

PRO AUDIO REVIEW



Shania Twain
page 74

Gear & Software Reviews For The End-User

January 2004

Annual Microphone Issue



In This Issue!

- **PAR Exclusive – Royer SF-24 Stereo Ribbon Mic**
- **Low-Cost, High-Res Recording From Alesis**
- **Emagic Logic Software For Mac**
- **Church Sound With EU's RE-1 Wireless Mic System**

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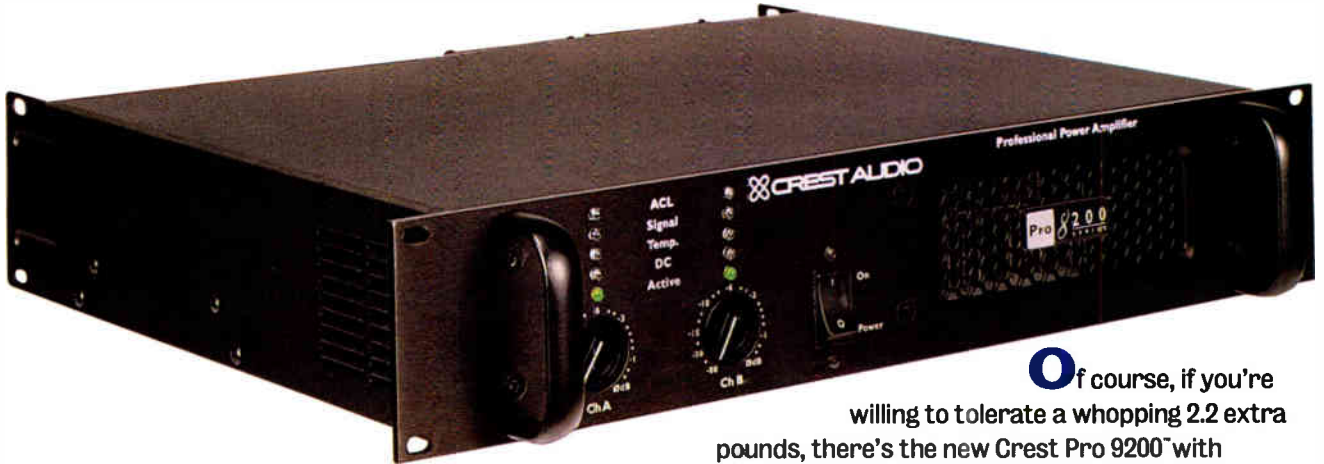
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New in 2004

Happy New Year to all those in the pro audio industry. I am excited about a new feature in this issue: UpSampler, an amalgamation of *smaller* reviews of products that often are vital but are not considered "sexy" as the latest DAW. For example, Henry Engineering's DigiMatch is an excellent example. Here is a box review that does not take up two pages, but aptly describes its great utility as a digital format converter/mini-digital router.

The column also is good for software and hardware updates of existing products, such as our update of the Yamaha MSP-10 Studio, a reference powered monitor that has been improved by addition of a redesigned tweeter.

UpSampler will include products from all of *PAR*'s niches (we cover it all) and will be written by a number of our reviewers.

MORE RESOLUTION, LESS MONEY

Our third review with the Conservatory of Recording Arts and Sciences in Phoenix is a dandy: the Alesis HD-24 hard disk high-resolution recording system. Although we reviewed the HD-24 in 2002, the 24/96 internal converters were not available. Thus, we wanted to give it a second look — along with a performance benchtest in the lab.

And as the panel of reviewer's point out, performance is impressive as is its ease of use. The removable hard drive as the recording media makes for a handy, relatively inexpensive way to track. Ye who are skeptics, ought to audition one. Like the Masterlink, the HD-24 is a serious tool for the professional end user that has a lot of flexibility.

WHAT WE DO

Speaking of end-users, readers may notice our front cover mission statement has changed with this issue. It is about as straight forward as we can get in terms what *PAR* is all about: "Gear and Software Reviews for the End-User."

Product reviews for the professional end-user has been our mission since September 1995. We have tailored our 27,000 BPA audited circulation to the engineer who uses the product.

Yeah, sure, we have some non-technical management people who read the mag because they control the purse strings, and they want to see what we say about a product before authorize a purchase. But for the most part, *PAR* is a magazine for those directly involved in using and buying the gear.

And that is why advertisers buy ads, and that is why our readers consistently rank us as the reliable product information source. It sounds like I am bragging, but when nearly 3/4ths of our readers say that *PAR* is their primary source for product information in pro audio, it makes us proud.

THE SWEETNESS OF RIBBONS

Just in case you skipped the cover and came directly post-haste to this fascinating column, January is our annual microphone issue. Microphones consistently show up as the number one product professionals are buying throughout the year.

We are very pleased to be the first magazine anywhere to test Royer's new ribbon stereo microphone, the SF-24. Royer's have a great reputation as a premiere producer of ribbons and everyone has been asking for a stereo version. Well, here is *PAR*'s take on it. Dr. Fred says it is one of the best mics he has ever used (and he even sold a few classics to purchase this one.)

Ribbons seem to be in a Renaissance these days with the Royer models, the venerable Coles line and Wes Dooley's AEA array of mics (not to mention speaker companies like Legacy, Genelec, SLS and ADAM). As Wes said, with regard to the ribbon microphone mystique: "They seem to listen to a room like your ear does." Well put, Wes.

John Gatski is publisher/executive editor of Pro Audio Review.

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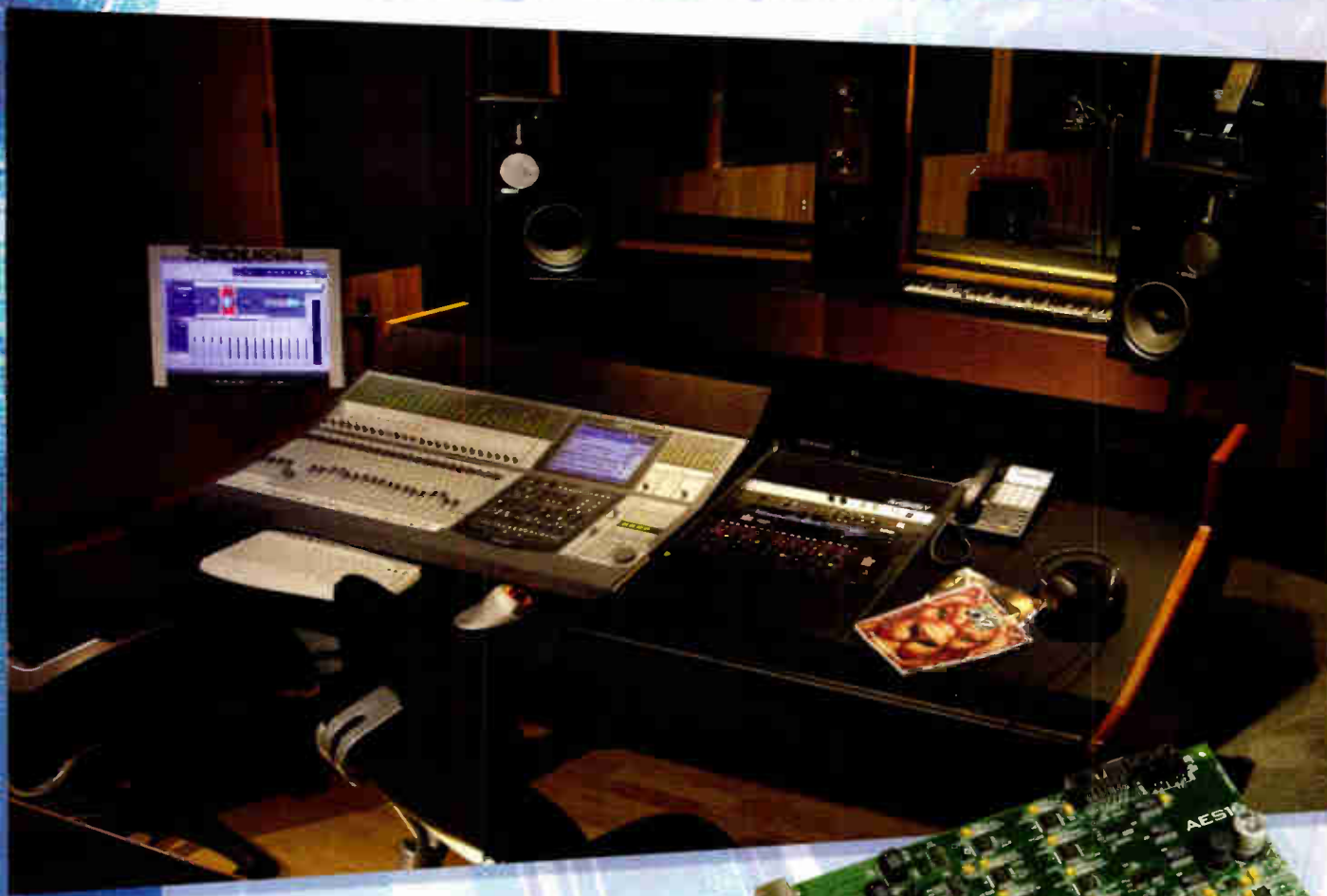
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With the New AES16, the Biggest Part of Your Digital Audio System May Be the Smallest



You have invested a lot of time, money and commitment into your digital audio system, with the best in digital mixers, converters, digital audio workstations, software and recorders. All you need now is the final piece to tie the entire system together - the AES16™ from Lynx Studio Technology.

Working in single-wire mode, the AES16 offers 16 channels of 24-bit AES/EBU I/O at 192 kHz using Windows or Macintosh computers. You can also use dual wire devices for eight I/O channels. The AES16's software controls its internal sixteen-channel mixer, routing your signals just about anyway you can think of with virtually no latency.

In addition to being the ultimate digital audio router, the AES16 features a new Lynx technology SynchroLock™. Basically "jitter control on steroids", SynchroLock provides extreme jitter tolerance at all inputs. By coupling statistical analysis with low-noise clock generation techniques, SynchroLock extracts a very clean clock with 3000:1 jitter attenuation from AES signals affected by long cable lengths and other noise sources. The clock output of SynchroLock can also be used as a very accurate word clock source for other studio devices.



Need more than 16 channels? No problem. Up to four AES16 cards can be installed in a single computer, for a total of 64



inputs and 64 outputs. You can also add 16 channels of ADAT Lightpipe I/O with the optional LS-ADAT LStream card that attaches to the AES16.

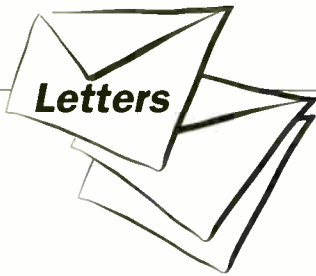
The AES16 was developed with your facility in mind. The AES16-XLR model with two six-foot cables and professional XLR connectors may be the best option for you. For added convenience, we offer optional twelve-foot cables with D-sub connectors for Apogee, Benchmark, Yamaha, Mackie and other top digital audio brands. Plus the AES16's PCI interface is designed for either 5V or 3.3V signaling, making it totally compatible with the new Macintosh G5 models.

Please visit our website at www.lynxstudio.com to learn more about how the AES16 lets your computer become the control center of your digital audio system.

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REVIEWS IN ENGLISH?

Dear Editor(s),

I painfully slogged through the review of the Schoeps surround mic in your November, 2003 magazine. This is a product that is intriguing and I was looking forward to reading the review.

Who is this reviewer? Was it originally written in a non-Western language and translated? Does anybody read or proof copy before going to press?

From the review, "Before launching into a location recording I setup the system at base, working with the microphone in a separate room to get as familiar as possible with the range of facilities." - what kind of confusing writing is that? (BTW, "setup" is the noun form, not verb, editor.)

If you want to see an example of good product reviews, go to www.dpreview.com. It's not in the audio market (its photo gear),

but their reviews are complete and (sometimes brutally) informative. I don't believe you have the balls being a manufacturer-supported magazine to do reviews as complete as theirs. You are just another outlet for manufactures to market their product without truly serving your readership.

You also don't have the confidence to print a letter-to-the-editor like this.

Jeremy Bataglia
Southport, Connecticut

Managing Editor Brett Moss replies:

To paraphrase that great American, Calvin Coolidge, "You lose."

The reviewer, Mike Skeet, has many years of professional audio under his belt. He's well-qualified and writes in a language we call, E-N-G-L-I-S-H. Perhaps you've heard of it? It's apparently big in some parts.

But seriously, this does bring up a legitimate concern about letting a writer demonstrate some personality and utilize jargon and phraseology that might not be familiar to every last reader. PAR has tended to use a very plain, "Just the facts,

ma'am" style to avoid this. This particular article was what we call a "flip" from our sister publication, Audio Media, so it was not initially written with PAR style in mind. I felt the meaning was clear though I did change a few things from the original. Perhaps I was too optimistic.

Your point about "setup" is correct though many prefer the noun to be "set-up" (PAR does not). I try not to be a language Nazi about these things, however (even sharpies like Bill Buckley and William Safire make mistakes). The point of language is to communicate and I believe the review was clear. My colleague, AM Editor-In-Chief Paul Mac, has brutally dissected your letter. Trust me, it's best we not print his response. Let's just say, readers who live in glass houses...

Furthermore, you cannot compare a magazine with a website. The economics are significantly different. Web space is cheap while publishing space is expensive. Until you, and 26,000 PAR subscribers, are willing to pony-up around \$30 a year for a subscription PAR will be a "manufacturer-supported" magazine.

Finally, Schoeps has NOT advertised in Pro Audio Review for several years.

IS HD RADIO HD?

Dear Editor,

I enjoyed the articles on "HD" Radio (PAR, September, 2003), especially the piece on XM and Sirius. Lots of pretty pictures of expensive studios and lists of the latest digital equipment. I've listened to Sirius and the only problem is, it sounds like sh*t. Many audio professionals like myself spend their careers trying to improve the sound of our product, then along comes satellite radio with their generous 56k(!) data rate, cynically labeled as "High Definition" or "CD quality" and foisted on the public as the latest and greatest thing. And regretfully, most listeners will never even imagine that broadcast music can sound dramatically better and more emotionally satisfying than this.

David Glasser
Airshow Mastering
Boulder, Colorado

PAR welcomes letters from readers. Send letters to Pro Audio Review, 5827 Columbia Pike, Third Floor, Falls Church, VA 22041 or e-mail par@imaspub.com.

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ELECTRONIC MUSICIAN MAGAZINE NOVEMBER 2003

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Eight analog outputs for L/R and 5.1 surround sound matrices.

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Optional FE-8 expander.

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Eight balanced 1/4" XLR analog Mic/Line inputs with studio-grade, high-headroom, low-noise mic preamps and switchable phantom power. XLR Input 8 is even switchable from Mic/Line to Guitar level.

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It's an 18-input-Firewire® audio I/O box, a 4-in/4-out MIDI interface...and a motorized fader controller for popular DAW programs! Co-developed with Frontier Design Group, the FW-1884 has everything you need to maximize workstation productivity in a single intuitive tool. For far less than the cost of a piecemeal approach.

Fire up the FW-1884 at a TASCAM dealer or visit our web site for more information.

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World Radio History

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NEW PRODUCTS

During the weekend of January 17 and 18 the Parsons Center for Audio Studies will hold a workshop, "Critical Listening for Audio Professionals." Headlining will be designer and engineer David Moulton and Tom Bates, a multiple Grammy-winning engineer. For more information: 781-431-8708 (ext. 11), www.paudio.com.

Bringing the magic of Mogami to the masses, Marshall Electronics has inked a deal with Guitar Center to sell retail packages

of Mogami cabling in popular configurations for studio, live, A/V and



home studio/theater use (See picture of Marshall's Phil Tension, Wayne Freeman and Scott Riedle preparing the first shipment).

Producers David Huff and Kurt Howell chose an Audio-Technica AT4060 microphone for main duty of Laura Turner's debut album.

The Cleveland Institute of Music has added a pair of ATC SCM100-ASL Pro powered monitors for use in the control room of the school's main venue, Kulas Hall.

Gibson chose Neutrik EtherCon RJ45 Ethernet connectors for use in its new Gibson Digital Guitar line of networkable guitars.

Headroom Digital, a commercial audio production house in New York, has installed an APT WorldNet Tokyo codec.

QSC SRA Studio Reference Amplifiers

QSC, well-known for its live sound, installation and movie theater amps, is venturing into the studio amplification field with the SRA series. The two-channel SRAs range in power from 200W @ 8 ohms (SRA 1222) to 1,800W @ 2 ohms (SRA 3622).



Features include subsonic filters, variable-speed cooling fan, light weight (22 lb.) and various a protection package (DC, subsonic, current in-rush, short circuit and thermal). Prices: SRA 1222 - \$1,499, SRA 2422 - \$1,999, SRA 3622 - \$2,499.

Contact: QSC at 800-854-4079, www.qscaudio.com.

Pendulum Audio Quartet II Mercenary Edition

Pendulum Audio's popular Quartet Tube Recording Channel has a sibling, the Quartet II Mercenary Edition. Picking Fletcher's



brain, Pendulum's Greg Gualtieri added an additional transformer to the mic preamp/DI input, a new "Passive/Aggressive" three-band tube EQ, a JFET/MOSFET peak limiter and modified the delta-mu compressor from the ES-8. It's still all Class A and crammed into a 2RU box. Price: \$5,000.

Contact: Pendulum Audio at 908-665-93333, www.pendulumaudio.com.

JBL LSR6328P Powered Monitor

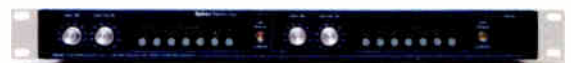
The full name of the JBL LSR6328P is Linear Spatial Reference Bi-amplified Studio Monitor. The important point is that it is part of the long-awaited revamping of the venerable LSR line. The 6328 has an eight-inch Differential Drive carbon fiber woofer and a magnetically shielded one-inch composite diaphragm HF driver with Elliptical Oblate Spheroidal waveguide. The power comes from a 250W amp for LF duties and a 120W amp for the high end. Part of the new LSR line is a Room Mode Correction system for room EQ. Price: \$1,339.



Contact: JBL at 800-852-5776, www.jblpro.com.

Aphex 1100 MkII Microphone Preamp and A/D Converter

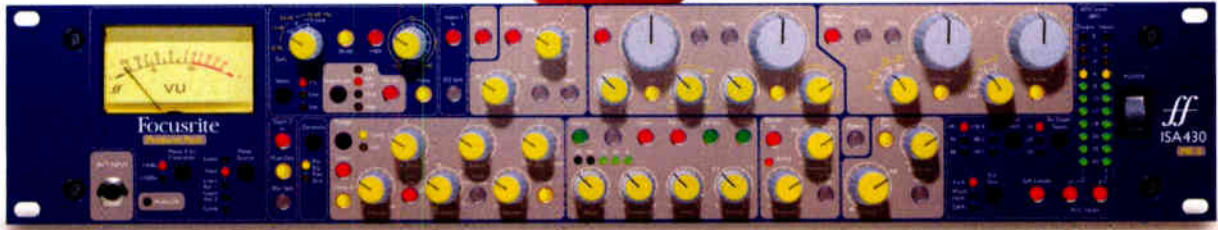
Aphex is upgrading the popular 1100 mic preamp and A/D converter combo unit.



The 1100 MkII retains all the features of the earlier (Class A, 48V phantom power, 20 dB pad, MicLim limiter, low-cut filter, tube) but adds improvements to the performance and ramps up the sample rate's high end to 192 kHz. It also has full digital I/O – AES/EBU, S/PDIF and optical. Price: \$2,495.

Contact: Aphex Systems at 818-767-2929, www.aphex.com.

Oh, we forgot something.



The New ISA 430_{MkII} Producer Pack

When we designed the original ISA 430 Producer Pack we wanted to include all the best features and circuits from the Focusrite ISA product family since 1985. And so we did!

However, in the past three years we have had a few more great ideas. So the ISA 430 MkII is born. Have we forgotten anything? All we can think to add is a cherry on top!

• Principle Feature Set: •

- Classic ISA transformer-coupled mic-pre; now with four switchable input impedances and inductor-induced "air". Extended version of the original ISA 110 EQ.
- Multi-format Compressor; a vintage optical circuit, as well as Focusrite's transparent VCA design.
- Unmatched flexibility with an incredible variety of insert points, "split" modes (for separating modules), and variable signal path arrangements.
- Superb De-esser employing optical technology for transparency and lower distortion.
- 'Listen' feature for precise control over compression, gating, expansion and de-essing.
- Soft Limiter to sensitively avoid digital overload.
- Optional Stereo A/D 24-bit, 192kHz.
- More features than the original and at a great new price.

"I can't think of anything negative to say about the ISA430 MkII — it really is that impressive. Committed recording engineers now have a new British standard-bearer when it comes to high-end analog recording channels."

— Hugh RobJohns, Sound on Sound, January '04



In collaboration with the Conservatory of Recording Arts and Sciences, one the country's leading pro audio teaching facilities, PAR has introduced a regular series of in-depth reviews conducted at the Conservatory's state-of-the-art teaching faculty in Phoenix.

Bench Test: Page 14

BY BETH JOHNSON

Since 1984, Alesis has been developing and manufacturing gear for the audio industry. The same company that brought us the ever-so popular eight-track ADAT recorder brought out last year the ADAT HD24, a 24-track digital hard disk recorder. Now available for the recorder is the EC-2 96 kHz Sample Rate Upgrade. This upgrade allows you to use the analog inputs and outputs at 88.2 kHz or 96 kHz nominal sample rates. Alesis does this for the affordable price of \$3,748. Or you can start from scratch with the just released HD24XR, a fully native 96 kHz hard disk recorder for \$2,999. The HD24 with the EC-2 upgrade reviewed here is equivalent to the HD24XR.

FEATURES

The HD24 is a 24-track, 24-bit hard disk recorder that allows the use of affordable IDE hard drives as its removable recording media. It uses a new format engineered by Alesis called ADAT FST, which was specifically designed for music recording.

This format keeps tracks of a given song in adjacent sections of the hard disk, thus speeding up the "seek time" required to search for songs on the drive. This, in turn, provides for much improved drive stability. Because of this, you can use low-cost IDE hard drives, and still have great results. Currently, you can buy hard disk media for around \$4 - 5 per gigabyte, which, track for track, is less than that of an ADAT tape. Alesis developed custom drive caddies and

Alesis ADAT HD24 Digital Hard Disk Recorder with EC-2 Upgrade



storage cases for the HD24, which ships with a 10 GB hard drive (which will give you about 45 minutes of 24-track recording at 24-bit/48 kHz). The other drive slot is empty, for you to install your own drive.

