



Meridian 861v4

Flagship Preamplifier/Processor

JOHN KOTCHES

Introduction—An Accidental Review

Not all reviews are well-planned masterpieces of logistics. Sometimes they just happen due to correct planetary alignment, throwing spilled salt over one's shoulder, or quite frankly as a bizarre coincidence, otherwise known as "accidentally." This is my "accidental review" of Meridian's flagship processor the 861v4 Preamplifier/Processor, which happened as a result of a phone call between Editor-In-Chief Gary Reber and myself just before Thanksgiving. This past summer, while in the process of building/preparing my multichannel audio and home theatre room in my new home, I happened upon what can only be described as a "fire sale" price on a used Meridian 861v2 which I subsequently upgraded to the latest available version, the newly released v4. I have owned my 861v4 for several months now, and originally had no intent of reviewing this processor.

"The 861v4 is a technological tour de force."

Meridian has earned some of their reputation by delivering noteworthy upgrades to their product lineup. They introduced the v4 upgrade to the 861 processor in the summer of 2003. As with the v3 upgrade, which allowed for a proprietary digital input from an appropriate Meridian DVD-Audio player, the v4 upgrade adds yet another compelling feature to their flagship. In this case, that feature is Meridian Room Correction™ (MRC™). In brief, for the moment MRC provides limited bandwidth correction of frequency response aberrations due to room related issues, to provide a more uniform response across a particular seated radius.

Construction, Interior, And Exterior

Modularity is key to the 861v4's flexibility, upgradability, and ultimately its tremendous processing power. The chassis is a passive backplane



SPECIFICATIONS

All inputs and outputs will vary for each 861 v4, depending on user requirements. Listing shows supported input/output options.

Audio Inputs: Digital Coaxial, TOSLink Optical, Digital Balanced AES/EBU, MHR™ Multichannel Digital (Proprietary interface), Analog Stereo, Analog Multichannel

Audio Outputs (up to 12 channels): MHR™ Digital (Proprietary), Analog Single-Ended, Analog Balanced

Video Inputs: Composite, S-Video, and Component

Video Outputs: Composite, S-Video, and Component

Decoding and Processing Modes: Direct, Music, Trifield, Ambisonics, Super Stereo, Music Logic, Dolby Digital, Dolby Digital THX, Dolby Digital Surround EX, Dolby Pro Logic, Dolby Pro Logic II, Dolby Pro Logic IIx, DTS, DTS Music, Meridian EZ™, MPEG, MPEG Music, and MPEG THX

Digital Signal Processors: 5 or more Motorola 56367 (Symphony™) at 150mHz depending on configuration

Digital/Analog Converters: Analog Devices AD1852, capable of up to 24-bit/192 kHz

Decoding

Analog/Digital Converters: Crystal Semiconductor

CS 5338 at 20-bit/48 kHz or Analog Devices

AD1871 at 24-bit/96 kHz

Dimensions (WHD In Inches): 18.9 x 6.9 x 16.2

Weight (In Pounds): 30

Price: \$18,500 - \$21,500 for typical configurations; \$21,045 as configured for our review

Manufactured In The UK For:

Meridian America, Inc.

