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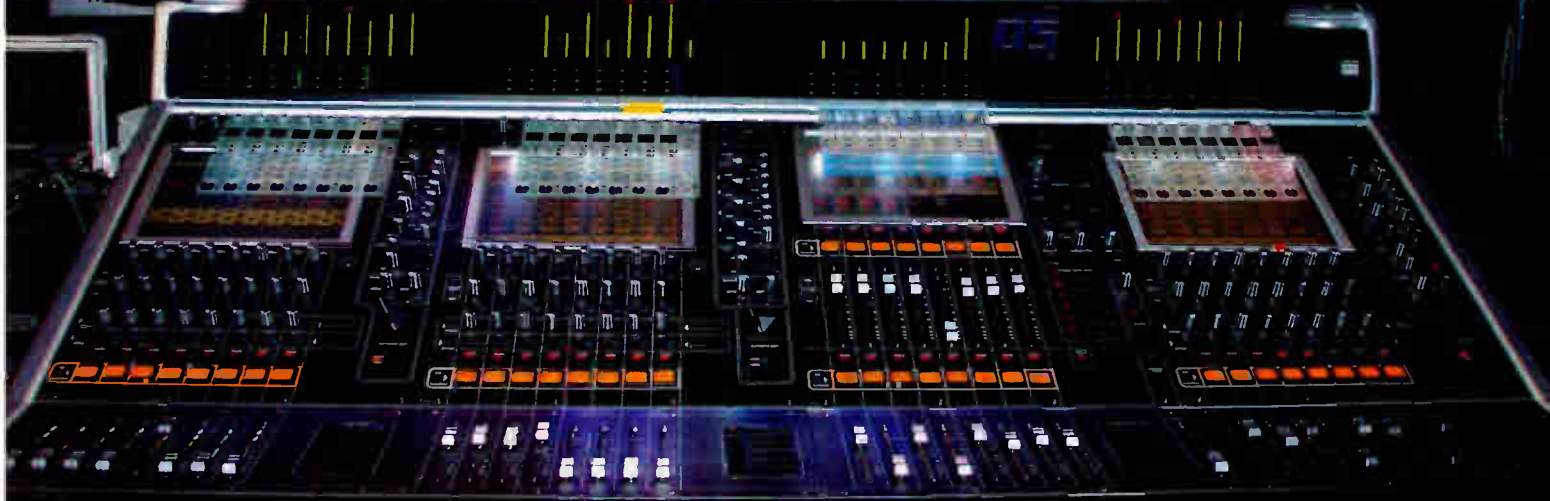
World Radio History

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Evaluating audio products for professionals in commercial recording, broadcast production, audio for video/film, project studios, live sound, contracting and multimedia.

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World Radio History

Like Father, Like Son

Everyone who told me that life would change when our baby was born apparently had a penchant for understatement - LIFE HAS CHANGED COMPLETELY!

Little Elias Gatski was born Sept. 26, 2003. A couple of weeks early, he was a little small, but otherwise healthy. As of this writing, the assimilation of the little tyke into the family had begun full force. With every two hour feedings and extended awakenings into the wee hours of the mornin,' my wife Mila and I have been operating on mucho sleep deprivation.



Future Publisher of PAR

I got to hand it to wifey, though, she is able to function much more coherently at 4 a.m. than me - changing a diaper with one hand and selecting the next day's baby wardrobe with the other. Speaking of diaper changes, you would think a guy who is pretty good at assembling and disassembling electronic gizmos and internal combustion engines could master today's prefab diaper. Nope. It's just not that easy. With Mr. Elias always complaining and squirming at change time, a task that my wife can do in the dark in three minutes, takes me 15 minutes - and the diaper is still crooked. It's those stupid paper Velcro straps.

Oh, well, I guess I will eventually master the task along with every other parenting skill I will need for the next 18 years. But it's all worth it and incredibly precious to see that tiny little being and knowing that he is our son.

And, by the way, the hospital staff said he

passed the hearing test with an A+. He's got those golden ears just like his old man. Hmm, I see a future in audio...

And last, but not least, I want to thank my staff and contributors for really pitching in these last couple of months while Papa Gatski's attention was somewhat diverted by the impending birth. I had to miss AES last month for the first time in 10 years, Managing Editor Brett Moss and Studio Editor Steve Murphy did a great job organizing the judges for the eighth annual PAR Excellence Awards.

SURROUND SURROUNDINGS

In this issue, *PAR*, in collaboration with sister title, *Audio Media*, has put together a tidy little section on surround production/post production with targeted reviews ranging from software to surround mixers. With surround-for-film, TV and high-resolution audio business booming, there is no better time for manufacturers to be coming out with products that fit the surround niche. The high-res music scene, surround in particular, seems to have attracted more attention in the pro community with re-releases of title, such as Pink Floyd's *Dark Side of the Moon* and new releases such as Sting's new SACD surround title. If the sound is mixed correctly and the playback setup is right, surround music can be awesome.

AWARD-WINNING GEAR

Those of you clamoring to know the winner of the coveted 2003 PAR Excellence Awards from the AES show don't have to wait until the official unveiling of the winners in the December issue. The list of winners is now on the PAR web site (www.proaudioreview.com). In keeping with our universal coverage of pro audio, 33 winning products ranged from studio to broadcast, to live and contracting, to broadcast and post, as well as the emerging class of project studio products. A small clue about this year's crop: the FireWire logo appears on several of them.

John Gatski is publisher and founding editor of Pro Audio Review magazine. Being a new father, he has a new appreciation for old-fashioned, analog rocking chairs.

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Publisher, Executive Editor: John Gatski ext. 119
e-mail: jgatski@aol.com

Associate Group Publisher: Nick Humbert
e-mail: n.humbert@audiomedia.com

Managing Editor: Brett Moss ext. 143
e-mail: bmoss@imaspub.com

Technical Editor: Edward J. Foster

Studio Editor: Steve Murphy
e-mail: editor@smurphco.com

Technical Consultant: Tom Jung

Contributors: Tony Angelini, Bruce Bartlett, Nick Baily, Dr. Frederick Bashour, Wayne Becker, Edd Forke, Frank Beacham, Carlos Garza, Will James, Bob Katz, Bascom H. King, Daniel Kumin, Russ Long, Alan R. Peterson, Rich Rarey, David Rittenhouse, Andrew Roberts, Alan Silverman, Chuck Taylor, Mark Ulano, J. Arif Verner, Roger Williams, Tom Young

Production Director: Annette Linn
Ad Traffic Manager: Kathy Jackson
Publication Manager: Davis White
Product Showcase/
Classified Coordinator: Milagros Castaneda
Graphic Designer: Lourdes Lilly

President/CEO: Stevan B. Dana
VP: Carmel King
COO/Editorial Director: Marlene Lane
Sales Director: Eric Trabb
Sales & Marketing Mgr.: Alan Carter ext. 111
Northwest Sales: Paul DaCruz 707-789-0263
Ad Coordinator: Joanne Munroe ext. 152
Circulation Manager: Kwentin Keenan ext. 108

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AS PASSIONATE AS YOU.

