnect to hook the DAC to the pre), is claimed to produce “extraordinary overall clarity.” And, boy, does it ever! And not just with digital signals. (I’m not sure I’ve heard better analog reproduction than what I get using the MSB’s passive analog attenuator, Lloyd Walker’s extraordinary phonostage, the Constellation Hercules II Stereo amplifier, Magico M3 loudspeakers with or without a pair of QSubs, and Lloyd’s Proscenium V turntable with Clearaudio Goldfinger Statement cartridge.)

The Reference DAC’s level of clarity is kind of magical. I don’t think there is a CD or SACD (and I got a million of ‘em, folks) that hasn’t benefitted from the MSB’s astoundingly lifelike resolution, neutrality, immediacy, and dynamic range—and almost complete elimination of the customary digital artifacts. You just hear more of what’s been played and recorded. Moreover, with the best source material (which I will come to in a moment) the speakers also disappear more completely. Now, this disappearing act is due in no small part to Holger Stein’s, Ben Piazza’s, and Ted Denney’s wonderful room treatment systems (which I use in combination) and to Magico’s superb M3 speakers (and their fabulously low-in-noise enclosures). But it is also due to the MSB DAC, which, when all is just so, “floats” instruments and voices in front of, behind, between, and far to the sides of the Magicos, escaping the bonds of sonic gravity in a way I’ve never heard before save via Radialstrahlers (which aren’t as neutral). For instance, there isn’t an instrument in the septet of violin, doublebass, clarinet, bassoon, cornet, trombone, and percussion in Pentatone’s wonderful SACD of Stravinsky’s *L’Histoire du soldat* that isn’t perfectly present in its own space in what seems like an unbounded (by room or loudspeaker or electronics) soundstage. On streamed MQA material (via Roon and Tidal), there isn’t one of the newly recorded backup vocalists potted into the late, incomparably great Aretha Franklin’s “Don’t Play That Song” (from *A Brand New Me* [Rhino/Atlantic]) who isn’t completely individuated and fully “there” in her own, cushioned-with-air space (which sounds a little different than the other spaces on the recording, as it should since it is a fresh addition).

As long as we’re talking about streaming and MQA, let me take a moment to voice an amateur opinion. A lot of folks (including some who make DACs) seem to think that MQA is a bamboozle of sorts—a new compression scheme in sheep’s clothing. All I can say is that if it is a compression scheme, it’s the best one of all time. Not that every MQA track is a winner. Just like any other medium, there are better and worse; everything depends on how the music was originally (or subsequently with analog sources) recorded and sampled. But try one of the better examples—say Tom Waits’ *Heart of Saturday Night*, which happens to be an analog master—and judge for yourself. The son of a gun certainly sounds goosebump “real” to me.

Interestingly, for a medium that is not long on depth of image (though it’s great on depth of field), MQA at its best does seem to add more of a third dimension to vocalists and instrumentalists than any other digital format. Of course, it does this without adding analog-like body, so you get an image that is more rounded but not solidly filled in, like a halftone of a continuous-tone photograph.

Let me say this as well—though it has nothing to do with the MSB Reference DAC and Transport—the notion that streaming is the trouble-free future of digital audio is almost laughable. Oh, the future part is correct. Streaming sounds better (or can), particularly select higher-res streaming, and even more particularly select higher-res MQA streaming. It’s the trouble-free part that is absurd. Unless its drive belt snaps or the stylus of the cartridge that is mounted on its tonearm falls off, a turntable never stops making music. Roon/Tidal streaming, on the other hand, is entirely dependent on your home’s Wi-Fi network, which, at least in my house, can give up the ghost if you look at it funny. I can’t tell you the number of times I’ve had to re-boot my home and Roon modems (and not always with success

when it comes to reestablishing a connection). Indeed, after weeks of on-again/off-again music, I felt compelled to upgrade my entire Wi-Fi system with higher-speed modems and higher-speed service. So far, that's been an improvement (though an ongoing costly one), but I still kinda hold my breath whenever I head upstairs to listen to MQA on the MSB gear. One thing that can be said for physical media like CDs or SACDs is that they don't frequently stop playing because the connection between the disc and the laser goes south. There is this, as well. While not quite as good sonically, CD/SACD doesn't sound a whole lot worse than streamed sources—don't forget what the MSB was capable of doing with a lowly 1990 Harry Connick, Jr. Red Book CD.