Suite 122, Building 2400

3800 Camp Creek Parkway

Atlanta, Georgia 30331

Tel: 404 344 7111 / Fax: 404 346 7111

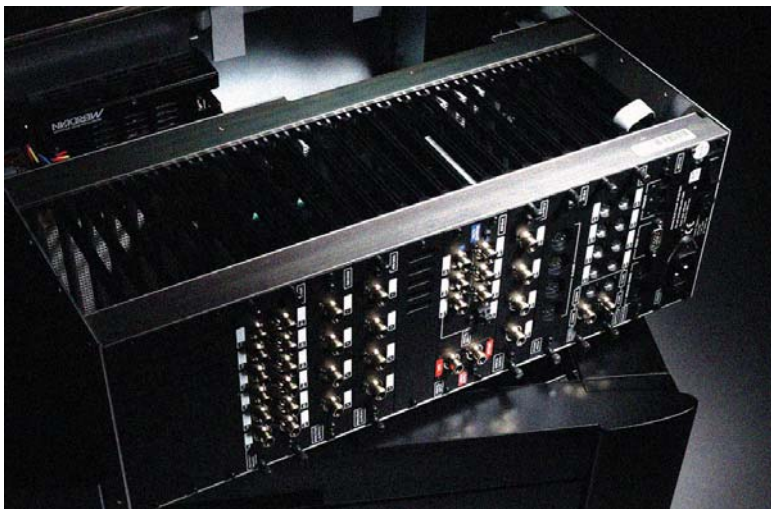
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with slots for up to 14 cards of various functions. Among the available card options are a phono card for pre-preamp functionality, stereo analog inputs (up to 24-bit/96 kHz sampling), multichannel analog inputs, digital inputs, digital outputs for Meridian DSP loudspeakers, analog outputs (single-ended or balanced), composite and S-video switching (with OSD), and component video. An HDMI card is not yet available, but will become available sometime in 2004. The 861 is flexible enough to support up to 12 output channels. If Tomlinson Holman's 10.2 surround sound technology is ever released into the home market the 861v4 is theoretically equipped to provide the outputs.

In addition, to cater to the varying market needs of the high-end home theatre and audio enthusiast, multiple faceplates are available. There is a traditional faceplate which is used for a free-standing processor



CONNECTIONS



on a traditional audio shelf, or a rack-mount faceplate when using a rack from companies such as Middle Atlantic or Raxxess. To brighten up the color scheme, black and silver are two of the colors that are "standard" for the 861 faceplate and chassis cover. For an additional charge, Meridian can supply alternate colors to match some of the palettes available for their DSP loudspeakers. Please note, if you are intending to rackmount your 861 processor, you will use a different shelf than you would for other components, as the rack-mount faceplate is intended to cover the rack poles completely. For my Middle Atlantic rack, I used the Wide Unit Shelf System, which attaches to the sides of the rack rather than through the traditional front of the rails. Without this, there would be insufficient clearance for the processor.

Starting with the v1, dual Motorola processors were employed to provide all necessary compute functions. With 861v3, two additional latest generation Motorola 56367 DSPs (C+D) were added to the system. With the 861v4 upgrade, processors A+B were replaced with processors E+F, and another pair of 56367s were installed bringing the available raw DSP power to 600 MIPS. The digital receiver card also contains another 150 MIPS, used for initial processing, such as upsampling of a PCM input.

Whenever making a purchase at the pricing level of Meridian's 861, it is important to enlist the aid of your dealer as the configuration complexity is quite high, and it could be easy to make a costly configuration error. This is one area where I feel Meridian could do a better job, in providing more information about the various cards available for this product. As it is, a dearth of useful information exists.

One of the goals of the 861 and its modular construction is to protect the lofty purchase price by offering upgrades without repurchasing the entire chassis and all of the cards. I can give personal testimony to Meridian's efficacy in delivering such protection, as my 861 was purchased used and was a rather dated v2 unit, which was brought current to v4 status. When upgrading from v2 to v4, my processor was nearly gutted as the configuration was radically different from my needs. Still, even purchasing used and upgrading was a less expensive option than purchasing brand new and Meridian is agnostic when it comes to the ownership. All who purchase upgrades are given the same pricing regardless of whether they are the original owner or not.

I have to say that my upgrade through two versions was not inexpensive. Frankly speaking, the upgrade cost for v2 to v4 was more expensive than many of the preamp/processors on the market. For owners of 861v3, the upgrade to v4 is quite reasonable, with an MSRP of \$750. The big change for v4 is the (previously mentioned) E+F DSP Cards and software, which allows for the use of MRC. Those in the know of such things say that the v3 upgrade while very expensive, also laid the architectural foundation for the v4 (and likely the next few rounds) of upgrades. If it's a matter of adding additional DSP horsepower plus software, future upgrades might well be just as cost effective.

