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MARCH/APRIL 2014

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technically speaking

20 Years Of Tools, Toys, Tips And Thoughtful Analysis

by Frank Wells

2014 marks *PAR*'s 20th year of publication. When the magazine first came out, the Internet as we know it was just beginning to crawl, and certainly had nowhere remotely near the depth of content and ubiquity of access as it does today. Today, when a product is released, you can download the manual online immediately. There are pictures and images to be found online at the instance of a product introduction (if the manufacturer's web team is doing their job). You can even find "reviews" the same day as a product's release.

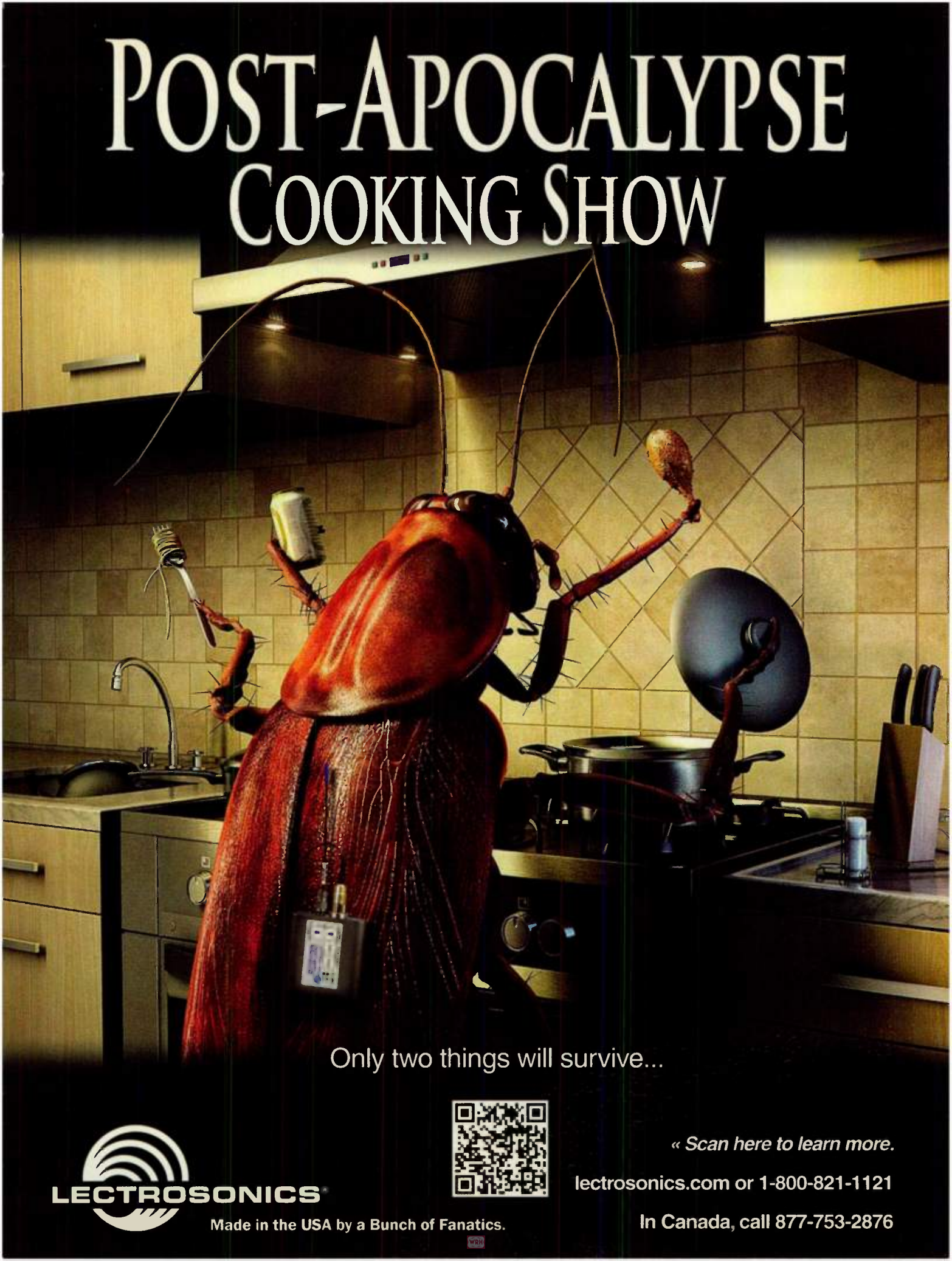
Now, by our standards, these don't qualify as actual reviews, but instead it's a feature rundown and pure speculation in regards to performance, representing the "reviewer's" preferences, experiences and often biases. The result is typically either a regurgitation of what's on the manufacturer's site, or a rant—neither terribly useful.

In earlier days, we'd tend to print a great deal of detail about a product; a near encapsulated manual in the guided knob and button tour. Unless you were fortunate enough to be at a trade show or demo, you couldn't get a true overview of a product in the pre-internet saturation days without such assistance. That's no longer the way of the world.

What hasn't changed is the need for opinion. And while the web is awash with opinion, it's often difficult to filter the noise in the quest for an intelligent signal. That's where we come in. Our review team is made up of your peers. They are voices you've learned to trust—reliable, consistent and low-noise.

With this issue we're fully implementing a more column-based approach to review content. There will be enough knob and button and feature-set description for you to categorize a product, but the focus is on what those details mean for you as an audio pro, as well as on real-world use and application. This new approach allows more products to be covered in the same page count, and at the same time there will be more from our contributors on their projects and the products that currently are garnering their favor outside of the review gear.

Jump on and hang tight—we're going to cover a lot of ground, fast.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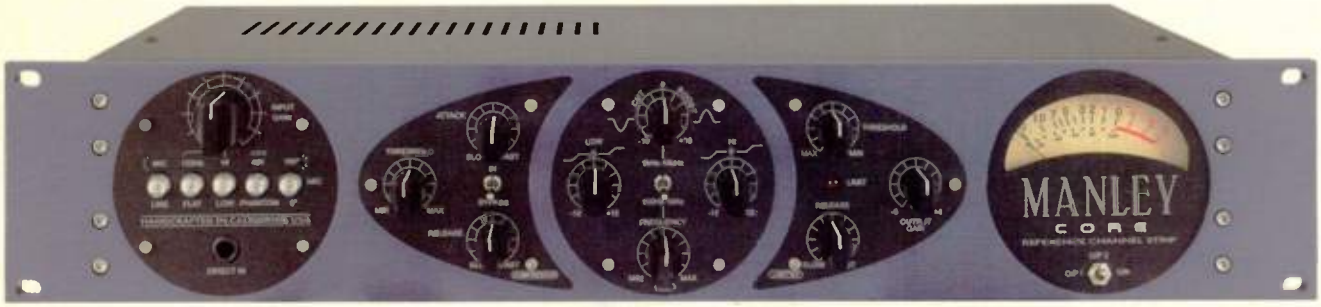

Manley Core

The editorial staffs of *Pro Audio Review* and *Pro Sound News* magazines presented the 2014 NAMM Show's ProSoundNetwork Best of Show Awards in Anaheim, California. A collection of NAMM Show-debuted products cited below are now officially recognized as Best of Show Award winners:

Audionamix ADX TRAX Software, Audio-Technica M Series Headphones, CharterOak K500 Ultra Parametric Equalizer, Corning Optical Thunderbolt Cables, Fender Passport Studio Monitors featuring FOCAL Driver Set, IsoAcoustics Modular Aluminum Systems, JBL Professional LSR310S Subwoofer, Lewitt LCT 550 Large Diaphragm Condenser Microphone, Manley Core Reference Channel Strip (pictured), MXL Mobile Media Series, Radial Engineering Space Heater, Softube Console 1, SPL Crimson USB Interface, Universal Audio Apollo Twin and the Waves Scheps 73 EQ.

During each of the major conventions and trade shows, the editors of *PAR* and *PSN*, with assistance from the editors of sister titles *Audio Media* and *MIX*, comb the exhibit halls for new and noteworthy products. Gear and software that show particular merit are singled out for the ProSoundNetwork Best of Show Awards. All products debuting at a given event will be eligible.

Visit the link below for more manufacturer-provided information about each of these award-winning studio products.

Link: prosoundnetwork.com/BOSNAMM2014

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new studio products

BBE Sonic Maximizer 500 Series Module

BBE's Sonic Maximizer technology is now available in a 500 Series module at $499. The single-channel SM500 is "engineered to brighten, clarify and add fullness by adjusting phase relationships and augmenting high and low frequencies, revealing more of the sound's natural texture and detail," boasts BBE. Features include the same processing engine as the BBE 882i rack-mount model, a bypass switch for comparison of processed and unprocessed signals, and +23 dBu of headroom.

Link: bbesound.com

Waves MetaFilter Plug-in

The Waves MetaFilter creative effects unit is designed to provide the sound of classic analog filters in a modern, plug-based GUI. MetaFilter can individually modulate the filter's cutoff, resonance and delay time using three separate modulators—a 16-step sequencer, an LFO, and an envelope follower with a sidechaining option to achieve effects such as filter sweeping, tremolo, auto wah, rhythmic gating, ducking, and modulating delays with saturation buildups.

Link: waves.com

Grace Design m920 Reference Headphone Amplifier/DAC/ Stereo Monitor Controller

Grace Design's m920 ($2,295) features the latest generation M series Sabre DAC. The Sabre is a 32-bit converter with 24-bit, 192 kHz inputs provided on AES3, S/PDIF, TOSLINK and asynchronous USB. The m920 includes DSD-64 and DSD-128 functionality via USB, DSD-64 through the AES3 or S/PDIF inputs, and 352.8 kHz and 384 kHz PCM (DXD) playback over USB.

User selectable DAC filter response is available for both PCM and DSD playback. Also new is a cross-feed circuit, developed for improved headphone imaging, and improved low frequency response on the m920's balanced and unbalanced line outputs.

Link: gracedesign.com

OWC Memory Upgrade Options for Apple Mac Pro

Other World Computing has expanded its memory upgrade options for the Apple 2013 Mac Pro.

The pricing and availability of popular memory options for all Apple 2013 Mac Pro 3.7 GHz Quad-core, 3.5 GHz 6-Core, 3.0 GHz 8-Core, and 2.7 GHz 12-Core models are as follows: 8 GB Module $119.99; 2 GB Kit (16 GB x 2) $437.99; 48 GB Kit (16 GB x 3) $649.00; 64 GB Kit (16 GB x 4) $849.00; and options for adding 4 GB and up to 64 GB to Mac Pro 2013 are now available from $74.99.

Link: owc.net

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Engineer Rafa Sardina and Focusrite RedNet

by Tony Ware

Tony Ware is a DC-based DJ, professional audio journalist, and regular contributor to *Pro Audio Review*.

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In early December 2013, 11-time Grammy award-winning engineer/producer Rafa Sardina entered Omega Recording Studios in Rockville, MD, for a two-day session to capture composer Marcos Galvany's operatic tableaux "On My Son." When he accepted the commission Sardina didn't know the facility to be utilized, with Omega chosen for its large ensemble-friendly Studio A and its proximity to the Washington, D.C., region homes of Galvany, the Washington National Opera Orchestra and Choir members featured on the recording.

What Sardina did know is he wanted to employ Focusrite's flagship RedNet modular Ethernet-networked audio interface system, officially launched in 2013. Here he discusses his relationship with Focusrite and the two RedNet 2 16-channel AD/DA interfaces, three RedNet 4 eight-channel mic/line inputs and two RedNet 5 32-channel HD Bridge units implemented.

Pro Audio Review: What drew you to first audition the RedNet system, and to deploy it in your Omega Studios session?

Rafa Sardina: A little over a year ago the company approached me with a new product to check out, and it was very appealing because of the way you can interconnect units and remotely create such large LANs from room to room through Ethernet. Obviously, that doesn't matter if it doesn't sound the way you think it's supposed to sound or if it's not failsafe, so I tested it thoroughly for transparency and latency—it's near-zero, thanks to the underlying Audinate Dante digital distribution system—and I was very impressed. I have two RedNet boxes of my own, including a RedNet 1 eight-channel AD/DA and a RedNet PCIe card, and I have used them in Los Angeles and Miami rooms.

PAR: What was your mic set-up and how did the RedNet system handle its character?

Sardina: I had a trio of custom microphones by David Bock [of Bock Audio]; they are based on the classic Neumann M 50 and are superb, really great. The center is more like a new TLM 150 but with a completely new power supply. And the rest are my [Neumann] M49s, my [AKG] C12s, Telefunkens—stuff I know works great for specific sections.

What I love about the RedNet is the transparency; it's superb for this type of recording because of that. Especially with classical-type recordings, you are not looking for extra character from the converters or to go through too many transformer-based preamps [RedNet 4 preamps are a remote-controlled, DC coupled, capacitor-free design—Ed.].

From the Focusrite RedNet collection, Sardina used two RedNet 2 16-channel AD/DA interfaces, three RedNet 4 eight-channel mic/line inputs and two RedNet 5 32-channel HD Bridge units.