One big advantage of the HD24 above some of the other hard disk recorders is that it comes complete with everything you need to record your session. You do not have to buy any cards or other extra items to get your audio in and out of the recorder. At 44.1 kHz or 48 kHz, you can record 24 tracks; at 88.2 kHz or 96 kHz, you have 12 tracks available. Other connections available include an external BNC word clock inputs, 24 channels of ADAT optical inputs and outputs, ADAT Sync In and Out connectors to allow for multiple machines to be connected (up to five) or to hook up to a BRC. When hooked up to a BRC, the HD24 acts like

three ADAT recorders.

The HD24 has three ways to allow the user to move data to and from the recorder:

- * Simply by switching drives. You can store the drives on the shelf, just like tape, and bring them back for later use. Drives can be backed up between the two trays in a matter of minutes. With the FireWire-based FirePort peripheral (\$249) you can download files directly to a PC.

- * ADAT Optical I/O will allow transfer of data to and from the recorder with standard fiber-optic cables.

- * Ethernet. Although I was not able to test this function, the HD24 can connect to a computer network as a standalone FTP server with its own IP address accessible from the network or over the Internet.

The HD24 has some synchronization options as well. The machine can generate MIDI Time Code (MTC), send MIDI Machine Control (MMC) messages, and synchronize with ADATs and the M20. The MIDI port is also used for software updates, and to send software from one HD24 to another.

IN USE

I was first able to use the HD24 in a mobile recording situation, in conjunction with a small Mackie console. I had not had a chance to read the manual yet, and was able to hook everything up, name my song, set proper levels and clear peaks, and set locate points. (And the important part was: I was able to do it quickly.)

For what we were recording, this was all I needed to know. In fact, I can imagine that for anyone who is using the HD24 in a simple mobile setup, this may be most, if not all, of the

Fast Facts

- **Applications:**
Studio, remote recording
- **Key Features:**
24-track; 24-bit audio; 1/4-inch TRS inputs and outputs; 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz sampling rates; uses any internal IDE hard drive; ADAT FST recording format; can be used with a BRC or LRC (LRC included) remote controllers
- **Price:**
\$2,499; with EC-2 upgrade - \$3,748
- **Contact:**
Alesis at 401-658-5760, www.alesis.com.

functions you would need at the time. We were limited on the number of physical inputs and outputs on the console, and the 1/4-inch jacks on the HD24 made it very easy to switch any of these around any time I needed to. Another thing that I found to be great for saving time was the fact that the drive automatically mounts when you turn on the machine, and unmounts when the machine is shut off. It does this much faster than other hard disk recorders I have worked with. When you power of the machine from the front, it asks you if you are sure you want to switch it off. This is a great safety, and actually prevented me from accidentally turning off the machine at a bad time.

The next time I was able to use the HD24 was on a drum session. Again, I did not read the manual before this session, because I wanted to see what I could do without it. I wanted to compare the lower sample rates to the 96 kHz sample rate. I recorded the same drum tracks at each sampling frequency. Once again, it was very easy to set up in the studio, to set up the number of tracks and sampling frequency I desired, and to name the song. At the 88.2 kHz and 96kHz, you are limited to 12 tracks, which could be inconvenient at times. One thing that fooled me when I first listened back to the session was the fact that at 88.2 kHz and 96 kHz, the outputs for Tracks 1-12 are duplicated on the outputs for Tracks 13-24. I had faders turned up on Channels 13-24 and heard my drums, even though I was seeing no metering on the machine itself. Once I figured out what was going on, I realized that this could be a very handy feature.

I found the 96 kHz session to have much smoother high frequencies. This was especially noticeable on the overhead microphones. It also seemed to me that the kick and snare drums jumped out of

the mix more. The low frequencies seemed to be rounder and fuller. The hi-hat and shaker were much less abrasive and the congas were definitely more pleasing to the ear.

Probably the most inconvenient thing is the fact that the BRC cannot be used with the HD24 at the 88.2 kHz and 96 kHz sampling rates, although it can still be used at 44.1 kHz and 48 kHz sessions.

After this session, I read the manual to see some of the other possibilities of the HD24. I found the editing functions to be easily usable, but somewhat basic. You are allowed the functions of cut, copy, paste, and undo. Copying audio from one song to another is possible. Start and end edit times are easy to find with the scrubbing function. Although if I had to do numerous complicated edits on a song, I would probably transfer my audio to a computer editing program like Pro Tools, and then transfer back to the HD24.

SUMMARY

I found the HD24 to be incredibly easy to use, even before reading the manual. I feel that for the price, and especially considering the current low cost of hard drives, the HD24 should be a definite consideration for anyone looking to buy a multitrack hard disk recorder. As much as a tried, I could not get the machine to make a mistake, or give me an error message. I also have not found one person here at the Conservatory who has had any problems with the machine. Because of their reliability we are planning on installing them in all of our studios.

Beth Johnson is an engineer/instructor at the Conservatory of Recording Arts & Sciences.

SECOND OPINIONS:

Based on their reliability, user interface, and storage medium, we are incorporating the HD24 into our studios at the Conservatory, and therefore, into our school curriculum.

After comparing the high-resolution (96 kHz) recordings to the standard resolution (44.1 kHz), I found the high-resolution recordings to be far less fatiguing to my ears at the end of the session.

—*Michael Jones, Director of Education/Audio Recording & Production Instructor*

What I like about the HD24 is the total ease of use - if you are even slightly familiar with digital multitrack recorders, you can use the basic functions of the machine without even looking at the manual. If you are familiar at all with ADATs, the HD24 will be a breeze to learn and use. During my session, I could create a new song, name the song, and be rolling in less than 30 seconds. I would highly recommend the HD24 for remote recording.

—*Tony Nunes, Audio Recording and Production Instructor*

Besides the HD24 being so easy to use, I found the high resolution to sound much less phasy, more open and natural sounding, and with improved transient response as compared the standard resolution. The unit is well-built and easy to hook up, and I found the commands and functions to be very logical and intuitive.

—*Dale Epperson, Conservatory Technician/Owner of Old School Audio*

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Bench Test: Alesis HD24 with EC-2 Upgrade

The Alesis HD24 is equipped with 24 channels of balanced analog input and output connectors. This unit has the EC-2 88.2/96 kHz sample rate upgrade and makes it the equivalent of the new HD24XR. Digital I/O is in the form of the Alesis ADAT optical connectors. Since the HD24 doesn't have AES/EBU digital inputs, I was able to borrow an A14 multiformat adapter to interface my Audio Precision's AES/EBU digital interface to the HD24's

ADAT optical digital inputs to check out its digital to digital I/O characteristics.

Unlike some of the other recent tape and hard disk recorders that I have measured in my lab and have had some-what of a difficult time figuring out how to make work, the HD24 rewarded me with immediate and intuitive functionality.

Frequency response for the sampling frequencies of 44.1, 48, 88.2 and 96 kHz are shown plotted in Figure 1. The fre-

quency range is down to 10 kHz and is linear to best show the high frequency rolloff shape. Including frequencies down to 10 Hz reveals a low frequency rolloff of 0.09 dB at 44.1 and 48 kHz Fs, and 0.19 dB at the two higher sampling frequencies. Square wave response was indicative of FIR digital filtering having symmetrical mirror image ringing at the beginning and end of each half cycle. Total harmonic distortion plus noise in a 22 kHz measuring bandwidth as a function of signal frequency and sampling frequency is shown in Figure 2. Increasing the measurement bandwidth to 80 kHz reveals that there are some out of band artifacts that do increase the THD+N within the audio bandwidth. This is shown in Figure 3. Figure 4 shows the reduction in THD+N with input level for a 1 kHz tone for sampling frequencies of 44.1 and 96 kHz. This is a good example of the analog I/O improvement we see in the HD24 where the THD+N is some 9-10 dB lower than the earlier HD24 measured by the magazine. Input/output linearity was quite good down to -120 dBFS at all four sampling frequencies and deteriorated below that input level. Data is shown for Channels 1 and 2 at 44.1 kHz sampling frequency in Figure 5. As can be seen, there is a glitch in the linearity in Channel 1 at about the -80 dBFS point. These phenomena showed up in some of the other channels but were most prominent in channel 1 as shown in the figure. Channel separation was found to be essentially independent of sampling frequency and, unusually, of testing direction. Channel separation is plotted in Figure 6 for adjacent channel and channels separated by one or more channel number.

— Bascom H. King

In the figures where the sampling frequency, Fs, is a parameter of the measurement, Red=44.1 kHz, Magenta=48 kHz, Blue=88.2 kHz, and Cyan=96 kHz

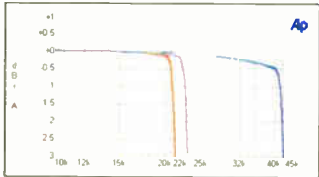


Fig. 1 Frequency response as a function of sampling frequency.

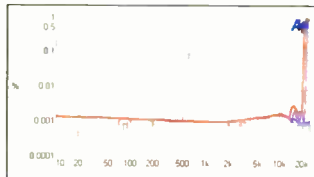


Fig. 2 Total harmonic distortion plus noise as a function of signal and sampling frequency, 22 kHz measurement bandwidth.

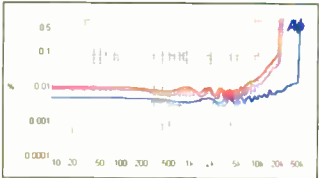


Fig. 3 Total harmonic distortion plus noise as a function of signal and sampling frequency, 80 kHz measurement bandwidth.

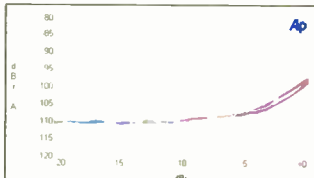


Fig. 4 Total harmonic distortion plus noise for a 1 kHz signal as a function of signal amplitude and sampling frequency.

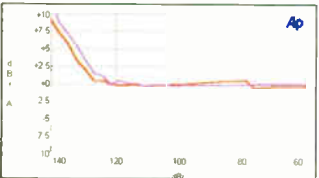


Fig. 5 Deviation from linearity of a 1 kHz test signal for channels one and two at a sampling frequency of 44.1 kHz. Red=channel one, Magenta=channel two.

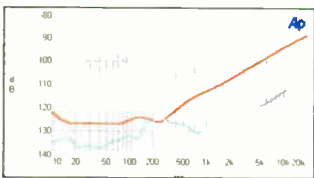


Fig. 6 Channel separation vs. frequency for adjacent channels and channels separated by more than one channel number. Red=adjacent, Cyan=separated by one or more channel number.

Bench Measurement Alesis HD24 Hard Disk Recorder

[ANALOG/ANALOG I/O]

OUTPUT LEVEL

19.1 dBu in,
44.1 - 96 kHz Fs 6.9V, 19 dBu

INPUT IMPEDANCE

44.1 - 96 kHz Fs 51.5 kilohm

OUTPUT IMPEDANCE

44.1 - 96 kHz Fs 440 ohm

FREQUENCY RESPONSE

44.1 kHz Fs +0.0, -0.15 dB 20 Hz - 20 kHz
-3 dB @ 21.2 kHz
48 kHz Fs +0.0, -0.10 dB 20 Hz - 20 kHz
-3 dB @ 23.1 kHz
88.2 kHz Fs +0.0, -0.03 dB 20 Hz - 20 kHz
-3 dB @ 42.3 kHz
96 kHz Fs +0.0, -0.03 dB 20 Hz - 20 kHz
-3 dB @ 46.1 kHz

TOTAL HARMONIC DISTORTION

22 kHz measurement BW
44.1 kHz Fs < 0.0017% 20 Hz - 13 kHz
< 0.08% @ 20 kHz
48 kHz Fs < 0.0017% 20 Hz - 15 kHz
< 0.003% @ 20 Hz
88.2 kHz Fs < 0.0017% 20 Hz - 20 kHz
96 kHz Fs < 0.0017% 20 Hz - 20 kHz

LINEARITY ERROR

44.1 - 96 kHz Fs +/- 0.75 dB 0 to -120 dBFS
< +5 dB @ -130 dBFS

SIGNAL TO NOISE RATIO

44.1 - 96 kHz Fs
Wideband 75 dB
A-weighted 112 dB

DYNAMIC RANGE

THD+N of a 1 kHz
-60 dBFS signal in a 22 kHz + A-weighted
Measurement Bandwidth
44.1 - 96 kHz Fs 112 dB

QUANTIZATION NOISE

THD+N of a 20 Hz tone at 0 dBFS in a 400 Hz to 22 kHz
Measurement Bandwidth
44.1 - 96 kHz Fs -106 dBFS

CHANNEL SEPARATION

Channel source impedance
600 ohm
Adjacent channels
44.1 - 96 kHz Fs > 110 dB 20 Hz - 1.5 kHz
> 88 dB @ 20 kHz

Separated by one or more channels

44.1 - 96 kHz Fs > 120 dB 20 Hz - 3 kHz
> 105 dB @ 20 kHz

[DIGITAL/DIGITAL I/O]

FREQUENCY RESPONSE

44.1 kHz Fs < +/- 0.025 dB 10 Hz - 20.7 kHz
48 kHz Fs < +/- 0.025 dB 10 Hz - 22.5 kHz
96 kHz Fs < +/- 0.025 dB 10 Hz - 45 kHz

TOTAL HARMONIC DISTORTION + NOISE

44.1 kHz Fs < 139 dBFS 10 Hz - 20.7 kHz
48 kHz Fs < 139 dBFS 10 Hz - 22.5 kHz
96 kHz Fs < 139 dBFS 10 Hz - 45 kHz

CHANNEL SEPARATION

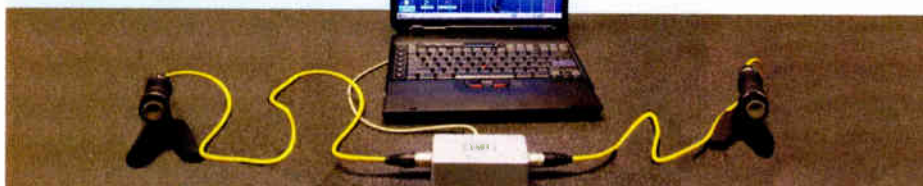
Adjacent channel
44.1 kHz Fs > 155 dB 10 Hz - 20.7 kHz
48 kHz Fs > 155 dB 10 Hz - 22.5 kHz
96 kHz Fs > 155 dB 10 Hz - 45 kHz

Note: Digital I/O measurements made with Alesis ADAT A14 ADAT-AES/EBU converter. Word length of digital audio test signal was 24-bit.

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BY DR. FREDERICK J. BASHOUR

Royer SF-24 Stereo Ribbon Microphone

Five years ago I purchased a Royer Labs SF-12 stereo ribbon mic, along with a pair of Royer's R-121 mono units. Finally realizing that a modern ribbon mic could stand comparison with the best of my tweaked-out vintage condensers was a veritable epiphany for me and, accordingly, I have used that SF-12 (and R-121s) on almost half of all the sessions I've done since that time.

After a session of very quiet contemporary acoustic music about three years ago, however, I started lamenting the fact that I would have been using my SF-12 even more, if it did not have such a low output level that no mic preamp in my kit could raise its voltage without adding so much noise that it would actually become distracting in a mix.

To make a long story short, in late August, 2001 I received Royer's first pair of SF-1A microphones — serial numbers 001 and 002. They had not yet built an active stereo mic, and wanted my opinion on the sound of these prototype mono units — each of which, I was told, was exactly one-half of a stereo SF-12A (the working prototype name for the SF-24). The minute I plugged them in and turned on the phantom power, my mouth fell wide open. A few months later, Royer sent me a prototype SF-12A, serial #002, and during the past several years, I have used that one, as well as #003, since the company continued to tweak various amplifier and ribbon diaphragm thickness parameters until everyone was satisfied.

FEATURES

Say what? Amplifier? Phantom power? Yessiree, these are active mics, complete with internal circuit boards! The phantom power from my Crane Song Spider mixer supplies plenty of current to run the SF-24's internal circuits, two special toroidal transformers mated

to little boards which together raise the SF-24's level about 20 dB or so above a standard "passive" Royer ribbon mic. This puts its output level in the same ballpark as, say, my tweaked-out large-diaphragm vacuum tube Neumann SM-69. Make no mistake, using phantom power current does not mean that these mics output line level; they still require a preamp.

But extra level is not exactly the point here, for gain with noise is not really worth very much. What was so special about those two prototype mics was that their noise level was virtually identical to that of any other condenser mic I own, and a far cry from the noise produced by my SF-12 when mated with the quietest of my high gain preamps — a Manley Mic/EQ 500 or Crane Song Spider mixer.

Since my first iteration of serial #002 incorporated the same transducer elements as Royer's passive SF-12 microphone (its minimalist electronics were purposely designed to be as transparent as possible) it sounded exactly like my SF-12, only noticeably louder, and much quieter. With Royer's active electronics, the ribbon "sees" an ideal load (just an inch or so away) at all times. Thus, its performance should be consistent regardless of a preamplifier's input impedance characteristics. Impedance mismatching is a common problem with standard ribbon mics and, to a lesser extent, with all microphones. This phenomenon is the rationale for the new mic preamps that offer adjustable input loading characteristics. The SF-24, on the other hand, sounds great with any preamp. Subsequent modifications to my SF 12A made it actually sound better than my SF-12 in such factors as transient response and hall ambience reproduction.

IN USE

The first time I got to use my first SF-12A took place at the end of October, 2001, for a week-long Dorian Recordings session of the early music supergroup, Fortune's Wheel. As usual, I used it as one of four pairs of mics in my setup at Mount Holyoke College's Abbey Chapel (along with my other favorites at the time — AKG C 24, Neumann M 50s and SM 69) and the singers and string players liked its sound so much that it became the main mic used

in the final mixdown. Even while picking up the quietest whispers from the group's soprano, Lydia Knutson, and the tiniest plucks from Robert Mealy and Shira Kammen's medieval vielles and harps, any noise contribution from the SF-12A was completely unnoticeable within the wonderful wash of sound captured in that stone chapel.

That session was the beginning of a long string of recordings I have made with my various prototype SF-12As. The mic I presently own is now representative of current production SF-24 models. I used it a few months ago on a solo piano recording of the music of Philip Glass, performed by Bruce Brubaker, at New York City's American Academy of Arts and Letters auditorium, and it helped establish a new "believe it or not" item in my recording career. After Bruce selected it as the best-sounding stereo pickup (up against the aforementioned mics, as well as SF-12A serial #003, which had a slightly thicker diaphragm), it received the distinction of being the first mic I was ever able to use all by itself for a solo piano recording! Its low noise level and superb ambience pickup was just perfect for capturing the sound of those hypnotic Glass Etudes in that most wonderful of East Coast chamber music recording venues.

SUMMARY

I have been pretty lucky to be able to make recordings with Royer's SF-24 for two years before anyone got a chance! This is a great microphone.

Dr. Fred Bashour holds a Yale Ph.D. in Music Theory, and currently performs as a jazz pianist and church organist, in addition to working as a classical music producer and engineer.



Fast Facts

- **Applications:**
Studio, location
- **Key Features:**
Ribbon element; stereo
- **Price:**
\$3,795
- **Contact:**
Royer Labs at 818-760-8472,
www.royerlabs.com.

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BY STEPHEN MURPHY

Long renowned for what many regard as the finest digital audio converters available, UK-based Prism Sound's analog-only Maselec product line is quickly gaining a similar reputation.

Prism introduced its Maselec Master Series several years ago to enthusiastic response from audio professionals and reviewers alike. Products in the discrete-component analog line include the MLA-2 Stereo Compressor, the MEA-2 Precision Stereo Equalizer and the MMA-4 (\$3,160) four-channel microphone preamplifier, reviewed here.

FEATURES

Prism's stated goal in the design of the MMA-4 was an audiophile pre-amplifier with a minimum of electronics in the signal path.

The company developed the MMA-4 in association with engineer/producer Leif Mases. Mases is best known for his work with top recording artists including Abba, Led Zeppelin, ELO, Jeff Beck, Scorpions and Black Sabbath. According to Prism, the collaboration with Mases resulted in a circuit design that is of the highest quality and a user interface aimed squarely at the working engineer with regard to ergonomics and ease of use.

The single rack-space front panel is divided into four identical control sections, with the exception of a master power switch and power status LED at the far left. Each of the four pre-amp sections are comprised of a large, stepped rotary switch, three mini toggle switches and a vertical bank of metering LEDs.

The oversized gain control switch features 21 discrete positions, allowing settings from 0 to 60 dB, in 3dB steps. The three horizontally



oriented toggle switches engage 48V phantom power, channel phase reverse and output mute functions. The ten-segment PPM bar graph meter indicates output levels from -30 to +20 dBu with seven green LEDs, two yellow LEDs and a single red LED to indicate clipping.

The rear panel of the MMA-4 includes a set of silver-plated male and female XLR connectors for each preamp channel. A "ground lift" mini toggle switch disconnects the audio ground from the chassis ground. A binding post/banana jack allows the unit to be connected directly to an external grounding point.

The MMA-4's power supply can be switched for either 115- or 230-VAC operation and is rated for 50Hz - 60Hz use. A standard IEC detachable power cable receptacle and integrated fuse holder complete the unit's rear-panel connections.

IN USE

Spartan and simple – just the way I like it! I am a big believer in 'less is more' when it comes to microphone preamplifiers used for critical recording. The Maselec MMA-4 is the poster child of such preamps.

The signal quality of the MMA-4 is extremely consistent across the gain range and as transparent as one could hope to expect from a high-end, test measurement –quality microphone preamp.

A peek inside the MMA-4's chassis reveals the stellar build quality and discrete component circuit design that leads to the unit's ultra-clean signal path. Preamp circuitry features socketed high slew rate op amps, a separate phantom power supply for each channel and a MU metal-encased toroidal power transformer.

In use in the studio, operation of the MMA-4 was absolutely straightforward and

without any complications. The white silk screen labeling over the gray anodized brushed aluminum front panel was easily read from typical control room distances, even in fairly dim "relaxed" situations.

The oversized gain knob provided clear confirmation of each channels' setting, and the 21 discrete steps across the range of the knob made repeatability and multiple channel consistency a breeze. Though the 3 dB steps are a bit coarse, I prefer the simplicity to the added settings complication and circuitry of a fine adjustment control.

After using the MMA-4 on numerous tracking sessions, I found my favorite applications for the preamp was on acoustic recordings – classical guitar, string sections and the like – though it also performed well on drum overheads and a range of percussion elements. The MMA-4's low noise specs and ruler-flat frequency response were most appreciated in solo instrument and small ensemble applications.

SUMMARY

While the value of a high-end, neutral pre-amp cannot be disputed, engineers who favor a range of preamps for the individual color each brings may not find themselves endeared to the ultra-clean Maselec MMA-4.