As I mentioned earlier, the 861v4 is loaded with DSP horsepower, and that horsepower is utilized in a divide and conquer approach. All DSPs in 861v4 are Motorola 56367s, and it's up to you to keep count of them! The primary DSPs (C and D) perform Dolby®

Digital, DTS® Digital Surround™, Matrix Surround (Dolby Pro Logic® II), Ambisonics, Trifield™, Treble and Bass Controls, Digital Volume control, and other functions. DSP E and F are utilized predominately for MRC, but DSP F is used for some housekeeping functions that are normally performed on DSP C+D, depending on MRC status. To add additional horsepower, another 56367 is employed on the digital receiver card for upsampling (or downsampling) PCM sample rates and sampling depths, format detection, and FIFO buffering (for jitter reduction).

There are a variety of analog input cards available for 861, and germane to my system is the multichannel input card (IA45, used for SA-CD) which employs three Analog Devices AD-1871 A/D converters. These are quite capable A/Ds operating at 24-bit/96 kHz precision, with a typical SNR of 103 dB, and a maximum tested SNR of 105 dB. After the MC input is digitized it becomes Just Another Digital Source™ (JADS™). An additional 56367 is employed on the IA45 card to provide functions such as FIFO buffering. For stereo analog sources (including my SPL meter for MRC), I am using the stereo analog input card (IA00), which employs the Crystal Semiconductor CS5338, operating with 20bits/48kHz precision.

I have two digital cards. The first is an IE42 which provides digital input and outputs. There are a total of six S/PDIF inputs, which can be configured for up to two MHR inputs (6x RCA connectors) plus a single TosLink optical input. In addition, a pair of digital outputs is provided, also on coaxial/ RCA jacks. On this card, yet another Motorola 56367 is fitted, for jitter reduction, upsampling (if applicable), and FIFO buffering. Because I have a number of sources available, only via optical (D-VHS VCR, Satellite receiver, and potentially a scaling DVD player down the road), I opted for an ID25 digital slave card. The input is slaved to IE42s oscillator and provides an additional 4 TosLink inputs.

If you want an On Screen Display, you need to add some type of video switching. I opted for a VS00 with a combination of four composite and four S-video inputs. Main (with OSD) and Tape (no OSD) outputs are provided. I connected the Main composite output to my OSD, a 7.4-inch widescreen LCD monitor. I also sent through OSD from my SA-CD player via this connection.

As you would expect, both digital and analog outputs are possible. I happen to use analog outputs, via a pair of OA13 balanced output cards for up to eight output channels. A single ended analog output card (OA03) is also available. Regardless of whether your analog output card is balanced or single-ended, a quartet of Analog Devices AD1852s are utilized.