Pro Audio Review – November 2003

Neumann is now 75 years old. To get the story of THE microphone company, check out "Neumann – The Microphone Company." Author Anselm Rossler had extensive cooperation from Neumann and its vast archives (Hey, they're German, of course they have detailed archives). Lots of pictures of those old mics that everyone is making modern retro copies of along with looks at cutting lathes the company's humble origins. See www.Neumann.com/book.

Martina McBride's latest album was mixed by her husband, engineer John McBride, on a new **ATR Services** ATR-102 1-inch analog tape recorder. ATR also provided customized Aria Reference electronics for the deck.



Christian publishing firm Maranatha! chose a 48-channel API Legacy Plus console for its new Beach City Studios operation at its San Clemente, Cal. headquarters.

Two **Amek** Media 51s were recently sold. Taylor-Made Productions in Caldwell, NJ put in a 48-input board into a retrofit. **Sonic Circus** handled the board acquisition and **Molecular Electronics** handled the actual work. And in Eugene, Ore., a 60-channel board went into Blackberry Hill, a studio owned by guitarist Justin King. On the academic front, Full Sail added a 72-channel Amek 9098i to its Winter Park, Fla. campus.

World Class Audio in Anaheim, Cal., has added a pair of **ATC** SCM20 powered monitors to its lineup.

In something of a twist, live sound speaker player **Turbosound**, placed several speakers into the studios of Music Bank, in London. The TFM-450 floor monitors and THL-2 side fills are utilized in a rehearsal space.

Traveling engineer Nathaniel Kunkel used **GML** 2020 channel strips for Sting's latest album, *Sacred Love*. The units were provided by Stephen Jarvis Audio Consulting in San Francisco. Other equipment used for the recording at Sting's home included a **Sony** DMX-R100.

NEW PRODUCTS

Neumann M 149 Jubilee Platinum Edition

When you're the gold standard what do you do if you want to offer something special? If you are Neumann celebrating your 75th anniversary you offer a platinum edition. The M149 Jubilee Platinum Edition is a multipattern side address studio tube microphone with platinum plating and a nickel finish body. It ships with a "vintage" power supply, cable, spider elastic mount and aluminum flight case. It is also available in stereo pairs (\$11,999 with special case). Each is numbered and only 500 will be made. Price: \$6,049. Contact: Neumann USA at 860-434-5220, www.neumannusa.com.



ADAM Audio S5V-A Powered Monitor

Germany's ADAM Audio continues to introduce new high-end monitors into the US market. The latest is the four-way S5V-A (ignore the nameplate designation). Heading up this package are two ADAM Accelerated Ribbon Technology folded ribbon drivers, a tweeter and a high mid-range. Providing lower frequencies are to Hexacone Kevlar-coated woofers – a 9-inch lower mid-range and a 12.5-inch woofer. Power comes from a pair of 150W amps for the ribbons and a 500W amp for the big lifting. Price: \$11,000 per pair. Contact: ADAM Audio USA at 805-413-1133, www.adam-audio.de.



Digidesign Pro Tools HD Accel

For the really well-endowed studios Pro Tools is often the DAW of choice. And since computer technology never rests neither does Pro Tools. New is the HD Accel card, a higher-powered HD Process accelerator card for all HD systems. The Accel card is fully compatible with the HD Core card and all HD plug-ins (TDM, HTDM, RTAS, AudioSuite). HD Accel cards promise to increase processing power at all sample rates (up to 192 kHz) approximately 50 – 100 percent. Digidesign offers several upgrade paths so check with them on pricing. A new system with a single Accel card starts around \$11,000. Contact: Digidesign at 800-333-2137, www.Digidesign.com.



Z-Systems z-Qualizer

The z-Qualizer from Z-Systems is a six-band stereo digital parametric EQ crammed into a half-rack unit box. The z-Qualizer offers 16, 20 or 24-bit performance and up to 192 kHz sample rates. It also has TPDF and POW-r wordlength reduction. On top of that it is Mid/Side-compatible. Price: \$1,200. Contact: Z-Systems/Transamerica Audio at 702-365-5155, www.transaudiogroup.com.



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Add in the DM2000 sound quality and the ability to share Automix and Scene data with its bigger brothers (DM2000/02R96) using the included Studio Manager software to make this console a truly indispensable tool packaged in a 19" rack mountable unit.

Yamaha DM1000. Big things come in little packages (even little brothers).



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World Radio History

BY STEPHEN MURPHY

The seemingly unending struggle between the SACD and DVD-A formats over professional acceptance and market share marches on. These two high-resolution-capable formats not only compete against each other, they also compete to gain the attention of increasingly apathetic consumers who, in such times, seem to cling even tighter to their Rio MP3 players.

The good news is that one does not need to be a card-carrying member of the DVD-A camp to see that a tool such as Minnetonka Audio Software's discWelder Steel (\$495) is useful in the modern recording or post production studio. Steel's true usefulness, in my opinion, is as a means to create quick reference copies of 5.1 surround mixes and of high-sample rate/high-resolution stereo mixes that can be played outside the studio. Of course, it can also be used to author a master DVD-A disc for duplication.

FEATURES

DiscWelder Steel is a streamlined program to burn audio files onto a DVD-R or DVD-RW for playback on a DVD-A-compatible player. The application is for Windows-based computers with minimum requirements of 128 MB RAM, 10 GB of free hard disc space and a supported DVD-R/RW drive.

Minnetonka also offers an advanced-features DVD-A authoring program called discWelder Chrome for \$2,495 (see sidebar).

Steel can burn stereo or multichannel surround files using up to six channels (5.1). The

Minnetonka discWelder Steel 2.0 DVD-A Authoring Software

program supports the importing of WAV and AIFF files (but not SDII) in stereo-interlaced or individual channel formats.

Steel can import and burn stereo recordings at sample rates of 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz and 192 kHz and resolutions of 16, 20 or 24 bits. Surround files can be of the same format specifications as the stereo files as long as the total of the simultaneous files does not exceed the DVD standard maximum rate of 9.6 Mbps.

Surround recordings (5.1) at sampling rates greater than 48 kHz and resolutions of 20 bits and higher exceed the maximum DVD data transfer rate and therefore cannot be burned to DVD without the use of MLP (Meridian Lossless Packing) data compression. MLP-compressed files are not supported in Steel, but are supported in Chrome.