That notwithstanding, I would be hard pressed to pick a better preamp when it comes to audiophile sound, control-room ergonomics and build quality. Prism and Mases most certainly met their stated design objectives of a consistent sound over the whole range of gain settings, signal transparency and ultra-low noise and distortion.

Stephen Murphy, studio editor for PAR, has produced and/or engineered hundreds of recordings, including Grammy-winning and gold and platinum-selling releases.

Fast Facts

Applications:

Studio, broadcast, live sound, post

Features:

Four-channel; precision stepped gain control; switchable phase; high-current phantom power; output mute; 10-LED PPM bar graph meters

Price:

\$3,160

Contact:

Prism Sound at 973-983-9577, www.prismsound.com.

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BY STEPHEN MURPHY

UK-based Coles Electroacoustics has manufactured and distributed the famous BBC-designed 4038 Studio and 4104B Broadcast ribbon microphones since the late 1960s, when the company inherited the mantle from ST&C (Standard Telephone and Cable).

In the pop studio world, the 4038 microphone achieved legendary status thanks in no small part to its extensive use on classic recordings by The Beatles, Rolling Stones, Led Zeppelin and many others. Contemporary engineers and producers continue to regularly call on the venerable mic for a variety of recording duties.

Last year, Coles announced the introduction of its first original-design microphone, the 4040 Studio Ribbon (\$1,375). The new design retains essential elements of the 4038 and adds several enhancements in sonic performance and physical construction.

FEATURES

The most immediately notable feature of the Coles 4040 is that it looks nothing like its predecessors, or any other ribbon microphone on the market for that matter. Instead of the unique designs that define the Coles mics and the ribbon mic industry in general, Coles built the 4040 within a classic large diaphragm-style body (similar to a Neumann U 49).

Like the 4038, the 4040 has a bidirectional pattern (figure 8). According to the company, the polar response of the 4040 is essentially identical on both sides of the mic, and the pick-up pattern radiates evenly across the vertical

Coles Electroacoustics 4040 Studio Ribbon Microphone

and horizontal axis.

Coles has isolated the ribbon/magnet assembly from the external casing with independent shock mounts. The suspension system can be locked down for transport via two screws on the bottom of the mic.

Coles says that while the 4038 was exceptionally flat from 30 Hz to 15 kHz, the 4040 extends the response beyond 20 kHz. Coles indicates that the 4040 emits no stray magnetic field, making the mic ideal for head-to-head mounting in a Blumlein configuration.

IN USE

Having plenty of experience with the Coles 4038 ribbon mic, I was quite excited to try out the first mic directly derived from its lineage. Upon opening the case, I was surprised to see what looked like a high-end large diaphragm condenser mic. But a peek inside the 4040's heavy casing revealed a familiar ribbon assembly adeptly mounted and isolated within.

I used the Coles 4040 on a number of sessions and in a variety of settings. Being familiar with the 4038, I had no trouble finding appropriate uses in which the new model excelled. By swapping the 4038 for the 4040, I was also able to quickly note any differences.

Right off the bat, it was immediately apparent that the 4040 was the progeny of the 4038. The response and characteristics were similar in many instances, though the 4040 seemed to have a slightly hotter output (always welcome!).

Favorite uses of the 4040 essentially mirrored those of the 4038: trumpet, trombone and other brass instruments were especially flattered by the 4040; overdriven electric guitars sounded great and sidled nicely into complex mixes; when used as a room or overall mic, the transients and punch of rock drums and larger percussion setups shined through the 4040.

Like the 4038, response is uncolored and even throughout the frequency range. Though the top end is extended compared to the 4038, which rolls off around 15 kHz, it is hardly as dramatic as the literature describes.

That may well be a good thing: those well



versed in the general use of ribbon microphones, and with the 4038 specifically, will not be shocked by the modifications. Instead, they will hear pleasing enhancements in output and high-end response that fall somewhere beyond subtle but short of being hit over the head.

Though I tried, I did not find a whole world of new uses open to me as a result of the 4040's extended frequency response. Quickly strummed acoustic guitar still felt mushy and undefined, as with other ribbon mics I have used; however, hand percussion, cymbals and bells fared much better than most ribbons – a little top EQ brought it right in line.

SUMMARY

By any measure, Coles Electroacoustics waited a long time before attempting to improve upon its ribbon mic design. The build and sonic quality of the 4040 Studio Ribbon microphone indicates that the Coles engineers were quite thoughtful in their undertaking.

For those unfamiliar with the complexities and peculiarities of ribbon microphones, the 4040 is an excellent way to start, given its extended range and increased output.

Stephen Murphy, studio editor for PAR, has produced and/or engineered hundreds of recordings, including Grammy-winning and gold and platinum-selling releases.

Fast Facts

Applications:

Studio, broadcast, live recording

Features:

Bidirectional (figure 8); ribbon; internal shockmount suspension; hard shell carrying case including velvet mic pouch and multiple mic stand mounting attachments

Price:

\$1,375

Contact:

Coles/Independent Audio at 207-773-2424;
www.independentaudio.com.

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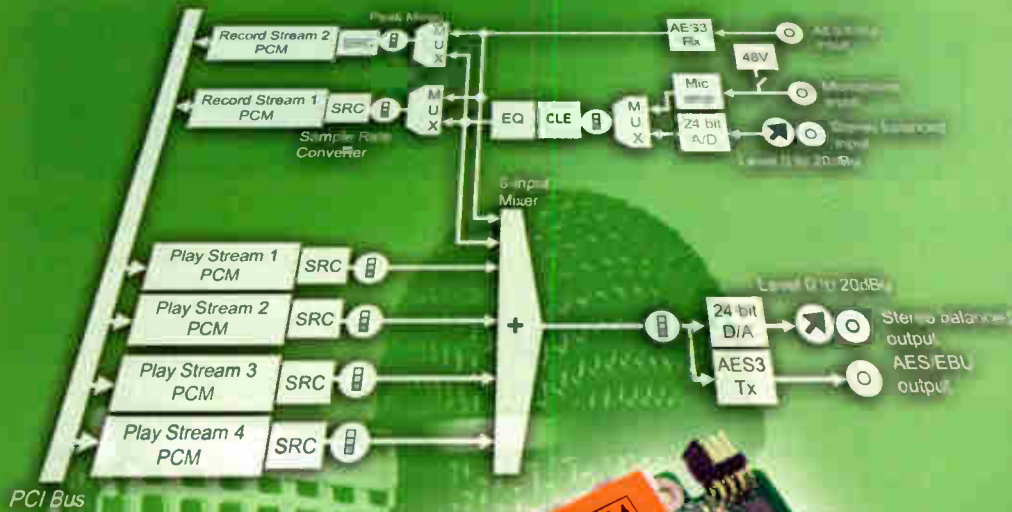
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BY TY FORD

GML 2020 High Resolution Discrete Input Channel

In the momentarily collapsing universe in which the forces of cheaper/faster prevail, the thought of an outboard input channel with instrument, line and mic inputs (a GML 8300 preamp, GML 8200 parametric EQ, GML 8900 dynamics sections) at a list price of \$6,600 (external power supply brick included) might appear squanderous. Having the GML 2020 land at my door meant the gauntlet had been thrown down. Certainly there are other similarly configured input channels to be had for less. Well then, let's see.

I am no stranger to GML designs. I bought a four-channel rack of 8300 GML preamps more than five years ago. They are extremely clean and accurate. They do not particularly care for some of the inexpensive Chinese condenser mics. The circuits are all-discrete, Class A, with no ICs in the signal path. There are no transformers, in or out.

Although there are differences in board layout and the feature set, the preamp in the 2020 is very much the same. I compared tracks using each preamp and the same mic. The tracks were interchangeable.

FEATURES

The preamp section of the 2020 differs from the 8300 in that there is an instrument input, a polarity switch and a more versatile input structure. While the 8300 preamp's lowest gain setting is +15 dB of gain, the 2020 starts at -10 dB. Both go up to +70 dB in 5 dB increments. In the 2020, from -10 dB to +15 dB, the signal bypasses the preamp stage and goes directly to the balancing stage. This feature comes in handy with

FAST FACTS:

Applications:
Studio

Key Features:
Single-channel; preamp section; high-pass filter; four-band parametric EQ; compressor; section order control

Price:
\$6,600

Contact:
GML/TransAmerica Audio Group at
702-365-5155,
www.transaudiogroup.com.



more sensitive mics that may overdrive the input stage of some preamps.

Having run into this once before with a Neumann TLM 103 and another preamp, I put up a TLM 103 and positioned the mic two inches from the grille of a Fender Super Reverb guitar amp. With the Fender's gain to 10, I still needed 10 dBu of preamp gain to get even a +18 dBu reading on the GML input display; not nearly enough to light the 2020 clip LED.

Mic and line inputs of the 2020 do not clip until +36 dBu. The instrument input clips at +20.1 dBu. The clip circuit measures the output of both the EQ and dynamics sections and not the preamp input. The outputs of the EQ and dynamics sections clip above 26.6 dBu.

In addition to the 1 kohm XLR mic input and 1/4-inch 1 Mohm instrument input, the 2020 also has an XLR 20 kohm line input and phantom power switch. Signals may be present at all three inputs without much concern of bleed or leakage. In the worst case, the mic to line crosstalk is -90 dB. Five LEDs comprise the input meter, which ranges from -30 dB to +24 dB.

Following the mic preamp is a high-pass filter selected by a three-position switch providing 40 Hz or 100 Hz 12 dB/octave high-pass filters. A standard GML parametric EQ follows, with four continuously variable parametric sections with sweepable .4 to 4 Q controls that offer ± 15 dB.

The first section offers shelving and/or control from 15 Hz to 800 Hz; the second, 120 Hz to 8 kHz; the third, 400 Hz to 26 kHz and the fourth, 400 Hz to 26 kHz with an additional shelving feature. The EQ processes the audio quite cleanly and with a minimum of artifacts normally audible with lesser circuits.

The next control is a five-position switch that determines the order of the EQ and compressor, whether the side chain input is used and what its input may be. Dynamics may feed EQ, EQ may feed dynamics, and in either case an external side chain signal may be applied to the dynamics section either via the XLR on the rear panel, or from the output of the EQ section itself with both the dynamics and EQ sections receiving input from the previous stage. In this mode the rear panel side chain input is not operational. The 2020 then becomes a self-contained frequency-dependent ducker or de-esser.

We have all grown up and are comfortable with attack, release, ratio, threshold and make-up gain controls and a few "intelligent" program-dependent circuits. Massenburg, however, has felt for some time that these controls are inadequate. He also believes we should all make more use of our own intelligence and ears when it comes to applying gain reduction.

Accordingly, he has created a complex circuitry in which RMS-derived, logarithmic mic control signals and three detectors (Peak, Fast RMS, Slow RMS) are used. In addition, there are seven controls: Threshold, Timing and Release Hysteresis, Fast as well as Peak Crest Factor, ratio and output. A companion DVD ships with the 2020. On it is a video in which Massenburg describes several typical operational modes of the 2020 for both tracking and mixing.

Getting acquainted with these controls and how they change the dynamic range is a challenge because the changes can be very subtle and happen without some of the distortion artifacts that most of us have come to expect from most compressors. I was able to make audio sound anywhere

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Telefunken North America would like to express our deepest appreciation to the members of the A.E.S., the Mix Foundation, and all of our loyal customers for the 2003 TEC Award in Microphone Technology/Studio.

► GML from page 22

from transparent to very dense to truly horrible without much effort.

The manual and DVD tutorial do not do justice to the capabilities of the dynamics section. I have heard from a number of knowledgeable audio folks who, upon initial exposure to the GML 8900 Dynamics controller, have simply furrowed their brows saying, "Huh?" Most of us encountered fractions, Geometry and Trig in school. Had I not bailed on Calculus, perhaps the science behind the dynamics section would be more apparent to me. Do not expect to get the most out of the dynamics section on day one, but it will come to you as you use it.

Mr. Massenburg and I had several conversations about the intricacies of the dynamics section. The back and forth was too lengthy to be included in this article, but can be accessed in my Online Articles Archive; <http://www.jagunet.com/~tford>.

In Use

I plugged into the 1/4-inch front panel instrument jack my semi-acoustic Telecaster

with humbucking pickup and then my D28 S Martin with Gold+ piezo saddle pickup. Unexpectedly, even without EQ or gain reduction, both instruments sounded as though I had strung them with heavier strings: bigger, broader and without losing any top end. I have tried a number of instrument inputs over the years; none have given me this effect. I have never heard either guitar sound the way it did through the instrument input.

A friend showed up with a vintage Guild F212XL 12-string acoustic modified with a piezo pickup under the saddle. His reaction was the same as mine: bigger strings. The Guild sounded so huge that it would require EQ tailoring to make it fit within most arrangements.

SUMMARY

I would add different colors to the number scales that ring the concentric controls. Even though the rings are of slightly different radii, having all numbers in white makes for difficult reading. After a month or so of regular use and if you are doing everything "by ear,"

the numbers become less significant.

Given the number of precise controls, it would be nice to have the ability to recall settings. Use the new digital camera you just got for Christmas to make snapshots.

The preamp, EQ and dynamics sections of the GML 2020 comprise a very powerful tool set for tracking, mixing and mastering. Linking functions provide for multiple units to be used.

The 2020's extra controls do allow for a wider palette of options. If you have ever fought with a mix in an effort to get tracks to fit without sounding ugly, you are a likely candidate for the GML 2020. The fact that you can use the 2020 during tracking for a gentle squeeze without crushing the audio further increases its usability. It is equally capable of transparent peak limiting which is essential for use in front of A/D converters and for containing highly dynamic vocals and other sources during tracking. My advice? Try one, and be patient with yourself as well as its learning curve.

Ty Ford may be reached at www.jagunet.com/~tford.

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BY RUSS LONG

Focusrite ISA 220 Preamplifier/Processor



Holding true to the original vision for Focusrite, the ISA 220 “Session Pack” offers an uncompromised recording channel with a bandwidth of 10 Hz to 150 kHz. The box includes a mic/line preamp, equalizer, compressor, de-esser and limiter. There is also an optional A/D card available (I reviewed the box with the optional A/D). The mic preamp is the classic Focusrite transformer-based design found in the ISA 110, the Red 1 and the Red 8, the EQ is the same as that found in the original ISA 110 and ISA 215 with the exception that the shelving EQ has four positions rather than six and the compressor and de-esser are the same circuits found in the ISA 430. The box’s digital option, also the same as the ISA 430, provides a high-quality digital route direct from the ISA 220 into a digital recording system

FEATURES

The rear panel of the 9.8-inch deep, 15.4 lbs, 2RU rackmount ISA 220 has a wide variety of connectors that easily adapt to nearly any recording or mixing situation. Two female XLR connectors provide mic and line input and a 1/4-inch TRS jack provides a Hi-Z input. A front panel-mounted 1/4-inch TRS jack also provides a Hi-Z input. A male XLR connector provides signal output.

The microphone and line inputs are transformer balanced with +4 dBu operating levels and a maximum input level of +26 dBu. The instrument input is unbalanced with a -10 dBV operating level and a maximum input level of +10 dBV.

The “Internal A/D Direct Input” 1/4-inch jack is used to route an external signal directly to the A/D card via the limiter. It is fed to the left channel of the A/D card and thus it

replaces that channel’s signal feed to the A/D card. This allows another audio path to make use of the ISA 220’s A/D card.

The “External A/D Input” routes an external signal to the A/D card via the limiter. The signal is fed to the right side of the A/D card and does not affect the left channel signal. By using this input, two ISA 220 units can be used to create a stereo recording channel.

The 1/4-inch TRS “Dynamic Link” jack allows two ISA 220 units to be connected with the compressor sections linked to behave as a single stereo unit. The ISA 220 generating the larger control voltage is the controller.

The VU Select switch toggles the VU meter between monitoring input gain and compression. The O/L (overload) LED illuminates when the peak signal level reaches or exceeds +20 dB, or when the peak signal level reaches 6 dB below clipping. The two 16-segment Digital Output Meters monitor the signal after the limiter but before the A/D input.

At the input stage the select button steps through the three input options (mic, line, instrument). A corresponding LED illuminates to show which option has been selected. When the mic input is selected, the gain range is set from 0 dB to +30 dB, in 10 dB steps or +30 dB to +60 dB, in 10 dB steps if the “30-60” switch is activated. When the line input is selected, the gain range is set from -20 dB to +10 dB in 10 dB steps. When the Instrument Input is selected, gain changes can be made only with the trim control that provides +10 dB to +40 dB of additional gain. When the mic or line input is selected, the trim control provides an additional variable gain of 0 dB to +20 dB.

At the EQ Module, the All EQ switch places the entire EQ module, including the high and low-pass filters, in the audio path. The Filter In switch inserts the high and low-pass filters into the audio path. Both filters provide an 18 dB/octave rolloff. The low-pass filter is variable from 400 Hz to 22 kHz. The high-pass fil-

ter is variable from 20 Hz to 1.6 kHz.

The “Param EQ” switch inserts the parametric equalizer into the audio path. There are two separate bands of parametric EQ, each with a continuously variable boost/cut (center detented), a sweep control with two ranges and a variable Q control. The first band is adjustable from 40 Hz to 400 Hz (120 Hz to 12 kHz when X3 is pressed) and the second band is adjustable from 600 Hz to 6 kHz (1.8 kHz to 18 kHz when X3 is pressed).

The Shelving EQ switch inserts the shelving equalizer into the audio path. The high and low-frequency shelving sections each have a continuously variable boost/cut (center detented) and a four position rotary switch that selects the rolloff frequency.

The Comp In switch inserts the compressor into the signal path. The ratio control, which determines the ratio by which the signal is compressed, is variable from 1.5:1 to 10:1. The threshold control, which is variable from -28 dB to +12 dB, determines the level at which the compression begins. The attack control adjusts how quickly compression is applied once the level of the source signal has risen above the threshold and the release control adjusts how quickly the compression is removed once the level of the signal has fallen below the threshold. Pressing the Auto Release switch makes the release time automatic, substituting an adaptive attack/release circuit, which varies the release rate to suit the dynamics of the signal. This enables the use of fast attack times without any “pumping” type artifacts.

The compressor is normally featured post-EQ. Pressing the Comp Pre EQ switch makes the compressor pre-EQ. Also featured in the compressor section is the Blend function. This feature allows smoother compression at more extreme settings. When engaged, Blend allows the uncompressed signal to be combined with the compressed signal. This retains a variable level of dynamics from the original source

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Fast Facts

Applications:

Studio

Key Features:

48V phantom power preamp; compressor; two-band parametric EQ; limiter; de-esser; VU meter

Price:

\$1,995, optional A/D card, \$525

Contact:

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Mitch Gallagher, Editor EQ Magazine

"Soundwise, I was very impressed that the V69 could hold its own against an industry standard like the U47. It struck me as very versatile and of higher quality than other budget tube condensers."

Pete Weiss, Tape Op Magazine



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► *Focusrite from page 26*

while still offering control of the dynamics. This operation simulates the practice of mixing compressed and uncompressed signals on two separate channels of a mixing console. The variable Make Up control restores the gain lost due to the signal's compression.

The de-esser, which is located just prior to the output section, combines threshold dependent EQ and phase cancellation, allowing the user to transparently remove excessive sibilance from a vocal performance. The De-Ess In switch activates the de-esser circuit. The variable threshold control determines how much de-essing is being applied to the selected frequency. The variable frequency control, which is adjustable from 2.2 kHz to 9.2 kHz, selects the frequency to be removed. The de-esser's active LED illuminates when the de-esser is active at the selected frequency and as the level reduction increases, it shines more brightly.

The Limit In switch activates the multiband limiter. This limiter has three separate fixed frequency bands, each with different limiting properties, to provide low-distortion limiting. The Limit-in LED illuminates when the limiter is active. An upper threshold is fixed at

+20 dBu to prevent overload of the internal (or an external) A/D converter. The limiter's active LED illuminates when the limiter is processing audio. The limiter's output control adjusts the ISA 220's output gain between -60 dB and +6 dB.

The digital option, which is user-installed, adds a high quality stereo A/D converter to the 220's list of features. A high quality 24-bit, 96 kHz delta-sigma converter running at 128 kHz oversampling is the core of the card. Focusrite proprietary designs are used for all internal clocking and phase lock loop circuits guaranteeing the lowest amount of jitter possible.

On the front panel, the Clock Select switches among 44.1 kHz, 48 kHz, 88.2 kHz and 96 kHz. The Bit Rate Select switch chooses 24, 20 or 16 bits. The ext select switch toggles between Ext and Ext/SC. Selecting EXT slaves the ISA 220 to an external word clock source and selecting EXT S/C slaves the ISA 220 to an external Digidesign Superclock source. The Lock LED illuminates to show the unit is locked to an external clock.

The A/D card adds several connectors and switches to the rear panel. Two BNC connectors allow the box to lock to word clock or Pro

Tools' Superclock. Three digital output connectors provide output via AES/EBU, S/PDIF, and/or two-channel optical.

The level switch determines whether a 0 dBFS reading on the meter corresponds to +20 dBu or +24 dBu. The 75 switch terminates the incoming word clock signal with a 75 ohm resistor.

IN USE

After opening the ISA 220, I was a bit frustrated when I realized that I was going to have to install the A/D card myself. After popping off the box top, I promptly realized that the installation was a piece of cake and in less than 10 minutes I was ready to rock using both the analog and digital outputs.

The ISA 220 works extremely well with drums and percussion. I had great results using the box along with an AKG D112 on kick drum and with a Shure SM-57 on snare. The box sounded wonderful coupled with a Royer R-122 to record percussion. As an experiment, I tried using the ISA 220 to record kick drum with an SM-57 (the world's worst kick drum mic) just to see what it could do. I was stunned
continued on page 56 ►



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Miking the Acoustic Guitar

BY BRUCE BARTLETT

The acoustic guitar has been a featured instrument on countless records and is still popular today. It has a delicate, beautiful timbre, which can be captured through careful mic selection and placement.

Before I give some miking suggestions, remember that there is no one right way to mike any instrument. It all depends on what results you want and what compromises you have to make. Do you want an accurate recording or an enhanced one? Do you want the instrument to sound close or distant? Will leakage force you to mike close? Clearly, there is not a single technique that does it all.

Mic Choice

First we will select a microphone. Generally a condenser mic has better transient response (more detail) and flatter response than a dynamic. A popular mic choice for the acoustic guitar is a cardioid condenser micro-

phone with a small diaphragm (under 1-inch diameter). It is usually end-addressed and has a stick shape. Thanks to its low-mass diaphragm, such a mic tends to have excellent clarity and detail. In recordings made with this microphone, you can hear each string being plucked within a strummed chord. Large-body guitars, especially, can sound great with a small cardioid condenser.

If the guitar has a small body and is weak in the bass, you might prefer a large-diaphragm condenser mic. Typically, this type has a 1 1/4-inch diaphragm and is side-addressed. Most large-diaphragm cardioid condensers have a deeper low-frequency response than small ones, and this extra bass can help add some bottom to a small guitar.