I'm not sure why I haven't covered this

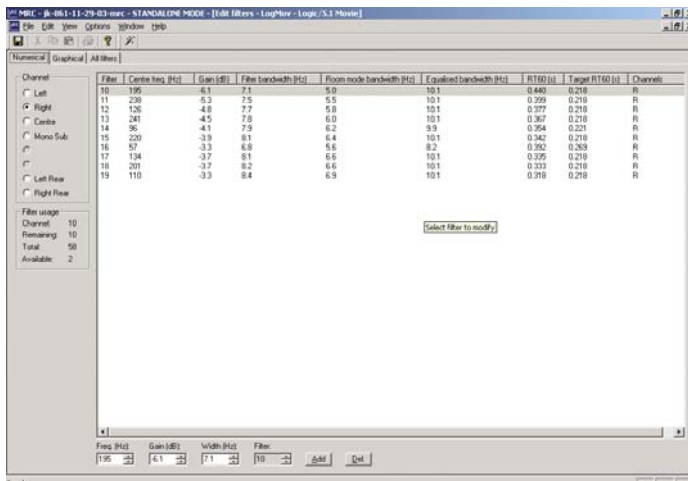


Figure 1

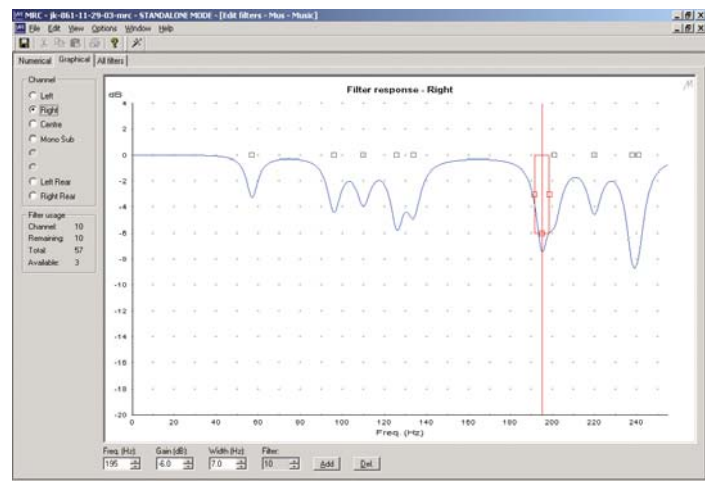


Figure 2

Table 1

Card Type	Slot(s)	Width	Description
C000	0	1	Control Computer (Mandatory)
VS00	1,2	2	Composite/S-Video switch
ID25	3	1	TOSLink slave for IE42
IA45	4,5	2	Multi-channel analog input
IE42	6,7	2	Multi-channel digital input (Mandatory)
OA13	8,9	2	Balanced Analog output #1
OA13	10,11	2	Balanced Analog output #2
IA00	12,13	2	Stereo Analog input
Open	14		
Open	15		

earlier, but the 861 chassis has a total of 16 slots. Each user can install the appropriate cards in their chassis for their particular needs. Three slots are fitted with mandatory cards. Also, some cards are single slot, and others, due to size of connectors or required electronics, are double slot. My chassis contains the following cards:

I still have sufficient space in my chassis to add an OE12 digital output card, and an SL00 Slave patch card should I ever go the path of Meridian Digital Theatre.

Technology

As with many other technology-driven companies, Meridian implements features first in their state-of-the-art product, after which it is trickled down into their more mainstream products. Much of the technology included on the Meridian 861v3 (and also in v4) was covered in my review of the 568.2MM processor (Issue 72, April 2003). Covered in depth in that review is the Meridian High Resolution™ (MHR™) digital interface, which first appeared in the 861, with multichannel implementation in 861v3. In addition, coverage of Meridian's

approach to linear (integer) upsampling for input sampling frequencies from 32 to 48 kHz is included in that article. New to 861v4 (and included in their new G68 processor) is MRC.

MRC is a bit like the icing on the cake in terms of performance. Unlike many other room-correction solutions, Meridian has consciously chosen to limit the bandwidth of correction to the range of 20 to 250Hz. The reasons are numerous, and the choice is eminently practical. There are room correction systems, which will correct to 20 kHz on the market, but one has to wonder about their efficacy when dealing with frequencies of 2 kHz and above, where a head movement of a scant few inches will move you a substantial fraction (maybe even multiples) of a wavelength.

MRC uses a different technique than some other room correction systems. Rather than working on adjustments in the amplitude domain (by raising or lowering levels of problematic frequencies), MRC works in the time domain as demonstrated in a research paper at a 2003 Audio Engineering Society (AES) international conference. There is an additional lay paper on

Meridian's Web site, which brings this extremely technical research paper down to levels that many audio enthusiasts will understand. Any errors in distillation for our readership are completely my own and I encourage you to read whichever paper is appropriate for your knowledge level to get an unadulterated version.

