SA Equipment
June / July 2009

World Premiere

EMM Labs TSD1 CD / SACD Transport And DAC2

Pushing the limits of high-resolution digital material.
Review By Phil Gold

Customers looking for the best possible CD and SACD sound have often sought out Ed Meitner's digital gear, just as many recording studios have. But to be fully competitive in the consumer space you need more than just performance. Ergonomic design, fit and finish and industrial design play an important role too, especially when competing with Japan's Esoteric Audio and the UK's dCS.

These two new components from Ed Meitner's EMM Labs, optimized to work together, will not challenge Esoteric for King of the Hill status on industrial design or ergonomics, but they do narrow the gap appreciably. They look and feel much more luxurious than earlier designs. A machined aluminum chassis with rounded edges and the logo worked neatly into the top cover conspire with the remote carved from a solid block of aluminum.

The TSD1 Transport ($11,000) replaces the earlier CDSD SE and uses the same Austrian transport that graces current versions of the CDSA SE one-box player. Inside the box is Meitner's MDAT (Meitner Digital Audio Translator) technology for signal processing, which upsamples your CD's 44.1kHz/16-bit signal to a 5.6mHz bitstream, double the SACD sampling frequency. It also upsamples SACD discs to 5.6mHz. The signal is then sent through an ATT glass cable (EMM OptiLink) to the DAC2 converter. EMM's OptiLink connection can support up to 8 channels of 2X DSD output, or 16 channels of standard DSD output. If you have another converter, then the transport will export a conventional Redbook signal over the AES/EBU XLR connection.

The TSD1 offers you control over which layer to read on a Hybrid disc, and the option (when not paired with the stereo only DAC2) to accept a standard external BNC word clock. The USB connection allows for software upgrades and connections are also available for wired remote control. The power supply is power factor corrected.

Now we come to ergonomics. Dominating the front panel is a vastly improved CD Text-enabled LED display guaranteed to generate confidence. I just love a display I can read from the listening position – why can't every manufacturer do this? The transport buttons are laid out in two neat rows on the right but EMM Labs would do well to adopt the more intuitive and much larger controls that Sony, Esoteric or Marantz offer on their best components, and even on their cheaper models. You won't find ten identical looking buttons there. Similar comments apply to the remote control. In both cases the functionality is there but ergonomics have been given a back seat.

As in the EMM Labs CDSA SE, Ed Meitner deliberately eschews microprocessor-controlled logic circuits. This does result in some idiosyncrasies. You can control the brightness of the screen (four levels) or turn it off altogether, but you can't see remaining track time or disk time, and the display does not indicate the track numbers you are keying in on the remote until after the machine has moved on to your selected track. This is a little disconcerting at first, but you do get used to it, and it's done for sound sonic reasons. The separate clock that microprocessor control would entail can interfere with the clean power supplies required for audio processing. Another oddity – closing the slot tray starts the disc playing rather than just reading the table of contents. With the drawer open, pressing the close button should load the disc and read the table of contents (TOC) and that's it. But there is a trick. If you close the drawer by pressing the Stop button, you do get

the desired effect. The Play button should load the disk, read TOC and start playing – and it does. Loading time is reasonable, at around 13 seconds for CD or SACD. Next and previous track buttons work immediately, but keying in the track number leads to a several second wait, as is also the case with my Meridian G08. All this is familiar territory to CDSA SE users. The transport mechanism is reasonably silent in operation, quieter for example than the Esoteric SA-60 Universal player I auditioned recently.

Turning to the DAC2, the casework is similar, width (43.5cm) and depth (40cm) identical but it's only 9.2cm high and weighs 12kg as opposed to the TSD1's 14cm height and 15kg weight. There's no big status screen, just a few indicator lights. While the TSD1 is clearly meant to be mated with the DAC2 or a forthcoming six channel partner from EMM Labs, the DAC2 is rather more universal in nature. It comes equipped with a wide range of digital inputs. First up is the EMM OptiLink for the 5.6mHz bitstream from the TSD1 drive over ATT glass cable. Then you have AES/EBU over XLR, SPDIF Coax, USB and two TosLink connections.

The key consideration for any external DAC is how to minimize or eliminate jitter. We've seen analog Phase Locked Loops (PLLs), digital PLLs and RAM buffers. Ed Meitner discards all of these methods in favor of his new MFAST (Meitner Frequency Acquisition System) technology, an asynchronous method which simply discards the clock embedded in the original signal. I asked EMM Labs' Shahin Al Rashid to explain:

"There are several types of asynchronous data communications techniques and what we do in the so-called 'MFAST' receiver is a specific high-speed method. Roughly speaking, we dump all the incoming bits into an elastic buffer and read them out with a stable clock, free from source jitter. The artful part is in how to avoid buffer overrun (bits will be lost) or underrun (not enough bits mean dropouts). The method is entirely digital and performed by programmable circuits within one of the three Xilinx gate arrays."