Another microphone choice is an omnidirectional condenser mic with a flat frequency response. This mic sounds neutral. Also, an omni microphone has no proximity effect (up-close bass boost), so its tone quality stays the same at any distance.



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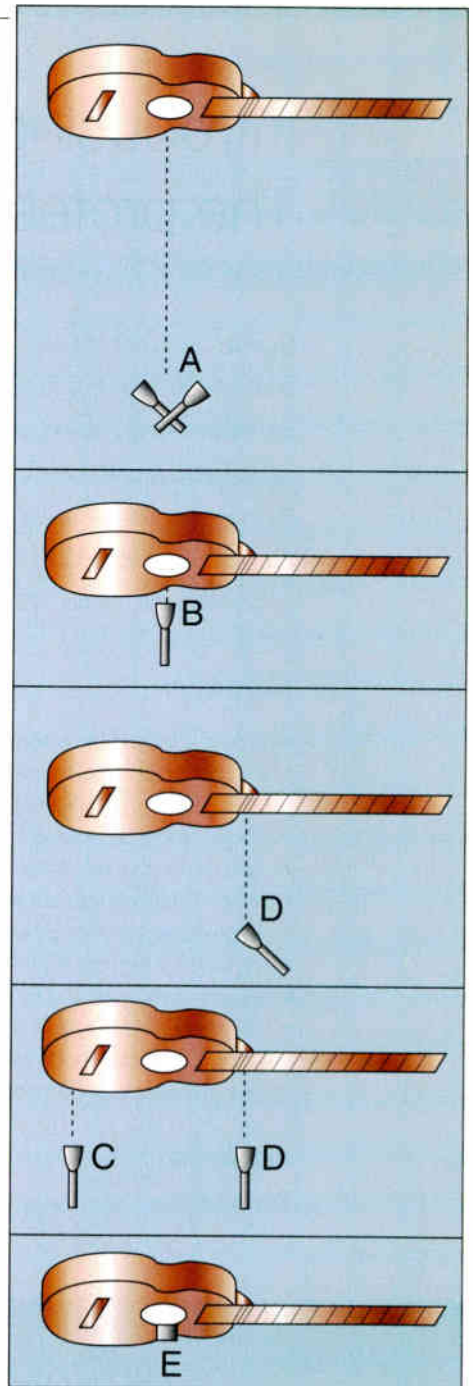


Figure 1. Some mic techniques for acoustic guitar.

A miniature omni mic can be attached next to the sound hole, providing a warm sound with good isolation in live situations.

PREPARATION

Once you have chosen a microphone, prepare the guitar for recording. To reduce finger squeaks, try a commercial string lubricant, a household spray wax, talcum powder on fingers, or smooth-wound strings. You might ask the guitarist to play louder; this increases the "music-to-squeak" ratio!

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World Radio History

► *Guitar from page 30*

Replace old strings with new ones a few days before the session. Experiment with different kinds of guitars, picks, and finger-picking to get a sound that's right for the song.

TECHNIQUES

When you are ready to record, have the guitarist play the guitar as you listen to it live. That is the sound you are trying to duplicate over your monitors (assuming you want a natural, hi-fi sound). Plug the mic into a preamp, and monitor on headphones or speakers.

Experiment with miking distance. As the mic gets closer to the guitar, the sound becomes clearer, more dry, more free of room acoustics. Close-miking aids isolation, but tends to sound a little harsh and aggressive. Distant miking lets the instrument "breathe"; you hear a more gentle, open sound.

If you want to hear some room reverb, put the mic far enough away to pick it up — maybe 3 to 6 feet. You might use this method to record a classical guitar solo in a recital hall. Try a stereo pair, such as XY, ORTF, M/S, Jecklin Disc, SASS, or a spaced pair (Fig. 1-A).

If you want a tight sound with a lot of presence (for pop or rock music), mike closer —

about one foot or less. Using an omni mic, you might hear too much room reverb or leakage at this distance. If so, switch to a cardioid.

As you get closer than about 18 inches, you start to hear whatever part of the guitar the mic is near. With the mic close to the sound hole (Fig. 1-B), the tone is bassy and thumpy — not like the real thing. The sound hole resonates around 80 Hz, so if you put a mic there, you hear this bassy resonance. Close to the bridge (Fig. 1-C), the sound is woody and mellow.

Is there a spot that sounds natural? Yes. Many engineers would agree that a good position is about 1 foot from where the fingerboard joins the guitar body — at about the 12th fret (Fig. 1-D). That's a good starting point for capturing the acoustic guitar accurately. Still, you need to experiment and use your ears. Another natural-sounding mic position is near the player's right ear, with the mic aiming down at the bridge.

The guitar will sound more real if you record in stereo. Try one mic near the 12th fret, and another near the bridge (Fig. 1-C, 1-D). Pan left and right.

If you need good isolation, tape a mini omni mic onto the body, at the edge of the sound hole (Fig. 1-E). This position sounds

bassy so you might want to roll off some lows on your mixer's EQ.

TAMING FEEDBACK AND LEAKAGE

If feedback or leakage are a problem, you will have to mike the guitar very closely. You could place a mic near the sound hole where the volume is loudest (Fig. 1-B, 1-E), and turn down the bass on your mixer until the sound is natural. If necessary, cut a little around 3 kHz to reduce harshness.

Another way to prevent feedback and leakage is to use a guitar pickup. Compared to microphones, many pickups have an "electric" sound. But some of the bridge-mounted piezo pickups sound surprisingly natural. You could mix a pickup with a mini mic that is mounted in or near the sound hole. The pickup provides volume while the mic adds some "air" to the string sound. A useful trick for live sound is to feed the pickup only to the floor wedges (where feedback is worst), and feed the mic only to the house speakers. Turn up the aux send (monitor send) on the pickup channel but do not assign the pickup to an output bus. On the mic channel, do not turn up the aux send (monitor send). Assign the mic to an output bus.

To prevent leakage in the studio, overdub the acoustic guitar rather than recording it simultaneously with guitar amps and drums.

SINGER/GUITARIST

Suppose the performer sings and plays guitar at the same time. You put one mic on the vocal and one on the guitar, then mix the two together. Often in this case, the vocal sounds thin or filtered due to phase cancellations between the vocal mic and guitar mic. This can happen whenever two mics pick up the same source at approximately equal levels, at different distances, and both mixed to the same channel. Try one of these methods to solve the problem:

* Record the guitar first, then overdub the vocal (if the performer is comfortable doing that).

* Use directional mics and place them 3 inches or less from the mouth and guitar. Angle the vocal mic up and angle the guitar mic down to isolate the two sources. The sound will be bassy due to proximity effect, so roll off the excess bass at your mixer.

* Use a pickup or mini mic on the guitar.

* Delay the vocal mic about 1 millisecond. This will put the vocal-mic signal in phase with the vocal picked up by the guitar mic, which is about 1 foot farther from the mouth than the vocal mic is. Some multitrack

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BY RUSS LONG

Recording Acoustics Direct: The Larrivée A6/A2 B-Band and the Taylor Expression System

The direct outputs on acoustic instruments have been traditionally reserved for live performance, while engineers and producers have continued to prefer the natural sound of microphones for recording these instruments. A new trend towards higher-quality pickup systems has the potential to change this. I had the opportunity to use guitars equipped with the Larrivée/B-Band A2 System and the Taylor Expression System and in both instances was thoroughly impressed.

LARRIVÉE/B-BAND

The new A6 System is the flagship of B-Band onboard side-mount preamps. This system is used on the 05 Series (Select Mahogany Series) and the 09 Series (Rosewood Artist Series). The A6 provides two signals, the first is the UST (Under Saddle Transducer) and the second is the AST (Acoustic Soundboard Transducer). The front plate of the A6 provides individual gain controls. Slide controls are used for the three-band EQ, the UST/AST mix control, and the volume. The rotary Notch Depth and Notch Frequency controls allow the control of feedback suppression.

The system also includes a push-button phase control and an LED indicator that notifies the user when the battery is low. A two-way output provides both a mono mix and a separate AST signal.

The Larrivée LV-09 guitar I tested (\$2,200) was equipped with the B-Band A2, the system. Larrivée uses on its 10 series higher-end guitars. Although the A2 system has no onboard controls like the A6, it uses the same two-pickup system and provides two signals via a 1/4-inch TRS jack. Both outputs are compatible with virtually all onboard equipment inputs. Unlike the A6 System, the A2 allows a UST/AST combination without creating a large cavity on the side of the instrument.

The thing I like about the Larrivée system is having the ability to create my own blend between the AST and the UST.

TAYLOR EXPRESSION

The new Taylor Expression System or ES is a standard feature on the Taylor 500 Series (tested on a \$3,200 514CE) and higher number instruments. Regardless of how loud the instrument is played or how hard

the attack, this system is claimed to make an acoustic guitar sound like a real live acoustic guitar at any volume, and it does just that.

For a generation the name Neve has been synonymous with fantastic sounding audio. Most engineers would agree that Rupert Neve is one of the best audio circuit designers ever. When it came time to begin development of the Expression System, Taylor's David Hosler enlisted Neve.

The two decided to take a fresh look at a branch of magnetics that had never been applied to the acoustic guitar. From sensor to preamp to power supply, the duo rethought every aspect of amplified sound and how a Taylor instrument behaves when it resonates. After extensive experimentation with laser-scanning, measuring, and charting the vibrations in the bodies of acoustic guitars, Bob Taylor, David Hosler, Rupert Neve, and the rest of the ES team applied their results and new audio design concepts to create Taylor's patented new pickup system and preamp.

THE AUDITION

Both guitars show huge advancements regarding the direct recording of the instrument. I first recorded the guitars via microphone. In the studio, the rosewood Larrivée had a mellow, warm tone that sounded both full and defined. I recorded the instrument with my AKG C28 and it sounded fantastic.

Getting a usable sound from the direct out was a little bit trickier. I found that after tweaking them through my GML 8200 parametric EQ, I was able to blend the two into a very usable stereo sound.

The beautiful cedar top Taylor 514 acoustic guitar that I tested looked and sounded fantastic. I also recorded the Taylor with my AKG C28 which worked wonderfully. The Expression's direct out also sounded good. As a matter of fact, I actually recorded the Taylor using one mic and the direct out instead of using two mics.



Taylor 514CE

When sitting in front of the monitors with the signals panned to 9 and 3, the artist, the producer and myself found it extremely difficult to tell which was the direct and which was the mic. The ES system faithfully reproduced every nuance of a performance, including subtle picking, hand dynamics and stylistic performance techniques.

I found that one of the advantages of the Expression's magnetic system, in contrast to a piezo pickup, is its resistance to feedback. When I plugged the guitar directly into an amp, I had to turn the amp up significantly before I had any feedback, even when standing directly in front of the amp.

CONCLUSION

If you've never considered recording an acoustic guitar direct via its electronics because of the sonic limitations, it might be time to reconsider. The Larrivée and the Taylor both offer quality sounding alternatives to miking the acoustic guitar. The Taylor Expression system is downright amazing in its natural warm sound and its ability to reduce feedback.

For more visit www.larrivee.com and www.taylorguitars.com.

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World Radio History

BY TOM JUNG

Over the past five years or so all of my recording projects have been done with DSD (Direct Stream Digital), which I have to say has changed the way I approach recording, especially as it relates to microphone choice and placement.

In the late 1970s when PCM was in its infancy I found it necessary to make changes in microphone types and technique. In my opinion these kinds of changes in practice are due to the coloration or lack of in the recording format itself. An example of this is the use of ribbon microphones with PCM. Ribbon mics with their smooth but not so extended top end are more PCM-friendly as they start to roll off just about when PCM starts to get ugly. The resulting rolloff can appear to have less harshness and more believable accuracy in the upper frequencies. This ugliness is less of a problem when higher sample rates are used with PCM and pretty much nonexistent with DSD.

Analog tape, still the format of choice by many engineers has its own coloration or



Notice the Decca-Tree setup using five Shure KSM 32 mics.

warmth that is hard to duplicate unless you actually record to tape. Some engineers do a great job at making microphone choices based on the anticipated coloration of the analog record/play cycle. PCM digital poses yet a different set of coloration challenges totally unlike that of analog tape or DSD and requires almost the opposite solutions as it applies to microphone choices as mentioned above.

Due to its minimal coloration, good harmonic detail and overall accuracy, DSD has led me in a direction of using far less microphones on all of my most recent surround SACD projects. Minimalist might even be an understatement

Minimalist Surround Miking

here as these projects have nothing more in the per channel signal path than a good microphone and pre-amplifier straight into a high quality DSD A/D converter.

I've recorded literally hundreds of two-mic stereo records in my career having varying degrees of success with the failures mostly due to bad rooms and less than perfect ensemble internal balances. So when I started thinking about doing minimalist surround projects I tried to find good acoustic spaces and musicians and singers who could understand that these were not fix it in the mix kind of projects (I'd like to think I've learned a bit from all of my mistakes).

Minimalist miking can be much more of a challenge than multimiking for obvious reasons, however when the right venue, the right musicians, the right equipment and engineer come together, the outcome has the potential of delivering that magic that we all strive for. A lot of engineer friends I talk to agree that much of today's music is over compressed and way too much in your face. With the exception of some classical records you don't hear much real acoustic space around instruments, which to me, is an important element in the sound of an instrument and the in overall sound of the recording.

One of the neat things about the minimalist approach to recording is that it tends to not sound like just another record but more like what music really sounds like in a good live setting.

Recently I was asked to consultant on a project in New York City where a live recording was being made at a club called The Living Room. A traditional multimic approach was used to record a six-member band called Ollabelle. The Living Room is owned by Steve Rosenthal who is an engineer producer and also runs a recording studio in SoHo called The Magic Shop. The performance space in the club measures about 30 x 40 feet with a nice high ceiling. Steve, being the fine engineer that he is, spent a good deal of time with acoustical treat-

ment getting the Living Room to sound just right, not too live or too dead but the kind of an intimate room you would like to hear smallish ensembles in. A pair of ATC three-way powered monitors were installed in the club for PA and only used for vocals and softer instruments; no drum mics or any electric instruments are fed to the ATC system. The sound in the club is about as nice as I have heard in any small venue. Cymbals sound so nice live.

The reason I got the call to help out on this recording was to try and capture the listening experience as if you were sitting in the club, for upcoming SACD release. After visiting The Living Room and listening to a few groups in the audience I decided to go for a surround Decca-Tree set up using five Shure KSM 32s, which have a very smooth response with extremely low noise and distortion. The Decca Tree I use is very flexible and made by Audio Engineering Associates. If you would like to learn more about the Decca Tree, AEA has a descriptive and informative manual for download at their website, www.wesdooley.com/pdf/DeccaTreeD2.pdf

Since the basic Decca Tree for stereo uses three forward facing microphones it lends itself perfectly to surround recording by assigning these three mics to LCR. The left and right microphones are placed 2 meters apart and the center mic is 1 meter forward on the tree. I mounted the LS and RS mics on the ends of the bars just outboard of the front L & R mics giving me a 2.5-meter spacing for the surrounds. The Tree with all five microphones was flown from the ceiling so as not to interfere with the audience and it looked pretty cool too.

Listening to the tree in the five-channel monitoring setup we had located in the basement of the club seemed to place you in the club, even to extent it made me thirsty for an adult beverage. The tree also mixed nicely with the close mics so that you could dial in the amount of presence you wanted on individual instruments. The five-channel Decca Tree along with the 14 or so close mics were recorded to a Genex GX 9048 DSD recorder with EMM Labs A/D converters. Nice.

Tom Jung is Pro Audio Review's technical consultant.



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WE SHIP WORLDWIDE

BY CARLOS GARZA

Emagic is one of the oldest and most respected names in the field of MIDI and digital audio workstation (DAW) applications. Best known for Logic, the company also has a line of studio software, soft synths and a sample playback plug-in, EXS-24. The Emagic hardware line includes USB audio and MIDI interfaces and Logic Control.

Logic Platinum 6.1 is the first major release since the German company was acquired by Apple Computer in July of 2002. While Emagic has not shut out their OS 9 users with Logic 6, they are clearly making the migration to OS X an attractive option.

FEATURES

All three versions of Logic support MIDI and digital audio recording. Logic Audio is the entry-level product. Logic Gold supports a higher number of tracks and more advanced notation. Logic Platinum is the flagship product and adds support for Digidesign's TDM and HD hardware. Emagic also provides more plug-ins with the higher-level products.

Logic 6 under OS 9 maintains compatibility with a large number of hardware audio interfaces through its support for Mac AV (Sound Manager), EASI, ASIO, Digidesign Direct I/O, DAE and Audiowerk. In OS X, Apple has embedded some of the functionality of these drivers and audio engines into its Core Audio driver specification.

Digidesign's Core Audio driver functions

Fast Facts

Applications:

Digital audio recording, mixing, processing

Key Features:

Support for Pro Tools hardware, OS X, new Channel EQ, track grouping, Project Manager, DV movie playback on FireWire, sample accurate audio display

Prices:

Logic Audio Big Box - \$239; Logic Gold - \$499; Logic Platinum - \$699

Contact:

Emagic/Apple at 530-477-1051, www.emagic.de.

Emagic Logic Platinum 6.1



like Direct I/O in OS 9. This lets you use your Digidesign hardware for recording and playback while using Logic's native audio engine. If you want to use your TDM plug-ins in Logic and run the signal processing on an HD, Mix or Farm card, you can use the DAE driver.

Users of Pro Tools HD hardware can use the PTHD plug-in to record tracks at up to 192 kHz sample rates. The Emagic System Bridge (ESB) lets you create tracks with a native audio engine and Digidesign Audio Engine (DAE) in the same song. With this option, you can use the native audio engine to add tracks and plug-ins when the TDM system is at full capacity.

Apple and Emagic provide tools to help get your basic MIDI and audio settings under control. In OS X, this starts with Apple's Audio MIDI Setup (AMS). Yes, you no longer have to choose between OMS and FreeMIDI.

The Logic Setup Assistant streamlines audio driver settings and the configuration of tracks and instruments. It combines functions that are otherwise spread across several menus. New in version 6 is the Project Manager. It is designed to be a knowledge base of project-related files on your system. It keeps track of which songs use which audio files, samples used by EXS-24 instruments, QuickTime movies and plug-in settings. The "Save File as Project" option collects all audio files, QuickTime movies and samples used in a song into a single location for archival or delivery.

Audio tracks with a lot of plug-ins can consume valuable processor time. The Freeze function solves this by storing processed audio on disk. Tracks can be stored in 16-bit, 24-bit or 32-bit (float) representations. The tracks can be "thawed" if audio edits or plug-in changes are needed. Speaking of edits, Logic now provides a sample-accurate waveform display.

Video support? Logic 6 supports a floating video window as it did in earlier versions.

If you would rather dedicate a computer monitor to the video, you can do this by command-clicking the video window. Logic expands the picture to fit the monitor. Video

thumbnail images can be enlarged by click-dragging the thumbnail track as you would to enlarge any track. Preferences allow you to set the space between the frames and zooming in on the timeline shows more frames.

The Track EQ in version 5 has been replaced with the new Channel EQ. This eight-band equalizer has high and low-pass filters as the outermost bands, shelving equalizers as the next bands in and four bell or peaking equalizers in the middle. Clicking on the equalization display curve, which doubles as a control, can change most of the parameters. Pivot points that show up as you hover over the line can be grabbed with the pointer to change the Q with up and down movement and change the frequency with side-to-side dragging.

Logic Platinum provides more than 50 native plug-ins. In OS X, you also have a choice of several Apple AU plug-ins. The Logic plug-ins include an assortment of dynamics processors including the Multipressor multiband compressor. Also included are delays, reverbs and some unique filters and distortions.

The track window now allows grouping of tracks for simultaneous control of volume faders and mutes. The groups function also allows simultaneous editing of multiple tracks.

IN USE

I tested Logic Platinum 6.1 on a dual 1 GHz G4 Mac with 1 GB of RAM, a Pro Tools HD1 and a 96 I/O. I also used Emagic's emi 6|2m audio interface, an Emagic amt|8 MIDI interface and an Emagic Logic Control. I ran Logic under OS X.2.6 and OS 9.2.2. Pro Tools 6.1 was also installed along with Digidesign's Core Audio driver 1.2.

It was a quick task to add the amt|8 to the MIDI setup using AMS. MIDI keyboards and modules are attached graphically to the MIDI interface with virtual "cables" similar to OMS. My only complaint with Logic in the MIDI department is the complexity of selecting

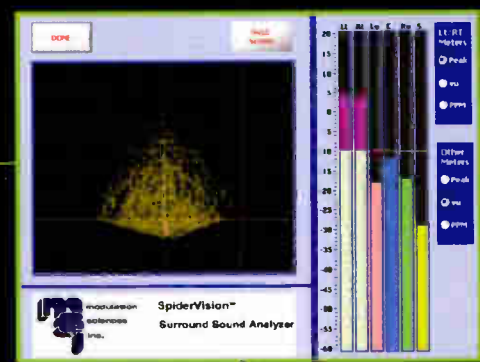
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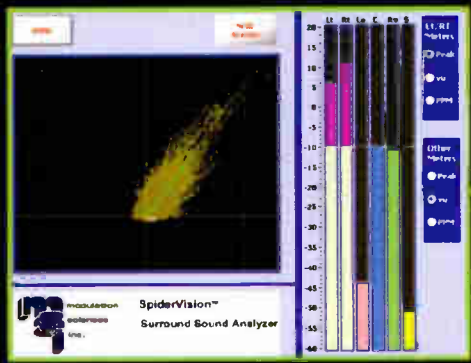
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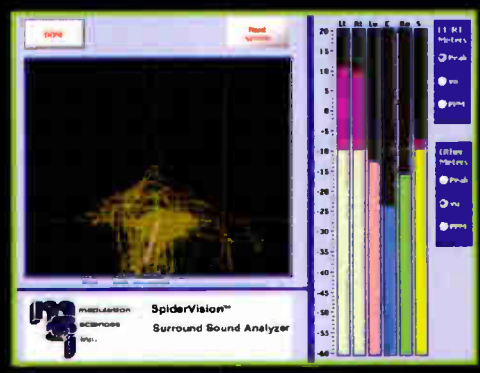
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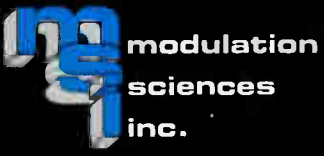
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FEATURES.

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► *Emagic from page 38*

synth patches. This was a whole lot easier in Studio Vision (RIP).

The visual enhancements in Logic 6 are a step in the right direction, but the real value is in the sound. Logic continues to provide an impressive array of signal processing plug-ins with the product. There are several new algorithms in the time compression/expansion function. Emagic has optimized algorithms for pads, rhythmic material and drum beats.