> "What I love about the RedNet is the transparency; it's superb for this type of recording because of that. Especially with classical-type recordings, you are not looking for extra character from the converters or to go through too many transformer-based preamps."
>
> —Rafa Sardina

PAR: What other benefits does the RedNet system bring when tracking an orchestra?

Sardina: It avoids the inflexibility of an unknown studio's connectivity. The RedNet lets me throw some preamps in the room in the best position once I figure out how to arrange it and not have to use that much of the board, which I was just using to play with placement and balance.

PAR: Did you utilize the remote gain-adjustment capabilities and the RedNet Control digital routing matrix?

Sardina: For this type of recording it's more set and go, but once it's set it lets me just be on the board to listen and do what I do. And when there are 60 musicians in a room the less someone must go in to change anything the better. The matrix allows you to have the most amazing set-up, but you must be conscious of it prior to a session. It's not a 1:1, ready-to-go type of system, but it gives you the most flexibility. It was not something I needed for this recording, but if you're doing something like a scoring session with submixing and multiple things being sent to different back-ups it is very powerful when you are clear-minded and program it carefully beforehand.

PAR: Will you continue to adopt RedNet components?

Sardina: Absolutely. The network capabilities, the way you can have the preamp boxes in totally different rooms and network different studios into the same converters and dispatch the signal to multiple systems & especially for 5.1 recordings and the mixing of live shows, it saves me so much work and gives me piece of mind.

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studio reviews

by Russ Long

PAR Senior Contributor

rlong@nbmedia.com

After reviewing a trio of "meat and potatoes" 500 Series modules in last month's *PAR*, I'm excited to dig into the two most inspiring 500 Series modules of any kind that I've encountered to date: the Moog Analog Delay and the Moog Ladder. These all-analog modules pack the classic Moog sound into the 500 Series format and are truly amazing.

I also delve into the Thunderbolt Optical Cable by Corning, which adds an entirely new dimension to Thunderbolt use in the professional studio and beyond. No longer limited to a three-foot long copper cable, Thunderbolt Optical connections may now stretch up to 60 meters in length.

About Moog

I interact with dozens of pro audio businesses in my endeavors, and it's always refreshing when I encounter a company that consistently does things right. Moog is one of those (relatively few) companies. I've been fortunate to visit Moog in Asheville, NC and take the tour (free and open to the public); besides the fact that Asheville is an awesome place, a visit to Moog is enough to make the trip well worthwhile. All Moog designs are made in America, 100 percent built in their Asheville factory, and even the smallest components within Moog products are American sourced, if possible.

Both the Analog Delay and the Ladder are beautifully designed, blending a modern look with a classy Moog vibe. The knobs are nicely spaced for easy adjustment. This is important since these are not modules to set and leave; rather, they lend themselves to constant tweaking and adjustment, as they are essentially instruments themselves. The modules accept signals ranging from -10 to +4 dB, making them easy to interface with both pro and consumer gear; a pair of either model can be stereo linked using the included jumper cable.

Russ Long reviews The Ladder and Analog Delay 500 Series pairs at his studio, the Carport in Nashville.

For this review, I had a pair of each model and, having utilized them both in stereo, I highly recommend getting a pair as their stereo integration adds a whole new layer of sonic manipulability. Both models are equipped with a relay-based and hardwired true bypass that completely removes the circuit from the signal path. Most importantly, both the Analog Delay and the Ladder have the uncanny ability to infuse life into even the deadest sound.

The Moog Analog Delay

As a standalone unit, the Analog Delay ($999) is impressive, though not a jaw dropper. However, once you implement the plug-in or standalone editor and begin to utilize the additional features it provides, its true power rapidly becomes apparent, as its sonic flexibility is massive.

As the name suggests, the Moog 500 Series Analog Delay is a delay with a fully analog signal path. It provides up to 800 ms of smooth, natural and warm delay, adding an entirely new musical dimension to recording and mixing. The ability to control the device with Tap Tempo, CV or MIDI gives the user significant control possibilities and the software editor plug-in provides the same recall and automation flexibility typically only found in plug-ins. The TAP/CV input allows the module to use with a Moog EP-2 expression pedal, Moog FS-1 tap

In every instance, the RTAS plug-in used along with Pro Tools 10 and the AAX version with Pro Tools 11 provided flawless performance.

switch or another control voltage source for external control via quarter-inch TRS that provides a +5 VDC reference on the ring, input on the tip and ground on the sleeve.

The plug-in provides a selection of various LFO wave shapes including Sine, Triangle, Square, Ramp, Sawtooth, Sample and Hold, plus Smooth Sample and Hold modulations. There is control over the LFO rate as well as the amount the LFO modulates the delay line. Tempo sync is added as well as increased control of the modulation settings and delay time. There is even a Slew Rate control that determines the transition time from one delay setting to another and a pull-down menu that selects the behavior of the CV/Tap input.

Initially, I thought, "Why do I need an outboard delay when I mix?" I have several delay plug-ins that I love and some of them—most particularly Sound Toys EchoBoy and Universal Audio EP-34 Tape Echo—give me an abundance of convincing analog tonality. Yet after spending time with the Moog Analog Delay, I realized that it offers much more than any plug-in can offer. It's both a delay and tonal shaping tool. Using it along with its plug-in provides all of the recallability and automation functionality that's available in the box but with a true analog device that can't be equaled by a digital algorithm. In addition to the stand-alone editor that I utilized on my laptop, I used the RTAS plug-in along with Pro Tools 10 and the AAX version with Pro Tools 11 and had flawless performance in every instance.

Over the past three months I've run lots of sound sources (including drums, loops, acoustic and electric guitars, bass, keyboards and vocals) through the module and had wonderful results. As is the case with even the best plug-ins, sometimes the module isn't the right choice; and unlike a plug-in, when the Analog Delay works, there's nothing else that can even come close. Just using the box to subtly overdrive a lead vocal can be amazing and automating the Drive control for slightly more aggressiveness in the chorus is a wonderful thing. I found the module can translate thin, sterile synth pads into massive sounds that I'd swear were analog; it can even work wonders on electric guitar and bass, too. I love having the ability to automate the module's parameters, and since I've been primarily using the box as a Pro Tools insert as I mix, I don't ever have to worry about documenting any of my settings—my precise sound is instantly recalled when I load my session.

MIDI-Enabled

The MIDI In port provides control of all of the module's onboard parameters (which includes several that aren't available on the front panel) via MIDI. A complete list of MIDI Control Change numbers and values is listed in the manual. The editor plug-in is AAX/VST/AU/RTAS/stand-alone compatible and works with both Macs and PCs. It can be downloaded for free from the Moog website.

Manufacturers often miss the mark when trying to implement MIDI connectivity. Not Moog—they understand MIDI as well, if not better, than others and they nailed it in the Analog Delay. My only complaint is that I wish there was a MIDI output that allowed capture of manual adjustments made on the actual module. I've successfully mapped the controls to another

MIDI controller, which works well, but the onboard controls are laid out perfectly.

Specs & Operation

Onboard controls include Drive (essentially an input control that provides both input level optimization and the ability to creatively overdrive the signal), Output, Time (70 – 800 ms, or 35 – 400 ms if the 0.5x switch is activated), Feedback, and Mix. Four LEDs provide useful information about the module's settings. The tri-color Level LED illuminates green to signify signal present, orange to signify that the on-board limiter is activated and red to signify that the circuit has reached the point of saturation. The tri-color Time LED indicates whether the delay time is set via Time knob, Tap input or MIDI clock. The LFO LED indicates the LFO rate and the MIDI LED illuminates when a MIDI control signal is present.

When two Analog Delays are linked, the master controls the slave's Delay Time, Time Range, Feedback, LFO Rate, LFO Shape and LFO Amount while the Drive, Output and Mix controls remain independent. The master's Tap/CV and MIDI inputs works across the stereo link from the master to the slave and all MIDI messages with the exception of SysEx messages are echoed to the slave unit.

The Moog Ladder

The Ladder ($699) is based on the classic ladder filter design on which Bob Moog filed a U.S. patent in 1966. It's arguably the backbone to the classic Moog sound. This Dynamic Transistor Ladder Filter packs the sonic bliss of the original ladder filter into a 500-series module.

As with the Analog Delay, the Ladder can work its magic on virtually any sound source. I've implemented it on the same standard audio fare as the Analog Delay (listed above) and had fabulous results. After spending so much time utilizing the MIDI controls on the Analog Delay, I wish the Ladder had the same MIDI implementation. Since there is no way to automate parameter adjustment, I typically route my source sound through the Ladder onto another track so I can record my performance. Besides capturing the sound of the Ladder, it eliminates the need to document any of my settings for recall.

When working with drums, I insert a stereo pair of Ladders into a parallel drum buss and push the Resonance control slightly beyond the point of self-oscillation which adds a powerful dimension to the drum sound. The module easily transforms a flat, dull bass into the punchiest bass I've ever heard and it works wonders on synthesizers and electric guitar. To convert a mono keyboard into stereo, I've had great results multing the mono signal into two stereo-linked Ladders each with slightly different Resonance setting. The resulting stereo image is huge.

Unfortunately, the Ladder is void of CV/gate connectivity; beyond this (and its aforementioned lack of MIDI), it's a near perfect device.

Specs & Operation

As with the Analog Delay, the Drive control adjusts the module's input level allowing a clean sound, extreme filter drive or anything in between. Attack and Release controls determine how quickly the envelope follower responds to the audio signal and how quickly the envelope follower's release responds to the audio signal. These can range from ultra-fast to unbelievably slow. The Amount control, which ranges from -10 to +10, regulates how the envelope's control-voltage affects the cutoff frequency and the Cutoff control defines the frequency at which the filter begins to mold the sound. Finally, the Resonance control changes the way the filter sounds by adding positive feedback, essentially a harmonic bump, that peaks at the cutoff frequency.

It is quite easy to push the resonance control into self-oscillation, which sounds wonderful. Two switches provide additional control over the Ladder. The 2 Pole/4 Pole switch selects between 2-Pole (12 dB/octave) and 4-Pole (24 dB/octave) operation and the High-pass/Lowpass switch allows the Ladder's operation to be switched between HP and LP operation in a snap. The tricolor input LED illuminates green to indicate signal is present, orange to indicate a small amount of analog coloration is being added to the signal and red to acknowledge that there is noticeable filter distortion being applied to the sound source. The Envelope LED is determined by the Attack, Release and Drive settings and it indicates the strength and dynamics of the envelope.

Link: http://www.moogmusic.com/products/500-series

Russ at Work

Russ on AEA A440 and Mojave MA-300 Microphones:

The AEA A440 ribbons have been my choice overhead microphones since I reviewed them for *PAR* several years ago. You can hear them shine on this cut from *The Sapphires* soundtrack. The horns were recorded with Mojave MA-300 tube condenser mics.

https://itunes.apple.com/us/album/i-cant-help-myself-sugar-pie/id614840341?i=614841052

Currently On My Desk

1. G-Technology G-DOCK ev with Thunderbolt 2TB External Dual-Hard Drive
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Thunderbolt Optical Cable by Corning

The first time Corning caught my attention was while reading Walter Isaacson's book *Steve Jobs* where he described the significant role Corning's Gorilla Glass played in the iPhone's development. In addition to remaining Apple's official glass for the iPhone, over 30 other major brands incorporate Gorilla Glass into over 1,000 product models, translating to more than 1.5 billion Gorilla Glass-equipped devices in use worldwide.

Corning's entrée into the pro audio market is the Thunderbolt Optical Cable. When the Thunderbolt standard was introduced in 2011, its blazing-fast 10 Gbit/s speed spec staggered the pro audio industry, though its three-foot (one meter) copper cable length limitation was disappointing. Users wishing to remote locate a hard drive housing because of a noisy fan, or put an I/O like the UA Apollo 16 in a machine room, have been out of luck.

Thunderbolt Optical cables are available in 10, 30 and 60 meter lengths, not to mention smaller and lighter than copper cables. I've been using the 10 meter version nonstop over the past several weeks and it has worked flawlessly.

I used the Thunderbolt Optical cable to connect my MacBook Pro to a UA Apollo, daisy-chained with a standard three-foot Apple Thunderbolt cable to a G-Technology G-DOCK ev Thunderbolt Hard Drive. I used Dante's Virtual Soundcard to record 64-tracks of audio for two hours into a Nuendo Live session and encountered no problems. Additionally, I've used the cable over and over in normal situations requiring a Thunderbolt cable and it has always performed flawlessly. Interestingly, Thunderbolt connectors get fairly warm during heavy use, but never hot. According to Corning, this is completely normal.

I have only two complaints with the cables. At $330 and $659 for 10 and 30 meter cables respectively, they are priced at the top of the cable market. Secondly, they can't power anything requiring bus power. My little Thunderbolt bus-powered hard drive will not work on optical Thunderbolt.

[Lynn Fuston, *PAR* Technical Editor, comments: The Thunderbolt cable relies on an electrical connector in order to reduce costs and allow it to carry up to 10 W of power to devices. Reportedly, Thunderbolt in the future will carry up to 100 Gbits/s of data, a ten-fold increase over the 10 Gb/s today. Part of the reason that Thunderbolt optical cables are so expensive is that they are 'active' cables, with built-in optical modulator/demodulator, and Corning uses premium, flexible fiber.]