If the signal did not come in over Optilink, then the MDAT circuits in the DAC2 upsample it to 5.6mHz before passing it to the discreet dual differential DACs, unique to EMM Labs, for conversion to analog. Ed Meitner believes that all available DAC chips exhibit some degree of non linearity, and that his design aims can only be achieved with discreet components. And sorry, he is not willing to sell his DAC circuitry to any other manufacturers. If you want his solution, there's only one place to go to get it. We'll let the listening tests answer the $64,000 question – is he right?

So there's a large number of ways to get the digital signal in, only one of which will currently accept a truly high resolution signal. The USB signal is currently limited to a ceiling of 48 kHz and the AES, TosLink and Coax top out at 96 kHz. However, this is an upgradeable DAC (through its USB port) and you can expect future software upgrades to take you up to 192 kHz sampling frequencies.

You've got two ways to take the analog signal out – balanced or unbalanced, and you can have standard output levels (4V balanced/2V unbalanced) or high output levels if your preamp can take it (3.6V/7.2V). EMM Labs is well aware of the importance of good cables. They supply their own glass connector, actually warning me that some rather expensive after market cables don't work as well as the one supplied. They also pack a good power cord, a Kimber PK14 (6ft) with each component. I used the glass connector they supplied, together with an AES/EBU XLR cord from Van den Hal, but all the other cables, power, balanced interconnect and speaker cable are Nordost Valhalla.

The Fate And Future Of SACD

If equipment of this caliber had been available earlier and from more manufacturers, the fate of SACD might have been quite different. If Sony had not been so determined to prevent the output of a pure DSD stream we might have seen numerous DSD compatible DACs and a wider acceptance for the medium. SACD exists now as a niche product but sonically it finally competes with the best vinyl and reel to reel tape while offering far greater ease of use and a surprisingly large and ever increasing software catalog.

Note that Sony is now back in the game with the new SCD XA5400ES – a bargain at $1495 and for some reason, not available in Canada. It's their first new high performance SACD player for many a year. This new integrated player also outputs the DSD stream, in two or six channels, using HATS (High-quality digital Audio Transfer System) over HDMI. My brother and fellow reviewer Alvin Gold has tested this player over in the UK and found it a major improvement over the

much more expensive and once highly regarded XA9000ES, now completely outclassed by components such as the EMM Labs duo.

Is it too much to hope that at this late stage, HATS over HDMI will take off and breathe new life into SACD? If it does, I'm looking to EMM Labs to add HATS support to their DACs and Transports.

The Listening Tests

The sound of a Meitner DAC is instantly recognizable for its purity. Despite the differences in amplification and the type and even the number of speakers, I am instantly reminded of the Kimber IsoMike room at CES, this year and for several years past. All other digital sources sound I have heard sound somewhat thick or flabby in comparison. Sure enough this combination bears all the hallmarks of the house Meitner sound, but there are significant gains in a number of directions compared to the previous generation components. As a reference, I used the EMM Labs CDSA SE, the $11,500 one box CD/SACD player, in its latest incarnation.

The new combo's most significant improvement is to imaging. The soundscape seems to expand further in every dimension, from time to time astonishing me with the exact placement of instruments well outside the physical speakers. In fact the sound appears completely unfettered by the speakers themselves, while the completely black background allows you to enjoy this image all the more. Low distortion, high resolution and immaculate dynamics go without saying for components of this caliber, but gains have certainly been made in the texture and the palpability of the sound. This is especially true on SACD material.

Before I go into details of the differences between Redbook and SACD performance, I should mention that CD sounds better when the TSD1 is connected to the DAC2 through the EMM Optilink (a 5.6mHz single bit stream) than through the AES/EBU connection (44.1kHz/16-bit). Why should this be, if the DAC2 converts the 44.1kHz/16-bit signal to 5.6mHz using MDAT technology, just like the TSD1? This puzzled me, and so I asked Shahin for an explanation and he wrote back saying:

"The MDAT is a sizable DSP algorithm executed in the hardware of a FPGA (Field Programmable Gate Array). Having it run in the transport simply leaves less for the DAC to do, reducing activity and system noises in the DAC. Plus, the glass optics is a better (less jitter) transmission link than AES/EBU."