Logic Platinum gives you a lot of sound-shaping power. The EQ and dynamics plug-ins are especially strong. If you are looking for some unusual electronic effects, Logic has you covered with some useful automatic filters and six distortion plugs.

Comparing the Multipressor to some of the multiband compressors on the market is not really fair, but it did tame my busiest mixes with minimal effort. The reverbs are more than adequate, but if you are fussy about your

reverbs, you may want a third party plug-in or an outboard unit.

The Channel EQ is the most complete equalizer I have seen in a DAW and has one of the most intuitive and informative interfaces I have seen in any product. Having a real-time analyzer in the EQ display makes it easier to identify the frequency you want to work with. Who wants to read numbers when you can look at the sound? The graphical interface with Q control is useful and fun.

The flexibility in video window-sizing, support for tempo computation between markers and FireWire playback support make Logic an ideal scoring platform. Speaking of scoring, Logic continues to have the strongest notation package I have seen in a MIDI sequencer.

I will not go into all the add-on synths, but will say that EXS-24 is by far my favorite. Having all the sounds in the sequencer is a lot easier than looking through stacks of zip disks and its ability to ingest my Akai sample library is a big plus.

I was also pleased to see a bounce option for MP3 files. You would not want to master your songs in this format, but for quick and portable reference mixes, it is very useful.

SUMMARY

Logic combines many professional features in a flexible package. The upgrade to Logic 6 should be considered for anyone moving to OS X or thinking about getting into a Mac for music production.

Given the amount of work Apple has done on the MIDI and the Core Audio architecture, it is clear that Apple wants to grow its market share in professional audio production with OS X. A full comparison of OS X to OS 9 is out of scope for this article but suffice it to say that the operating stability and enhanced support for dual processors are two good reasons to think about OS X. As we went to press, Emagic announced release of Logic 6.2, which includes support for the 64-bit architecture of the G5.

Carlos Garza operates Pepperland Recording in Springfield, Virginia, where he engineers and composes surround scores for independent and classic silent films. He is also a Senior Technologist for the Recording Industry Association of America (RIAA). The opinions expressed in this review are solely the opinions of Garza and do not reflect the opinions of the RIAA. The RIAA takes no position on these products.

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NEW PRODUCTS

Big 3 Entertainment of St. Petersburg, Fla. has added two ATI Paragon II boards to its facilities. One will perform FOH duties while another will cover rehearsal spaces. Matchbox Twenty's tour is using a Paragon II Production board. And the Grand Ole Opry is keeping it in the family by contracting a custom 64-input Paragon II Production console to replace its older ATI P40 console.

Microsoft used three InnovaSON Grand Live digital consoles for a recent Global Briefing in New Orleans. ATK Audiotek handled the sound which also used 84 JBL VerTec speakers.



British sound contractor SSE Hire Limited has ordered five InnovaSON Sy80 digital consoles. On tour with Ben Harper in Europe are a pair of Grand Lives (see picture of engineer Derek Van Ord at one of the consoles).

Beach Sound of Miami provided 12 L-Acoustics V-DOSC speaker rigs (with four dV-SUBs) to the Chene Park amphitheater in Detroit as its main sound system for the summer show season.

Southeast of Detroit, in Columbus, Ohio, the Columbus Symphony Orchestra used Audio-Technica AT4050, AT4040, AT3035, AE5100 and AE3000 microphones during its summer season. FOH engineer Mick Hughes chose A-T's AE5400, AE2500, ATM35, AT4050 mics and an Artist Elite 5000 wireless system for use with Metallica on tour.

Peavey CS Amplifiers

Peavey's CS line isn't new but these additions to it are. These two-channel amps feature several redesigns of the basic CS along with improvements in performance. Each amp has level controls, variable crossovers, variable low-pass filters, DDT speaker protection and LED meters. Twin dual-speed front-to-back cooling fans are heat activated. I/O features combo jacks, Speakons and binding posts. Power output ranges from 250W @ 4 ohms to for the smallest (CS 800H) to 2,150W @ 2 ohms for the heftiest (CS 3000H). Prices start at \$799. Contact: Peavey at 601-483-5365, www.peavey.com.



Rane MM 42 Monitor Processor

The MM 42 from Rane is a stereo/dual mono processor designed for handling personal and in-ear monitor mixes. It includes a three-band compressor, five-band



parametric EQ, a three-band peak limiter, high and low-shelf/cut filters. Settings can be saved in one of 16 memory locations. Also onboard is a headphone amp. The MM 42 is linkable with other MM 42s for larger jobs. Price: \$999. Contact: Rane at 425-355-6000, www.rane.com.

Allen & Heath ML3000 Console

Following in the footsteps of the larger ML5000, Allen & Heath's new ML3000 offers frame sizes from 24 mono inputs to 48 mono inputs (with 2 stereo inputs). The mic preamp is standard 48V with 20 dB pad, phase reverse with sweepable high-pass filter. Channel EQ consists of a four-band EQ with sweepable mids. The desk also includes an 8 x 4 matrix, talkback function, and LCR panning. It can pull either FOH or monitor duty. Price starts at \$7,199.



Contact: Allen & Heath at 800-431-2609, www.allen-heath.com.

Audio-Technica AEW-DA660D UHF Antenna Distribution System

Its name might be a jumble and its purpose vague for most and decidedly unsexy to those who know what it is but Audio-Technica's AEW-DA660D UHF Antenna Distribution System is a very useful product to many. The 660D is a UHF (655 – 680 MHz) antenna distribution system with capacity for four UHF wireless mic receivers and two antennas. In these days of crowded racks, the rackmountable 660D can make efficient use of space and paired with a useful antenna it can enhance wireless reception. Price: \$959. Contact: Audio-Technica at 330-686-2600, www.audio-technica.com.



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- Balanced XLR & TRS I/O
- Universal internal power supply
- Extensive multi-mode metering
- Real knobs!

quad gate

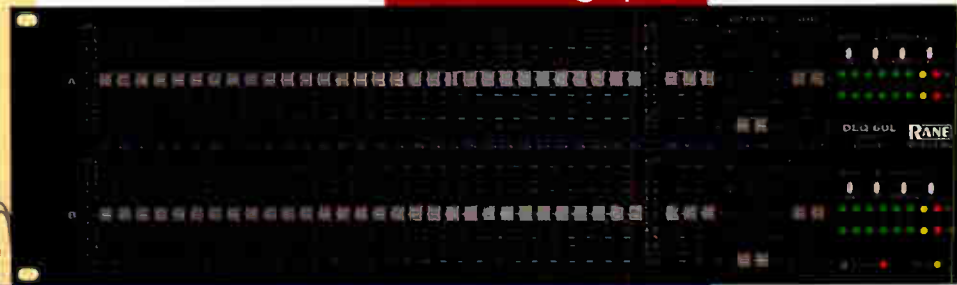


NEW!

DEQ 60L

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- 25 mm DEQ 60 sliders: 45 mm DEQ 60L sliders
- Full 12 dB Cut-only mode on DEQ 60L
- Separate Accelerated-Slope™ 3-band full-cut tone controls
- Separate High- and Low-Cut filters
- Stereo linking
- A/B curve comparison

Perfect-Q™ graphic



DEQ 60

DEQ 60L

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- True de-essing
- External Side-Chain with balanced/unbalanced TRS input
- Side-Chain Listen, PEQ filter and metering
- Stereo linking
- Universal internal power supply
- Real knobs!

quad compressor*



C4

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- Alignment delays
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4-way crossover



AC 24

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BY EDD FORKÉ

Any “live sound” guy always has uses for wireless mics, whether for voice or instruments. The flexibility and freedom afforded by “wirelessness” is high on the list of sound reinforcement must-haves. Any new wireless mic that comes along, especially one by Electro-Voice, is going to get a hard look by the live sound types, however....

I’m not an audio equipment freak – meaning I don’t really care about looks, “cool,” what’s hot, trendy, etc., but rather, how user-friendly, reliable, hassle-free and capable the equipment is. I am big on functionality and simplicity, set-it-and-forget-it is perfect for me. If I can get through a show without any component calling attention to itself - “disappearing” so to speak, while in use - that’s what I want. In that context, the RE-1 (starts at \$1,490) certainly didn’t disappoint.

FEATURES

The new RE-1 Series Wireless Microphone System is a programmable frequency agile system with what Electro-Voice calls Advanced ClearScan, a scheme that scans all (user) defined frequency groups to find the ones with the greatest number of receiver channels that are clear of interference and then looks to find the best channel within that group.

The RE-1 system I tested consists of a receiver that is programmable in 25 kHz steps across a 24 MHz operating bandwidth, creating over 950 possible channels. Finding a clear channel is virtually guaranteed. Electro-Voice’s Advanced ClearScan is an automatic group and

Electro-Voice RE-1 Wireless System

channel selection feature that allows a quick setup of a clear channel. Electro-Voice’s patented DSP Posi-Phase Diversity System is said to maximize range and audio quality. The audio quality was simply superb, and the range... I’ll take their word for it since I never managed to get far enough away in any venue for it to cut out.

Electro-Voice has incorporated a three-function “Sound Check” mode that allows one person to walk-test the microphone in the performance space with results that are displayed on the receiver screen. The Sound Check display, accessed on the receiver’s menu screen, has a peak hold audio meter that allows you to set the transmitter gain to the maximum signal-to-noise ratio. Second, there is a Squelch Break Counter that tells you to back off if you are pushing the range or if you may run into interference problems. Third, a “Hi-Low RF” (radio frequency) meter lets you know if you have satisfactory coverage in the performance area.

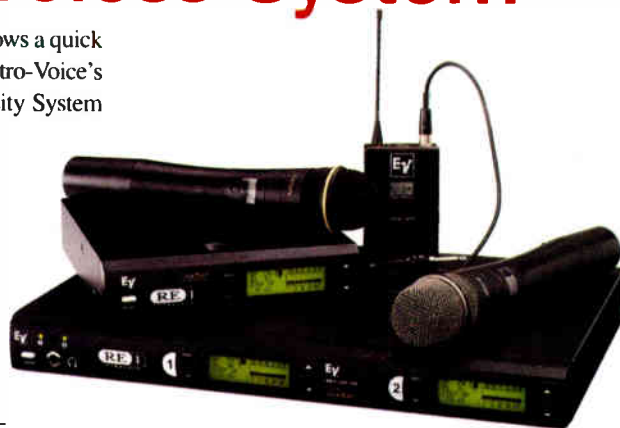
The receiver’s front panel (where else) display is a backlit LCD-type display that shows the Group/Channel you are operating on, the transmitter battery status, Posi-Phase Diversity System status and RF and audio level meters. There’s even a space for a “custom label.” You can put the name of whomever is using whatever mic. If you are on the road a lot, you could, I suppose, put your wedding anniversary as a reminder. This might stave off your future ex getting 3 dB of everything you have worked for.

The receiver’s output choices are balanced XLR and a 1/4-inch unbalanced adjustable line level output. Rackmount hardware is included.

There is an LCD display and the same four control buttons as the receiver for channel or frequency programming.

There are “low battery” LEDs that light when the battery is, well, low. And, you can check the battery level whenever you turn on the transmitter.

There is an on/off switch that “acts as a mute” (don’t they all?) but I take this to mean that it doesn’t pop or click when turned on/off, which my unit did not, at least not audibly, which is what counts. The on/off switch can



also be disabled, which is cool. If you have ever had a mic go off at, of course, the worse possible time in a performance, and people look over at you, the sound dude, you will appreciate this feature. Even if it was the performer’s fault, if they’re on their toes, they will shoot you a look, confirming that everything’s your fault. You won’t have to put electrical tape over the switches anymore.

The handheld mic features Interchangeable microphone heads which allow a choice of elements to fit a vocalist’s style and environment. The N/DYM 767 head is “a premium dynamic vocal mic with VOB (Vocally-Optimized Bass)” that which provides “excellent gain before feedback for high SPL stages.” The wired version of this mic is my wife’s personal mic.

The other mic head is EV’s “new RE510 premium condenser vocal microphone for experienced vocalists, spoken word and quieter stages.”

There is an internal 1/2-wave antenna which is nicer than the little external cell phone-looking antennas that I have always found to be visually distracting, seeming to amplify the hand movements of the performer... just a personal quirk, I suppose, but I certainly prefer the more pro look of the EV.

Finally, the handheld mic uses EV’s comfortable “Over-molded Warm-Grip” which feels nice and reduces handling noise.

The bodypack features a cast magnesium housing that is light and very solid feeling. It definitely does not share the feeling of lesser quality bodypacks that, when squeezed, squirm around like a plastic garage door remote control unit. In fact, squeezing hard and twisting

Fast Facts

Applications:

Live sound, installation

Key Features:

Handheld and bodypack transmitter versions; ClearScan frequency finder; Posi-Phase diversity reception; dual-band compander; choice of capsules for handheld transmitter; George L solderless cable for guitar/bodypack

Price:

Handheld transmitter package - \$1,550; beltpack transmitter - \$1,490.

Contact:

Electro-Voice at 800-667-3968, www.electrovoice.com.

with both hands did not elicit a creak or crackle. These things are very solid, yet nice and lightweight. You could probably drive over it and it would survive.

The bodypack comes with a cell phone-style beltclip that is detachable via a spring-loaded button. This makes a very secure clip that will not accidentally pop off when pushed up from below. My cell phone is now under the back seat of some Vegas cab because of the lack of this very feature. Optional pouches are also available for hiding the bodypack under costumes. This will be appreciated by performers allergic to duct tape adhesive.

EV also has a wide selection of lapel and headworn microphones and accessories to go

I could really go on about all the features, functions and adjustments available to tailor the RE-1 to the specific environment, but that would take the whole magazine, and I'm way over my allotted word count already.

The multitude of singers provided a great test for the RE-1 system but especially the mic sound qualities. I used both the handheld and lav or lapel mics. My choice (I got to make the call) depended on the experience of the vocalist in using a handheld mic. Some of the singers had never sung in public or handled a mic. Right! Those people got "assigned" the lapel mic.

The sound quality for either mic was superb - clear, intelligible and natural. I am very famil-

The sound quality for either mic was superb - clear, intelligible and natural.

with the RE-1 bodypack transmitter. Guitar bodypacks are also available which has a mic/instrument switch that adds a 20 dB pad in the transmit path so the standard bodypack can be used for microphone and guitars. Also, a dual-band compander circuit provides the audio bandwidth required to cover the lows of a bass guitar to the highs of a solid body. And, of course, a patch cable to hook into your guitar.

Fit and finish on all components are first rate and exude quality and professionalism.

IN USE

A local "cabaret" doing a two-night performance offered a good chance to put the RE-1 through its paces. To evaluate the ease of setup (or not), I decided to go through the "Quick Set-up" procedure in the manual, as someone might do when using the RE-1 for the first time. This is a one-page, follow-the-numbers procedure for the receiver, the transmitter, and then the system as a, um, system. The whole procedure took four minutes. Three minutes to read the step-by-step and one minute to actually do what it says.

The ease of setup allowed me extra time to play with the many functions of the RE-1, in particular, the "Sound Check" mode. Not surprisingly, this function worked exactly as described in the manual. This is a really helpful feature takes some of the guesswork on system setup.

iar with the sound I could expect from the loudspeakers, etc. so the only component changed in my system was the RE-1. RF Interference never was an issue, but probably wouldn't be in Maine. I think I own 50 per cent of the things that run on electricity in Maine, so I'll just say that it's not a complex RF environment.

I did change the RE510 condenser mic head for one vocalist, picked at random, but luckily, turned out to be, by far, the best of the group. Luckily, because I could really evaluate the condenser mic with someone who could really bring out its best, which it did - oh-so-clear, airy, detailed, precise. The airy part might have been her, a Rita Coolidge smoky voice-type. Later, I played a recording of her performance on my home Magnepan ribbon speakers - what a great compliment to the RE510 condenser. If something isn't very "right," it'll sound lousy on the Maggies. If something is great, it will be magic on the Magnepan.

SUMMARY

The RE-1 system is a very high quality, very well constructed and well thought out wireless microphone system that would be on the A-list for any sound reinforcement use. The programming flexibility and sound quality are among the best systems I've used. Highly recommended!

Edd Forké is a sound reinforcement engineer specializing in gospel music.

"Awesome — and I don't use that word often!"

—George Massenburg - Producer/Engineer

"A winner!"

—Lester Smith - Abbey Road Studios

"Bright and open with an extended low end."

—Joe Chiccarelli - Producer/Engineer



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Large
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—Tim Pak - Woodshed Studios



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BY WILL JAMES

MIPRO ACT-707D

Dual Channel Wireless Microphone System

Since I was not previously familiar with the MIPRO Electronics Company, and I had heard some good things about some of their products, I was eager to explore this new product, the ACT-707D wireless mic system.

FEATURES

The MIPRO system consists of five pieces: the ACT-707D, a two-channel diversity receiver, an ACT-707HM metal handheld UHF transmitter/mic, an MU-53LX lavalier mic, an MU-53HNX headworn mic and the ACT-707TM metal beltpack UHF transmitter for the lavalier and headworn mics.

The dual-channel receiver is an attractive and easy-to-read unit, with the front panel containing an RF signal presence/strength meter and a modulation meter, both in a blue LCD bar graph side-by-side, on both channels of the receiver.

Directly next to the meters is the main function display, surrounded by the various controls. These controls include the Menu control, which allows you access to the Group/Channel, frequency and volume of the received signal and the naming of the particular setting. Directly above the Menu button is the ACT button, which provides a means of automatic channel selection and alignment between either of the transmitters and a channel of the receiver. There is an infrared window and sensor combination that will allow the transmitter and channel of the receiver to actually "see" each other by placing them at a set distance apart. They will run a scan of the available frequencies and lock into each other, all in about five seconds.

The handheld microphone of the MIPRO

rig is a comfortable unit to hold, containing a proprietary supercardioid mic capsule, with each handheld color-coded to readily identify differing frequencies. The handheld also has a legible display, that tells you the battery strength, the group and channel, and any possible errors in programming. The on/off switch is located on the very bottom of the handheld mic/transmitter, turning on and off the mic capsule as well as the actual transmitter. It is concealed by a snap-on cover. The battery door is threaded, removing from the bottom to open the battery compartment that houses two AA batteries.

The beltpack transmitter offers the same LCD display as the handheld mic, and is located on the very front above the hinged battery door. Inside the battery door are the level and sensitivity gain controls, and the housing for the two standard AA batteries. On the top of the MIPRO 707 beltpack is the mini four-pin connector for either the lavalier mic or the head worn microphone, the on/off switch, and the antenna.

The headworn microphone is also proprietary, as is the lavalier mic. And both are of a cardioid pattern. The lav comes with a tie-tack type clip and a three-foot cable with the four-pin connector at the end. The waterproof headworn mic is worn by shaping rubber-coated earhooks around your ears and held secure with a wire band around the back of the head.

IN USE

I brought the MIPRO wireless rig to several concert shows at Harrah's casino. Harrah's is an RF-heavy environment, with tons of UHF radios and other wireless mics in use, so this was a good test of the onboard RF frequency analyzer. At our show with Tanya Tucker, we employed the MIPRO as a backup wireless for the star (she was carrying her own primary RF system), and the product delivered as promised, by aligning both the transmitter and receiver in five seconds. The electronic path was smooth with no interference or other frequencies drifting in. We further employed the mic system with The Marshall Tucker Band and Steve Wariner on other occasions. Each time, the



MIPRO handheld mic performed flawlessly, with the proprietary capsule sounding warm and succinct, requiring similar amounts of monitor EQ as many other RF rigs we have used. There were no noticeably blaring frequency problems. The handheld was stable and responded with complete predictability in the supercardioid realm. Additionally, it handled fairly high SPL quite nicely, never flattening or overloading when used with screaming vocalists (names withheld to protect the guilty).

I tested the wireless lavalier mic and belt-pack combo on numerous occasions with novelty acts at fairs and festivals, and several said that they actually preferred the MIPRO to whatever rig they were currently using. Here again, the RF signal path was very lean, with no adjacent channel interference. At a very high-end fashion show the emcee wore the headworn mic, comfortably and completely unnoticed. It blended into her evening attire very nicely. The sound quality of the lav and the headworn mic was exceptional, with plenty of warmth and clarity, and it was extremely manageable in close proximity to speaker clusters and systems.

SUMMARY

The MIPRO wireless rig is an exceptional value in the world of affordable wireless rigs. I was most impressed with the ease of programming, the quality of construction, and the dexterity of sound replication. I found the RF path and electronics to be of very good quality, with excellent rejection of outside RF, and very quiet while idling. I said in the beginning of this article that I was unfamiliar with MIPRO products, but I would now like to see and hear more of the company's equipment.

Will James, owner and chief engineer of Atlantis Audio and Lighting, is a contributor to Pro Audio Review.

Fast Facts

- **Applications:**
Live sound, broadcast
- **Key Features:**
UHF system; dual channel receiver; Autoscan; headworn, lavalier mics; beltpack, handheld transmitters
- **Price:**
Single and dual systems range from \$555 to \$1,920
- **Contact:**
MIPRO/Avlex at 877-447-9216,
www.avlex.com.

VISION

The high frequency section features a titanium compression driver coupled to an elliptical horn with a 1" throat. The horn design controls dispersion more accurately and sounds more natural than conventional square horns.

The midrange device is a titanium compression driver coupled to a proprietary horn with a 2" throat. The non-planar walls eliminate the sharp edges that cause distortion, and common horn resonances.

All VISION™ models feature heavily braced, roadworthy construction utilizing 18mm Birch. A heavy duty polyurethane finish protects the enclosures from the rigors of professional use.

Proprietary cast-frame aluminum woofers with high temperature voice coils are utilized for low frequencies. Delivering 800 watts of continuous power handling, these transducers feature an optimized motor design and suspension geometry.

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Now you can experience high performance in one of its most powerful and elegant forms. Vision™ is Cerwin-Vega's all-new flagship lineup with more of the features, performance and value that you've been looking for. Five completely new designs specifically developed for live sound reinforcement and non-engineered sound applications.