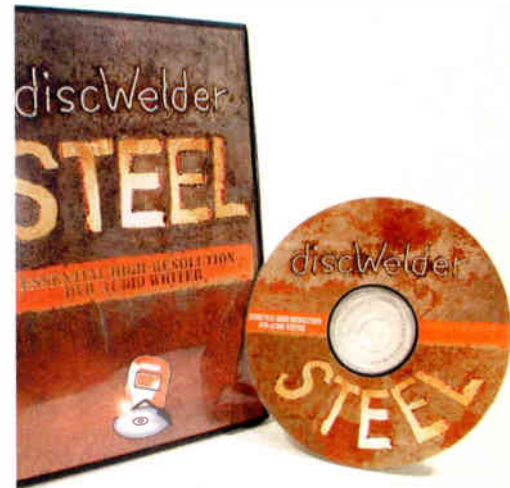
The bottom line is that Steel supports burning of six-channel surround tracks at the following resolutions and rates: 24-bit/48 kHz, 16-bit/48 kHz, 24-bit/44.1 kHz, 16-bit/44.1 kHz and 16-bit/88.2 kHz. Surround recordings with less than six channels are also supported as long as the total data rate is less than 9.6 Mbps.

Minnetonka recently released Steel Version 2, adding several features previously only available in Chrome. The most significant audio improvement is the addition of Gapless PCM Track Play, allowing seamless playback of successive same-format files, bypassing the playback gap imposed by most DVD-A players.

The other new features focus on the onscreen video display appearance. Version 2 adds the ability to import image files to be used as the menu background (Version 1 used a default background only); the ability to use the same menu background as a display during audio playback; access to the Windows fonts and styles library for text display (V.1 allowed only Arial and Times New Roman in black, white and gray); and the setting of up to three vertical text columns for the Track Menu.

IN USE

I installed discWelder Steel on a 3.06 GHz PC with 1 GB RAM running Windows 2000. The installation was as simple as can be and



the program found the Pioneer DVR-104 DVD-R/RW recorder right away.

DiscWelder Steel is an example of exemplary programming, the result being a streamlined and intuitive application. Though I am sure Minnetonka would like purchasers to read the manual, anyone with rudimentary knowledge of CD burning software like Roxio EZ CD Creator or Nero Burning Rom will be able to burn DVD-A discs without ever cracking the cover.

The Steel interface is divided in half, horizontally. The top half is a familiar two-pane file explorer, with the folder tree on the left and the folder contents on the right called the "Soundfile" window. The Soundfile window only displays files that are compatible with Steel (WAV and AIFF files). Specifications such as track duration, number of channels, audio format (resolution/sample rate) and date are conveniently shown for each file.

The lower half of the interface is the "Album" window where the individual files are assembled into a sequenced master. The master hierarchy is as follows: Album (the overall DVD), Track Group and individual Tracks. Steel allows only one group per DVD; the group consists of up to 99 tracks (each track is a stereo file or set of up to six files for surround).

Tracks can be added by right-clicking on the Group #1 icon near the top of the tree in the Album window or by simply dragging a file from the Soundfile window onto the Group #1

continued on page 12 ▶

Fast Facts

- **Applications:**
Studio, post production
- **Key Features:**
DVD-Audio stereo and multichannel PCM authoring application for Windows; imports WAV and AIFF PCM; sample rates up to 192 kHz; 16, 20, 24-bit; allows format mixing on same disc; onscreen video display/menu options
- **Price:**
\$495
- **Contact:**
Minnetonka Audio at 952-449-6481, www.discwelder.com.

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as high as when you first discovered the fun of recording.
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... then you're either deaf or dead.”

Phil O'Keefe, Sound Sanctuary Recording, Riverside CA



“I can't mix without them.”

Jim Chapdelaine

Independent composer/musician/producer, NYC, NY

“The S3-A monitors are so transparent and detailed, I “see” inside a mix.”

Andre Knecht, ARK Digital, Pasadena, CA

“I've been searching for an accurate pair of nearfields, and I've finally found them.”

Richard Landis

Blueberry Hill Studios, Nashville, TN

“They sound absolutely unbelievable - better than anything I have ever heard!”

Aaron Jaffe, Grooveshaman, NYC, NY

“I'm really happy with my ADAMs - the imaging and detail are outstanding!”

David L. Newman, film composer, Los Angeles, CA

“You couldn't pry them from my cold dead hands.”

Barrett Nichols, Alphajerk Recording, Asheville, NC

Distributed in the United States by ADAM Audio USA (805) 413-1133



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► *Minnetonka from page 10*

listing. If an interlaced stereo file is placed in the track, an "S" icon appears and the track orients itself for stereo.

Likewise, if a single channel file is placed on the track, individual icons for L, R, C, LFE, LS and RS appear and the track is then oriented for the placement of the individual surround files. A noninterlaced stereo recording can be added by simply placing the appropriate files on the L and R icons. Right clicking on a track allows adjustment of the "Pause" time before the next track plays.

Steel allows successive tracks of differing formats to be placed in the group. This ability is one of the keys to the program's usefulness as a one-off reference disc burner for professional studios.

For example, I was able to place the mixes at 16/44.1 kHz, 24/88.2 kHz and 24/176.4 kHz plus a six-channel surround mix at 24/44.1 kHz of the same song, one after each other (with a slight pause due to the format changes; same-spec files can be played back with no gap) on the DVD-R.

SUMMARY

DiscWelder Steel is impressive application that quickly and intuitively allows the burning of a variety of files onto the same DVD disc. The fact that it does not import MLP files or a VIDEO_TS for "Universal" DVDs is the major limitation that justifies the \$2,000 price difference between Steel and Chrome. But Steel is a fine tool for all but the highest-end surround requirements.

Being able to play back and quickly skip between the same material mastered at standard and high-resolution formats makes discWelder Steel an excellent reference tool. It is also the most painless and convenient way to bring high-resolution tracks-in-progress and final mixes to listening environments outside the studio. Any living room with a DVD-A-compatible player will do!

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

DISCWELDER CHROME

Minnetonka Audio's discWelder Chrome (\$2,495) offers several advanced features not found in Steel (\$495):

Allows importing of Meridian Lossless Packing (MLP) compressed audio files, enabling the burning of six-channel surround recordings at 24-bit/96 kHz data.



Interfaces with Minnetonka's SurCode MLP data compression software.

"Gapless" MLP audio file playback.

DLT output

Hierarchy of selection menus

Up to 99 slide-show graphics to accompany audio tracks

Up to nine track groups per DVD (Album) with up to 99 tracks per group

VIDEO_TS folder import to create hybrid DVD-A/DVD-V formatted discs.

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"Brilliant!"

Tony Romano, Front of House, Diana Krall

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Larry Cummings,

Grammy Award Winning Engineer,
David Grisman Quintet

"The SCX-25 is my go-to mic for acoustic guitar. It adds a gentle presence boost that makes any acoustic sound better, and its lack of proximity effect makes the bass more natural than other mics I have used."

Jahn Gatski, PRO AUDIO REVIEW

"Two SCX-25s in a Baby Grand and my work is done! There's just nothing else like it."

Pat Lucatorto, Audio Engineer,
The Tonight Show

"My first choice on Grand Piano. Easily one of the finest acoustic guitar mics ever! The size and unique design make them very observer-friendly. I love them for the sound... television directors love them for their looks."