Link: http://www.corning.com/CableSystems/OpticalCablesbyCorning

Available in 10, 30 and 60 meter lengths, Thunderbolt Optical is smaller and lighter than copper cables.

About Russ

A native of Boulder, Colorado, Russ Long moved to Nashville, Tennessee to attend Belmont University in 1986. Since graduating with a BBA degree in 1988, he has remained in Nashville engineering and producing a wide variety of music and film projects.

Russ's credits include the hit singles "Kiss Me" and "There She Goes" by Sixpence None The Richer alongside albums by Wilco, Newsboys, Over the Rhine, Relient K, Dolly Parton, Fernando Ortega and Jim Brickman. His film credits encompass the soundtracks to *The Sapphires, Girl Interrupted, Here On Earth, Jonah: A VeggieTales Movie, How To Lose A Guy In 10 Days, The Second Chance, Hannah Montana: The Movie,* and *She's All That.* Additionally, Russ has diversified to engineer 5.1 DVD mixes for artists such as Allison Moorer, David Crowder and Mercy Me as well as live sound recordings, having multi-tracked live performances for Switchfoot, Chris Tomlin and Guy Clark.

In 1994, Russ opened his Nashville studio—The Carport—which has played a key role in the majority of his projects. He has been a regular contributor to *Pro Audio Review* since 1997; as such, he has authored well over 100 equipment reviews and instructional audio production articles to the benefit of the pro audio industry.

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studio reviews

by Rob Tavaglione
PAR Contributor
rtavaglione@nbmedia.com

PAR readers—welcome to my new bi-monthly column where I review new gear, resuscitate the old, and glorify the pursuit of better audio—all from a "pro-project" studio veteran's perspective. In this installment, I believe I may have found my new favorite studio monitors, the most versatile compressor I've ever used, the very best way to trigger drums and some ideal studio monitor isolators.

The Neumann KH 310 A Active Studio Monitor

Upon review back in 2011, I found Neumann's KH 120 monitors to be effective, well-designed and pricey. Having recently spent months getting to know the KH 310 A three-way, tri-amplified monitor, I must say I feel the same way about them—along with the increased performance expectations that naturally accompany a pair of over-$4,500 near/mid-field studio monitors.

The KH 310 A packs a lot of features into a relatively small footprint (for a three-way speaker). Drivers include a 7.25-inch woofer, a 3.5-inch dome midrange and a 1-inch soft dome tweeter. The enclosure is not ported—it is an acoustic reflex design—and includes both rear and side panel mounting brackets. This, along with the absence of a rear port, makes the speaker a fine choice for broadcast truck control rooms and other tight spaces and Neumann offers a number of mounting brackets and plates.

Initially mounted along my crowded meter bridge, I began utilizing the KH 310 A pair and enjoyed them immediately. Positioned only 3.5 feet apart, I found them quite useful for dialog/vocal editing as I sat very close them. It quickly became clear to me that the KH 310 A has extremely effective crossovers: virtually undetectable, with seamless transitions between all the drivers. Used without a subwoofer, I was pleasantly surprised by the KH 310 A's bass response smoothness. The KH 310 A reproduced lows quite faithfully and as low as they could, with nary a chubby peak or hollow valley.

Upon inviting four audio friends over to aid in evaluation, we removed items from my meter bridge, giving the pair room to breathe, and placed them on Primacoustic Recoil Stabilizers too. With my comparable Blue Sky SAT8 monitors (3-way speakers with the same driver configuration) and video monitor removed, the KH 310 A pair opened up to reveal a sonic nirvana. It is not hype to say that these monitors sound fantastic. The sealed cab design provides tight, punchy, well-damped and accurate bass; midrange frequencies are translated in incredible detail and with uncolored, life-like clarity in vocals, instruments and even percussion; and high frequencies are detailed, crisp without crispiness and bright without harshness.

In listening, we bounced between folk, pop, EDM and nu-metal; the KH 310 A pair delivered consistently in each and every genre. Even as I connected my sub to the

The KH 310 A's output level is 113 dB short term (99 dB long term, average) via three class A/B power amps with 150 W to the woofer, 70 W to the midrange, and 70 W to the tweeter.

"The Audix D6 is in a class by itself!"

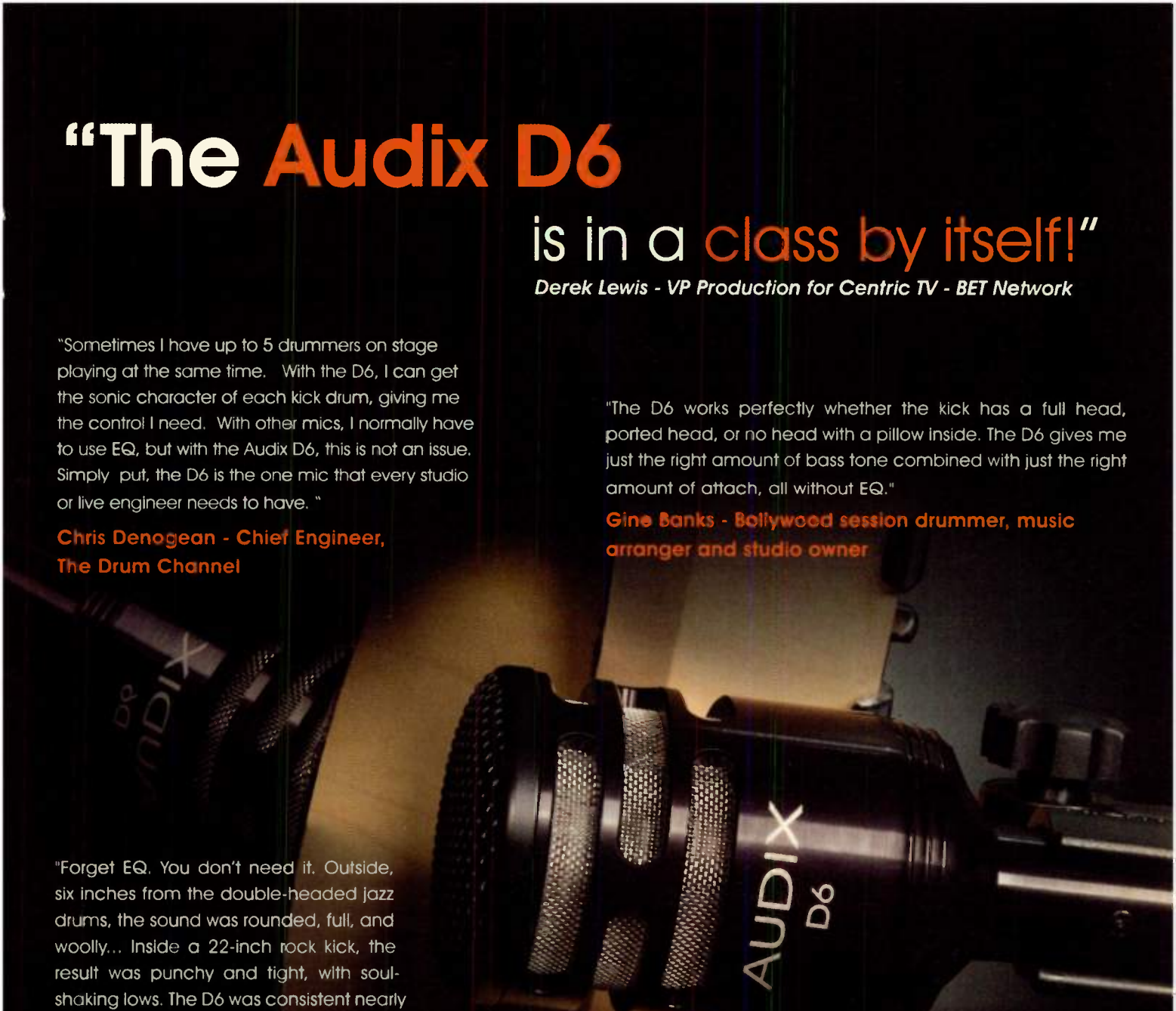
Derek Lewis - VP Production for Centric TV - BET Network

"Sometimes I have up to 5 drummers on stage playing at the same time. With the D6, I can get the sonic character of each kick drum, giving me the control I need. With other mics, I normally have to use EQ, but with the Audix D6, this is not an issue. Simply put, the D6 is the one mic that every studio or live engineer needs to have. "

Chris Denogean - Chief Engineer, The Drum Channel

"The D6 works perfectly whether the kick has a full head, ported head, or no head with a pillow inside. The D6 gives me just the right amount of bass tone combined with just the right amount of attach, all without EQ."

Gine Banks - Bollywood session drummer, music arranger and studio owner



"Forget EQ. You don't need it. Outside, six inches from the double-headed jazz drums, the sound was rounded, full, and woolly... Inside a 22-inch rock kick, the result was punchy and tight, with soul-shaking lows. The D6 was consistent nearly anywhere within the kick, with a solid, no-hassle sound....On stage or in session, the D6 rocks – literally!"

George Petersen - Editor, Front of House Magazine

"With the D6 and the Randall May internal miking system, my kick drum sounds the way it should sound, with no weird dips or spikes. It sounds just right to me!"

Steve "The Mad Drummer" Moore

"The best kick drum mic I've ever used. Replaced my kick drum mic I'd been using for 15 years!"."

Paul Rogers - Front of House, George Strait

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KH 310 A pair, they exceeded my expectations. They actually "melded" with my powered Blue Sky sub very nicely, with increased extension, if at the expense of accuracy.

Specs & Operation

The controls on the KH 310 A include three bands of EQ control (stepped low cut, low-mid cut and high-end boost or cut); an input sensitivity control; four output levels; and a display brightness control for the illuminated Neumann logo (this LED also flashes red for protection indication and lights solid red for the over-temp attenuated output condition).

The KH 310 A can reach output levels of 113 dB short term (99 dB long term, average) via three class A/B power amps with 150 W to the woofer, 70 W to the midrange, and 70 W to the tweeter. Crossover points are at 650 Hz and 2 kHz, each fourth order with a steep 24 dB /octave. Thermo limiters are present for all three drivers along with woofer soft clip and excursion limiter along with an infrasonic 15 Hz HPF.

Short of monitors I'd normally only find in a world-class mastering room, this KH 310 A pair is the sweetest I've heard to date. I can say that I absolutely love them. One of my colleagues said they are slightly forward with high-mids. He may be right, though if he is, it's the only criticism I can imagine—other than the hefty $4,500/pair price.

Link: http://www.neumann-kh-line.com/neumann-kh/home_en.nsf/root/prof-monitoring_studio-monitors_nearfield-monitors_KH310A

The P3S might be the single most versatile compressor our reviewer has ever used (and it doesn't even have a wet/dry blend control).

Foote Control Systems P3S Bus Compressor

Most compressors seem to have a "sound," and except for a few variables, I chose one for its inherent personality. Nowadays, outboard comps come equipped with multiple modes, exhibit numerous personalities and offer wildly varying tones. Foote Control Systems' P3S is a perfect example of this growing trend in premium hardware flexibility.

The VCA-based PS3 bus compressor has an abundance of features, although the unit actually has more versatility than these controls indicate; many of them interact profoundly in specific modes. The P3S takes the cake for extreme versatility: a novice may not be able to understand it, a journeyman will want days with it, and busy pros may be frustrated by needing more time to tweak while clients twiddle their thumbs. Users are likely to attempt a lot of tracking with it, too (not unlike my own Chandler Ltd. Germanium with its personalities and multiple signal paths). However, unlike my Germanium, this seemingly complex P3S is actually easy to use. There are enough legends and few enough controls for an experienced user to dig right in. Comparatively, I liked the P3S almost as much as my beloved Daking FET3 on mix buss; the P3S sounded a little woolier and thicker, while the FET3 was a little more crisp and forward.

Rotary controls include Attack, Release, Threshold, Ratio (from 1:1 to 12:1 with a predominence of low ratios below 2:1) and Gain. Sidechain controls contain a High Pass Filter switch (set at 100 Hz), and the F/B side chain switch. Feed-forward looks at the input, reacting harder and more precisely (somewhat like a SSL 4k), while Feed-back

looks at input and compressor output, with a more vintage sound (somewhat like a Fairchild, with thickness and density) and switchable Cinemag output transformers. There are side-chain inputs on 1/4-inch TRS for even more control.

Time Constant switches include A/R to engage the rotary Attack and Release controls. RMS is for the smoothest and cleanest dynamic control, the "Classic" mode. This mode bypasses the Attack and Release controls, but is interactive with the HPF and F/B controls. NL represents the P3S's growly non-linear capacitor circuit, with very quick attack/release on transients and a slower envelope on long/slow waveforms; this is not unlike a Valley 610 or Distressor on "nuke." Finally, there's a bonus feature: with all three switches out, the P3S becomes a versatile distortion generator, with Ratio controlling the amount of distortion.

And thank goodness for a Bypass switch, as the P3S is capable of so many different sounds, both subtle and outrageous.

In Use

In a nutshell, the P3S can do most anything, and it might be the single most versatile compressor I've ever used (and it doesn't even have a wet/dry blend control). I found it to be a very "stereo unit," ideally applied to two-channel jobs like mixing, mastering and subgroup/parallel/NY-style compression. Don't get me wrong, there's enough versatility here for tracking, too—but let's focus on stereo apps, as the name implies.