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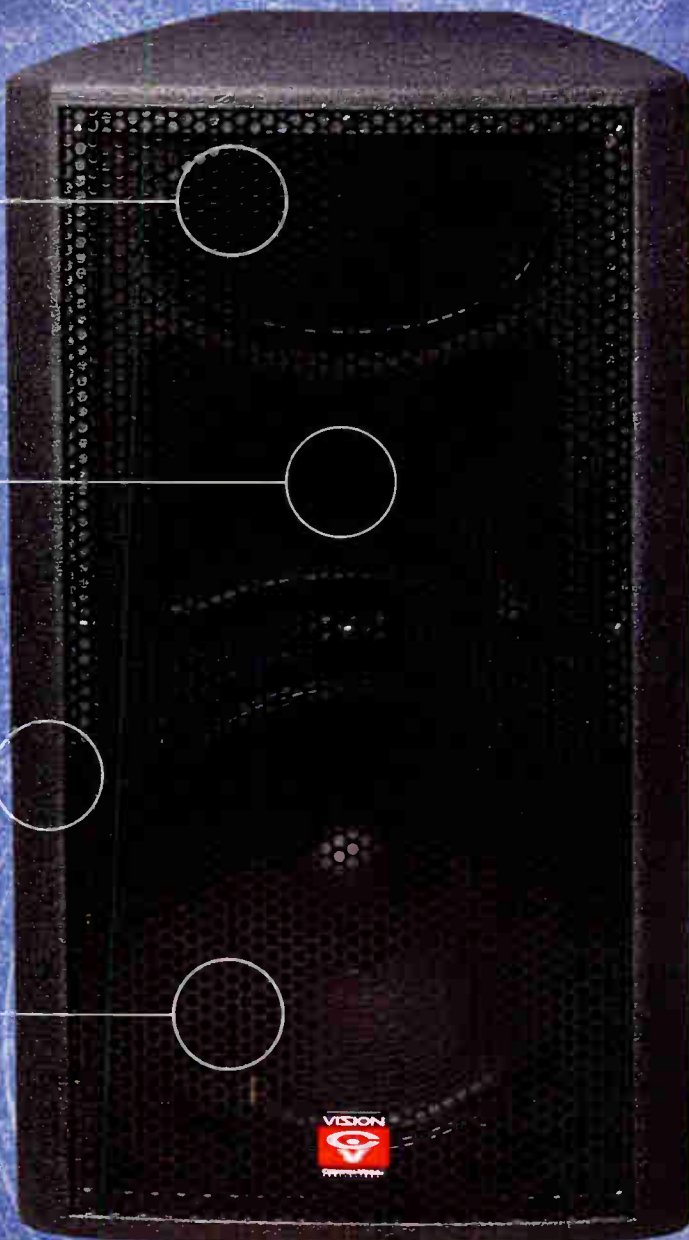
VegaGrip™ handles are ergonomically designed for maximum comfort.



Full-range models feature ATM® brackets for structural integrity. An ATM® truss bracket is available as an option.

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Cover Your Assets (C.Y.A.) is our 24/7 customer service guarantee. If for any reason your system goes down, we'll ship you a component replacement for next day delivery.



VIS-DSP

The VIS-DSP is a 40-bit speaker management system with two inputs and six outputs. The unit offers parametric equalization, crossover filters, high/low shelving filters, limiter and delay.

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BY TOM YOUNG

Sound Down Under



I recently had the opportunity to mix front of house for Tony Bennett and k.d. Lang in Australia as part of the Wonderful World tour, supporting the platinum selling record of the same name. The tour, promoted by Paul Dainty dc Touring, consisted of eight sold-out shows at the Melbourne Concert Hall, Brisbane Concert Hall, and Sydney Opera House. Performances were also held on the Footy Grand Final TV show in the Rod Laver Arena. The Australian Footy Grand Final is the equivalent of the American Super Bowl. Working in the three best concert halls in Australia provided the opportunity to record each show in great acoustic environments.

THE BASICS

The promoter hired Ian Morrison as production manager and Simon Hardiman as audio systems tech. I had previously met Simon at the Queens Jubilee in London doing monitors, while mixing FOH for Tony Bennett. Grant McAree, k.d.'s longtime front of house engineer, handled monitors on the Australian tour for both acts, while I mixed FOH for k.d. to maintain consistency between both. After advancing the tour with the production manager, we decided we would carry a Midas Heritage console, two Meyer Sound CQ-1 speakers, two MSL-4 flown side-fill speakers and Klark Teknik DN 360 equalizers for monitors for all the shows. An additional outboard rack for FOH consisted of a BSS 901 frequency compressor, Klark Teknik DN 3600 EQ, Lexicon 480XL, Yamaha SPX 990, dbx 160 compressors, and a Pendulum Audio compressor for Tony and k.d.'s vocals.

The tour started with three shows at the Melbourne Concert Hall. With its spectacular interior painted in the colors and patterns of Australia's mineral deposits, the three-level hall seats 2,600 people. The musicians for the tour were Clayton Cameron on drums, Paul Langosch on bass and Gray Sargent on guitar. Lee Musiker (for Tony Bennett) and Teddy Boroweicki (for k.d. Lang) shared the piano and musical direction for the shows. The PA system consisted of a high-powered left/right with all Meyer Sound speakers: four MSL-4s,

one CQ-1, two DS-4Ps and two PSW-6 subs per side. A center cluster flown above the stage had three MSL-4s and two CQ-1s, two UPA-1Ps and two UPA-2Ps. Additionally, three delay clusters were flown in the auditorium to fill in the areas shadowed by balconies, consisted of Meyer CQ-1 and PSW-2 speakers. This well designed system also had Meyer UPM-1P speakers for front fill and under balcony fills.

Alignment and control for this comprehen-

show. Having one band for both performers was great for monitor placement consistency and also helped at FOH creating a uniform sound that worked for both artists. It was decided during rehearsals, k.d Lang would use her usual AKG 535 mic for her solo portion of the show and a Sennheiser SKM 5000 wireless with a Neumann KK 105 capsule (Tony's microphone of choice) for all the duets.

I found matching the two mic elements was not too difficult as both are condenser elements with similar characteristics in the vocal mid-range. The KK 105 is definitely smoother in the bottom and top end. However, k.d has such a great vocal instrument, she would sound incredible on any microphone.

Working with these two great singers was a unique experience. K.d Lang works downstage at the stage apron, so she is very sensitive to the house sound. Tony Bennett is also sensitive to the combination of stage and house sound as he first began to sing even before monitors and was used to hearing the house sound coming back. They both have the best ears of any I've worked with.

During sound check, k.d uses her voice like a tone generator and sweeps her voice to hold a note or frequency that she hears that sounds unpleasant onstage. Using the BSS 901 and a 1/3-octave EQ on her vocal subgroup, I would notch the unwanted frequencies.

Starting this tour in the Melbourne Concert Hall couldn't have been a better choice. The ability to dial in the mix on the acts and band in a great sounding concert hall, proved a great start to a very successful run. Technically, this facility is one of the best I have worked in on any continent. From a comprehensive sound system and a great split system for recording to the excellent crew, we were on our way to making history in Australia.

To be continued...

Tom Young is live sound engineer for Tony Bennett.



The Melbourne Concert Hall

sive system was done with six BSS 9088 Sound Webs with a BSS 9010 remote and laptop PC running "Sound Designer and RMS." The FOH mixing console was a 56 channel Amek Recall II with eight Rupert Neve modules. A BSS MSR 604 II active mic splitter was located off stage left, which enabled splitting the microphones for stage, FOH and record.

John Schauer from Yamaha America introduced me to his Australian counterpart, Gary Compson, who loaned the tour an AW 4416, 16-track mixer/hard disk recorder with CD burner to record all shows.

REHEARSALS

We rehearsed two days prior to the shows in a rehearsal room at the concert hall with the artists working out the duets they would perform during the show. Tony's band also learned k.d. Lang's material for her solo portion of the

"This is not your *ordinary, average* microphone."

Joe Walsh - guitarist for
The Eagles & just an
ordinary average guy

Bob Heil, pioneer innovator of live sound reinforcement systems for such greats as The Who, The Grateful Dead, Joe Walsh, Peter Frampton, and countless others has been carefully listening to broadcast engineers, industry professionals and talented performers for many years. Bob has now allied his vast knowledge and 37 years of experience into his new line of high quality microphones and audio hardware.

The introduction of this new product line marks the birth of the new PROLINE division at Heil Sound, Ltd. It is documented in recent product review's that the new Heil dynamic microphone element has raised the bar for dynamic microphone technology.

This latest Heil technology captures every note and feeling with brilliant, natural articulation. Clean, clear, condensor-like sound produces an exceptional rich, warm sound. The most beautiful and affordable microphone ever... The new Heil GOLDLINE PRO.

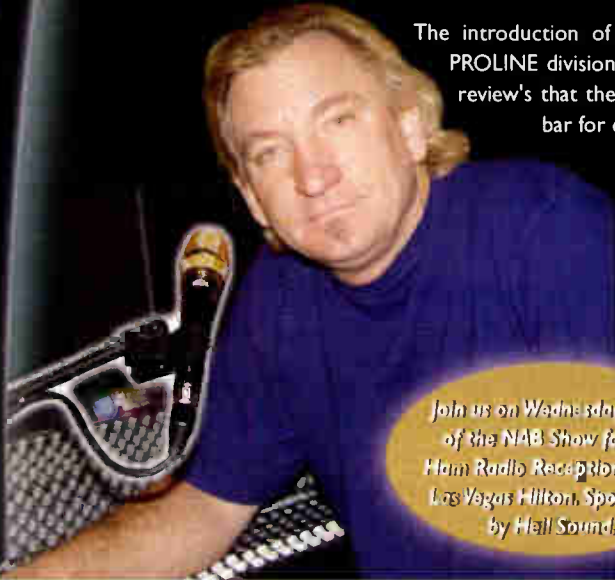
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NEW PRODUCTS

DiGiCo has announced the sale of its 100th D5 digital console – this one to Christ Church of the Valley in Peoria, Arizona. The sale was handled through Southern California Sound Image.

Cresting the waves of the high seas, **Crest Audio** has provided a V12 console for use aboard Celebrity Cruise Lines' cruise ship, Millennium (see picture).



Down South, the University of Miami's marching band needed help at its Orange Bowl home. Alum George Feldner of sound contractor Gig's Up came to the rescue with several **Sound Physics Lab SPLtd-1** speakers and two SPL BassTech 7 subwoofers deployed in mobile configurations. And SPL's trik speakers were brought in to solve seriously deficient acoustic problems at Flowery Branch, Ga.'s Blackshear Place church.

The Small Theater, a not-so-small theater at the Conference Center for the Church of Jesus Christ of Latter-Day Saints in Salt Lake City, has installed three **Lake Technology Contour** speaker processors to handle an installation of **L-Acoustics dV-DOSC** speakers and a **Yamaha PM1D** digital console. Installation was handled by Poll Sound.

In a coincidental but completely unrelated story, Ohio-based sound contractor Eighth Day Sound is using Contours on several tours, including Good Charlotte.

Shure Microflex MX692/C Wireless Boundary Microphone

Doing away with limiting cables and the drilling of furniture-damaging holes, Shure's Microflex MX692/C is a wireless boundary microphone. The magic is provided by an onboard Shure frequency agile UC wireless system transmitter with a choice of 100 channels across two frequency bands. The low-profile unit offers a removable grille, 9V battery fuel gauge a programmable logic switch. The MX692/C is compatible with other Shure Microflex capsules along with UP and UHF wireless systems. Price: \$798.

Contact: Shure at 847-600-2000, www.shure.com.



Community Loudspeakers SH462 Horn System

Community Loudspeakers is not afraid to design something that looks unusual. The new SH462 horn system is an array based on Community's new Focused Array technology. The whole system features four M200A two-inch exit compression drivers mounted into a unitary 60 x 20 degree Focused Array waveguide horn. The horn is constructed of weather-resistant laminated fiberglass. Maximum output should top 143 dB between 400 Hz and 8 kHz. Price: \$1,165.

Contact: Community Loudspeakers at 610-876-3400, www.loudspeakers.net.



Juice Goose JG11-20A Power Distribution Center

The JG11-20A from Juice Goose is a 20 Amp power distribution unit. It features

11 outlets – one unswitched on the front and ten on the rear (one also unswitched), a 15-foot cord, front-mounted fuse and basic power conditioning. Price: \$126.

Contact: Juice Goose at 713-772-1404, www.juicegoose.com.



Radian Audio RMW-1108 Floor Monitor

Radian Audio's MicroWedges just keep getting smaller. The RMW-1108, the latest and smallest addition, is a two-way floor wedge monitor with an eight-inch woofer for the low end and a one-inch compression driver for the high end. The dispersion pattern is 90 degrees. The specs include 100 Hz – 20 kHz frequency response and a sensitivity of 95 dB 1W/1m. Inputs and outputs are Neutrik NL4 Speakons. Price: \$1,075.

Contact: Radian Audio at 714-288-8900, www.radianaudio.com.



THE IDEAL INDUSTRIAL AUDIO SOLUTION



WHAT ARE THE TWO BIGGEST HEADACHES IN PROVIDING AUDIO FOR CORPORATE-INDUSTRIAL EVENTS? **SPACE & TIME!**



If you've ever provided sound for a corporate event, then you know that audio usually gets the "short end of the stick". Because scenic or lighting designers drive most events, you typically get the least amount of space and setup time. Yet, who is first to hear complaints if it doesn't sound great? You are.

Here's a solution that combats these challenges. QSC's ISIS speaker systems are designed specifically to address all that corporate audio demands:

- *Lightweight, attractive composite enclosures for quick, easy handling*
- *Multifunctional cabinet and waveguide designs that cover a wide range of duties—fly, stack or pole mount—for FOH or monitors*
- *Very small footprint—very high output*
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- *High-powered, self-contained plug and play systems—no amp racks, outboard DSP, or system EQ needed. Connect your source and AC power—it's showtime*

You owe it to yourself and your company to audition these systems today. You'll agree, they are indeed, "The Ideal Industrial Audio Solution." For more information, visit our website (www.qscaudio.com), call toll-free 800-854-4079, or visit your authorized dealer.

QSC[™]
HEAR THE POWER OF TECHNOLOGY

BY WAYNE BECKER

There are many challenges facing the audio/video contractor today. One such challenge is the distribution of audio and video signals over long distances. And with the advent of the DVD player, the awareness of video quality has been heightened. No longer will users have patience with ghosting, grainy pictures and other anomalies caused by poor or improper signal management. The BVD-10 (\$250) and BVR-10 (\$250) A/V distribution system by AudioControl is a solution that can help.

FEATURES

Utilizing CAT-5 cable as its distribution method, the BVR/BVD system actively balances and distributes video and stereo audio signals over a distance of up to a quarter of a mile. The system is comprised of a driver and a receiver, each powered by a local 24V wallwart power supply. The power supply connects via a Phoenix connector. The manual states that for remote installations, the units will operate on 12V while only slightly affecting the audio headroom. The driver/receiver modules are housed in black, painted steel cases with punched wall mounting tracks, making them easy and quick to mount to any surface. The driver module provides connections for stereo audio on phono jacks, two composite video inputs on phono jacks and one S Video jack.

The units are connected using Category 5 data cable through the modular CAT-5 jack located on both units. It is important to observe all typical CAT-5 wiring practices and avoid any noise-generating sources such as lighting power supplies, florescent lights, motors and the like. You can use any standard network wiring as long as it does

AudioControl CAT 5



Balanced Video/Audio Driver and Receiver System

not run through any routers or hubs. The wiring must be connected directly from the driver to the receiver. If you need to extend the signal over 1,000 feet, you can extend it by using a second set of drivers and receivers. The system is capable of extending two composite video signals or one S Video signal. In applications where you need to extend a component video signal, you can use AudioControl's new similar product, the BVD-20 and BVR-20.

It is possible to connect a composite video signal on one end to an S Video output on the other as well. Adjustments to audio and video signals are made using trim pots located on the face of the units. The driver has an audio gain trim ranging from unity to +20 dB and a cable compensation trim ranging from 0 to 1,000 feet. The receiver has an audio gain trim ranging from min to 0 dB and video gain trim ranging from min to +6 dB. A power indicating LED is provided on both units.

IN USE

Out of the box, it was very apparent how the system gets connected. I plugged in the wallwarts and connected them to the driver and receiver modules. I then connected a Sony DVD player to the driver module via the S Video and stereo audio connectors and the receiver module to a Panasonic 32-inch TV monitor via the composite video

Fast Facts

- **Applications:**
Installation, A/V presentation
- **Key Features:**
CAT 5-cable system; two video and one audio channel; up to a quarter-mile range; locally or remotely powered
- **Price:**
\$250 each
- **Contact:**
AudioControl at 425-775-8461, www.audiocontrol.com.

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and stereo audio connectors. I then connected the driver and receiver modules through 1,000 feet of CAT-5 cable. I put in a DVD (Tim Burton's *The Nightmare Before Christmas*) and, voila! Instant video and sound. The image seemed to be very crisp.

As a test I connected the composite video



output of my DVD player to the Video 2 input on the monitor. I then switched back and forth between inputs. I noticed that the BVR/BVD system using the S Video was crisper than the direct composite video connection to the monitor. There were no signs of noise or signal degradation whatsoever. The audio was clean and even the surround channels decoded properly. I messed with the attenuators for the audio and video signal and could find no discernable artifacts in either the video or audio, except for over-driving the video signal a bit. It appears that I had more gain than I needed, which led me to believe that increasing the distance was quite possible.

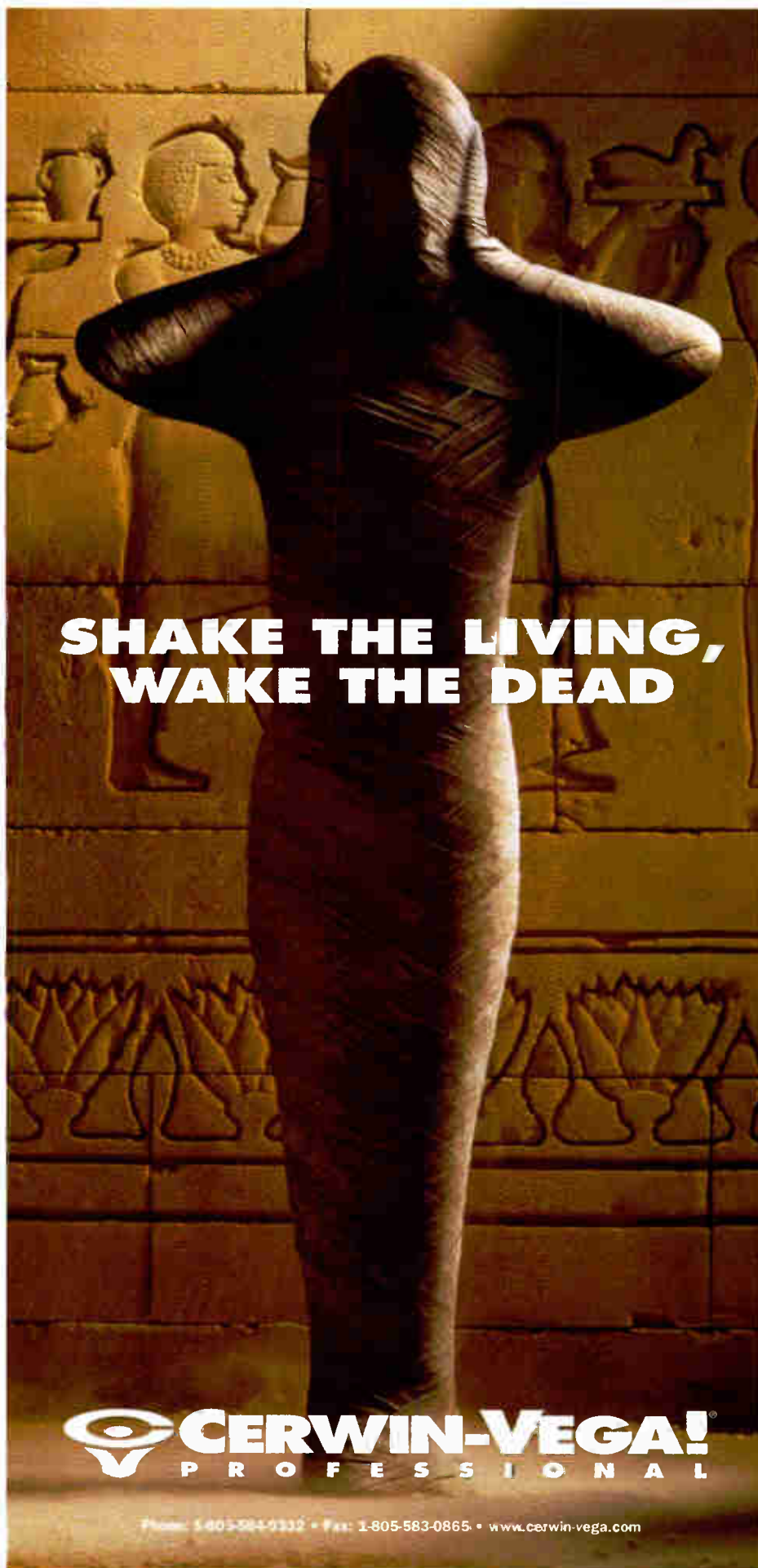
SUMMARY

With its ease of use and quality audio and video performance, the AudioControl balanced audio/video receiver/driver CAT-5 system is an excellent choice for any long-distance A/V distribution solution.

Wayne Becker is Vice President of Sales for Communication Systems, Inc. and has worked in the pro audio and systems integration business for 23 years. He also owns Westwires Digital USA, a music production and consulting company based in Allentown, PA. He can be contacted at wbecker@systemsbycsi.com.

Review Setup

Sony DVP-NS25 DVD player; Technics SAGX330 AV receiver; Panasonic 32-inch flat screen TV monitor; JBL surround speaker system.



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NEW PRODUCTS

For all those Macoids wondering if their favorite older hardware will be G5-compatible – the answer is “We’re working on it!” **M-Audio** has announced a program for upgrading Delta cards. Some can be some can’t. See M-Audio.com. **RME/X-Vision** seems to be in more of a pickle with its Hammerfall line. It highly recommends returning the card to RME for evaluation. Compatibility problems seem to be inconsistent. See www.rme-audio.com. The main problem – and this will be true for all card makers – is that the G5 uses a 3.3V power PCI-X standard while many older cards are 5V PCI. Wrong card in wrong slot equals disaster so don’t chance it.

And speaking of compatibility, **MOTU** has announced that Digital Performer 4.1 is Pro Tools/HD Accel-compatible.

Drummer/sound designer Willie Wilcox uses a **Furman HDS-6/HR-6** headphone



monitoring/distribution system in his home studio in New Jersey (see him below).

Native Instruments has inked a deal with Berklee College of Music to install a complete line of NI processors, synths and samplers in the college’s computer workstations. In other news, NI’s Kontakt sampler is up to 1.5 with a new time-stretching feature along with a beat detector and improved GUI.

KRK ST6 and ST8 Monitors

KRK steps away from its familiar yellow Kevlar woofers for the new double-layer anodized aluminum cone woofers for the ST series of passive closefield monitors. The ST8 features an 8-inch woofer and ST6 goes with a 6.5-woofer. Both models have a 1-inch silk dome tweeter, magnetic shielding, bass ports and 7/8-inch MDF cabinets. Price: ST8 - \$249, ST6 - \$199. Contact: **KRK** at 805-584-5244, www.krksys.com.