MRC uses a modified MLS system to emit a series of tones at discrete intervals. Since the duration of each tone is known, the amount of excess time recorded is the result of activating a room mode at (or very near) that particular frequency. The overall goal is to get the RT60 (the amount of time it takes for a sound to decrease by 60 dB SPL) near the one-fifth of a second range for all frequencies corrected. The target RT60 varies according to frequency. In figure 1 (numerical analysis), we see that there are 10 filters utilized (numbered 10 to 19 for this correction set). Note that the gain figures are correlated directly with the difference between the measured reverberation time and the target reverberation time. In other words, the larger the difference between the measured and actual reverberation times the more (negative) gain applied.

The graphical analysis in Figure 2 shows the results of the various corrections to be made. The curves are inverted to show comparable attenuation for each targeted filter. In other words, if you rotate the graph 180 degrees, you will see the in-room response.

It is possible to create your own filters or to modify the ones that the MRC application has calculated. There is a full manual mode in addition to the option of editing filters once they have been calculated. I will tell you that the individuals that created MRC are extremely gifted; their judgment will, in all likelihood, be better than mine and possibly even yours.



MRC is aided by a garden variety SPL meter and a laptop computer running MS Windows 98 (or higher). The MRC application is designed to work quite well with a rather inexpensive meter such as the Radio Shack Analog SPL meter that many of us already own. I initially had a few modest issues getting the 861v4 and my laptop to converse fluently which was neatly solved by a \$10 serial to USB converter cable. Using the MRC application is fairly straightforward and starts by testing the SPL meter. My best results for fast response were by using an input sensitivity of 1.0v with the meter set to the 90 dB SPL range. Once done, the processor generates a test tone to verify that the microphone is acceptable. If it meets requirements, the main application then launches. I used the automatic mode for all measurements and was quite pleased with the results which I will cover later in my listening assessment.

I have two crossover points defined, 80 Hz for movies and 65 Hz for music. This is the best compromise for my system that I can find. Each crossover point is given a different set of filters. It is possible to create many sets of filters based on room conditions; it is not out of the question to have a set for one person, two persons, five persons etc. All you need is the time, some earplugs (the MLS tones are not particularly pleasant to listen to) and the appropriate number of individuals. I have not pursued this option at this point, but will be doing so in the near future. To date, MRC has worked flawlessly.

The user interface is where the 861v4 like previous versions has a bit of a weakness. Configuration of the processor essentially demands the use of a PC. Otherwise, it is a very complicated task requiring some sort of On-Screen Display device. Since I have a laptop, it's no big deal, and I cannot stress strongly enough that it is (in my opinion) essential to getting the optimum performance out of the 861v4. Once I had all of my inputs configured, selecting the input made everything work seamlessly and flawlessly. Although somewhat daunting, the sheer flexibility is tremendous. When setting up a particular input, you can define the audio input (analog or digital, and the choices change based on your processor's card configuration), the video input (again, dependent on your particular configuration), the processing to apply based on the input signal type, and whether or not to engage MRC or upsampling (if applicable). For the uninitiated it is daunting, as for me I'm used to it and it posed no issues. Once again, this is a great time for your dealer assistance, especially given the premium price commanded by 861. There are a few quirks to the configuration application, such as the

need to go back and re-enable High Speed Output whenever downloading from the unit. Once I had an operational lockup it could not be cleared without a power cycle. Since I was never able to duplicate the conditions, I have to classify this lockup as an operator error.

The new MSR+ is now shipping with all Meridian products, and it is a tremendous improvement over the previous generation of remotes. This remote is programmable and contains a decent library of codes to cover many of the components you might have within your system. In addition, it is fully learnable and includes blank key caps that can be labeled as required for your system. In addition, it is fully backlit, and lights up when a key is depressed. Battery life is not an issue, and the transmission range is much wider than the previous remote control. Since this remote is all hard keys, it isn't perfect, and you have to remember your key mapping for various sources. I didn't have issues, but some might with this approach. I still prefer a remote with both soft and hard keys, but this is a dramatic improvement for Meridian. A few have commented about a high-pitched whine coming from the remote. It does produce a whine when the backlight is active, however, I had to place it right up to my ear (literally) in order to hear this. Since placing the remote in that location interferes with the soundstage, I didn't find myself listening with this particular remote configuration.