Vaughn Skow, Audio Producer,
Live from the Bluebird Café

"What you hear is what you get. Not only is it the best sounding piano mic available, the shape, size and mount allows you to get right on top of the soundboard."

Paul Mitchell, Front of House,
Joe Sample and The Crusaders

"I have mixed dozens of bands at recent Megawatt festivals with just one mic—the SCX-25. The band's response is always the same—they can't believe the tremendous sound that comes out of a microphone with such a small footprint."

Paul Knight,

Knight Sound Systems

"I honestly think the SCX-25 is one of the best mics available, and destined to become a classic."

Dennis Leonard, Supervising
Sound Editor, Skywalker Sound



"IN A WORLD SUDDENLY CROWDED WITH CHEAPLY MADE STUDIO CONDENSER MICROPHONES DESPERATELY TRYING TO OUTWARM AND OUTSHEEN EACH OTHER, AUDIX HAS MANAGED TO PUSH FORWARD WITH THE SCX-25. A COOL-LOOKING AND INNOVATIVE MICROPHONE THAT CAPTURES DETAIL VERY ACCURATELY WITHOUT SOUNDING ABRASIVE OR HARSH, THE SCX-25 HAS A GREAT FUTURE IN THE DAY TO DAY WORKINGS OF ANY STUDIO."

ANDREW GILCHRIST, ENGINEER, ANI DIFRANCO

"I put a pair of SCX-25 mics in Diana's piano in July 2003 and they haven't come out since. These are the best piano mics I have ever heard—Brilliant!"

Tony Romano,

Front of House, Diana Krall

"I license piano samples to major keyboard companies like Emu and Easonic. In what I do, every note is like a mastered CD. It is painstakingly hand crafted and has to be perfect. I have chosen the SCX-25 mic simply because they produce better source material."

William Coakley, Sound Designer,
PERFECT PIANO SERIES

"There is need of an excellent piano mic and look no further. As an overhead drum mic, it provides a transparent and full-sounding presentation that is up there with the best. It's also a great choice for a flexible range of vocal recording duties."

Richard Salt,

ELECTRONIC MUSICIAN

"De Merlo's current CD we recorded Willie and Hag with a pair of SCX-25s in the middle of the band to get a "live" feel—and the vocals sounded great."

Law Bradley, Engineer/Producer,
Merlo Haggard

"I essentially just set the mic up, bring up the fader... and just sit back and enjoy the mix!"

Pete Norris, Norris Audio

"It behaves like a mic twice its size, a condenser with solid highs but no excessive top, and with a robust midrange and upper bass range that belie its visual appearance."

Marty Peters,

RECORDING MAGAZINE

"Having played the roles of artist, engineer, and producer, there is a fine balance between the technical and the artistic side of music. I find that the SCX-25 has really helped to bridge that gap as it faithfully reproduces vocals and acoustic guitar regardless of the style or content of the music."

Phil Keaggy, legendary guitarist

"...destined to become a classic."

Dennis Leonard, Supervising Sound Editor, Skywalker Sound

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See Bench Test page 18

BY DR. FREDERICK J. BASHOUR

It seems that audiophile-quality 8x2 stereo mixers looking for a home always seem to find one here at my studio! Since the early 1970s, I have purchased several such units, and have never seen the need for a larger board, since I do mainly classical and acoustic jazz recording sessions. And yet, although I own many tube mics and preamps, I have never had the opportunity to audition a tube mixer any more sophisticated than my extremely basic vintage Ampex MX-10 4x2 unit.

Early in the summer, a TL Audio M-3 Tubetracker (\$3,530) arrived at Studio Dufay in a shipping carton nearly the size of a refrigerator. This baby is heavy, and its center of gravity is nowhere near its physical center! The specs list its weight as 18 kg (40 pounds), but it feels much heavier than that due to the layout and distribution of its internal parts. Its (2RU) separate power supply resembles a large stereo mic preamp, in size.

FEATURES

This huge (10 rack-units high) mixer has every feature I have ever seen in an audiophile 8x2 mixer, and then some!

Fast Facts

Applications:

Studio, project studio

Key Features:

8x2 mixer featuring hybrid amplifier structure with electronically-balanced input amplifiers, vacuum tube triode second stage and summing amps, and balanced, floating solid state monitor and main output amps. Flexible design features comprehensive monitoring and insert facilities, four-band EQ, and two mono aux sends and stereo returns. Optional 96 kHz, 24-bit ADC outputs in various stereo formats.

Price:

\$3,530

Contact:

TL Audio/Sennheiser USA at 860-434-9190, www.tlaudio.co.uk.

TL Audio M-3 Tubetracker Mixer



Looking at the rear panel, one sees eight XLR mic inputs, two more XLRs for line output, and three sets of eight 1/4-inch connectors for line input, insert, and direct output. It is really nice to have separate direct outputs (switchable to -10 or +4 dB levels) in addition to the typical TRS in/out insertion points; thank you, TL Audio! There are also pairs of 1/4-inch jacks for monitor and aux outputs, and for two sets of effects returns: there is also a pair of TRS jacks for a two-track return. Most of these 1/4-inch jacks have -10/+4 dB pushbuttons associated with them. There are also DB15 input and output connectors for linking multiple units. Across the bottom of the rear panel are various sets of recessed channel, link, meter, and stereo output level calibration trimpots.

The upper left-hand corner of the rear panel features a 4-inch rectangular open-

ing that can either be covered by a plate or, in the case of my review unit, fitted with a stereo ADC option card. Mine had several parallel digital outputs (AES/EBU, S/PDIF and TOSLink), as well as a BNC jack for word clock input, and a switch for selecting external or internal clock. On the front panel, one can select any common sampling frequency between 44.1 kHz and 96 kHz, and bit depths (dithered, of course) of 16, 20, and 24 bits.

The front panel has eight identical channel strips, and then a double-width master and monitor section. Each input channel features — from top to bottom — a gain pot (16 to 60 dB for mic, -20 to +20 dB for line), four pushbuttons for selecting line/mic, polarity, a 90 Hz, 12 dB/octave high-pass filter and EQ on/off. Below these are six EQ knobs — HF and LF

continued on page 16 ►

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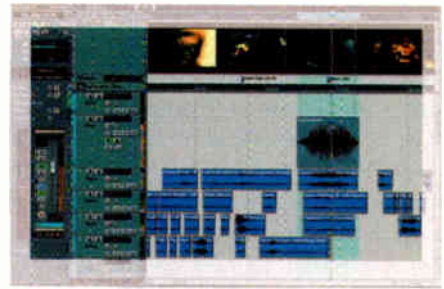
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► continued from page 14

shelving level, and upper and lower midrange variably swept frequency, and level. The EQ shelves are at 80 Hz and 12 kHz, while the range of frequencies selectable for the peaking circuits runs between 50 Hz to 2 kHz on the LM band, and between 500 Hz to 18 kHz on the HM band. The Q is fixed at 0.7, and all bands have ±15 dB level controls.