The RMS mode offers kind, gentle dynamics control without obtrusion or obvious audibility. For mix "glue," or containment of a subgroup like drums or vox, this mode gets it done invisibly (except for possibly the slightest touch of low-mid plumpness, more subliminal than perceptible).

Personally, I like the HPF on almost any task, as the compression opens up and the kick/bass pop through with firm, unrestrained authority. Depressing the F/B switch sets the compressor to feedback mode, instead of the normal feed-forward mode, and is powerfully useful and purely a matter of taste as it offers differences in density and containment that are a tweaker's delight (I use both equally). The custom steel/nickel Cinemag transformers present yet another useful option, in application, they present a subtle plump/silky texture; I found myself using them most of the time.

The NL (non linear capacitor) mode is just ridiculous! The range of character here spans from grainy through barky and gnarled to grungy. Hit the A/R button and shape the envelope to capture the ideal response; try HPF to allow some clean thump to pass through for body; flip the F/B around and enjoy options beyond verbal description; and kick in the transformer for either extra grit or smoothing (it varies). Disengage all three switches for the "all out mode" for mangling and distorting; the Ratio control becomes "distortion amount" and the party starts. This isn't moderate—it's about getting really dirty without sounding like a nest of bees or digital-overs. Kick in the transformer, feed it forward, HPF if I want to retain some credibility, and grind my drums into gravel, send the vocalists to a nightmarish hell or turn an innocent bass into a beast: the P3S does all this and yet it retains a certain classiness, not unlike the all-tube Thermionic Culture Culture Vulture does.

The P3S is a steal of a premium compressor at only $1,650. The Class A version (reviewed here) is $2,250. The mastering version P3S ME uses some 24-step ELMA Goldpoint pots, with a mastering-oriented range of operational controls and Carnhill transformers for $2,600. Finally the Class-A mastering version sells for $3,150.

Link: http://www.footecontrolsystems.com/footep3s.html

Rob at Work

Rob Records Grey Revell "Retro" with '60s-era Electro-Voice Microphones

Retro-style or highly personal and intimate vocal presentations sometimes call out for a microphone with a pronounced frequency peak. Its uniqueness can pull the listener in and create keen interest. I often use a collection of toy, plastic and even antique "included free with the tape machine mics" for such jobs, but it's my 1960's Electro-Voice models that really excel in such apps.

For Grey Revell's new track "Santa Cruz," he wanted to achieve a dry, stark and breathy track that would reinforce the song's vaguely '70s So-Cal pop feel (augmented by a t-shirt-wrapped snare head, acoustic guitars, piano and sparse arrangement). Upon putting up my Electro-Voice 647 (a 60's "lavalier" sized more like a small-diaphragm condenser with response up to 12 kHz), Grey sang one line and immediately professed his love for the mic. Adding a pop filter, tube preamp, a light UA LA-2A squeeze, careful filtering and the slightest bit of EQ (to mitigate a nasal bump) we got a vocal that Grey is still talking about.

Check out other un-respected models that are equally useful, like the E-V 649A or 649B (a later "lav" one-fourth the size of a 647), Ampex mics (nice little "bullet" dynamics that are funkily colorful) and mics from Radio Shack's precursor Lafayette (utilized on "Santa Cruz" background vocal tracks): these old models are built like tanks, usually have variable impedance and are great for creative sonic mangling.

https://itunes.apple.com/us/artist/grey-revell/id269378094

The big improvement over V.1 in Trigger V.2 is in better overall accuracy in difficult triggering tasks.

Slate Digital Trigger 2 Platinum Software

Whether it's a bane, a crutch, or likely something in between, drum triggering is ubiquitous today and its popularity shows no sign of slowing down. Since reviewing Slate Digital's Trigger back in 2011, I've been relying on it to either augment or replace my drum sounds, so the new update was of great interest to me. Now that I've grown accustomed to Trigger 2 Platinum, I have found it's no major revolution, but indeed an effective jump up in both quality and ease-of-use.

I initially struggled with installation—due to file corruption problems with my now deceased "downloads" computer—but since then I've been enjoying its stability, largely familiar controls and phase-accurate, glitch-free operation. The GUI has been re-designed with an eye-friendly grayish look, larger controls, and the single biggest improvement—I can now single-click drum sounds in the browser to audition them, which is great.

Trigger's sound library has indeed grown and there are some excellent new sounds, no doubt. The bigger improvement, however, is overall improved accuracy of difficult triggering tasks. Overall, it's simply quicker and harder to fool, resulting in far fewer false triggers. The new noise gate is extremely useful, too.

If using Trigger 2 Platinum for realistic drum augmentation, the gate combined with wet/dry blend control and the "bleed-rejection" feature make for truly believable response and consistency. Using the global polarity reverse, single-sound polarity flips, dynamic envelopes, automation of input sensitivity/output levels and careful settings on "re-triggering," users can worm their way out of any hole, replacing problems with solutions.

I highly recommend Trigger 2 Platinum. It's not only an effective artistic solution, but also an economic one. Few audio products can truly "pay for themselves" quite like this software does, now available as low as $129 street.

Link: http://www.slatedigital.com/products/trigger

Star Sound Technologies Sistrum Apprentice Platforms

As anyone who has ever placed monitors on a meter bridge or other work surface will recognize, the audible resonance of coupling with such surfaces is troublesome and detrimental to mixes. I have witnessed improvements of this problem by employing Primacoustic Recoil Stabilizers, so my curiosity was heightened at the chance to try out this "marketed-to-audiophiles" mechanical grounding platform system.

Frankly, audio engineers, including me, tend to be skeptical of many audiophile industry claims, despite the fact that we largely share the same passions. So admittedly, I brought cynicism to the review: the concept of "developing Coulomb Friction and then quickly dissipating this energy away from the transducer" (and also away from rack-mounted gear that may be resonating) via a "high-speed calculated conductive pathway to earth's ground" is beyond my formal education.

Star Sound's sistrum platforms sit on Audio Points—conical brass "feet" designed to transmit vibrations in the platform away from the speaker. The vibrating object itself (the speak-

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Conical brass "feet" are designed to transmit vibrations in the platform away from the speaker.

er) sits on Audio Points, which are firmly attached to the sistrum. I set up this arrangement incorporating both my midfield monitor pair and subwoofer.

Upon first listen, changes in my control room's sound were obvious. Primarily, the bass buildup (within 160 to 250 Hz) from my resonating monitor shelf was largely gone. In fact, bass response in general was tighter and quicker, but overall bass volume was reduced. Imaging was also improved with more accuracy and stability, while the soundstage gained increased depth and width.

At this point, I was advised by Star Sound that the lost bass response would return within a few days, as the objects all settle into place and achieve better coupling. Yeah, right? But here's the kicker, my skeptical sound sculptors: the bass did indeed return. Each day I could hear slight improvements, until I found myself with the permanent improvement of punchy, accurate, trustworthy bass response.

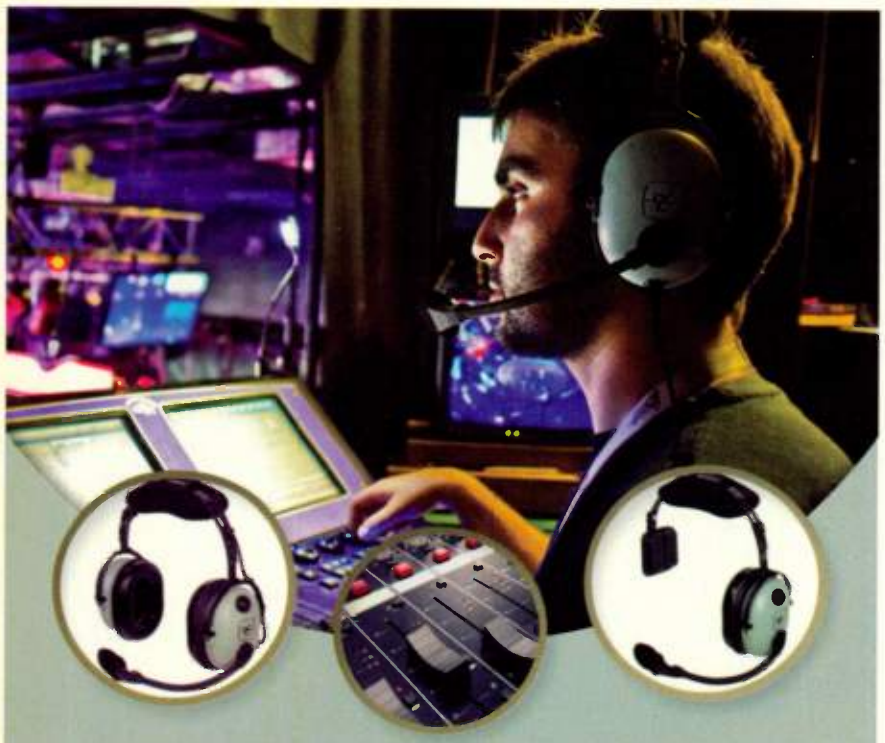
Star Sound makes a number of products that utilize this concept of mechanical grounding: from lower-priced Audio Points, to mid-priced Apprentice Sistrums, to pricier Sistrums—all the way up to Energy Rooms (Mechanically Grounded Structural Environments). I've visited an Energy Room and was indeed quite impressed with the purity of sound transmission.

While physics isn't my forte and audiophile claims are easily dismissed by veteran gear heads, may I simply suggest that Star Sound's 100% satisfaction guarantee is the best way to second-guess my findings. And you know you're curious.

Link: http://www.audiopoints.com/SistrumApprentice.php

About Rob

Rob Tavaglione has owned and operated Catalyst Recording in Charlotte, North Carolina since 1995. An early adopter of the project studio concept, Rob has recorded nearly 600 music projects since Catalyst's inception. Rob has also dabbled in nearly all forms of pro audio work including mixing live and taped TV broadcasts (winning two regional Emmy Awards); mixing concert and club sound (including arenas, stadiums, dives and corporate events); mixing and music supervising for indie films; mixing webinars and webcasts; mixing live sports (NBA, AHL hockey); and composing and scoring for film/TV and various artists. Keep up with what's happening at Catalyst via http://www.catalystrecording.com.



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studio reviews

Within the span of one week, I recently worked on six different systems running Pro Tools 8, 9, 10 and/or 11. It's simply the reality of the music production world we're currently living in; some choose to upgrade sooner than others, and some are simply afraid to change. Aside of all the software, updating a full Pro Tools system now often requires the expense of new hardware, which certainly has slowed down the process for some users.

by Rich Tozzoli
PAR Software Editor
rtozzoli@nbmedia.com

Avid Pro Tools 11 and 10

I'm currently running three different Pro Tools rigs: HDX for my main mixing system with PT 10 and 11; a laptop UA Apollo Twin travel rig running PT 10 and 11; and an iMac "B system" with PT 10 via rack-mount UA Apollo. As new AAX plug-ins become available, I integrate them into my system and continue the crossover to PT 11.

It's A Process

My transition to 11 has had to be a patient one, since I need a lot of plug-ins for my daily work. As the ones I use the most crossover to AAX—including plug-ins from Altiverb, McDSP, Sonnox, Waves, Sound Toys, and Eventide—I install them and run test Pro Tools 11 sessions. I also have to update all of my composition libraries, such as those from East-West, Native Instruments, Spectrasonics, Ilio, Vienna Instruments, and so on. I also updated the latest Universal Audio UAD software to Version 7.5.0, which is working fine with Pro Tools 11.

Often, updating DAW systems involves updating your operating system. In my case, I had to move up to OS 10.9.1. While I don't generally update to the latest OSX version (due to a long history of post-upgrade incompatibility with many of my work tools), 10.9.1 seems to work comfortably with both Pro Tools 10 and Pro Tools 11.

I'm currently running Pro Tools 10.3.8 and Pro Tools 11.0.2. Both systems are running flawlessly with each other—knock on wood.

My transition to 11 has had to be a patient one, since I need a lot of plug-ins for my daily work.

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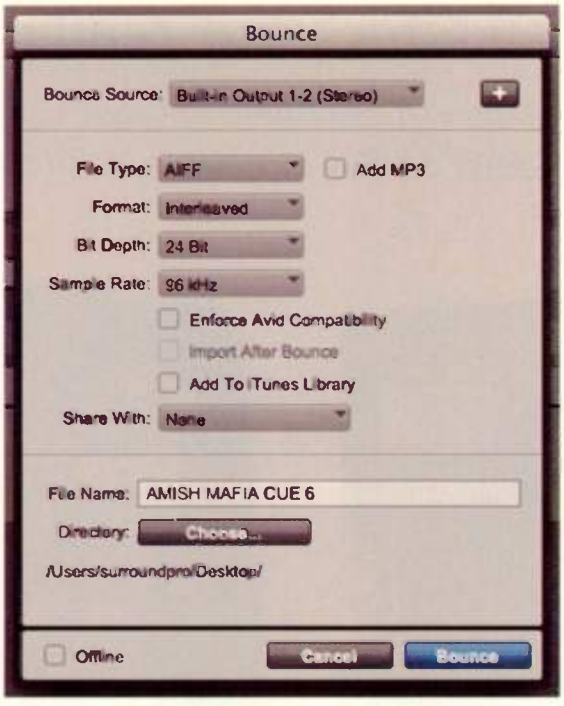
No Mas!