A software upgrade for Dolby Pro Logic IIX™ was rolled out in December 2003, but a seven-channel loudspeaker setup that was to have been delivered did not arrive so I was unable to do any in-home evaluation of the extended surround functionality.

Listening Impressions

Here's where it really gets fun with Meridian's 861v4! Those who read my review of the 568.2MM last summer will recall how positively thrilled I was with its performance. I can safely say that the 861v4 surpasses the 568.2MM in every category—the price premium for the 861 is compensated for with incredible flexibility, due to its entirely modular architecture and the knowledge that future upgradability will be available.

The 861v4 is armed with a large complement of processing modes, almost exhaustingly so I found myself gravitating towards Trifield for stereo reproduction, which improved (yes improved) upon nearly every stereo recording I tried. What you gain is a far more natural presentation across the front of the room, which gives you a highly stable and solid image which is anchored by the center channel. In addition, the sur-

rounds are very tastefully utilized. Unlike some DSP processing modes, which tend to draw attention to themselves, Trifield doesn't. As before, I found that while my center channel loudspeaker is a good timbral match, the apparent size of the image is not, which can be distracting. I will be switching over to a matched front trio loudspeaker setup sometime in 2004, at which point this will cease to be a problem.

For standard Redbook CDs, all of my previous impressions hold true, only more so. Every recording I threw at the 861v4 sounded better than any reproduction I've had to date for CD. However, the 861v4 doesn't sugar-coat the presentation. In other words, bad recordings still sound bad. Great recordings sound superb, and frankly when CD is as well-done as this product is capable of reproducing, you will find that your CD collection won't be collecting dust on the shelf. An example of an old favorite that has made it back into my player is Steely Dan's *Katy Lied*. For its era (the middle 1970s) it is a very well-recorded popular music disc. The track "Doctor Wu" is my favorite from this disc with Phil Woods' wailing alto saxophone with ascendant trills and sharpness of tone on his palm keys and that nearly-honking characteristic at the bottom of his instrument's range plainly apparent. Fagen's lead vocal was captured with a slight bit of constraint and chestiness. Here again, the 861v4 coaxes out the subtleties of inflection that are preserved ad infinitum on the disc. It is important to note that when receiving a PCM input (from any source) the 861v4 will dutifully upsample at twice the input frequency, so 44.1 kHz inputs are upsampled to 88.2 kHz. The reasons for this were covered with greater detail in my 568.2 review last year. Suffice it to say that the algorithmic mathematics for synchronous upsampling are cleaner than asynchronous upsampling.

Movies are presented in Dolby Digital and DTS Digital Surround encoding and the 861v4 gives these formats no short shrift. In fact, in a brief comparison that is as close to head-to-head as I could manage, the 861v4 sounded noticeably better than the 568.2. One area that this becomes rapidly apparent is in dialogue clarity. While certainly the 568.2 does well, the 861v4 betters it. As an example, the spoken dialogue prior to the start of "A Case Of You" on Diana Krall's *Live In Paris* DVD is one spot where the difference jumps out. This was true whether using the Dolby Digital or DTS Digital Surround audio stream. With the 861v4, there is (to me) a substantial improvement in the natural quality of her voice. The combination of high-definition video and seemingly high-resolution audio



is potent, and the addition of this level of decoding on the HDTV broadcasts I've watched make the experience far more immersive than previously experienced.