The differences I heard were not subtle. Holly Cole sounded softer through the AES/EBU, but more focused, detailed and punchier through the EMM Optilink. The Fry Street Quartet (Redbook layer) showed a rougher string tone through the low speed connection. Kenny Rankin's Blackbird from Red Rose Music showed a thickening of the guitar and a slight loss of focus through the low speed connection.

The level of performance achieved through the AES/EBU connection is still in the first rank, but falls a little shy of what the one box CDSA SE can achieve at little over half the price. But when you use the high speed connection the combo pulls away from the crowd, comfortably exceeding the best the CDSA SE can offer from CD, reaching levels of purity, dynamics and impact that no EMM Labs components have reached before.

Listening To SACD

There are some poorly produced SACDs out there. Some were even derived from low resolution digital feeds. There also many great recordings available. Some are from modern high resolution digital recordings and others from analog recordings of the fifties and sixties. The new EMM Labs components dig a little deeper into these great discs. The extension at both ends of the frequency band is extraordinary, and if you have really wide bandwidth speakers this makes a significant difference. Bass is even, fast and uncompressed, revealing faults in almost all competitors. The biggest revelation is the treble, usually the weakest link in any digital source. Some competitors offer a rolled off top, some are peaky, others thin or grating. EMM Labs have always offered a sweet extended treble, but this time they have excelled themselves. Compared to the CDSA SE the treble is more detailed and extended – actually it seems limitless and fully controlled at all volume levels. The high frequency performance is the cleanest and clearest so far, accurate in level and phase, masterful in transient response and in sustaining the harmonics.

This accuracy does wonders for the timbre of musical instruments of all kinds. Whatever the fundamental frequencies of the noted being played, it's the extensive series of harmonics at frequencies well above the fundamental that tell us whether it's a Guarneri or a Stradivarius, a Les Paul or a Stratocaster. This is the gear to deliver the tonal accuracy we all crave. When this information is missing or distorted, the brain must work hard to recreate the sound image the recording is hinting at. This leads to listening fatigue, even if you can't put your finger on what's wrong. You sure can tell when it's working the way it's supposed to work. The TSD1/DAC2 combination is relaxing and present, menacing when it needs to be, thunderous and gentle in turn - in short, just like a good live performance. You need bottom, middle and top to be working at peak performance to get this result. Many components do justice to the all important middle frequencies. A few, those who have paid the proper attention to the power supplies in particular, get the bass right. You can tell because the music feels alive, rhythms taut, dynamics powerful and the deepest notes are still precise and tuneful. Those who get the top end right end up with the rock solid imaging and tonal accuracy for all instruments, especially the grand piano. The components nail all three - this is the new Gold standard.

A few listening notes comparing the CDSA to the new duo on the Fry St Quartet's Beethoven:

CDSA "lively... forward... sweet... dynamic... good image... stable... good string tone... plenty of space in image... good flow, pace..."

TSD1/DAC2 "Darker background... more lively... higher definition... greater impact... absolutely superb..."

My hat is off to the superb standards Dr Ray Kimber and his artists have achieved on this IsoMike recording of the *Grosse Fuge* Opus 133 and Opus 18 No 4. Anyone who doubts the potential of SACD or the degree to which it surpassed CD has not heard this disc on these components.

Listening To CD

CDs do not reach these elevated levels of reproduction. How far they fall short depends a lot on the quality of the engineering and the type of music you're playing. If you can avoid a lot of high frequency energy and high standard have been set in the recording studio and in the production process end to end, CD can stand up pretty well these days, a far cry from the early digital days. I've heard excellent imaging, realistic piano tone, excellent transient attack and strong dynamics. I've heard them on these new components too. What's missing is the subtlety of musical clues, the intricacies of texture on the instruments and voices, the depth of imaging and the aliveness of the best high resolution audio. You can still get an astonishing purity of tone, precise location of the players and the warmth that a great instrumentalist can produce from his instrument. In many ways it can sounds bigger and bolder than hi-res, but that is an illusion brought about by the absence of extreme low level resolution that reveals the subtleties of the string tone or the singer's voice.

Vengerov's amazing Shostakovich *Violin Concerto No 1* [Teldec 4509922562] is even more solid than through the SA, the image firmer and the high frequencies more solidly defined. Brass instruments are more burnished, less bloated, and the bass digs deeper for a bigger closer sound. More importantly, the violin is more realistic and better focused. These improvements enable me to listen with less stress and more enjoyment, and they typify my experience over a wide range of material. On an acoustic guitar track, my notes read "more skin on the bone... greater subtlety... better sense of space... improved color."