No, I wasn't kidding that I worked on six different systems in one week. Drummers Ray Levier and Vincent Miraglia, with whom I do TV composing, both have iMac/Apollo rigs. Ray runs Pro Tools 10 and Vincent runs both Pro Tools 10 and 11; we literally switch back and forth depending on what plug-ins I need. In between that, flamenco guitarist Hernan Romero was running Pro Tools 9, and singer/songwriter Scott E. Moore was running Pro Tools 8. Both of them plan to upgrade to Pro Tools 11 in the next few weeks and they will be both buying new hardware as well.

But when Romero cut tracks at Ray Levier's studio on Pro Tools 10, I forgot to save them to a format he could open at home. I had to go back to the master session, and go to File>Save Copy In, then save the Session Format to Pro Tools 7>9 Session. We were then able to open the session in Pro Tools 9 for overdubs, which then came back to me to be mixed in Pro Tools 11. Crazy, I know, but that's what you need to do to get the job done.

In addition, I cut drum tracks at drummer Omar Hakim's studio on his Pro Tools 11 setup, and then recorded another session upstate in Rhinebeck, New York at Clubhouse Studios. Owner Paul Antonell had also just switched over to Pro Tools 11. Both sessions went flawlessly—and, I have to say, Pro Tools 11 is very stable.



The Bounce GUI from my recent PT 11 session for the Discovery Channel's *Amish Mafia*.

Almost There

All of the tracks I do generally come home to my HDX system for mixing. Most of the work is still in Pro Tools 10, but I have begun to mix and compose more in Pro Tools 11. For me, high-speed offline bouncing is a monumental timesaver. If you think about all the thousands of hours we've sat there for Pro Tools bounces—well, actually, never mind. Let's *not* think about it. But my point is, I can finally do high-speed offline bounces that sound great. Also, I can run a lot of virtual instrument plug-ins and the system doesn't bark.

I'm almost there with Pro Tools 11. Really. I look forward to having everything installed, working perfectly and comfortably, and moving on past Pro Tools 10. I also look forward to everyone *around* me also using Pro Tools 11, no matter what form of hardware they choose to run it on.

Now, please: let's not even *think* about Pro Tools 12 for a looooong time.

Link: http://www.avid.com/US/products/pro-tools-software/

Waves Scheps 73 Three-Band EQ Plug-in

Based on the Neve 1073 console EQ and preamp module, the mono/stereo Waves Scheps 73 (Native, $99 street)—developed with engineer Andrew Scheps—adds a few new twists to a classic piece of gear. Waves set out to model and capture the essence of the hardware along with the character of its great harmonic distortion and unique thickness. The 1073 has long been one of my favorite hardware EQs, so I was curious to hear what the software would sound like in use.

Like the original, it's a three band EQ with the usual fixed high 12kHz shelf, midband with seven cutoff points, low shelf with four cutoff points and a high pass filter with four cutoff points. One of its unique features is the inclusion of a 10kHz bell in the midband, found in the original 1073 schematics but only working on the 1078 channel strip.

Also available is Pre-Amp control, which increases the harmonic distortion; Drive on/off, which activates the Pre-Amp; Phase reversal; and VU metering with Meter I/O switch. On the Stereo module, there's a Monitor knob for Left/Mono/Stereo and Right selection; an EQ mode for Stereo, Duo and M/S; plus stereo Input and Output faders with Link I/O.

In Use

I've always liked the way the 1073 works on electric guitars in the 4.8kHz range. The grit, growl and edge that it brings are undeniable. So the first thing I did is call it up on a session that was recently tracked through a vintage Neve console featuring 1073 channel strips at Clubhouse Studios. These were hard and heavy detuned electrics with a variety of mics including a Sennheiser MD 421, Shure SM7, AKG C 414 and an AEA N22 Nuvo. On the 421, the Scheps 73 ripped into the mids. I like being able to click on the MID button to do a quick A/B of the sound, which allows for easy before-and-after comparisons. Note that you can also click on the master EQ button to turn it on and off as well.

I also used the '73 on the kick, which was

The Scheps 73 has all the goodness of the original, but with the added Preamp grit and ability to EQ in M/S, it takes it all to another level.

tracked with a Beta 52. Dialing in the 60 Hz low band, I added a few dB of thick thump while cutting some of the 360 Hz band in the mids. Again, it's thick and creamy, just like the real deal. I was able to push up a bit of Output, too (users have up to 12 dB of gain).

Next, I called up that 'new' 10 kHz band and put it on the drum overheads, which were Neumann U87s. It added a nice touch of sparkle to a comparatively dark mic pair, and I also used the HPF to reduce some 160 Hz.

Next I used the Scheps 73 on bass DI and kicked in the Drive a bit, which pushed the Preamp up a bit. I really liked the harmonic distortion it added—not grainy, but pleasing to the ear. This can be pushed to extreme, so a few decibels will do on this. Adding the preamp drive also pushed up some extra low end, so I carved out some 360 Hz and HPF'ed at 80 Hz. I also reduced the Output gain to get the balance correct.

Finally, I placed the '73 on my stereo mix bus. Loading in a preset called Mix Widen and Focus, it did exactly that. It's very useful to be able to EQ the mid and sides of your mix differently, and adding a touch of 12 kHz to the outside was very nice. I also put some 60 Hz on the middle of the mix and the kick and bass jumped out a bit—again, in a pleasing way. This is quite a tool for rock mixing.

There's a reason the 1073 is classic, and I feel Waves did a great job modeling this EQ. It has all the goodness of the original, but with the added Preamp grit and ability to EQ in M/S, it takes it all to another level.

Having said that, if I had both hardware and software, I probably would still use the hardware for straight EQ work. However, this plug-in immediately found its way into my workflow—it's that good. Plus, I can use lots of them!

Link: http://www.waves.com/plugins/scheps-73

About Rich

Rich Tozzoli is a Grammy-nominated, Surround Music Award winning producer, mixer, composer and sound designer. With a personal studio located in New Jersey, Rich has worked with a wide variety of musical clients including Ace Frehley, Al DiMeola, Average White Band, Billy Squier, Blue Oyster Cult, David Bowie, Carly Simon, Daryl Hall/Hall & Oates, Emerson, Lake & Palmer, Joni Mitchell, the Montreux Jazz Festival and more. A guitarist by trade, Rich has also found much success in composing original music for clients such as Oprah Winfrey and Deepak Chopra (the *21-Day Meditation Challenge*) and hit television shows such as *Duck Dynasty*, *American Guns*, and *Pawn Stars*, among others. Rich's first solo album, *Rhythm Up*, is available on iTunes: https://itunes.apple.com/us/album/rhythm-up/id350726679

This plug-in immediately found its way into my workflow—it's that good.

by Lynn Fuston
PAR Technical Editor
lfuston@nbmedia.com

The Mercury Recording Equipment Co. M72s Studio Microphone Amplifier

I've lost count of how many preamps I've heard over the years, but it's dozens-times two. In all my listening, there is a very short list of preamps that I consider indispensable: ones that would top my list if I had to pick just a handful to record everything. The Mercury M72s is one that would be on my list.

About the M72

The Mercury Recording Equipment Co. M72s Studio Microphone Amplifier is a recreation of the classic Telefunken/Siemens V72 amplifier module that was designed by North West German Radio (NWDR) and manufactured in great number (25,000+) from 1952 until the mid 1960s when it was replaced by the transistorized V72t. The V72 is a self-contained tube amplifier with gain fixed at 34 dB, used as a mic amplifier and buffering amp. The variant V72s was developed by Siemens and offered fixed gain of 40 dB and lower input impedance. One claim to fame of the V72s is that it was the preamp in the famed REDD.37 console that was used by the Beatles at Abbey Road Studios on their recordings prior to 1964.

Here's a brief rundown of the Mercury M72s. It's a hand-wired, transformer-balanced tube preamp, with settings from 28 to 58 dB max gain, with "FDI" (Mercury's FET Direct Input), polarity reverse, phantom power, two-position pad (-16 and -28 dB). The steel case is substantial and very well built. Available in both stereo and mono versions, this piece is an investment you'll likely keep for a long time.

So how did the Mercury M72 come into existence? David Marquette, founder/owner of Marquette Audio Labs and Mercury Recording Equipment Co., began racking and refurbishing V72 modules for studios back in 1994. As the years passed and demand increased, the number of vintage modules and their condition declined, forcing him to be more creative to satisfy demand. In 1999, David started Mercury Recording Equipment Co. to start manufacturing a recreation of the V72s, and several other vintage classics, with new parts that would match the sound of the originals. According to Marquette, "I had all the mechanical parts down, the cases and power supplies, transformers and tubes. It was just a matter of assembling the parts." Clearly, the advantages of using parts that are not 30 to 60 years old can be enormous, in terms of reliability. Matching parts and specs can be relatively easy. How about matching the "sound" of a vintage unit? Is that even possible using modern components?

Listening

Although I had obviously heard the V72 sound on many classic recordings, I was unfamiliar with its lineage when I first tried out the Mercury M72s in 2004. I was amazed. There was a familiar sonic quality to it that was immediately desirable. I'm not sure how to describe it, apart from it being full and present, very musical. It was forward without being hard, and full without being thick. It was astounding on vocals especially. I com-

Lynn at Work

Lynn on "White Christmas" by Steve Pixler:

For Steve's vocal—a very smooth baritone reminiscent of Bing Crosby or Johnny Mathis—I reached first for classic vocal mics of that era: a vintage RCA 44, Neumann U47 and also my Bock 251 that "wins" on lots of vocalists. I ended up selecting a Brauner VM1-KHE, which captured the resonance and warmth of his voice, yet with clarity. The preamp I chose was the tube LaChapell 583e into a Tube-Tech CL1B.

tinyurl.com/om4wozw

I compared it to many of my other favorite preamps and frequently I liked it better. It was one of those voilà moments (and they don't happen often for me).

pared it to many of my other favorite preamps and frequently I liked it better. It was one of those voilà moments (and they don't happen often for me).

At the 2006 AES Convention in San Francisco, Mercury sponsored a listening party with all the Soundelux (now Bock Audio) mics and all the Mercury preamps. I was engineering the session. After extensive listening with a room full of engineers, my magic combo was the Soundelux 251 into the Mercury M72s. (Thankfully, Joe Chiccarelli hosted the event the following night and came to exactly the same conclusion. Whew!)

How Does It Stack Up?

So the burning question: "If the M72s sounds great, wouldn't the originals sound better?" In my recent evaluation, I acquired a pair of original V72s from Blackbird Rentals here in Nashville and put them right beside the M72s. Over two days of recording, I tried switching back and forth between the two. With any vintage gear, the condition of the vintage unit is always a variable. Time may have taken a toll on capacitors or transformers, and the power supply is critical as well.

In my listening, especially on a big vocal group (12 singers) with two of the mics going through vintage V72s and two through the M72s, I was unable to discern a difference. I had to look at the labels to remind myself which preamps were on which mics. The distortion characteristics when pushed hard, the noise floor, the sonic quality: any differences between the two were indistinguishable to my ear. Even though there is a slight difference in the noise floor of the two, for my purpose (with gain at about 35 dB) it was a non-issue. For me, the M72s is a winner.

About Lynn

A 35-year veteran of the Nashville music scene, engineer/producer Lynn Fuston is the owner of 3D Audio, a music mixing and mastering company. His engineering credits include albums and singles for artists such as Amy Grant, Michael W. Smith, Andy Griffith, DC Talk, Andy Williams, Cynthia Clawson, Kathy Troccoli, the Gaither Vocal Band and hundreds more. He built three studios by the age of 25 and has since written articles for magazines including *EQ*, *Pro Sound News*, *Pro Audio Review* and *Audio Media*. In addition to tracking, mixing and lecturing, he is the Technical Editor for *Pro Audio Review*, moderates the longest-running internet pro audio forum (since 1998) and another private recording forum on Facebook (3D/FB) and teaches recording workshops when he's not busy with his two main hobbies: gardening and photography.

Prices: $1,874 and $3,294 (mono and stereo, respectively)
Link: http://www.mercuryrecordingequipment.com/products/m72s/

Going 500 With USB
plus Great & Affordable Euro LDCs

by Strother Bullins

Strother Bullins is an active gigging musician, self-recordist and the Editor of *Pro Audio Review*.

While Thunderbolt has caught fire quickly, encouraging many forward-thinking recordists to adopt higher bit-rate I/O, USB remains the ubiquitous connection point for the modern mobile DAW. With that in mind, I focus this month's column on the coolest new USB-oriented product I've seen around: Aphex's USB 500 Rack.

The USB 500 Rack is a flexible 500 Series chassis featuring USB connectivity. It's American-made, $749 street, can easily fit under my legs in the car (not recommended in most states) and effectively joins the most diverse realm of today's pro audio devices to the most common: any one of *hundreds* of 500 Series modules direct to any DAW, even one as basic as Garageband on iPad (which is "unofficially supported," confirms Aphex—*Ed.*).