Below the EQ controls are level controls for the two mono aux sends, each with a PFL (mono solo) switch. Further down are a channel pan pot, mute and PFL switches for each channel, a scribble strip, a pair of LEDs showing the attainment of a particular peak level, and a “drive” light, indicating attainment of a specific place in the mixer’s gain scenario between the first (solid state) and second (triode vacuum tube) stages. Learning how to read these two LEDs enables the engineer to creatively use the characteristic saturation sound

available only with slightly overdriven tube preamp circuits.

Mixing to the stereo buss is done via the aforementioned pan control and a 100mm fader, which is located at the bottom of each input strip.

However, one can also monitor the two-track return inputs. Any PFL (mono solo) signal automatically overrides the monitor output. Directly below the meters is a single horizontal set of LEDs that correspond to the digital output level, and two controls

Their sound is big and “ballsy,” and the solid state outputs were able to drive any sort of cables or adapters I could muster

Over on the output and monitoring strip located to the right, one first notices the pair of large illuminated moving coil VU meters (each with a peak LED beneath it), which follow the monitor output — which normally follows the stereo output.

for the unit’s stereo digital output’s sample rate and bit depth.

There are also master level controls for the two aux outputs (with PFL switches), and separate level and balance controls for the two effects returns (also with PFL switches). Below all this lies the master 100mm fader, and a 1/4-inch headphone jack, which drove my Sony, AKG, and Sennheiser headphones to appropriately high levels.

IN USE

I’ve had the Tubetracker here in my studio for nearly two months, and have used it just about every day. Everything that I could possibly send through it, I have. Thus, I have certain conclusions about its “sound” or, more specifically, its various “sounds.”

The easiest way to explain these conclusions is to begin by detailing what I call my “simple audiophile switching setup.” Take a great sounding source (for example, “Things I Miss the Most” or “Pixeleen” from the new analog-recorded Steely Dan CD, playback through the best DAC chain you have (in my case, an Audio Alchemy CD transport through a Weiss DAC-1 Mk. II converter — directly through a passive Coleman Audio MS8 switching box (*PAR* 4/00) to heavily modified McIntosh MI-200 industrial tube amplifiers, driving Manley Tannoy loudspeakers augmented by custom transmission line subwoofers.

What did I switch? Well, the direct out-



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put from the Weiss, and the various outputs from the Tubetracker. That is to say, I connected the TL Audio mixer's direct outs, aux outs, main stereo buss outs, and monitor outs — so I could hear clearly which parts of the Tubetracker imparted the most coloration to the audio signal passing through it — and carefully matched the levels amongst them. TL Audio publishes a block diagram of the mixer's circuitry and, by carefully studying it, one can easily map the number of various tube and solid state amplifiers through which the audio signal passes onto the listener's subjective impressions. Sort of an "informed A/B" test.

Parenthetically, I also tested the Tubetracker's mic preamps, but found them not as outstanding as the unit's line level and EQ circuitry. Low-output ribbon mics, such as Royer or my AEA R-84,

focus," while the rest of the band was given a small "euphonic coloration" from the single triode tube stage and solid state buffer amps through which the signal passed. Thankfully, the Tubetracker's design allows the most important part of its circuitry, in my opinion — its EQ — to be applied to the direct outs, so I can comfortably state that, for someone who simply wants to send eight tracks through something for EQ and "tube coloration," the Tubetracker would be perfect!

The main stereo buss outs sounded almost as good as the direct outs, and the vocal still sounded fine. Their sound is big and "ballsy," and the solid state outputs were able to drive any sort of cables or adapters I could muster from my basement milk crates. And when I used the Tubetracker's digital outputs, I was really pleasantly surprised that they sounded

Product Points

■ Plus

- + Euphonic tube sound
- + Musical-sounding EQ circuitry
- + Smooth digital output stage

■ Minus

- Heavy, "ungainly" size
- Different outputs have different "sounds"

■ The Score

If your studio needs a permanently-installed 8x2 mixer with a wonderfully smooth sound — perhaps to record to, mixdown from, or simply "warm up" DAW tracks — the Tubetracker is just the ticket.

When I used the Tubetracker's digital outputs,

I was really pleasantly surprised that they

sounded great, even at 44.1 kHz!

sounded very noisy and undistinguished, and picked up strange whistles (never-before experienced) in my studio. (Editors Note: TL Audio is aware of the problem and says that current production models have an improved preamp.)

Modern solid state microphones, such as my Gefell M-930s, sounded more or less as I expected, albeit with a bit of a solid state edginess, which I did not expect — since I'm so accustomed to hearing them through my various high end tube mic preamps. The Tubetracker's mic stage is an electronically-balanced solid state one, so one should not expect much "tube magic" from it.

There were a few other surprises, but the Tubetracker's obvious "winner," sound-wise, was its direct outputs. And that's a good thing! Through these, Donald Fagin's voice stayed completely "in

great, even at 44.1 kHz! If you own a Tubetracker, you'll be hard pressed to justify the expense of an external ADC.

The aux outputs, for some reason, imparted a bit of softening and quite a little phasiness to the voice. According to the schematic, the main difference between the aux and main output circuitry lies in the fact that the main outputs include a triode gain stage before the solid state buffer amp, while the aux outputs have both solid state summing and output amplifiers. This slight degradation of the sound quality may or may not affect most users — depending on what they expect the aux outputs to drive. For example, an optical stereo buss compressor would change the sound much more than the aux outputs do and, thus, would swamp any of their slightly negative effects. On the other hand, if an engineer wanted to use the

auxes to drive a separate recorder, or a super-duper audiophile-quality equalizer in insert mode like a Manley Massive Passive, the decision would be more difficult to make.

The monitor outputs imparted the most phasiness and softness to a center channel vocal but, after all, they are only monitor channels. My original Neil Muncy-designed Suburban Sound SS-III 8x2 mixer from 1971 (the small high-end mixer from those days) uses a pair of little Beyer transformers to isolate the PFL signals and then needs an extra +30 dB gain stage to get the level back up. That bit of elegant engineering compromises its sound quality much more than the TubeTracker's monitor circuit does, so a little perspective here is indicated.

CONCLUSION

But where it counts, the sound quality of the TL Audio Tubetracker is unimpeachable and, at its asking price, it is quite a bargain, considering all that you get. I know of no other piece of mixing equipment that does as much, and sounds as good, overall, as TL Audio's TubeTracker.

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/engineer.