Well, that's my tale, folks. The guy who railed against digital is now listening happily to same. Oh, I don't take back my diatribe. Most digital does still sound like digital. It's just that, in some of the most critical ways, the Reference DAC and Transport don't. The MSB is not one of those beautifying DACs that smears over detail with a thick coat of even-order harmonics. It is not one of those purely analytical DACs that sounds the way clothing feels fresh from the dry cleaner. It is just a realistically neutral, astonishingly detailed, very dynamic source component that leaves less of an impression on soundstage and system than anything else digital I've tried out (or heard at any length at shows). There is a good reason why I cannot recommend MSB's DAC and its Transport highly enough, and why I will now be using both as references.

It's a little scary to think that the Reference is MSB's penultimate product, that there is another DAC above it (The Select), which supposedly outdoes it in every way. I'd have to hear that to believe it. But in the nonce the Reference DAC and Transport have set a new standard of realism from digital sources (both physical media and streaming) chez Valin. If you've got the dough, you'd be silly not to give these exceptional components a long, long listen. They may not be as fool-you realistic as that knock on the door I heard while watching a movie, but for a digital skeptic like me they are the knock on the door I've been waiting for.

Specs & Pricing

MSB Reference DAC

Base inputs: SPDIF module (optical and coaxial inputs)

Base output: Base output module (XLR/RCA)

Base clock: Femto 140

Base power supply: Dual Reference Powerbase

Available options: Preamp output module, \$6000; Femto 77 clock, \$4995; Femto 33 clock, \$14,905; Pro ISL module, \$990 (includes cable); Quad-rate MQA USB module, \$1590; Renderer V2 module, \$1950; Dual I2S module, \$990; RCA analog input, \$990; Isolated XLR analog output, \$1590; Isolated XLR sub output, \$1590; Isolated RCA analog output, \$1590

Base price: \$39,500

MSB Reference Transport

Cable: IEC power cable

Remote: Transport remote

Options: Reference Transport Powerbase, \$11,500 (includes Dual-Link cable)

Price: \$18,500

JV's Reference System

Loudspeakers: Magico M Project, Magico M3, Avantgarde Acoustics Zero 1, MartinLogan CLX, MBL 101 E MK. II, Magnepan 1.7 and 30.7

Subwoofers: JL Audio Gotham (pair), Magico QSub 15 (pair)

Linestage preamps: Soullution 725, Constellation Altair II, Siltech SAGA System C1, Air Tight ATE-2001 Reference

Phonostage preamps: Walker Audio Proscenium V, Soullution 755, Constellation Perseus, Audio Consulting Silver Rock Toroidal

Power amplifiers: Soullution 711, Constellation Hercules II Stereo, Air Tight 3211, Air Tight ATM-2001, Zanden Audio Systems Model 9600, Siltech SAGA System V1/P1, Odyssey Audio Stratos, Voxativ Integrated 805

Analog sources: Acoustic Signature Invictus Jr./T-9000, Walker Audio Proscenium Black Diamond Mk V, TW Acoustic Black Knight/TW Raven 10.5, AMG Viella 12

Tape deck: United Home Audio Ultimate 1 OPS

Phono cartridges: Clearaudio Goldfinger Statement, Air Tight Opus 1, Ortofon MC Anna, Ortofon MC A90

Digital sources: MSB Reference DAC, Berkeley Alpha DAC 2

Cables and interconnects: Crystal Cable Absolute Dream, Synergistic Research Galileo UEF, Ansz Acoustics Diamond

Power cords: Crystal Cable Absolute Dream, Synergistic Research Galileo UEF, Ansz Acoustics Diamond

Power conditioners: AudioQuest Niagara 5000 (two), Synergistic Research Galileo UEF, Technical Brain

Support systems: Critical Mass Systems MAXXUM and QXK equipment racks and amp stands

Room treatments: Stein Music H2 Harmonizer system, Synergistic Research UEF Acoustic Panels/Atmosphere XL4/ UEF Acoustic Dot system, Synergistic Research ART system, Shakti Hallographs (6), Zanden Acoustic panels, A/V Room Services Metu acoustic panels and traps, ASC Tube Traps

Accessories: Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Walker Prologue Reference equipment and amp stands, Walker Valid Points and Resonance Control discs, Clearaudio Double Matrix Professional Sonic record cleaner, Synergistic Research RED Quantum fuses, HiFi-Tuning silver/gold fuses