Also, low-cost JZ and Sennheiser LDCs reaffirm that there's never been a better time to buy a European-made microphone. Read on for my experience with the Sennheiser MK 4 and JZ Microphones J1 large diaphragm condensers.

The Aphex USB 500 Rack

Aphex was the first third party company to support API's 500 Series format in the early '80s with two modules—the EQF-2 equalizer and CX-1 compressor/gate—and two chassis. After being out of the category for many years, Aphex "saw the opportunity for a solution" within the 500 Series market and is now shipping the USB 500 Rack. It features four 500 Series module slots with XLR I/O per channel and flexible input source switching; TRS stereo outputs; S/PDIF, MIDI, BNC/word clock in and out; dual headphone amps and outputs; and the USB 2.0 port. As such, it performs as any other 500 Series-compatible rack would, plus offers direct I/O to Mac, PC or (unofficially) iOS DAWs via USB with some very compelling routing options, too. In this way, the USB 500 Rack serves as the affordable and straightforward way for modern ITB (in-the-box) recordists to begin exploring 500 Series modules.

Much of the flexibility of the USB 500 Rack lies in its input source toggles, one per slot (USB/Chain/Analog). Each module will accept XLR or USB input, while slots 2 and 4 will also accept the previous slot's output, allowing users to build a custom 500 Series channel strip, a two-channel pre/comp DAW front end, a four-channel/swappable module outboard analog processor via USB "tape returns," and so on. To visualize the unit and its features, watch this video: http://www.prosoundnetwork.com/aphexusb500rackvideo.

It is so very simple to use. I was glad to have received the USB 500 Rack preloaded by Aphex with two clean and pristine J Pre 500 preamplifiers and two subtle workhorse Comp 500 compressor units. With a singer/songwriter to record the day it arrived, I traded out the Comp 500s for more preamps (dual Lipinski L-609 units) and hit the ground running. For stereo room, vocal and acoustic guitar live tracking, respectively, I employed an Audio-Technica BP4025 stereo condenser via J Pre pair, JZ Microphone's new J1 large-diaphragm cardioid condenser via L-609 #1, and an AKG C451 via L-609 #2, straight to Apple Logic Pro X via USB. Hear what I recorded that evening—Eddie Carter's "You Turn Me On" with only stock Logic processing—here: soundcloud.com/pro-audio-review-magazine.

Over the past year, I've used and/or reviewed at least a half-dozen USB interfaces, each widely varying in I/O, routing

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features and overall quality. Of those, the USB 500 Rack is what I would personally buy today. Empty, it still serves as a monitoring device and digital audio interface; loaded, it can become a multi-thousand dollar front-end. It's one box that connects the freedoms of 500 Series modules with the practical nature of USB-based DAW productions.

The Aphex Project Channel

Meanwhile, I had an Aphex Project Channel ($499 street) in for review, too. Equipped with a newly-designed solid-state Class A preamp, optical compressor with "one knob" ratio adjustment, Aphex's proprietary Big Bottom and Aural Exciter spectral enhancement processing, and comprehensive I/O (XLR I/O, front panel instrument input, switchable -10 dBV/ +4 dBU TRS output, and up to 96 kHz S/PDIF digital output), it easily paired with the USB 500 Rack via S/PDIF, allowing for an additional non-500 Series input. The Project Channel does "clean" very well, but excels in aggressive, sculpted processing; it's ideal for scrappy compressing while tracking, too.

In my use, the Project Channel worked notably well for VO, pop/rock vocals, and especially well as a DI channel for guitar and bass tracking. While it's not a "high end" channel, it's a solid and intuitive workhorse performer priced to be a great option for self-recording musicians as well as budget-conscious live applications (especially houses-of-worship and mid-level music venues and theaters).

Super Affordable European LDCs

(L to R): Sennheiser MK 4 and JZ Microphones J1 LDCs

I've been fortunate to use Sennheiser's MK4 cardioid large-diaphragm condenser (LDC) microphone for nearly a year now. Made in Germany and packed full of cross-pollenated Sennheiser innovations, the price is almost too low at $299 street.

I also recently received JZ Microphones' aforementioned new low-cost cardioid LDC, the J1 ($399 street). Hand-built in Latvia, there's never been a more affordable microphone from JZ, whose top models made alongside the J1 come in slightly under $4,000 street.

Each microphone is without a pad or HPF; these are simply straightforward LDCs.

Sennheiser MK 4 Cardioid LDC

The MK 4 comes in at a deceptively low price and is actively touted at US retail as a "project studio" microphone, but it's actually much more than that. Do not doubt how much Sennheiser/Neumann innovation is built into the MK 4; different packaging, same German factory as the other Sennheisers. Actually, its one-inch capsule is based upon the Sennheiser e 965's, a super quality $699 live vocal handheld condenser.

It's very well made, and feels and performs substantially. For what it's worth, its look perfectly matches a Mac Book, too. The MZQ 4 microphone clamp is made from a really resilient plastic; it gives a bit when flexed yet feels very sturdy.

The MK 4 is an open sounding mic, and overall rather frequency-flat until you hit the upper mids. Specs show a small (1 to 2 dB) bump at 1 to 2 kHz, then a rising plateau (2 to 4 dB) from 4 to 10 kHz, where it steadily drops off to 6 dB down at 20 kHz. I've personally recorded mainly close vocals with the MK 4, but also saxophone, acoustic guitar, distant and close amp miking, outside kick drum and drum room. It's a great solo source microphone; it flatters sounds with a "sparkle" of sorts, not with brightness. As such, it seems to help voices and other sources to sit well in the mix.

Basically, if you have no more than a $300 budget, look no further than the MK 4 (and if you have a $500 budget, listen to the MK 4 before you buy).

JZ Microphones J1 Cardioid LDC

Juris Zarins, the "JZ" in Riga, Latvia's JZ Microphones, has now been delivering his namesake's strikingly designed and hand-

(continued on page 50)

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The Art of Monitoring

The art of monitoring involves two types of reflection: the good and the bad. When you're trying to critically assess a mix you want to reflect on every choice, but you don't want a substandard listening position to be reflected on any choice.

The science of monitoring avoids this through custom-tuned environments full of bass traps, acoustic panels, diffusors and meticulously angled installations; however, not everyone has that luxury and, if you're an on-the-go production type, consistency could be even more of a challenge. Advancements in headphones and in-ear monitors are helping compensate, allowing for more compact, coherent playback for any budget and situation. What follows are a few recently tested components that balance the need for accuracy and at least semi-portability.

by Tony Ware

Tony Ware is a DC-based DJ, professional audio journalist, and regular contributor to *Pro Audio Review*.

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Sennheiser HD6 MIX/HD8 DJ Headphones

Aiming to further the legacy of the Sennheiser HD25-1 II—praised for being rugged, highly attenuating ambient noise and delivering generous bass response in a lightweight body—Sennheiser's new HD6 ($280) and HD8 ($390) closed-back headphones are intended for active lifestyles and equally energetic genres (such as pop, hip-hop and EDM). And, whether used by a DJ/producer mixing tracks or a drummer/bassist live tracking, I can see a place for these in the studio or on the stage.

Both circumaural, both models offer very good isolation, though comfort is slightly better on the HD8, which features metal-reinforced articulated earcups that really let you dial in head placement. As befits a DJ headphone, the HD8 features elevated, while still impressively controlled, subbass and an enriched forward midrange with extended but sculpted treble, presenting punch without fatigue. Their shared spec is frequency response of 8 Hz to 30 kHz), with the differences being impedance (150 ohms for HD6, 95 ohms for HD8) and SPL (112 dB for HD6 and 115 dB for HD8). The contrast—lively rumble versus flatter response—assures each model leans toward a different application and environment, but there is overlap.

In the live room either model could assure musicians follow the rhythm with minimal leakage, and the HD8 especially feels like it could handle the abuse of being pulled on and off or dropped repeatedly. Both offer precision acoustics for track prep in transit; the HD6 lets you dial in EQ and the HD8 makes sure you don't overload that 800 Hz to 2 kHz region. There's a case to be made for how the HD6 grounds the mix, though I'm slightly more taken by the feeling of the HD8 both physically and aurally. I also like Neil Young far more than Yngwie Malmsteen, so your mileage may vary.

Audiofly AF160 Triple-driver In-ear Monitors

An Australian in-ear monitor designer/builder launched in 2011, Audiofly made an immediate impact with custom-voiced dynamic drivers and a hybrid configuration that paired one dynamic with a balanced armature driver. With the AF160 ($450) the company introduces its first balanced armature-only in-ear, which appears to be aimed at critical listening and live-performance purposes. Neither as syrupy as several of the universal in-ear models near the same price range (such as the quad-driver Westone 4R), nor as dry and unforgiving as the single-driver Etymotic Research ER-4S (a benchmark for in-ear accuracy), the AF160 strikes a balance that's not overly analytical but still more firmly planted in the clarity camp.

At 18 ohms impedance, the AF160 is far easier to drive than the 100 ohm ER-4S, and

can play at comfortable and even uncomfortable volumes (110 dB at 1 kHz sensitivity) from a laptop, digital audio player or beltpack without need for additional amplification. The three-way crossover arrangement dedicates one driver each to lows, mids and highs, though the mids and highs come across as more present without sacrificing too much energy at the low end. The 18 Hz to 22 kHz response confirms that, while everything feels in proportion, there's a tinge more extension up top, which makes it easier to follow the lead line if performing or mixing with the AF160.

The AF160 offers good ergonomics, standard isolation (dependent on proper tip selection/insertion) and laudable instrument separation in a crowded sector. (My review pair did suffer from a loose MMCX socket on the right Audioflex SL cable, making it difficult to seat the monitor without severing the connection. Hopefully this is a solitary occurrence.) Remember, though, with so many in-ear monitors in the market there are more rhythm-oriented options, if that's the tuning you need, so shop around for a more reinforced bass response (for example, Audiofly's own quad-driver AF180).

Audeze LCD-X Planar Magnetic Headphone

I have an intimate, ongoing relationship with Audeze headphones. I first encountered the LCD-2 in 2011, when a DJ/producer friend introduced it to me as his constant companion while mastering drum 'n' bass and dubstep tracks. Since then I have tried on dozens of headphones, but it's felt a little like cheating and I've always come back because my time with the LCD-2 has been honest without edginess.

I quickly found the flat membrane of these open-back planar magnetic headphones imparted a detailed, dynamic immediacy. In the years since, Audeze—an independent, proudly domestic headphone designer/manufacturer based in California—released the LCD-3 before introducing the LCD-X ($1,699), a neutral-voiced beauty benefitting from a thinner, lighter transducer and patent-pending Fazor elements that "help guide and manage the flow of sound" to improve phase response, frequency extension, smooth frequency response and imaging.

Whereas my LCD-2 is all about energy, the LCD-X ramps up the realism. Compared to previous generations the LCD-X has less "body" yet more linear impact. This is a combination of both heightened efficiency (22 ohms impedance, 96 dB/1 mW) and the fact that the less concentrated low end allows for more forward voicing and nimble definition. Clad in black anodized aluminum rings and black lambskin cushions, the LCD-X has the appearance of a studio component when compared to its wood-trimmed big brother, the $1,945 LCD-3. It's sleek industrial design versus audiophile luxury, and it's appropriate polish and precision to match the LCD-X's airy attack, smooth decays and reference-level soundstage.

Without feeling unbalanced, the LCD-X has a bit more warmth than a Sennheiser HD800, for example, but in a way that slight upper bass/lower midrange lift compensates for the lack of in-room response provided by a pair of full-sized monitors. On the flip side, the LCD-X reinforces spatial awareness for those crucial mix decisions. Accompanied by a custom military-grade waterproof road case, and able to be driven from mobile devices in a pinch, the LCD-X can bring high-volume, low-profile, top-quality monitoring to any quiet room.

Antelope Zodiac Platinum DSD DAC

With the introduction of the Antelope Zodiac Platinum DSD DAC ($5,500), Antelope has introduced a converter/headphone amp/preamp that bridges and benefits the home, pro and well-heeled project studio worlds, and it works so well I forgot all about it in the best way.

The Platinum DSD256 DAC is comprehensive, intuitive and transparent, able to route an abundance of digital and analog gain-matched connections within its small footprint (AES/EDU, S/PDIF and TOSLINK PCM) and engage optional DSD256 upsampling. The USB architecture is bespoke and backed natively by AFC (Acoustically Focused Clocking) technology with 64-bit DSP, meaning there's ultra-low jitter and an oven-controlled crystal oscillator applied to the sound even if you don't add the optional $6,000 10 MHz Rubidium atomic reference generator.

The Platinum DSD comes with dual variable impedance headphone outputs, fed by dual-stage drivers.

The analog volume control is calibrated in 1 dB steps. Overall, the Platinum DSD offers an unobtrusive, future-proofed front end.

Lewitt LCT 940 Reference Class Tube/FET Microphone

Just when you thought that no one could come up with anything truly different in the large-diaphragm condenser microphone market, Austrian microphone company Lewitt did. Their LCT 940 is unique: not only is it a tube mic and a FET mic combined, but the power supply also acts as remote control to alter sonic characteristics and to mix the tube and FET stages.

by Andrew Graeme
for *Audio Media*

Andrew Graeme is a British audio engineer and regular contributor to *Audio Media*, *Pro Audio Review*'s sister publication based in London.

