Tape Op

The Creative Music Recording Magazine

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Antelope Audio

Eclipse 384 stereo AD/DA converter

Antelope Audio's founder, Igor Levin, came on the scene in the early 1990s as lead designer of Aardvark, before most commercial studios even owned a DAW. By the mid-'90s, the AardSync was the de facto clock for the DAWs in major studios — even when the highest-end converters were in use. Over the past 20 years, Antelope's understanding of the digital world has led to the development of their current generation of pro audio and audiophile gear. The recently-released *Eclipse 384* vies for the title of heavyweight champ in the combined contest for converter, master clock, audio interface, and monitor controller. My studio has been the host to an *Eclipse* and an Isochrone 10M Rubidium Atomic Clock [*Tape Op* #68] for a few weeks. A product this sophisticated requires quite a bit of description, but I will keep this review to the nuts and bolts, and suggest you get into the details of the unit through the downloadable manual if your interest is piqued.

The heart of the *Eclipse* lies in its clock, which it shares with the acclaimed Isochrone Trinity master clock. The *Eclipse* clocks audio from 32 kHz up to 384 kHz, utilizing a proprietary 64-bit control circuit which modulates the jitter in a way that enhances the sonic quality of a "perfect" clock. Basically, in the same way that a random dither signal helps make quantization noise less noticeable, Antelope's Acoustically Focused clock first removes unwanted jitter and then introduces a controlled jitter that actually improves the perceived sound of the digital audio. This is somewhat esoteric territory, but my ears certainly perceive the natural tonality of the audio produced by a well-clocked digital converter. A good clock and converter, along with higher sampling rates, all help the audio seem more real, dimensional, and dynamic.

Along with the clock, the *Eclipse* provides an A/D converter and two D/A converters. One DAC supplies the monitor output, and the second DAC performs other conversion duties. Two independent clocks oversee the separate digital paths, and separate internal power supplies fuel the analog and digital paths, which prevents digital noise from entering the analog ground plane and contaminating the analog audio. In addition to the clock and converters, the *Eclipse* performs control-room monitoring and audio-routing functions, effectively combining a mastering-style center section with a recording-console center section. The monitor section provides speaker selection; monitor volume control; headphone outputs for control room and studio cues; as well as talkback; two independent peak meters; tone generation; and monitor effects, like mono, dim, polarity inverse, and various forms of L/R monitor summing. Inputs to the box are plentiful: three stereo analog on Neutrik Combo jacks, three AES/EBU, two TOSLINK, and two S/PDIF. Additionally, there are two analog insert patches (TRS), as well as talkback mic and footswitch jacks. The outputs are similarly thorough: one main stereo D/A (XLR), three analog stereo monitors (XLR and 1/4"), one analog LFE channel (XLR), two AES/EBU, two re-clocked AES/EBU, one S/PDIF, and one TOSLINK. Also, there are two headphone jacks in the front and two more in the rear. Standard BNC jacks are used for word clock input, 10M clock input, and four word clock outputs. The rear panel also sports a USB Type B port to connect to a host computer.

The 2RU-height front panel looks surprisingly simple, with two large knobs for monitor and cue level; a power button; five preset recall buttons; buttons for mute, dim and mono; one button simply labeled with the Antelope icon; and two huge, horizontal, 32-segment LED peak meters, which have assignable sources. The Antelope button swaps a portion of the display to show meter labels or internal routing settings.

For the first 10 minutes or so, the most useful feature of the unit is the USB connection. Antelope provides a software control panel which controls every parameter of the *Eclipse* over USB, including a meter display mirrored in software, volume controls, and even a power button. Once the software is downloaded and installed on PC or Mac, the *Eclipse* sets up very quickly. I created and stored a few of my typical setups as presets, which can be recalled from the software or by using the dedicated front-panel buttons. The software could easily run the entire show, allowing the unit to be mounted outside of arm's reach, and I often found myself simply using the on-screen volume control with my mouse or up/down keys on my keyboard. For this reason, I kept the software open on my second monitor, but you certainly don't need to keep it running once you've stored your presets. A dedicated hardware remote for the *Eclipse* will soon be available. The software provides four tabs to control the different functions of the unit: inputs and outputs can be named, routed, and clocked; monitor and cue mixes can be configured with sources and nominal levels; clocks can be assigned and set; and the ADC and DAC paths can be defined. Five presets can be saved, and each includes all of the settings, including monitor and cue volumes as well as clocking. Changing over from mixing to mastering — or just monitoring external sources (like a DVD player or video game system) — is almost instant when you switch between presets. The *Eclipse* offers so many choices for interfacing and routing that any typical setup is easily achieved, but take a look at the website and manual for the nitty-gritty details.