TL Audio's M-3 Tubetracker 8/2 Valve Mixer hails from Merrie Ol' England as if the "valve" moniker hadn't given that away. It's an eight-in/two-out board, and, although it has an optional onboard stereo A/D converter, it's not the A/D that you'd buy the M-3 for but rather its hybrid topology and well-executed equalizers. The M-3 marries solid state preamps with triode tubes (excuse me, 'valves') that appear at two points in the circuit: in each channel after the preamp, phase inverter and high-pass filter but prior to the equalizer; and, after the buss-summing amps, prior to the main stereo faders and output amps. Since the whole point of this board are those tubes and their attendant soft-overload characteristics, I took all the measurements from the balanced line and mic inputs to the main stereo outputs and tried to tailor the specifics of the measurements to exercise the tubes. More about that

in a moment. First, the generalities. **Figure 1** overlays the response curve taken using the line input and with the equalizers bypassed (solid curve), with that taken with the equalizers engaged but with their controls at the detents (large dashes). Activating the equalizers humps the midrange to a minor degree (about .25 dB) and rolls off the highs a little sooner (-3 dB at 48 kHz rather than 55 kHz) but otherwise is benign. The third curve (shorter dashes) shows the action of the high-pass filter. It's 3 dB down at 91.5 Hz (close to target) and probably ultimately rolls off at 12 dB/octave as specified but it's slow getting there. The characteristics seem closer to Bessel rather than Butterworth but I've not analyzed the curve that precisely. The Figure 2 set of curves documents the range of each equalizer section. **Figure 2A** shows the maximum spread of the low and high

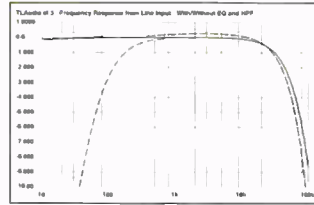


Figure 1: Response curve

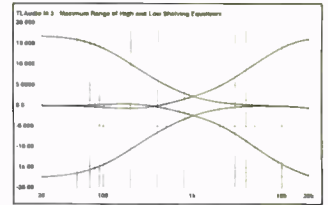


Figure 2A: High, low EQ range

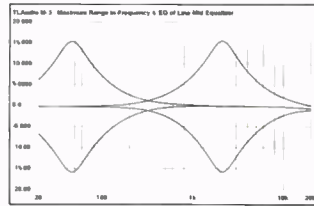


Figure 2B: Low/mid EQ range

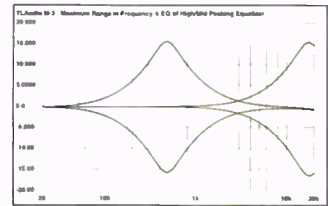


Figure 2C: Mid/high EQ range

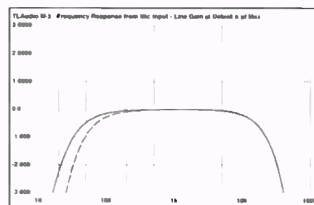


Figure 3: Mic input response

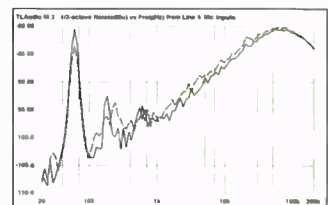


Figure 4: Noise spectrum

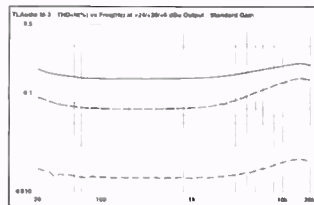


Figure 5: THD+N vs. frequency

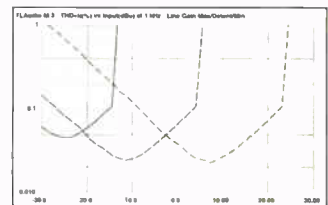


Figure 6: THD+N vs. input level

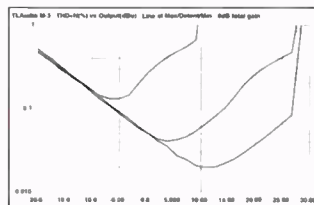


Fig. 7: THD+N vs. output level

shelving equalizers (somewhat over +/-15 dB), **Figure 2B** shows the response of the Low-Mid peaking equalizer with the frequency and boost/cut controls at max and min. **Figure 2C** shows the same for the Mid-High peaking equalizer. There are two octaves of overlap in the midrange of the peaking equalizers so you can use either to make adjustments from 500 Hz to 2 kHz. The shapes are almost identical too with a maximum range of just over +/-15 dB. I took curves with each control at 9 o'clock and 3 o'clock,

and although space considerations precludes showing them all, they were "classic." The shelving controls shelved properly topping out at with a +/-5 to 6 dB spread. The peaking equalizers had about the equivalent peak spread but don't rely on the frequency markings to be spot on. (They rarely are!) **Figure 3** shows the overall response using the microphone input. The solid curve was taken with the gain pot at the detent; the dashed curve with it maxed out. (Reducing gain below the detent didn't affect response.) It's obvious that there's a measurable degree of bass roll; response is down 2.2 dB at 20 Hz with the gain at the detent and down 4.4 dB with it maxed out. The noise spectrum (**Figure 4**) shows major hum components at 60 Hz and lesser ones at 180 Hz. I tried

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various groundings trying to get rid of it but to no avail. Perhaps I was beating my head against the wall because the M-3 actually better its noise specification so I guess this is what you can expect. Interestingly, the 60 Hz component using the microphone input (dashed curve) was a bit less than when using the line input (solid curve) although the overall thermal noise was a tad higher. (That's to be expected from the -40 dB of extra gain provided by the mic preamp.) Input overload using the line input was more than adequate (+29.1 dBu/22.1 volts) and extraordinary on the microphone input (+10.2 dBu/2.51 volts).

Figure 5 plots THD+N versus frequency using the line inputs and "standard" gain settings: Gain at the detent, Channel and Output faders at marked 0. From top to bottom, the curves plot the results at output levels of +24 dBu, +20 dBu and +6 dBu.

I scratched my head deciding how to explore the tubes' overload characteristics. The first tube comes after the input gain pot, and there's a yellow LED down near the channel slider that glows progressively brighter as the input level rises suggesting the gradual onset of overload. I decided to plot THD+N versus input level using three set-

tings of the gain control (Max/Detent/Min). The results are plotted in **Figure 6**. The input level at which each curve breaks abruptly upward indicates input clipping. Below that point is a region at which distortion rises gradually from approximately 0.025% to 0.1%. This is the region where the first tube is "doing its thing." At lower levels, the THD+N slopes upward but this region is almost certainly due to residual noise (remember the 60 Hz component) rather than distortion so it's fair to say that the first tube gradually introduces more distortion (likely even order) until the THD hits 0.1% at which point the circuit clips.

That leaves the question of what the second tube is doing — the one just before the output fader. To get a handle on this, I repeated the tests of **Figure 6** but this time plotting THD+N versus output level and adjusting output fader for 0 dB overall gain. The results are plotted in **Figure 7**. My interpretation of all this is that, by choosing an appropriate combination of gain setting and input level, you can introduce as much as, perhaps, 0.5% of "tube distortion" before something clips. I'll leave it to our hands-on reviewer to tell us how he thought this all sounds.