My first impression of the LCT 940 is its high quality. The mic is heavy and is supplied with a superb cradle that easily supports its 1.45 lb. weight. Together they weigh-in at 2.4 lbs., so a sturdy mic stand is recommended.

The power supply/control box is beautifully engineered, revealing what the knobs and buttons do once it has been switched on. Tiny LEDs light up the hidden functions—attenuation, high-pass filters, polarity patterns, and the mix-knob for tube and FET stages. The whole thing comes in an attractive black case, with handbook, a 26-foot long 11-pin XLR connector, and power cable.

On the LCT 940 is a little Perspex window that shows the tube inside the mic, glowing when switched on; as the glow is a sort of greenish-yellow, it reveals that it is actually an LED behind the tube—a pleasant, if perhaps gimmicky effect that may inspire vocalists. My first mistake was to assume that the logo side was the front, so when I placed the mic in front of the first vocalist, it didn't take me long to figure it out.

The left knob on the control box mixes signals from the FET and tube stages while a red dot illuminates next to the chosen setting. Polar patterns are set with the right-hand control—omni, sub-cardioid, cardioid, super-cardioid, and figure-of-eight, with stages in between.

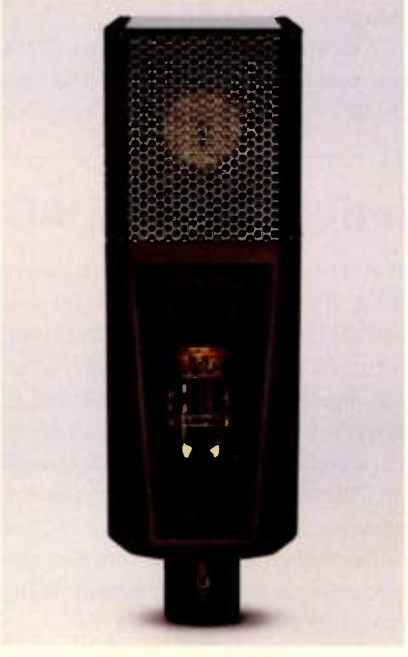
In the span of a week, I used the LCT 940 on a variety of sources including drum overheads, room mic, various guitars and vocalists. After that I tested the mic while comparing it to the usual suspects: Neumann U 87, M 149 and TLM 103 on vocals and an AKG C 414 BTL II pair on overheads.

Lewitt documentation notes a comparably flat frequency response of 20 Hz to 20 kHz, but it goes well beyond both figures in both tube and FET mode: -10 dB at 25 kHz with a variable bump from 3 to 5 dB from 10 to 15 kHz, depending on which pattern is chosen. This is a function of the capsule and is not affected by choosing tube or FET.

Self-noise is low at 8 dB as FET and 12 dB as a tube mic. Sensitivity is -33 dBV in cardioid, typical in my experience for a LDC. The polar patterns really lived up to the measurements given in the handbook and differences in directionality between the frequencies only begin to show above 3kHz.

In Use

In tube mode, the LCT 940 came across every bit as open and clear as the best tube models I've used, making it ideal for applications ranging from room mic to intimate, close-up vocals. In pure solid-state mode, it is notably precise—very good for such sensitive beasts with complex overtones like piano and acoustic guitar.



We tried a little bit of male VO and the proximity effect was warm and smooth. It popped significantly less than other mics I normally use and, with a shield, it didn't pop at all, with no filters engaged. The LCT 940's cradle kept out nearly all nearby mechanical noise too.

There are three bass-cut slopes (12dB per octave @ 40Hz and 6dB @ 150 and 300Hz) and a pad-switch for -6, -12, and -18dB. There is also an automatic pad function in cases of very loud noises. However, used as a tube mic, it is capable of handling up to 128 dB-A, 135 dB-A in FET mode. I would imagine someone could own this mic all their lives without ever triggering that function; in my use, a screaming rock vocal certainly wasn't enough! Needless to say, this mic has a very wide dynamic range.

Summary

I just loved this mic. The high quality of the construction was matched by the high quality of the sound. Having a remote control for polar pattern, attenuation, and tube/solid state switching is brilliant.

Overall, this mic is keenly priced (at $1,599 street), placing it at a sweet point: nose-to-nose with some solid state LDC classics and considerably cheaper than the best tube mics on the market.

Link: http://www.lewitt-audio.com

PMC twotwo.8 Active Reference Monitors

Since starting with monitor commissions for the BBC in the early 1990s, PMC—originally the Professional Monitor Company—has become a respected name in the loudspeaker world. Based at Luton in the UK, PMC has lately turned efforts to the midfield and nearfield market with three active monitors in the new twotwo range, the .5, .6 and lastly the .8 ($7,999 per pair, street), reviewed here.

by Nigel Palmer
for *Audio Media*

Nigel Palmer is a British audio engineer and regular contributor to *Audio Media*, *Pro Audio Review*'s sister publication based in London.

The "twotwo" is a two-way driver configuration; all models have an offset 27mm soft dome tweeter and an LF unit featuring the ability for use in either portrait or landscape orientation. The 'point' designation describes the size of the bass driver in inches, hence the 8-inch woofer in the .8.

In portrait mode, the 19.6 x 9.8 x 16.3-inch, 26.8-lb. enclosure presents business-like blue/black styling with tweeter at the top (an illuminated PMC logo in the HF unit's panel acts as a power and excursion limiter indicator), bass driver below and the ATL (or Advanced Transmission Line) port at the bottom of the cabinet. All PMC loudspeakers have transmission lines—a folded internal horn fed by the LF unit, 74 inches long in the .8—which extends bass response well below that in an equivalent sealed cabinet; in this case, it contributes to the overall 35 Hz to 25 kHz usable frequency response.

On the rear panel, an LED status display features four navigation buttons—up, down, left, and right. Pressing up and down for more than two seconds reverts to the factory default state. Inputs are comprehensive: RCA/Phono Analog (unbalanced), XLR Analog (balanced), XLR AES digital, and CAT5 network (both in and thru).

The heart of the twotwo range is a powerful DSP engine similar to that in the more expensive PMC IB2S-A offering a high-quality A-D converter on the analog inputs and the ability to take AES digital signals at up to 192 kHz. The signal processor provides volume control, equalization, driver optimization, and filtering at the 1.8 kHz crossover point; it then converts back to analog to feed two onboard Class D amplifiers (150 W LF and 50 W HF). The twotwo's user interface offers a good level of control with input source, trim, and sensitivity, high and low shelving, and low rolloff adjustment. Optional is a RJ45 wired remote connected via CAT5, which mirrors functions for easy setup from the listening position; the network facility is also used to link loudspeakers in digital mode with one as the master.

In Use

To begin a review period of two weeks, I adjusted the twotwo.8 system's input sensitivity so I could operate at my usual reference level. After playing some familiar material (and dimming the treble response to taste via HF shelving at -1.5 dB), working with them on everyday mastering tasks offered a commendably accurate and neutral presentation, making EQ and dynamics decisions a breeze. In spite of their neutrality, I found them enjoyable to listen to, and the net result non-fatiguing. Although low frequency extension was sufficient for me in my room and similar to the response of my usual loudspeakers, PMC offers subwoofer options for those requiring it.

I tried both XLR analog and AES inputs. Although taking the analog route implies an additional A-D conversion, this didn't trouble me sound-wise at all when compared to an all-digital approach. I have a number of digital sources that would require a patchbay in order to use the digital input, so I was content going in analog from my DAC and being able to access them via that as usual. I also conducted a comparison with the speakers in both orientations; although I used the landscape mode the majority of the time, I found no significant difference in either way of working—a useful trait in situations such as outside broadcast vehicles where available mounting height or width might be restricted.

Summary

The twotwo.8 could be used for any audio job and will be at home in any studio or location environment where box size isn't an issue. To me, this is a major achievement and clearly the end result of much research and canny use of trickle-down technologies. In spite of the active speaker market being crowded, I have little doubt that the twotwo range in general and the .8 in particular will be a success among pro-level users.

Link: http://www.pmc-speakers.com/products/professional/active/twotwo8

new live products

2014 NAMM Best of Show: Live Products

prosound ProAudio Review

PROSOUND NETWORK

BEST of SHOW

The editorial staffs of *Pro Audio Review* and *Pro Sound News* magazines presented the 2014 NAMM Show's ProSoundNetwork Best of Show Awards in Anaheim, California. A collection of NAMM Show-debuted products cited below are now officially recognized as Best of Show Award winners:

Allen & Heath Qu-24 Digital Console (pictured), Electro-Voice ETX Series, Midas M32 Digital Console, QSC TouchMix Series and the Tectonic Audio Labs Tectonic Plate.

During each of the major conventions and trade shows, the editors of *PAR* and *PSN*, with assistance from the editors of sister titles *Audio Media* and *MIX*, comb the exhibit halls for new and noteworthy products. Gear and software that show particular merit are singled out for the ProSoundNetwork Best of Show Awards. All products debuting at a given event will be eligible.

Visit the link below for more manufacturer-provided information about each of these award-winning studio products.

Link: prosoundnetwork.com/BOSNAMM2014

Allen & Heath Qu-24

Shure SM Series Headset Microphones

Shure has extended its legendary line of SM microphones with the introduction of two new headset microphones—the SM31FH Fitness Headset Condenser Microphone and the SM35 Performance Headset Condenser Microphone (pictured) for live sound applications. Also, Shure is now shipping the PGA31 Headset Condenser Microphone and the Centraverse Lavalier (CVL) Condenser Microphone, designed for presentation applications.

The SM35 Performance Headset Microphone ($99) is offered for use with the BLX Wireless System, GLX-D Digital Wireless System, and ULX-D Digital Wireless System. The SM31FH ($99) is a wearable, cardioid condenser microphone that features hydrophobic fabric, a material that repels moisture to protect and shield the microphone cartridge from corrosion caused by sweat.

The PGA31 headset ($39) is a versatile and affordable vocalist microphone, and the CVL Lavalier Microphone ($39) is offered with the BLX Wireless Microphone System.

Link: shure.com

Roland Systems Group S-2416 Digital Snake Stage Unit

The new 4U S-2416 Stage Unit expands Roland's Digital Snake line-up via 24 input, 16 output analog and 8 input, 8 output digital—a total of 32 input and 24 output channels. In addition to comprehensive I/O, the S-2416 has two REAC ports to cascade an additional snake for expanded I/O or for a fully redundant, no-loss audio back-up solution. In addition, its discrete and "uncolored" mic preamps are newly developed.

Neutrik connectors and 25-pin D-sub-type AES/EBU rear ports are featured, and the S-2416 supports 24-bit/96 kHz, 48 kHz, or 44.1 kHz when switched to clock master mode. Word clock input and output enable a master clock signal to be connected when using AES/EBU. The S-2416's mic preamps can be remotely controlled using any V-Mixer, R-1000 or S-4000R connected by RS-232C or by using the S-4000 RCS remote-control software on a computer (Mac or Windows) connected via USB.

Link: rolandsystemsgroup.com/s2416

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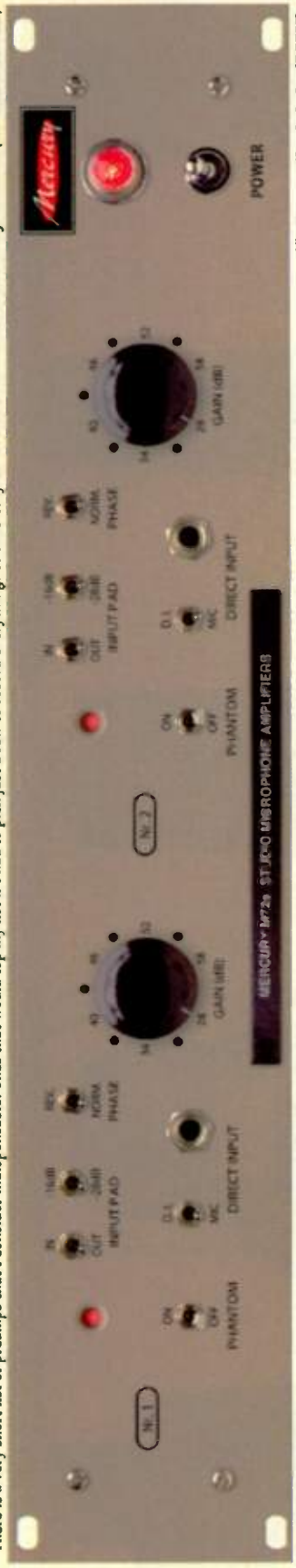

live review

Yamaha CL1 Digital Console

There are many production companies that now have vast stockpiles of heavy old analog consoles; I know because my company is one of them. I may have been the last sound guy on the planet to embrace digital consoles though, now that I have, I am in a state of mixer bliss.

by Will James
PAR Contributor
wjames@nbmedia.com

For the most part, all the companies that manufactured analog consoles now also manufacture digital consoles. We are witnessing a veritable digital console war out there, with each manufacturer adding goodies and features while dropping prices to unheard of low price points. One such manufacturer is Yamaha: they were pioneers in this digital market and continue to pave the way with new consoles. In this review, I will discuss their latest model, the CL Series.