For my use, I set up the 10M clock as the master to the *Eclipse* and then patched word clock to my Pro Tools interface. My main Pro Tools output went into the *Eclipse* via S/PDIF, and the *Eclipse*'s cue mix took analog stereo input 1 and routed that to its cue output and into my headphone system. The AES/EBU out from the *Eclipse* routed back to the AES/EBU input 1-2 on my DAW, and I patched two channels of mic preamps into analog inputs 3 for recording overdubs. The optical output of my Mac fed the TOSLINK input of the *Eclipse*, providing the best sound I have heard from my Mac — ever! This simple setup gave me centralized control over my control-room monitors, studio cues, and control-room headphones — as well as some digital and analog routing for Pro Tools. Again, your setup may be very different, but many setups can easily be accommodated.

As a monitor controller, the *Eclipse* sounds fantastic. Compared to my console's monitor section, the center image became focused dead-center and the stereo field appeared much more defined. Panning moves could be heard in much smaller increments. I spent a lot of time tuning and calibrating my room for stereo and surround, and the *Eclipse* showcases how good a properly setup room can sound. Once I was accustomed to the sound of the monitor path, I switched the clock in Pro Tools to follow the *Eclipse* (which effectively re-clocks its Trinity clock to the 10M's Rubidium clock). Despite the white papers that explain how internally clocking converters provides the purest clock and lowest jitter, I found that my DAW mixes sounded much more detailed, spacious, and even a bit louder (or at least more dynamic) when I clocked from the *Eclipse* and fed my mix into the *Eclipse* digitally. As a bonus, the *Eclipse* allows vari-speed control via sample-rate adjustment from the control panel. Vari-speed can be adjusted by percent, sample-rate frequency, or even cents — pretty cool. In this setup, you must be careful to make sure your DAW session rate matches the *Eclipse*'s clock, or digital mayhem will ensue. (You will only make that mistake once!) Incidentally, running my system on internal clock and feeding the digital output to the monitor section of the *Eclipse* also resulted in a noticeable improvement in the monitored sound. That shows that the digital inputs of the *Eclipse* provide a more accurate conversion by providing a superior analog path as well as removing the jitter from its digital input. Worth noting is that re-clocking the digital audio or removing jitter produces no noticeable latency in the *Eclipse*, since the buffer size only needs to be two samples, corresponding to a delay measured in microseconds.

So now I have the *Eclipse* clocking my system, providing monitor control for my speaker and headphone systems, and D/A conversion for my DAW. When I want to record through mics, the *Eclipse*'s ADC will route my analog mic preamp output to my DAW. The *Eclipse* ADC sounds great — more open and natural than a stock Digidesign 192 I/O, thanks to top-level analog circuitry, state-of-the-art Burr-Brown converter chips, and stellar clocking. In mixing or mastering setups, a DAW track could be routed out an analog output of the *Eclipse* to be processed with analog gear and then back into the *Eclipse* and out to the master recorder, as well as back to the DAW using a digital patch. From my listening tests, there is, in practice, no detectable coloration from the DAC to ADC roundtrip using the *Eclipse*. I couldn't reliably tell if I was monitoring my original source or the looped and twice-converted signal. That says a whole lot about the integrity of the *Eclipse*'s conversion processes.

Wow, there is so much to say about a box with this much functionality, and my description surely leaves out a few features and capabilities of the unit. The *Eclipse* very elegantly fills the bill as a world-class monitor controller, master clock, ADC, and DAC — with sharp metering and even cue functions. And it exhibits the highest-fidelity sound. What more could you want? Its price seems very fair for all it provides. *($6995 street; www.antelopeaudio.com)*

–Adam Kagan <www.TemptressThePlugin.com>

Cross·Spectrum Labs

Calibrated Dayton EMM-6 mic

A reliable measurement mic is something every engineer should have. However, high-end, certified models can be expensive. But can't you just buy a cheap measurement mic off the shelf from the likes of Behringer and Dayton Audio? Sure, but a little research reveals that even "measurement-grade" microphones are not perfectly flat. Fortunately, today's acoustic-analysis software can correct for imperfect performance of the measurement mic, as long as the deviations in the response of your individual mic are known. That's where Cross·Spectrum Labs comes in. They sell low-cost measurement mics, and each mic is individually tested and calibration files for that individual mic are provided.

We purchased a Dayton Audio EMM-6 from Cross·Spectrum and put it through its paces on several tests. The stock EMM-6 mic comes with a calibration curve from the manufacturer that's custom-produced for each mic. You can download an individualized TXT file from Dayton