The Meridian 808.2 is a touch warmer, the EMM slightly purer, but both conceal an iron fist in a velvet glove. They can each explode at a moment's notice, and when they do it will be overwhelming and without distortion. Both maintain the massive dynamics required to reproduce live music with any accuracy, and both throw very large images across the room and far back behind the speakers. Hardly another CD player comes close. I will mention two that do. One is the brilliant EAR/Yoshino Acute CD from Tim de Paravacini, ravishingly beautiful in sound and offering great presence at a very reasonable price, at the expense of the last word in resolution and low bass definition. The other recommendation is for the CDSA SE which sets a very high standard for CD, trailing the new gear by a very small margin on Redbook.

The TSD1 is also the best transport from EMM Labs to date. I compared it to the CDSA SE used as a transport to feed the gorgeous new Chord QBD76 DAC. I always preferred the TSD1, and by a significant margin, despite the fact they both use the same drive unit. Compared to the older CDSE SE Transport, the TSD1 has a more powerful processing platform and higher chassis integrity in addition to the more robust drive unit. The single optical transmission link is also an improvement on the complex triple fiber master/slave clocking scheme offered before.

The Bottom Line

Good marks for industrial design but once again only fair marks for ergonomics. Flexibility is improved, but I'd like to see the USB input upgraded to accept 192 kHz signals. But the $64,000 question I asked earlier – yes, the sound is exceptional, the best yet from EMM Labs and the best stereo SACD reproduction I have ever heard. What you get here is also reminiscent of the best analog sound, 15" master tape. There's a complete absence of digital *nasties* of course, but the realistic dynamics, the sonic purity, the organic musicality and the unparalleled low level resolution bring the listener closer to the performers and let you experience the music more deeply. You can forget about all the advanced technologies involved. Just *Enjoy the Music!*

It is a winner too on CD, challenging Meridian's phenomenal 808.2 Signature Reference CD Player ($15,995) for title of *King of the Hill* in my book. It illustrates only too clearly how far CD is from a perfect medium. Strokes are bolder, cymbals are sharper and tizzier, instrumental tone color has less texture and images are shallower and less stable than on well produced SACD recordings. It isn't even close, but it's not the fault of the EMM Labs combo. It is all in the bits. There aren't enough of them.

The combined price tag of $20,500 will raise many an eyebrow, and you can get most of the sound quality (but not the flexibility) from EMM's one box CDSA SE at $11,500. On the other hand, I have not heard its equal on high resolution digital material at any price, although you can easily spend a lot more. If you're looking to impress your friends with a flashy exterior, this may not be the ticket, but if you're looking for the best available sound, put the TSD1 and DAC2 right on the top of your shortlist.

Manufacturer Comments

We find ourselves impressed by Mr. Gold's careful work and by his lucid descriptions of the sound he heard. Mr. Gold has effectively captured the spirit and intentions of Ed Meitner's latest work. For that we thank Mr. Gold.

Shahin Al Rashid
EMM Labs

Specifications

TSD1 CD-SACD Transport
Supported Formats: Redbook CD, MP3, Stereo and multichannel SACD
Digital Outputs: AES/EBU XLR, EMM OptiLink Hi-Res - 2/6 channels
Clock Input: Standard BNC 75 ohm word clock
Remote Control: Infrared
System Control input: Wired remote, Serial RS 232, USB for upgrades
Power Supply: Power Factor Corrected
Voltage: 100V/115V/140V 50/60 Hz - Factory set
Power Consumption: 40 watts
Dimensions: 43.5 x 40 x 14 (WxDxH: in cm)
Weight: 33 lbs
Warrantee: 5 yrs except 1 yr on drive and associated electronics
Price: $11,000

DAC2 Stereo D/A Converter
D/A Conversions: 2-channel PCM to analog, 2-channel DSD to analog
PCM Input Frequencies: 44.1, 48, 88.2 and 96 kHz

DSD Input Frequency: 5.6mHz
AES/EBU input: 1 Connector
S/PDIF Input: 1 Coax
TOSLink S/PDIF Input: 2 Optical connectors
EMM OptiLink Input: 1 high speed glass connector for 2 active channels
USB Input: 1 Connector
EMM Expansion port: For future digital inputs
Remote Control: Infrared
Balanced Output: 100? XLR pin 2 hot, 7.2V (high) or 4V (low)
Unbalanced Output: 50? RCA, 3.6V (high) or 2V (low)
Phase Switch: Positive or negative output phase
Power Supply: Power Factor Corrected
Voltage: 100V/115V/240V 50/60 Hz - Factory set
Power Consumption: 50 watts
Size: 43.5 x 40 x 9.2 (WxDxH in cm)
Weight: 27 lbs
Warrantee: 5 yrs
Price: $9500