Features

For this review, I was provided with the CL1, a 16-fader console with touch-screen menu

operation, 48 inputs and 16 outputs. Its OS is quite reminiscent of the M7CL, with many identical features and operations. The console comes preloaded with initial data settings that allow for a quick start.

Relative to larger digital consoles like Yamaha's own PM5D, the CL1 takes up very little room in the truck. It weighs in at 51 lbs. and is roughly two feet wide, two feet long, and a foot tall at its rear.

The CL1's surface is laid out cleanly–functional and not too busy. Users will likely use the right bank for input faders and the left bank for inputs or outputs. In input mode, the left faders can be a continuation of the right-side mix faders with numbering continuity; in output mode, faders are switchable to masters L/R, mono, and VCA aux masters. All faders can be labeled and color-shaded from an internal naming source or on-screen keyboard, allowing for quickly identifiable groups of faders. The right fader bank is directly accessible via touch screen, thanks to Yamaha's Centralogic operational system.

Each fader on the console is selected by depressing the key above the fader, which illuminates to remind users of the channel up for adjustment. Once the fader key is selected, complete access to the channel's on-screen control strip is available. The CL1 offers a nice set of channel control options with parametric EQ, comp/gate/expander, insert, pan and 16 aux sends.

The CL1 has a nice selection of 'rack' items, including 32 insertable graphic EQs, allowing the console to be used nicely for monitor mixing applications. The effects package is nicely arranged with a variety of reverbs, delays and other effects.

The back panel offers limited I/O, as the XLRs are accessed through the complementing stage panel, connected via CAT5. The panel contains eight additional input XLRs, has connectors for iOS devices and extra effects, as well as insert returns for dynamic devices. Eight outputs can be used to run local cue wedges or IEMs for the monitor engineer; an insert send is available for additional outboard devices. There is also a provision for external word clock.

In Use

The CL1 arrived at my office in time to take it for a stint at a contract casino gig; I've provided full audio there for 20 years. This day, the act was classic Country artist John Anderson ("Seminole Wind"). I used the console as the monitor desk; the artist needed nine mixes for his full band.

I did most of the show's preset details at our shop, delving into the naming and coloring menu, setting up monitor mix masters in cool pink and inputs in sky blue. Naming the channels was quite easy using the touch-screen keyboard. I proceeded to name the 29 inputs, which took me 15 minutes to do. I preset the masters, the effect returns and sends, inserted graphic EQs on the masters and set the reverb parameters—all in about 30 minutes—and then saved to the internal show menu as well as to my own flash drive via the front panel USB point.

With the console set, I packed, shipped and unpacked, using CAT5 to connect the head to the surface and our copper snake fanout from our main splitter head to the CL1's provided head. I continued on to the "ring-out" portion of the day, settling in the monitor wedges via the CL1's on-board graphic EQs that had been inserted into each of nine mixes. The adjustment of the EQ can be done by touch screen or by fader assign, which I preferred.

When mixing monitors on CL1, I have the option of adjusting volumes via either fader by fader flip key, or the actual hard surface aux sends. I found the use of the hard surface rotary sends to be the most expedient; to me, the fader flip method adds an additional step to a simple process. Though fader flip allows for quick visual representation of the various channel levels in a given mix for quick reference, in general, using the rotary sends resembles the operation of a typical analog monitor mixing style, with which I am very comfortable.

About Will

Will and his wife Skip have owned Atlantis Audio and Lighting for 33 years. A regional production company, Atlantis also provides concert roof and staging services and have provided production services for musical acts ranging "from Creedence to Korn, from The Beach Boys to Bill Bruford," happily states Will.

He began writing for Pro Audio Review in 1999 and has covered a bit of everything, "from mics to digital consoles to power amps to software," with over 100 articles published. "I began in the business by rolling cables, pushing speakers, and sweeping out trucks back in the very early '70s. Skip and I raised 3 kids in and around the business, and have been married for 37 years, residing in Scottsdale AZ, where we have four grandkids. Anyone with any sense would have gotten out of this end of the business a long time ago. I'm still hanging around and will be for a long time, thanks to digital consoles."

Summary

I found the CL1 to be a good-sounding, comfortable feeling, and very useful console, built like a Sherman tank. Some engineers may feel the need to use an outside word clock to bolster the performance, but I found it was not really necessary in typical concert applications. The EQ section is quite responsive, the comps and gates are friendly, the operating system is intuitive, and the overall usefulness of this console on a pro concert level is very good. As with other new digital desk offerings, the amount of internal goodies has gone up exponentially, while the price tag is certainly more affordable. The CL1 is a serious live digital console, useful on the simplest of levels as well as by higher end concert professionals.

Price: from $15,000
Contact: Yamaha Commercial Audio | http://www.yamahaproaudio.com/global/en/products/mixers/cl/

We are witnessing a veritable digital console war out there, with each manufacturer adding goodies and features while dropping prices to unheard of low price points.

Solid State Logic Live Digital Audio Console

As a live and studio engineer—with experience using both digital live consoles and SSL's studio consoles—I was eager to finally try out SSL's new live console. Jason Kelly (who previously oversaw the entire Midas digital console range at Midas/Klark Teknik) gave me my personal introduction to the console at SSL's Oxford headquarters.

by Simon Allen
for *Audio Media*

Simon Allen is a British audio engineer and regular contributor to *Audio Media*, *Pro Audio Review*'s sister publication based in London.

Features

Before you even see the new Live, its specifications make interesting reading thanks to SSL's new Tempest chips, designed from the ground up for this sole purpose. Depending on the number of stage boxes and external devices used, there can be up to 976 inputs and outputs connected with 192 internal audio "paths" all running at 96 kHz and 64-bits—easily one of the highest spec counts in this price range. Running at such a high bit depth and sample rate allows the console to have a staggering amount of internal headroom; Jason tells me it's in the region of 300 dB.

All preamps on board and in the stageboxes are SSL's SuperAnalogue, including analog high-pass filters. After that point, all audio is converted by 96 kHz, 24-bit A-D converters and remains in the digital domain until output. There is a good selection of local I/O with 16 analog ins and outs and four pairs of AES/EBU. (This can be expanded to twice the amount, if required.) Each AES/EBU connection has an independent fully-variable sample rate converter. External remote I/Os are connected with either coaxial or optical MADI or, for some connections between some SSL devices, an optional SSL Blacklight II connection (SSL's proprietary, high speed multiplexed MADI format, equivalent to eight MADI connections, bi-directional, on a single multimode fiber). Each coaxial connection can either be run with a redundant connection or each port can be utilized as an independent connection.

SSL has also made great use of the extra data embedded within the MADI stream. All the available SSL remote stageboxes are auto sensing, appearing automatically in the software routing pages on the desk. Another benefit is the extra gain data for when two or more consoles use the same stagebox. The "master" console, with control over the analog preamps, also transmits any changes in the analog gain to other Live desks. The operator then has a channel-by-channel option to enable gain sharing where the slave console can digitally trim any offset needed in real time.

Instead of having set templates or a given number of digital busses and auxiliaries available, the Live offers 144 full processing paths and 48 "dry" paths of processing to distribute in whichever way. This is then further broken down into some restrictions for total numbers of input channels, stem groups, auxes, masters, and matrixes. However, with a maximum of 96 full auxes and 24 dry auxes as well as 32 in and 36 dry out matrixes, there is plenty of scope to make the mixer work as desired.

The overall design of the control surface is well organized with clean and simple lines. The main focus is the 19-inch center touchscreen, which SSL claims to be one of the brightest on the market. The main screen is also the first to support major multi-touch gestures, which we have all become accustomed to with touchscreen iPads and iPhones.

Around the main screen are three fader tiles with twelve 100mm fader strips containing rotary encoders and color-changing backlit buttons. Each strip has 14-segment level meters with separate compression and gate meters. Each fader tile is independent with five scrollable layers containing five recallable banks. Each bank can be set to anything from input channels to masters, allowing the console to be set up as desired. One feature I like is that each channel has a Query button that spells out all of the channels associated with it; this can help to quickly solve simple routing issues or allow for direct and simple send adjustments.

In the master tile, there is a focus fader that can be assigned to any channel for right-handed fader riding and more hardware-based parameter editing. The focus fader works with the control tile that uses a

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European LDCs

(continued from page 38)

built condenser microphones to eager US customers since 2007. I remember visiting their booth at NAMM for the first time, being quite taken by their impressive aesthetics, build quality and innovative and truly unique ideas—for example, the signature design and mounting systems of the Black Hole LDC series.

Lately it seems Zarins has embraced a stark Bauhaus-sense of mic design for his version of an entry-level JZ LDC, the J1. From the hyper-minimalist packaging to its gray, accouterment-free body, to yet another unique mounting system, the J1 is different and definitely "JZ."

I've been able to spend significant time with both the Vintage 67 LDC (PAR April 2011), a retro-style U67 remake, and the BT201|3s stereo condenser mic kit (reviewed in *PAR* Oct 2009) both of which are world-class performers. The J1 exhibits equal build quality, just with lighter, cost-effective materials. To the touch, it feels like aluminum and/or some composite material; this is far from a criticism of its looks and build. Actually, the J1 is a microphone that will impress clients.

The J1 is a notably frequency-flat LDC with a 0.8-inch diaphragm, built "using JZ Microphone's patented Golden Drop technology," explains product info. Capable of handling 134 dB SPL, its specs show a subtle, round bump between 2 to 4 kHz, peaking in the middle at about +3 dB at 3 kHz, yet otherwise quite accurate. Sonically, it's a pleasing mic with just enough forward midrange detail to avoid dullness on most primary applications—vocals, stringed acoustic instruments, and multi-source percussion tracks.

MK 4 Vs. J1

I conducted back-to-back comparisons—with the Lipinski L-609 preamp via USB 500 Rack to Logic—of the MK 4 and J1, each capturing self-recorded/performed acoustic guitar (a Martin DX1RAE). Each was absolutely usable, but the MK 4 added some upper-mid emphasis that was very pleasing, supporting my standing opinion of the MK 4 in multiple applications on vocals over the past year. The J1 was overall leaner and flatter-sounding, more accurately translating the source.

If the goal is accuracy overall, selecting the J1 would be the obvious choice, at least for me. However, at a difference of $100 more, users may be able to get more mileage out of the MK 4—a great sounding, flattering mic, too—thus saving a whole Benjamin for cables and an iOS DAW, etc.

SSL Console

(continued from page 48)

smaller 7.5-inch touchscreen with a number of hardware controls for more traditional operation. The controls are set out in dedicated effects, EQ, and dynamics sections. I should make it clear, however, that all parameters can be altered from either the control tile or the main large touchscreen. Although the control tile is more natural to use, it's really nice to be able to edit an EQ via multi-touch gestures on the touchscreen.

In Use

For the purpose of this review, Jason set up SSL's live multi-track recorder with video footage from one of Peter Gabriel's concerts. The last Peter Gabriel tour used two Live consoles—one for stage and one for FOH—and proved the ideal testing ground before the console's shipping date.

There is a feeling of fluidity between the multi-gesture touchscreen UI and the control surface with its distribution of processing power. It feels effortless to jump straight to parameters and edit them, including inserting new effects without any drop in audio. The idea of having a single large screen with large graphics that are easy to manipulate by touch is so simple, yet effective.

The Live exhibits its SSL heritage in two ways: first, it uses all of SSL's digital algorithms from EQ through to reverbs. It has the simulated analog EQs, compressors, the famous bus comp and effects, which all sound great. I tried out the bus comp in the only way I knew how from regularly using an analog one and—to my surprise—Jason remarked, "So you've used one before, then?" It hadn't occurred to me, as I was just punching in some standard settings, but sure enough, it behaved just as expected (not to mention on a touchscreen, too).

There are also a few very neat sonic features SSL has introduced with this console. There is a new "tube warming" feature on the channel compressors—it is out of this world. Before you apply any other processing on the channel, or even edit the compressor's threshold, the simple action of enabling the tube warmth is really distinct. I'm now left wanting the plug-in version to have in my DAW in the studio.

Another unique feature is the addition of an all pass filter on every full processing channel. All pass filters are not common but make perfect sense; the implementation allows for user controllable phase adjustment at user specified frequencies. With so many potential phasing issues when working live, such as between two different mics on a common source, I can see these easy all pass filters considered as a closely regarded secret by many engineers in the future.

Along with the release of this new hardware is, of course, the first release of its software, which has been completely purpose-built by SSL and isn't based on any commonly-found operating system. This has given SSL the ability to fine-tune every aspect of the digital domain for audio. As this is only the beginning for SSL Live, there are a number of updates already planned for release with some exciting new features. For now, SSL has been focusing hard on making sure the system is as stable as possible.

Summary

The new Live console from SSL certainly lives up to expectations. It encapsulates everything I'd hope to see from an SSL console in terms of quality, build, and sonic reproduction. At the same time, it has a few tricks to excite even the most experienced engineers, and I was personally surprised by its fresh approach to digital processing. This is a truly remarkable introduction.

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