I'm trying to avoid lapsing into reviewer cliché here, because the presentation of Dolby Digital and DTS Digital Surround soundtracks when used in conjunction with a Meridian DVD player, such as my 598DP, is a cut-above-standard means. When using an appropriate Meridian DVD player (598D, G98, G91, or 800v3), the player does the decoding of the soundtrack and passes the PCM decoder output via Meridian High Resolution™ (MHR™). This allows the 861 to upsample all channels to 96 kHz and provides a superb boost in audible performance. Since I covered this extensively in my 568.2 and 598DP review, I will leave it at this: An important improvement can be gained using this combination for DVD-Video playback. There are a lot of movie soundtracks where massed strings are utilized, and the "body" of the orchestra appears weak. I found that when utilizing 598DP to 861v4 much of the body was brought back, and the portrayal was very convincing.

DVD-Audio discs reached new levels of quality playback, with all of my personal favorites spending time in the 598DPs tray. Whether it was grooving with good stereo discs from Hi-Res music, or the astonishingly clear performances captured and presented by AIX Records, the 861v4 shined. It is obvious why these recordings are used as reference tools for reviewers everywhere; they represent the current state of the art in recording via PCM. As just one example, I'll point to the disc released in late 2003, Laurence Juber's *Guitar Noir*. This trio's recording features the finger style guitar work of the former Wings member. It's a stunningly good DVD-Audio delivery and the immersive mix adds a significant enhancement to the presentation.

It's hard not to sound like an infomercial spokesman when writing this review. Just when you thought I was done it seems as if I'm about to cry out: "But wait, there's more!" and indeed I am. While many purists are about to shudder, for every 861v4 owner out there, I cannot recommend highly enough the introduction of an IA45 multi-channel analog input card to your chassis. This allows you to bring in the analog output from an SA-CD player, sample at 24 bit/96 kHz and voila, you have now integrated SA-CD into your system. Anyone would be hard pressed to find fault with this "treatment" after hearing the results. By doing so, you can leverage the considerable processing prowess of this product with SA-CD, in both stereo and multichannel. I used the concept of a phantom source on my 861v4, defining

one input as the multi-channel input and another as just the L/R input on the IA45, which allowed me to handle things very flexibly. When using the Multichannel input, multichannel discs and pure stereo were available. When using the stereo input, Trifield was available. Needless to say, Trifield was my default choice for stereo-only discs. Adding room correction and highly competent bass management and time alignment are very compelling additions. The 861v4 did not disappoint when fed analog signals from the Denon DVD-5900, or my Philips SACD1000 players. Outstanding and rousing reproduction was enjoyed.

Conclusion

It is difficult to review a product like the 861v4 for the simple reason that it makes you seriously ponder the resolution of the rest of your system. Have I heard the best it is capable of? I highly doubt it. Has the 861v4 bought me the best playback to date I have heard in my own home and in my room? Without a doubt it has by far.

The 861v4 is a technological tour-de-force, with superb decoding of Dolby Digital and DTS Digital Surround soundtracks from various external sources, reference grade playback, and tasteful processing of stereo CD via Trifield, and currently, in this reviewer's opinion, the reference standard for playback of DVD-Audio discs when used with an appropriate Meridian DVD-Audio player. Even when asked to do an A/D conversion of SA-CD, which is unthinkable to the purist, the 861v4 shines through with an undetectable signature, while adding all of the PCM tools that allow for truly accurate reproduction of SA-CD, with time alignment and superbly flexible bass management. With the addition of results from their research, i.e. Meridian Room Correction, the 861v4 helps relieve the most problematic frequency region for every room, the first three-plus octaves. This places the 861v4 into the realm of truly reference grade products.

Meridian's flagship processor is a great product and those fortunate enough to have the budget will find it to be a leading contender for the best preamp/processor on the market. You don't need to take my word for it, two individuals for whom I have the utmost respect for in creating recordings, Bob Ludwig of Gateway Mastering and DVD, and Mark Waldrep of AIX Records, utilize 861 processors in their studios. Given the consistently high quality of their recordings, it doesn't surprise me in the least. I've had a glimpse at what of they hear and it is spectacular. ■



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