— Ed Foster

Test Report: TL Audio M-3 Tubetracker

Gain to Stereo Out:	from Balanced Input	41.8 dB
	from Microphone Input	82.0 dB
Output Impedance:	Balanced Output	47 ohms
	Headphone	21 ohms
Maximum Output:	Balanced Output	+28.4 dBu (20.4 V)
	Headphone	9.58 V open circuit
Maximum Headphone Power:	into 600 ohms	145 mW
	into 50 ohms	80 mW
Input Overload:	Balanced Input	+29.1 dBu (22.1 V)
	Microphone Input	+10.2 dBu (2.51 V)
Frequency Response:	Line Input	+0.0 dB, -0.40 dB, 20 Hz - 20 kHz
		-3 dB at < 10 Hz & 55 kHz
Frequency Response:	Mic Input, Gain at Min	+0.0 dB, -2.2 dB, 20 Hz - 20 kHz
		-3 dB at 16.4 Hz & 40.5 kHz
Filter:		-3 dB at 91.5 Hz, ~12 dB/octave (cf text)
THD + N:	at +6 dBu output	< 0.022%, 20 Hz - 20 kHz
	at +20 dBu output	< 0.143%, 20 Hz - 20 kHz
A-Weighted Noise:	Line Input	-79.4 dBu
	Mic Input Gain at Detent	-78.2 dBu
EIN (A-weighted):		-133.2 dBu
Channel Separation		>46 dB, 20 Hz - 20 kHz

Notes:

Unless otherwise noted or implied, all measurements were made from the balanced line input to the balanced stereo output with the Channel and Master Faders at marked 0 and with the preamp gain control at the detent. Measurements made on one channel are made on Channel 1.

Unless otherwise noted or implied, THD+N measurements were made using a 80 kHz analysis filter.

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BY TOM JUNG

The 3A Midi Master was a relatively successful speaker from the 1980s and was a forerunner of today's Reference 3A series of higher performance monitor speakers. The MM deCapo speaker has been around the audiophile community for a few years but only recently upgraded to the "i" for improved status.

FEATURES

When the potentially harmful effects of crossover components are removed from a speaker the results can be very appealing, as is the case with the MM deCapo-i from Reference 3A (\$2,500 per pair). I call it almost a one-way because the 8.25-inch main driver is almost full range and rolls off naturally at the rate of 6 dB per octave without any help from crossover components. This is a good thing as the amplifier is directly coupled to the main driver's voice coil with consequential benefits not the least of which are efficiency (92 dB, 1 watt at 1M), good LF control and an easy-to-drive smooth 8 ohm impedance.

As the main driver is rolling off (naturally), a single audiophile grade capacitor is rolling in a one-inch textile tweeter at the same gentle rate of 6 dB per octave. Could this be called a 1 1/2-way speaker? The beauty of this design is that the critical upper mid range is not corrupted by multiple filters trying to get drivers out of each other's way spectrum wise.

The main driver is made from woven carbon fiber and has what the company calls a Hyper-exponential-shaped cone with a Precisely-shaped phase plug. This combination accounts for the more extended smooth high frequencies comparatively free from the usual peaks and nonlinearity found in most drivers this size.

Fast Facts

Applications:

Studio

Features:

Two-way; 8.25-inch shaped cone woofer; 1-inch cloth tweeter; phase plug

Price:

\$2,500 per pair

Contact:

Reference 3A at 519-749-1565,
www.reference3a.com.

Reference 3A MM deCapo-i



A resonance absorbing Vibra-Puck disc is mounted on the back of the driver reducing superfluous frame vibrations. This custom-built wide range driver has been refined and tweaked over the years and is now considered by some audiophiles to be the heart of the best small monitor out there.

A one-inch soft dome tweeter was selected to match the main driver acoustically and electrically for seamless integration with a resonant frequency of 600 Hz, octaves below where the tweeter actually becomes active.

The enclosure has a rear tuned port and a slanted front baffle with the tweeters mounted to outside above the main driver so that left and right are mirror images of one another. The company recommends NOT toeing in the speakers but pointing them straight into the room thereby creating a slight HF delay with the tweeter distance to listener being greater than the main driver, bringing both drivers into phase and time alignment. The cabinet is heavily braced internally making it extremely rigid and is finished in a beautiful high gloss piano black finish. All edges are attractively beveled minimizing diffraction. Two sets of five-way binding posts are mounted on a thick metal rear plate, accommodating bare ended spaded or banana connectors. Biwiring is highly recommended by the company although the de Capo-is are delivered with solid copper plate jumpers for single wire speaker cables.

Because of the efficiency of these speakers and the easy-to-drive load impedance, relatively small amplifiers can be used. I find that amplifiers with only a pair of output devices often times sound better than more powerful amps with lots of output transistors in parallel.

IN USE

I set up the pair of deCapo-is on RPG speaker stands, toed in as I typically listen to and review speakers of this size. First impression was too much energy in the upper mid-range, but then remembered no tow. After pointing

them straight into the room the upper mids settled in nicely with the rest of the spectrum and the tonal balance was significantly improved. Listening to what seemed to be off axis was a bit weird for me but there was no doubt that from top to bottom the amplitude response was very smooth and uncolored. The lack of crossover in the lower high frequencies gave the presentation a sense of clarity and realism not typical of any speaker I've heard. Brass instruments, especially trumpets and trombones benefited from this crossover-less design.

The bass was full and deep extending down to an honest 40 Hz. Using a quality amplifier with good low frequency control and high damping factor like the Bel Canto eVo presents a bottom end experience hard to beat in a speaker this size. I'm sure some of this is due to the fact that the amplifier is directly coupled to the drivers voice coil and not a series inductor which is typical of most crossed-over speakers.

As long as I sat in the sweet spot equidistant from each speaker the deCapo-is sounded great, but as soon as you move from one side to the other, the tonal balance changes and the closer speaker exhibits a boost in the upper midrange which could be a problem for monitoring with a large console. But with today's workstations this should be no problem at all.

(Editor's note: Reference 3A says it now offers a 'Studio' version with more tonal balance and better behavior with solid state amplifiers.)

SUMMARY

If crossovers get in the way between you and the music, you should definitely check out the Reference 3A deCapo-is. The clarity in the upper midrange is exceptional. Extended articulate bass, smooth natural mids, open and airy highs make the deCapo-is a real contender for high-quality monitoring.

Tom Jung is Pro Audio Review's technical consultant.

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All Sides Now: A Surround Perspective

by Stephen Murphy

As the most recent Audio Engineering Society convention once again confirmed, there is no shortage of top-notch tools for the audio trade. Significant product innovation and updates were de rigueur at the industry's most anticipated show of the year. Compared to the previous two U.S. AES shows, the increase in enthusiasm for the industry, demonstrated by attendees and exhibitors alike, was hard to ignore.