Steinberg Cubase SX 2.0

There’s some advantage to being the junior sibling in a product family – you can get some really nice hand-me-downs. Such is the case with Steinberg’s Cubase SX 2.0 (stepsister to Nuendo), a sequencer/sampler/synthesizer package. This latest iteration adds several new features highlighted for the latest Nuendo package – “Freeze,” Time Warp tempo maps and improvements in the VST engine. The most striking new feature is a new GUI. Price: \$799. Contact: **Steinberg** at 818-973-2788, www.steinbergusa.net.



Boss BR-864 8-Track Digital Studio

Almost hand-sized, the battery operable BR-864 from Boss is an 8-track digital recorder with a glut of digital effects doodads stuffed into its small body. Numerous onboard effects include Roland’s COSM Amp modeling along with a Rhythm Guide, bass simulator, guitar synth, wah effects and Harmonist pitch-shifting. The target media is Compact Flash (a 128MB chip is included). An onboard USB port facilitates communication with Windows and Mac computers and analog I/O includes XLR, 1/4-inch and RCA connectors. Price: \$595. Contact: **Boss** at 323-890-3700, www.bossus.com.



Glyph Technologies GT 103

The GT 103 from Glyph Technologies is a FireWire-based storage solution with more than average features. The GT 103 array can handle up to three drives – fixed (FireWire or SCSI) or removable and features Glyph’s Integrity FireWire hot-swappable interface. Keeping things quiet is QuietMetal, an acoustically dead metal sandwich that is used in the Glyph drive frames. Drive sizes include 80GB, 120GB, 180GB and 250GB. Prices: start at \$999. Contact: **Glyph Technologies** at 607-275-0345, www.glyphtech.com.



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▲ Area 51



▲ ST



▲ LE



▲ S

"I've now used the ADK Model "S" on almost everything including vocals, guitars, and drums. They remind me of very expensive German mics I have tracked with before."

-Adam Kasper, Producer/Engineer, Cat Power, REM, Pearl Jam, Soundgarden, Foo Fighters

"ADK Commemorative Tube Mics are a Gas! We used them with the Cincinnati Pops Orchestra and our Vocals Really Soared!!"

-Tim Hauser, Vocalist, Manhattan Transfer

"I use ADK LE Matched Pairs for recording my toms, and two ADK Transformerless for overheads. Warm and accurate, the perfect complement to my sound!"

-Joel Rosenblatt, Spyro Gyra Drummer

"The sound is huge and wide open when tracking vocals. The accurate and transparent sound reproduction, especially on the acoustic grand piano, is nothing short of amazing!"

**-Dale Sticha
Piano Tech for Sir Elton John**

"We took ADK Microphones on our Christmas tour last year with Jaci Velasquez. The entire band was totally impressed by the sound! From the violins to percussion, ADK covered it all. We will be using these mics again in future tours."

-Jay Lipschutz, FOH Engineer, Jaci Velasquez

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— Studio

► Focusrite from page 28

when I made the kick sound not just good, but great with the 220.

I had fantastic results using the ISA 220 to record vocals with both the BLUE Cactus and the Brauner VM-1KHE. I was extremely pleased with the performance of the de-esser. In comparison to the dbx 902 de-esser (my trusty standard), I found the ISA 220's de-esser to have substantially fewer audible artifacts.

The Blend function is one of the ISA 220's strongest features. I found it to work extremely well on bass guitar, electric guitar and excessively dynamic vocals. In every case, I was able to compress the signal more drastically than I normally would while still retaining a dynamic feeling.

I had great results using the ISA 220's instrument input to record bass guitar. The bass had a nice big bottom end while maintaining its definition and presence. It was no surprise to hear that Simon Osborne (Grammy winner for recording and mixing Sting's *Brand New Day* album) has made the ISA 220 his box of choice for recording bass guitar.

I used a Royer R-122 to record electric guitar through the ISA 220 and had wonderful results. The box worked equally well coupled with an Earthworks SR77 to record acoustic guitar.

The ISA 220's A/D converters sound fantastic. At 96 kHz, I compared their sound to those in my iZ RADAR (my favorite converters) and found the sound to be nearly identical. My only complaint with the ISA 220 is that all of the switches return to their default position after the unit has been powered down but as long as the status of every section is checked after powering the unit up it shouldn't cause any problems.

SUMMARY

In the Focusrite tradition, the ISA 220 sounds fantastic. The box has detail and clarity while remaining clean and quiet. The EQ is powerful yet very musical and the compressor and de-esser are quick and easy to use; they sound extraordinary. Likewise, the blend feature and the multi-band limiter are the icing on the cake.

Russ Long, a Nashville-based producer/engineer, owns The Carport recording studio. He is a regular contributor to Pro Audio Review.

MORE STUDIO REVIEWS ON PAGE 58.

► Guitar from page 32

recorders have a track-delay feature for this purpose.

* Use a coincident pair of figure 8 mics crossed at 90 degrees. Aim the front of one mic at the voice; aim the front of the other mic at the guitar.

* Use a stereo mic or stereo pair about 1 foot out front. Raise or lower the mics to adjust the voice/guitar balance.

PRODUCTION TIPS

If your recording has no bass guitar in the arrangement, consider making the acoustic guitar sound a little bassy or warm to fill out the sound.

You might want to create a wide, spacious effect. Here are three ways to do it: (1) After recording a rhythm guitar part, re-record it. Pan the original part to the left and pan the second part to the right. (2) Use a stereo chorus on the guitar. (3) Pan a pickup to the left and a mic to the right.

I hope that these techniques – or your own – help you capture a great guitar sound.

AES member and microphone engineer Bruce Bartlett is the author of Practical Recording Techniques 3rd Ed. published by Focal Press.

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Capsule Reviews and Product Review Updates

Gator Cases Cable Caddy

Retail price: \$115 • info: www.gatorcases.com

Need a transportable vessel to keep those snakes and cables handy for your next gig? Well, the Gator Case Cable Caddy was made just for you.

Made from tough padded Denier material, this 13.5-inch high by 12.5-inch wide semisoft case sports a large internal cavity capable of holding a 100-ft. snake or many other kinds of cables. The top unzips to access the internal storage space, and a lift-out utility tray adds extra space.

The Cable Caddy rolls on two wheels and leverage is applied from a luggage-like, retractable handle. An external zipper pocket and side-lift handles completes the package.

Stuffed with cables, the Cable Caddy can easily handle the bulky weight of packed cables, yet it is easy to move on its wheels with the retractable handle. (The more you put into it, however, means it is harder to lift into places the wheels won't go.) I found the top-tray a handy place to place my favorite pouch-stored, dynamic mics.

—John Gatski



Henry Engineering 96 kHz DigiMatch 2x6

Retail price: \$325 • info: www.henryeng.com

Henry Engineering's DigiMatch 2x6 is a low-cost, handy, digital router as well as an AES/EBU to S/PDIF, S/PDIF to AES/EBU format converter.

In its familiar Henry blue box design, the AC-powered DigiMatch contains an AES/EBU XLR input and an RCA S/PDIF input. Digital output is routed through either three XLRs and three RCA jacks, or both XLR or RCA. The unit can either: convert AES/EBU to S/PDIF (output from the three RCA jacks) and S/PDIF to AES/EBU (output from the XLR jacks); feed all six outputs with either AES/EBU or S/PDIF input; or it can separately output AES/EBU to the XLR jacks and S/PDIF to the RCA jacks.

With more 96 kHz gear and workstations out there, the Henry box is mighty nice for multiple source routing of high-bit, high-sampling rate audio. I used it as the digital distribution router for my Mac G3 workstation output - feeding a CD recorder, an Alesis Masterlink, a Sony DAT, Fostex DV-40 and an Audio Alchemy dejitter interface. The routed or converted signals were pristine.

—John Gatski



Yamaha MSP-10 STUDIO Powered Monitors

Retail price: \$2,000 per pair • info: www.yamahaproaudio.com

A few years ago, *PAR* reviewed the powered MSP10s and found them premium built with very good sound.

However, the tweeter design resulted in a bit of edge in the treble region that bordered on harsh. The new versions have a reworked tweeter that make the MSP10 STUDIO a serious contender in the medium-priced, high-end powered speaker niche.

To refresh your memory, the MSP10 STUDIO contains a 10-inch woofer (120 watts) and a 1-inch titanium dome tweeter (60 watts). The two-way system is housed in a very inert, heavily-braced 10 3/8 inches x 12 7/8 inches x 16 1/2 inches (WxHxD) cabinet. Features include low-cut filter, low and high trim controls and variable sensitivity switch. Input is XLR only.

I played the re-tweetered MSP10 STUDIOS with a number of high-resolution digital sources (their analog outputs routed through a Bel Canto Pre6 preamp) and found that the original MSP's treble harshness had disappeared. The same uncolored mid voicing was there as was the pinpoint imaging and deep, tight bass. As before, though, I wish it also had a balanced 1/4 jack for added connector versatility.

—John Gatski



Heil Sound Heritage Dynamic Microphone

Retail price: \$189 • info: www.heilsound.com

Engineering whiz Bob Heil, who has worked live sound tours with many a star including the Who, Peter Dinklage and Joe Walsh, says he is out to revolutionize good sounding mics at ultra-affordable prices. The vintage-look Heritage is one of his inaugural products.

With its "Elvis microphone" look — a vintage style, chrome steel body from the 1940s-50s era, the Heritage features a 1 1/8-inch aluminum voice coil assembly. The classic sound is said to be the result of the voice coil and the design of the phasing plug assembly - which works in conjunction with the mic port placement.

The result is claimed, uniform cardioid pattern, reduced proximity effect and a "smooth 40 Hz-18 kHz frequency response. For handling noise reduction, The dynamic element is isolated in an sorbothane isolation mount, and a blue foam wind screen filters out breathiness and pops. A mute switch turns off the mic, a feature broadcasters should like.

Available Heil mic options include the CB-1 vintage style desk stand and a desk-mount Pro Line mic boom.

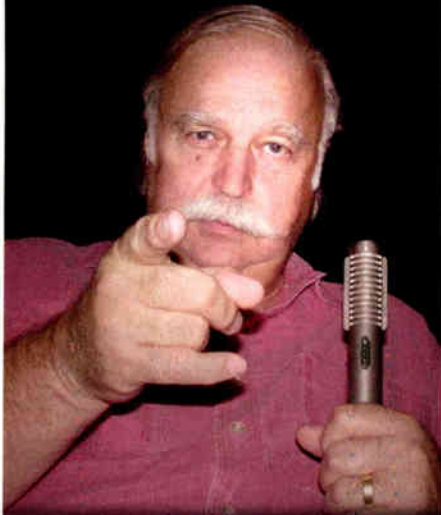
The Heritage sounded really nice on voice, with a fullness and pleasant presence boost that you don't often get from an inexpensive dynamic. My Martin 000-28EC acoustic guitar got a presence lift as well, with the essence of the guitar being reproduced nicely without a lot of proximity effect. Rejection from the back was excellent.

At \$189 retail (\$150 on the street) and assembled in the U.S.A, the Heritage is a pretty darn good mic value. It looks and sounds like the good 'ole days. Let's see what else Heil comes up with next.

—John Gatski



Bruce says



"I've never heard anything better in a ribbon microphone than Royer's new R-122, ever! Something happened when they put that amp and larger transformer in there and this has become my new favorite ribbon microphone. I always use ribbon mics for their warmth and sweet high frequency response characteristics, but there is something truly unique about the powered R-122's sound quality. My pal Omar Hakim was bouncing off the walls when he heard the first playback with R-122's on overheads on his drum set - they just sound absolutely fantastic! Royer really nailed it with the R-122."

Bruce Swedien

(Grammy winner, Jennifer Lopez, Michael Jackson, Quincy Jones, Duke Ellington, Count Basie)

Visit royerlabs.com to hear Bruce speak about ribbons and to see photos of his current recording session.



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#1 in a series

— Studio —

Chandler Limited LTD-1 Preamp/EQ



BY RUSS LONG

Chandler Limited, a Waverly, Iowa-based company, specializes in manufacturing and reintroducing classic equipment that is no longer available or in some cases never was. The Chandler Limited TGI has been one of the most talked about and lusted after pieces of analog gear over the last few years. The box is a recreation of the classic and extremely rare limiter/compressor featured on the custom EMI/Abbey Road recording and mastering consoles that were used on hundreds of albums, including classics by The Beatles and Pink Floyd. Most of Chandler's products are based on vintage EMI or Neve modules and every product manufactured is completely hand-assembled and hand-wired in the USA using point-to-point wiring. The company is so committed to original designs that they do not modernize or re-plot the circuits. Instead, every detail, including circuit board layout, wiring and module layout, ground structure and part selection, is recreated as accurately as possible to ensure the sound and function of each unit is true to the original.

FEATURES

The \$2,100 Chandler Limited LTD-1 pre-amp and equalizer is essentially a remake of the classic Neve 1073. The power supply, which is an additional \$100, can power four LTD-1s. In the design of the LTD-1, Chandler has paid extraordinary attention to duplicating the grounding, wiring techniques and part selection of the original 1073. The box uses identical replicas of Neve's five original circuit boards and all of the inductors and transformers are the English St. Ives that were used in the original 1073. This attributes to the accuracy at which the LTD-1 reproduces the character and performance of the Neve 1073.

The LTD-1's highly polished, nickel-plated steel chassis even resembles the original Neve modules. Unfortunately, the top and the bottom of the chassis fit rather loosely and if the box is

rackmounted with nothing in the space below it, the bottom of the chassis sags about 1/4 inch below the bottom of the front panel.

To make the LTD-1 practical in today's recording environments; Chandler has expanded the features of the Neve 1073 to include a high-impedance direct input, phantom power, EQ in/out, phase reverse, nine additional EQ points and an output fader.

The LTD-1's rear panel has two unlabeled female XLR connectors for line and microphone input and a male XLR connector for line output. The mic input impedance is 1,200 ohms and the line is 10 kohms. The maximum output is +28 dBm and the box boasts a flat frequency response from 15 Hz - 20 kHz .

All of the box's controls are on the front panel. The DI button switches the unit to DI input, which is accessed via a 1/4-inch jack on the front panel. The 48V button activates 48V phantom power. The EQ button inserts the equalizer into the circuit. The PH (phase) button reverses the phase of the output of the unit.

The LTD-1's equalizer blends the strengths of the Neve 1073 with additional frequency options found on the Calrec and Audix consoles that were commonplace at the BBC in the 1970s. The three-band EQ offers a smooth sound and a musical selection of EQ points.

The mic/line input sensitivity control selects between the mic or line inputs on the rear panel

Fast Facts

Applications:

Studio, broadcast, post production and sound reinforcement

Key Features:

Phantom power; phase reverse; three-band EQ; DI; modeled on Neve 1073 input module.

Price:

\$2,100

Contact:

Chandler Limited at 319-352-2587, www.chandlerlimited.com.

and attenuates the selected input. The bottom and left side of the control adjusts the mic input and provides 20 – 80 dB of gain. The right side of the control adjusts the line input and provides control from -20 dB to +10 dB.

The output control functions like the fader on a mixing console. It can be used to adjust between the 5 dB steps of the input or to run the input hot without distorting your recorder.

All of the LTD-1's connections are transformer balanced and pin 2 hot. The box is designed to be used with the Chandler Limited PSU-1 external power supply.

IN USE

Like the Neve 1073 that it is modeled after, the Chandler Limited LTD-1 sounds amazing. While I did not have a Neve 1073 at my disposal to directly compare with the LTD-1, I have logged an extensive number of hours on the 1073 so I know it very well and I am happy to report that the LTD-1 has the sound, the feel and every bit of Class A, discrete character of the original 1073. I was fortunate to be able to hold on to the LTD-1 for several months and during that period I used it on everything and never once was I disappointed. The box sounds fantastic on drums and percussion. I had

extraordinary results recording kick drum (with an AKG D112), snare drum (with a Shure SM-57), hi-hat (with a Neumann KM 86i) and tambourine and shaker (both with a Royer R-122). I am sure the LTD-1 would have performed equally well on toms and overheads, but with only a single LTD-1, I was unable to give them a try. I had great results using the box to record bass guitar (through the DI input) and also had nice results using it in conjunction with an EV RE20 to record bass guitar through an SVT rig. I would swear the LTD-1 was made to record electric guitars. The pre, along with a Royer R-122 and a Distressor, did a stellar job of capturing the precision and punch of the instrument.

I also had nice results using the box to record a Taylor 514 acoustic guitar with an AKG C28 microphone. The mic and LTD-1 worked together to create the perfect, classic, full-frequency acoustic guitar sound with plenty of top end (but never scratchy) and plenty of bottom (but never boomy).

The LTD-1 along with a Tube Tech CL-1B and the Brauner VM-1KHE to record vocals produced fantastic results. I found the pre to be very quiet compared to most of the vintage components I have encountered. In addition, the LTD-1 worked well in combination with

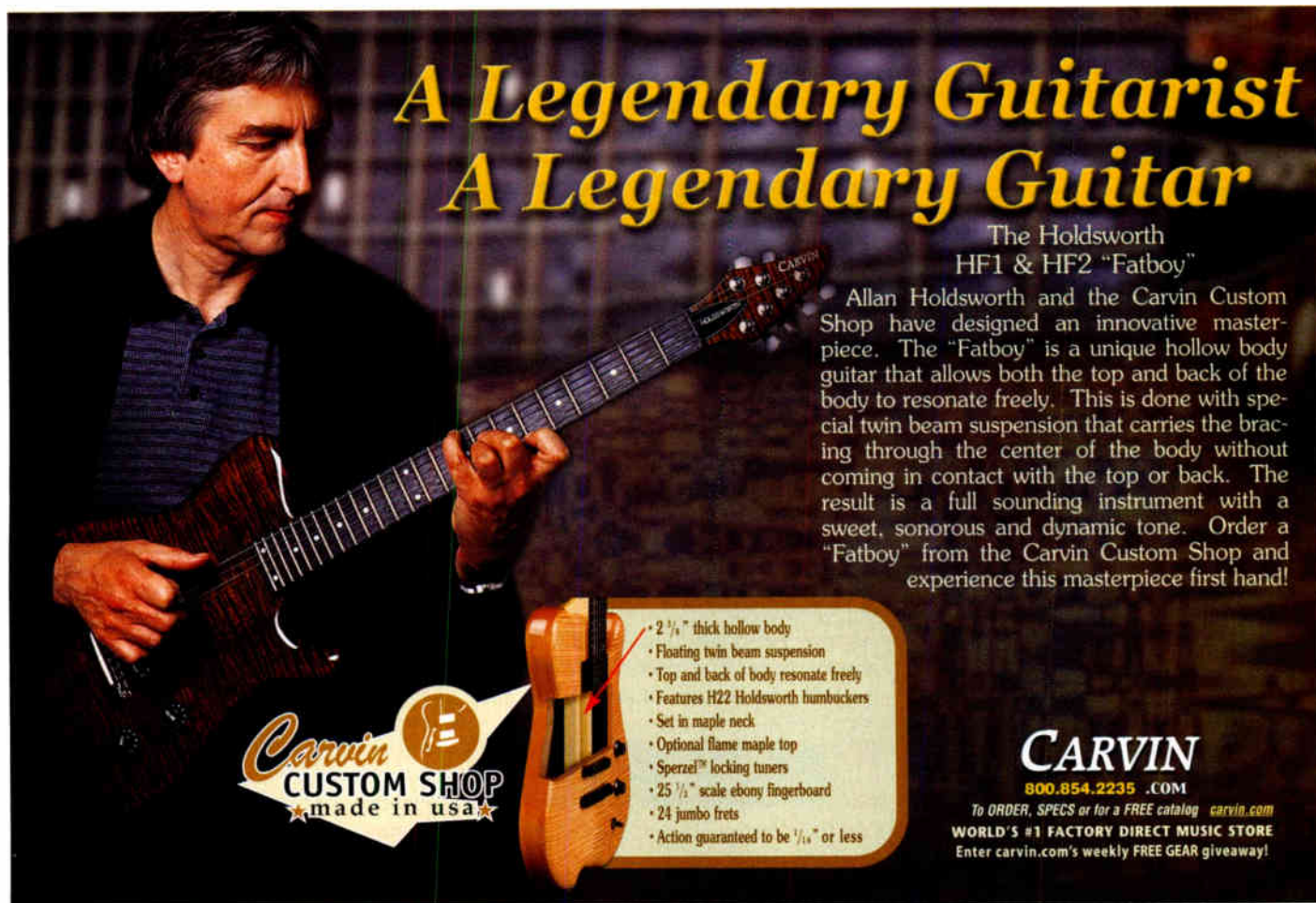
a Sony C-800G, a BLUE Cactus, an AKG 414 and on one occasion a Neumann KSM 105 to record vocals.

I was disappointed that the inputs on the rear panel of the LTD-1 are not labeled; there is no way to differentiate between line input and mic input except by trial and error. I should have labeled the review unit that I tested myself as I found that I never could remember which was which and I only guessed correctly about 25 percent of the time (I'm not the kind of guy that needs to be going to Las Vegas). The saggy bottom panel is a bit dodgy as well. Fortunately, these are all flaws in the construction of the box, not in the sonic performance. The performance of the LTD-1 is exceptional.

SUMMARY

The Chandler LTD-1 offers uncompromised, discrete, Class A sonic performance at an extremely reasonable price. Considering the parts are new and there is a two-year warranty, I would buy the LTD-1 before I would purchase an actual 1073.

Russ Long, a Nashville-based producer/engineer, owns The Carport recording studio. He is a regular contributor to Pro Audio Review.



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Preamplifiers

Crest Audio ST2

Features: Dual single-channel; 48V phantom power; phase reverse; 20 dB pad; low-cut filter (75 Hz); two-band parametric EQ; front panel XLR and 1/4-inch DI inputs; SmarTube tube emulation; pan controls. Price: \$699.



Contact: Crest Audio at 201-909-8700, www.crestaudio.com.

Toft Audio Designs ATC-2

Features: Preamp/compressor/EQ; two-channel; attack, release, ratio, makeup gain controls; four-band EQ; 48V phantom power; 1/4-inch front panel DI input; bypass; stereo link; VU meters. Price: \$1,299.



Contact: Toft Audio Designs/PMI at 877-563-6335, www.toftaudiodesigns.com.

Manley Labs DualMono Micpre

Features: Dual/mono; 48V phantom power; input controls; phase reverse; front panel 1/4-inch input; tubes. Price: \$2,400.



Contact: Manley Labs at 909-627-4256, www.manleylabs.com.

Joemeek ThreeQ

Features: Preamp/compressor/EQ; single-channel; compress, attack, release controls for compressor; three-band Meequalizer



EQ with sweepable mid; LED meters. Price: \$299.
Contact: Joemeek/PMI at 877-563-6335, www.pmiaudio.com.

True Systems Precision 8

Features: Eight-channel; 48V phantom power; phase reversal; high-pass filter; M/S decoder; front panel 1/4-inch DI input. Price: \$3,249.



Contact: True Systems/Neumann at 860-434-5220, www.neumannusa.com.

Millennia Media TD-1 Twin Direct Recording System

Features: 1/4" front panel input; Speaker Soak input; input impedance controls; 20 dB pad; tube and solid state circuit paths; two-band parametric EQ; REAMP outputs; optional



HV-3 mic preamp circuit (\$400). Price: \$1,395.

Contact: Millennia Media at 530-647-0750, www.mil-media.com.

Aphex Model 1100MkII

Features: Two-channel; 48V phantom power; 20 dB pad; phase reverse; low-cut filter; 24-bit A/D; 44.1 kHz, 48 kHz, 192 kHz sample rate; MicLim limiter. Price: \$2,495.



Contact: Aphex Systems at 818-767-2929, www.aphex.com.

Pendulum Audio Quartet II Mercenary Edition

Features: Single-channel; tube preamp; Delta-Mu compressor/limiter; "Passive-Aggressive" three-band EQ; 48V phantom power; phase reverse; 20 dB pad; low-cut filter (75/150 Hz); front panel



1/4" input; switchable VU meter. Price: \$5,000.
Contact: Pendulum Audio at 908-665-9333, www.pendulumaudio.com.

Rane DMS 22 Dual Mic Stage

Features: Two-channel; 48V phantom power; phase reverse; Accelerated Slope three-band EQ; low-frequency filter (15/50/100 Hz); pan controls. Price: \$549.



Contact: Rane at 425-355-6000, www.rane.com.

Lavry Engineering Mini PRS-2 Audio Interface

Features: Mac OS 9x, OS X, Windows 98, Me, 2000, XP; WAV, AIFF, MP3; USB port; Lavry Sound Recorder software. Price: \$250.



Contact: Lavry Engineering at 206-381-5891, www.lavryengineering.com.

A Designs MP-2

Features: Two-channel; phase reverse; 48V phantom power; level controls; two 6NIP tubes; two EF86 tubes; Jensen transformers; VU meters. Price: \$1,499.



Contact: A Designs at 818-716-4153, www.adesignsaudio.com.

Phonic America T8100 Tube Vocal Max



Features: Two-channel; 48V phantom power; phase reverse; tube warmth control; three-band EQ; high-pass filter; VU meters. Price: \$269.

Contact: Phonic America at 800-430-7222; www.phonic.com.

Focusrite The Liquid Channel

Features: Preamp/compressor/EQ; single-channel; 48V phantom power; phase reverse; high-pass filter; threshold, ratio, attack, release, makeup gain controls; three-band EQ; factory presets; Dynamic Convolution emulation technology; LED meters. Price: \$3,495.



Contact: Focusrite/Digidesign at 866-362-8774, www.focusrite.com.

D.W. Fearn VT-2 Mic Preamp

Features: Two-channel; attenuation controls; input controls; 48V phantom power; polarity; Lo-Z input; four 6072A triode tubes; VU meters. Price: \$3,675.



Contact: D. W. Fearn at 610-793-2526, www.dwfearn.com.

Earthworks 1024 Zero Distortion Technology Preamp

Features: Four-channel; 48V phantom power; phase reverse; gain controls, variable output controls per channel. Price: \$3,500.



Contact: Earthworks at 603-654-6427, www.earthworksaudio.com.

Crane Song Flamingo

Features: Two-channel; gain, attenuation controls per channel; phase reverse; "Iron" and "Fat" effects; Class A; LED meters. Price: \$3,125.



Contact: Crane Song at 715-398-3627, www.cranesong.com.

Universal Audio 2-610

Features: Two-channel; gain controls; phantom power; phase reverse; EQ, boost controls; Hi-Z inputs; 12AX7, 6072 tubes; modeled on 610 input module. Price: \$2,295.



Contact: Universal Audio at 866-823-1176, www.uaudio.com.

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Audio Technologies (ATI) ML200

Features: Two-channel; gain control; 20V phantom power; peak LED. Price: \$299.

Contact: ATI at 215-443-0330, www.atiguys.com.



Groove Tubes Vipre

Features: Single-channel; 48V phantom power; phase reverse; low-cut filter (100 Hz); mic impedance control; front panel 1/4" Hi-Z input; tube-based; switchable VU meter. Price: \$2,999.

Contact: Groove Tubes at 818-361-4500, www.groovetubes.com.



Great River Electronics MP-2NV Mercenary Edition

Features: Two-channel; gain, output level controls; phantom power; phase reverse; impedance controls; Class A; Hi-Z input; LED meters. Price: \$2,499.

Contact: Great River Electronics at 651-455-1846, www.greatriverelectronics.com.



M Audio TAMPA

Features: Single-channel; preamp/compressor/A-to-D converter; Temporal Harmonic Alignment technology; Class A; mic gain, impedance controls; 20 dB pad; low-cut filter (80 Hz); 24-bit; 44.1, 48, 88.2, 96 kHz sample rates; phase reverse; VU meters. Price: \$799.

Contact: M-Audio at 800-969-6434, www.m-audio.com.



Grace Design Model 201 Preamplifier

Features: Two-channel; 48V phantom power; 20 dB pad; phase reverse. Price: \$1,995.

Contact: Grace Design at 303-443-7454, www.gracedesign.com



Audio Toys, Inc. (ATI) 8MX2 Preamplifier

Features: Eight-channel; 48V phantom power; phase reverse; gain level, limiter threshold, channel level, pan controls per channel; linkable; headphone jack controls; LED meters. Price: \$2,995.

Contact: Audio Toys, Inc. at 301-776-7879, www.audiotoys.com.



API 512C Preamp Module

Features: Mic preamp module for API Lunch Box modular processors frames; 48V phantom power; 20 dB pad; 1/4" Hi-Z input; mic/instrument switch. Price: \$795.

Contact: API at 301-776-7879, apiaudio.com.



Gordon Instruments Preamplifier System

Features: Two-channel; 48V phantom power; phase reverse; Hi-Z input; optional gain control (\$300). Price: \$3,500.

Contact: Gordon Instruments at 615-665-1005; www.gordoninstruments.com.



Drawmer 1969 Tube Mic Pre/Compressor Mercenary Edition

Features: Two-channel; 48V phantom power; phase reverse; low-cut filters (50, 100 Hz); tube-based DI section; compressor; Burr-Brown op amps; VU meters. Price: \$3,100.

Contact: Drawmer/TransAmerica Audio Group at 702-365-5155, www.transaudiogroup.com.



DACS MicAmp

Features: Two-channel; switchable bass rolloff (30 Hz, 80 Hz); gain control; phase reverse; phantom power. Price: \$2,250.

Contact: DACS/Independent Audio at 207-773-2424, www.independentaudio.com.



Sonifex RB-MA2 Preamp/Converter

Features: Two-channel; 48V phantom power; level control; bass rolloff (125 Hz). Price: \$365.

Contact: Sonifex/Independent Audio at 207-773-2424, www.independentaudio.com.



TL Audio Ivory 2 Series 5001 Quad Tube

Features: Four-channel; 48V phantom power; high-pass filter (90 Hz); input,



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Buyer's Guide

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output level controls; 30 dB pad; front panel 1/4-inch DI inputs; LED meters. Price: \$749.

Contact: TL Audio/Sennheiser USA at 860-434-9190, www.sennheiserusa.com.

Simon Systems RDB-400 Integrated Direct Box

Features:

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1/4-inch inputs; front panel 1/4-inch and XLR outputs; attenuation, line trim controls. Price: \$995.

Contact: Simon-Kaloi Engineering at 805-707-8400, www.skeng.com.

TDL Technology Model 432 Audio Card Preamp

Features: Two-channel; gain controls; A, B-weighting; 5V – 48V phantom power. Price: \$283.

Contact: TDL Technology at 505-382-3173, www.zianet.com/tld.



Amek Pure Path Channel in a Box

Features: Single-channel; 48V phantom power; phase reverse; four-band parametric EQ;



compressor; high, low-pass filters; side chain. Price: \$2,995.

Contact: Amek at 818-920-3212, www.amek.com.

DB Systems DB-8 Phono Preamp

Features: RIAA curve. Price: \$165.

Contact: DB Systems at 603-899-5121.



BSS AR-133 Active DI Box

Features: Phantom power or battery operable; 20/40 dB pad; ground lift; arched aluminum case. Price: \$185.

Contact: BSS at 818-920-3212, www.bss.co.uk.



PreSonus Eureka Channel Strip

Features: Preamp/EQ/compressor; 48V phantom power; 20 dB pad; high-pass filter (80 Hz); impedance control; three-band parametric EQ;



threshold, attack, release, gain makeup controls for compressor; 1/4" front panel DI input; VU meter. Price: \$699.

Contact: PreSonus at 800-750-0323, www.presonus.com.

GML Model 8302

Features: Two-channel; gain control; transformerless design. Price: \$2,100.

Contact: GML/Transamerica Audio Group at 702-365-5155, www.transaudiogroup.com.



Daking Mic-Pre EQ

Features: Mic/line preamp/four-band EQ; 48V phantom power; pad; phase

reverse; gain, output level controls. Price: \$1,995.

Contact: Daking/Transamerica Audio Group at 702-365-5155, www.transaudiogroup.com.



Crate Audio SM6MP

Features: Single-channel; 48V phantom power; 20 dB pad; low-cut filter; phase reverse; level control; VU meter. Price: \$159.

Contact: Crate Audio at 800-727-4512, www.crateaudio.com.



Benchmark MPS-420/2000

Features: Four-channel; 20 dB pad; gain controls per channel; stereo mixdown; headphone amp. Price: \$1,595.

Contact: Benchmark Media Systems at 800-262-4675, www.benchmarkmedia.com.



Paul J. Cox Active DI System

Features: 24-channel; 1/4-inch front panel inputs; ground lift; customizable outputs. Price: \$2,500.

Contact: Paul J. Cox Systems at 818-951-4572, www.pauljcox.com.



Demeter Amplification VTMP-2c

Features: Two-channel; phantom power; phase reverse; 20 dB pad; 6/12 dB low-cut filter; gain control; volume control; 1/4-inch front panel DI input; LED meters. Price: \$1,899.

Contact: Demeter Amplification at 818-994-7658, www.demeteramps.com.



Prism Sound MMA-4

Features: Four-channel; gain controls, phase reversal per channel; 48V phantom power; LED meters. Price: \$3,160.

Contact: Prism Media at 973-983-9577, www.prismsound.com.



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Sony C-38B

Features: Variable pattern; condenser element; FET. Price: \$2,200.

Contact: Sony at 800-635-7669, www.sony.com/professional.

Audio-Technica AT3060

Features: Cardioid pattern; condenser element; internal tube shockmount; ships with shockmount, carrying pouch. Price: \$599.

Contact: Audio-Technica at 330-686-2600, www.audio-technica.com.

Peavey PVM 22

Features: Cardioid pattern; dynamic element; Amorphous Diamond-Coated Diaphragm; neodymium iron boron magnet; internal pop

filter. Price: \$189.

Contact: Peavey at 601-483-5365, www.peavey.com.

Studio Projects C3

Features: Omni, cardioid, figure 8 patterns; 1.06" six-micron Mylar diaphragm; high-pass filter (150 Hz); 10 dB pad. Price: \$499.

Contact: Studio Projects/PMI at 877-563-6335, www.studioprojects.net.

Joemeek JM47

Features: Pressure-gradient element; 1.06" three-micron Mylar diaphragm; high-pass filter; 10 dB pad. Price: \$249.

Contact: Joemeek/PMI at 877-563-6335, www.joemeek.com.

Royer Labs R-121

Features: Figure 8 pattern; 2.5-micron aluminum ribbon; neodymium magnet; high SPL. Price: \$1,195.

Contact: Royer Labs at 818-760-8472, www.royerlabs.com.

Shure KSM141

Features: Omnidirectional, cardioid patterns; Class A; transformerless; 15/25 dB pad; low-frequency filter; ships with mic clip, windscreen, carrying case. Price: \$770.

Contact: Shure 800-257-4873, www.shure.com.

Audix D6

Features: Cardioid pattern; dynamic element; Very Low Mass (VLM) capsule; aluminum body; ships with stand adapter, carrying pouch. Price: \$349.

Contact: Audix at 800-966-8261, www.audixusa.com.

Gefell M930

Features: Cardioid pattern; 1-inch gold-coated diaphragm; condenser element; internal shockmount. Price: \$1,150.

Contact: Gefell/C-Tec at 604-942-1001, www.gefell-mics.com.

Heil Sound Goldline Pro

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Contact: Cascade Microphones/Bayview Pro Audio at 888-718-0300, www.cascademicrophones.com.

ADK ST-Pro

Features: Omnidirectional, cardioid, figure 8 patterns; dual 1.1" diaphragms; pad; bass rolloff; Class A. Price: \$695.

Contact: ADK at 360-566-9400, www.adkmic.com.

Marshall Electronics MXL V77S

Features: Cardioid pattern; 1" three-micron diaphragm; condenser element; 6072 tube; ships with power supply, shockmount, cable, foam windscreen. Price: \$700.

Contact: Marshall Electronics at 800-800-6608, www.mxlmics.com.

Carvin CM98ST

Features: Multipattern; 1" 5-micron gold sputtered diaphragm; 10 dB pad; tube; low-cut filter; ships with shockmount, power supply; carrying pouch, cable, aluminum flight case. Price: \$700.

Contact: Carvin at 800-854-2235, www.carvin.com.

M Audio Luna

Features: Cardioid pattern; 1.1" gold-evaporated diaphragm; brass capsule; Class A. Price: \$249.

Contact: M-Audio 800-969-6434, www.m-audio.com.

Lawson L251 Vacuum Tube

Features: Variable pattern; Telefunken ELAM 251 capsule; 6922/6N1P tube; internal shockmount; 10 dB on power supply; ships with cable, carrying case; swivel-mount. Price: \$2,495.

Contact: Lawson at 615-269-5542, www.lawsonmicrophones.com.

AKG C 451 B

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Groove Tubes GT-44

Features: Cardioid pattern; condenser element; .75-inch evaporated gold six-micron diaphragm; 15 dB pad; GT6205 tube; ships with power supply, 25-foot cable, shockmount, hard mount, case. Price: \$699.

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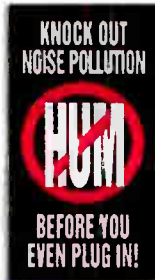
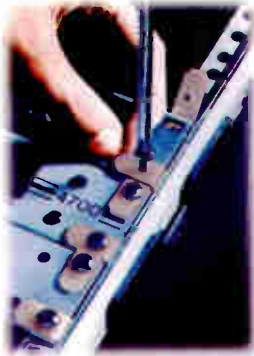


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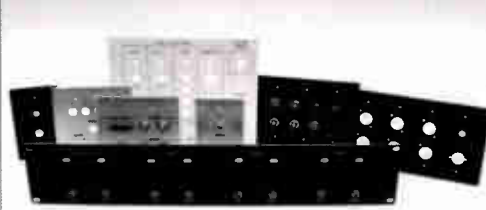
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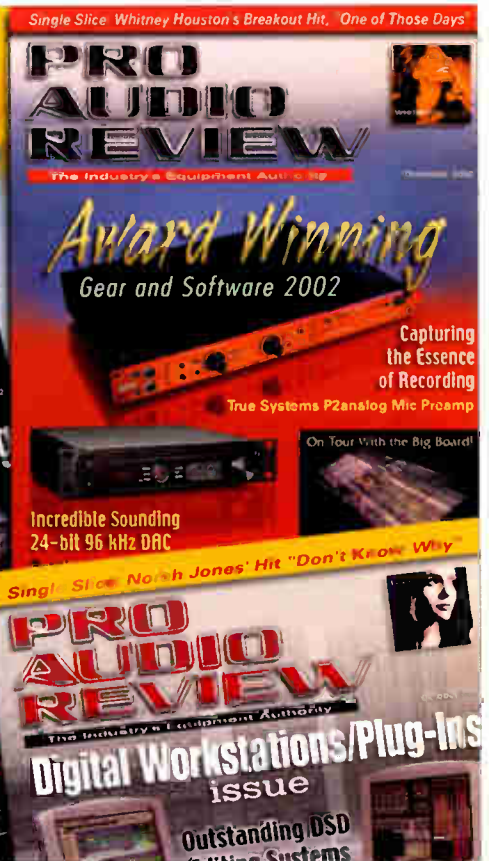
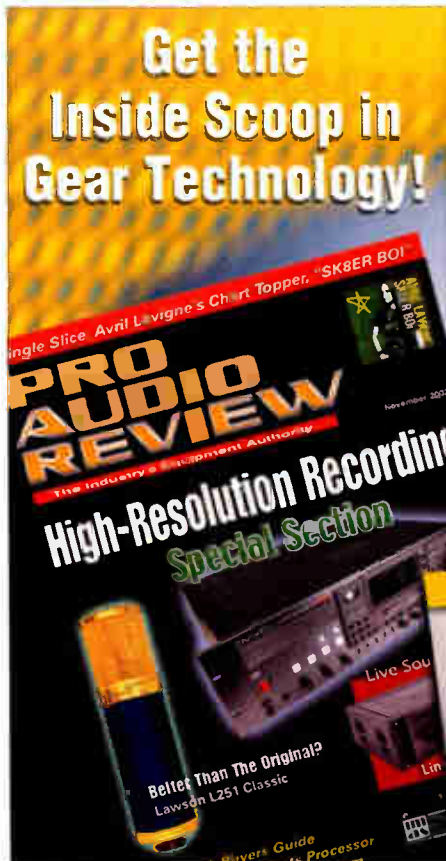


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BY CHUCK TAYLOR

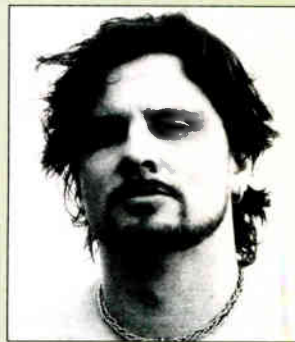


Working on Shania Twain's current Up! was not a venture for the faint of heart. Not only was the album recorded in locations around the world over the course of two years, but its 19 tracks were all recorded twice for the double-disc package: with arrangements for both country and pop.

"I've never had as many organizational charts as I did for this album," says engineer Kevin "Volt" Churko, who assisted Twain and her coproducer/cowriter/husband Robert "Mutt" Lange throughout the ordeal. "I had an enormous binder of notes, keeping track of who played what where."

For country/pop/AC hit "Forever and For Always," the process began with a sequenced demo, followed by separate instrumental sessions for the country and pop versions. For the most part, the country musicians banded together, arranging the music as an ensemble. The pop mix, however, comprised players from around the world, all of whom recorded in piecemeal fashion.

Twain is also involved throughout the process and in the case of this song, laid her vocal down early on. "The guys constructed the track around her vocal, which is unusual," Churko says. "Usually, it's done the other way around, but



Kevin "Volt" Churko

this allowed the music to really follow the emotions she was putting in the song."

While Churko has worked with a Who's Who among artists, he puts his experiences with Twain and Lange at the top. "Mutt is on a different planet as far as talent goes," he says. "I can't say enough about what an extraordinary producer and person he is."

SINGLE: "Forever and For Always"

ALBUM: Up!

DATE RECORDED: throughout 2002

ENGINEER: Kevin "Volt" Churko

OTHER PROJECTS: Celine Dion, The Corrs, Britney Spears, Liz Phair, Jenna Drey, Bryan Adams, Michael Bolton, Alison Krauss, Dolly Parton

SINGLE SONGWRITERS: Shania Twain, R.J. "Mutt" Lange

SINGLE PRODUCERS: R.J. "Mutt" Lange

RECORDING STUDIO: Compass Point Studios, Nassau, The Bahamas; Officine Meccaniche Studios, Milan, Italy

MASTERING STUDIO: Marcussen Mastering, Hollywood, Calif.

MASTERING ENGINEER: Stephen Marcussen

CONSOLE: SSL Axiom MT, Neve V-3, MCI

RECORDER: Pro Tools, Sony 3348 reel-to-reel

MONITORS: KRK, PSI

MICROPHONES: Manley, Shure, Neumann, AKG

MICROPHONE PREAMPS: Focusrite, Manley, SSL, Avalon

PROCESSORS: Empirical Labs Fatso, Empirical Labs Distressor, SSL, LA-2A, Universal Audio 1176

Chuck Taylor, a regular contributor to Pro Audio Review, is senior editor at Billboard magazine in New York.

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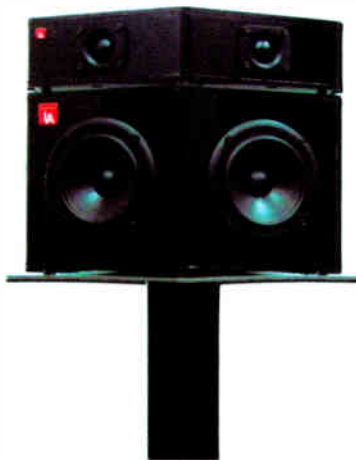


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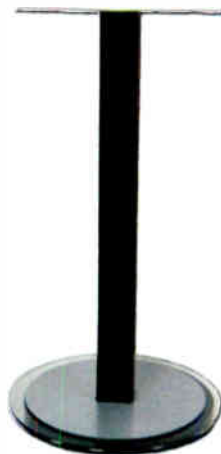
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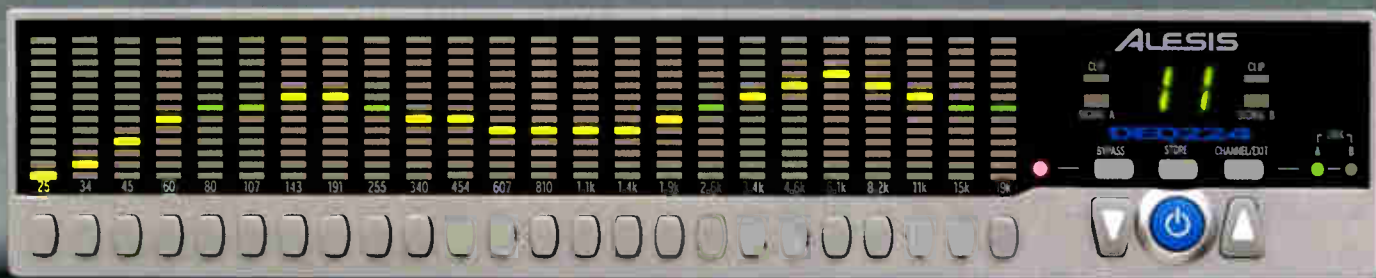
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