For many exhibitors at the show, the focus of their new wares was on multichannel audio support. New surround-capable products were shown for every link in the pro audio chain, from field acquisition through broadcast and consumer delivery.

It would not be an exaggeration to say that the proliferation of surround sound is breathing new life into every area of professional audio production, from live sound to car sound.

The Peoples' Surround

In any significant format introduction, classic chicken-or-egg inertia is the major impediment to ultimate acceptance. In the past several years, the general entertainment industry has taken this principle to a new level by simultaneously introducing several competing and incompatible – and to many consumers, indistinguishable –

delivery formats: consumer-level confusion, frustration and buyer apathy are the result.

New consumer audio and video format roll-outs such as the Compact Disc and VHS/Beta tape recorders are predictably uphill battles, but no one was quite prepared for the industry quagmire caused in part by the recent high-resolution and multichannel audio format wars.

In retrospect, convincing the buying public to ditch their vinyl and cassettes for the Compact Disc was a cakewalk: the CD was essentially a unified delivery format that was universally supported by the major record labels and offered the consumer significant and palpable benefits. Unfortunately, what has been going on in the industry in recent years renders the VHS-Beta hardware wars – in which many companies went out of business and many consumers were left high and dry and somewhat lighter in the wallet – insignificant.

Imagine if, when the Compact Disc was being rolled out, consumers had to choose between a few expensive first-generation players of competing and incompatible formats, each of which is tenuously supported by incomplete and frequently exclusive software catalogs. Also imagine that, after deciding on one of the new CD formats, the consumer also has to purchase a compatible amplifier capable of receiving and/or decoding the player's output in order to realize any benefit from the chosen format.

The system also requires new speakers, several new interconnects and a reasonably involved setup process. And, after all that, never far from the mind of the consumers is the fact that their chosen format may be dead in a year. The sound you are now hearing is that of millions of checkbooks closing.

Surround Salvation

Even with impediments similar to those above, multichannel audio and audio-plus-video formats have meandered their way into many consumer markets. HDTV and HD Radio broadcasts, digital cable and satellite delivery systems, live concerts, video games, theater



Logitek 7.1 meter

productions and, most significantly, home theater setups have all done their part to increase consumer awareness and interest in surround sound.

Many industry players have predicted that the ultimate boost will come on the day automobile manufacturers begin installing surround systems as standard. That day arrived with the recent announcement from Acura that its 2004 TL line will be equipped with factory-installed DVD-Audio 5.1 surround sound systems from Panasonic Automotive Systems.

The process may have taken longer than it needed to and there are many kinks to resolve, but from all indications multichannel audio and surround has officially reached the mainstream consumer. This good news heralds a significant increase in demand for surround programming, which in turn means more and more of us will be working in surround. It is not unlikely that every one of us will be involved in surround production or delivery by the end of the decade.

Gearing Up

Even if you are not actively involved in multichannel production, chances are you already own several products designated as surround-capable. Like their consumer-counterparts, pro audio manufacturers have been doing their part in the steady march towards surround acceptance by updating existing products and introducing new ones. In another few years, making the transition to professional surround work should be nearly painless.

Developers of digital audio workstations and plug-ins have almost universally incorporated surround support into their systems. If you use Steinberg Nuendo, Pro Tools, Merging Technologies Pyramix, MOTU Digital Performer, Emagic Logic, Magix Samplitude or any of the other DAWs available, you probably already have the core of a surround mixing setup.

Surround-capable plug-ins and surround-specific plug-in bundles are available, with notable recent releases from Waves, Steinberg and TC Works. Minnetonka Audio Software has led the way for software-based standalone multichannel audio encoders and authoring software with its SurCode line (Dolby Digital, Dolby Pro Logic II, DTS, MLP) and discWelder DVD-A authoring applications. Surround-encoding plug-ins and authoring tools are also available from Steinberg, Digidesign,

Sony/Sonic Foundry and others.

Recent mergers between desktop video and audio developers such as Pinnacle/Steinberg, Adobe/Syntrillium, Apple/Emagic and Sony/Sonic Foundry are in no small part driven by the increased need for high-quality multichannel audio for video productions.

On the hardware end, chances are that if you own a digital board, you own a surround mixer. Just about every small to mid-sized digital board that can be purchased today from Yamaha, Sony and Mackie is surround capable, and many earlier models are upgradable via system software and/or firmware updates. New surround-capable consoles such as the Yamaha DM1000, digital mixer and TASCAM SX-1LE mixer/workstation provide an incredible amount of professional features for the price. ; for project studios, check out the affordable Phonic MRS1-20 and Behringer DDX3216 digital consoles.

At the digital processor high-end TC Electronics has its powerful System 6000 while Z-Systems has several rackmounted digital six-channel processors.

But production is not limited to "digital" tools alone. The new console from API, the Vision, is a dedicated 5.1 surround mixing console with API's legendary analog modules installed. And SSL has broken out a rackmounted 5.1 compressor from its console line. Drawmer too has a six-channel mastering compressor, the DL651 Sixpack.

Not to be forgotten is the lengthy list of big boards from the usual suspects (DiGiCo, AMS Neve, Amek, Euphonix, Harrison, SSL) that have handled 5.1, 7.1, etc. surround for several years in the high-end production and post worlds. Also dedicated broadcast/video mixers from Calrec, Harrison and Zaxxon have surround paths built into them.

Professional studios and engineers upgrading to surround production will find that the purchase of a few specialized multichannel tools is a wise investment. There are two utilitarian tools for surround production that I have found to be indispensable: a surround monitor/source controller and good surround meter. Both are worth their weight in gold in the professional



Yamaha DM1000

environment. Check out my reviews of the TASCAM DS-M7.1 monitor controller (PAR 5/03) and DK Audio MSD600-series surround meters (PAR 10/02) for two of my favorites.

If those don't float your surround boat there are other surround monitoring devices from companies such as Magtrax, Studio Technologies, SPL and Martinsound. Surround metering can be had from Logitek and Dorrough, both of whom have had tricolor surround LED meters for years.

A Sense of Space

Increased consumer interest combined with new multichannel audio tools – and the sense of renewed enthusiasm for our industry – displayed at the AES convention signals that it is a good time to look at how your business can prepare for the future.

Surround is steadily encroaching into consumers' activities from every facet of the entertainment industry. It is not hard to imagine a time where consumers will accept nothing less than surround audio, with stereo going the way of mono LPs and black and white TVs.

There are still competing audio formats and delivery systems to contend with (witness the fact that DVD-A, not DVD-A/SACD universal players are going into the aforementioned Acura line), but it seems the logjam is starting to dissipate. The chickens and the eggs haven't exactly reached an accord, but the groundwork for cooperation and progress has been laid.

Stephen Murphy, contributing studio editor for PAR, is an audio engineer/producer with Grammy Award-winning and a Platinum-selling album credits.



Solid State Logic's new 5.1 compressor

Waves 360 Surround Toolkit

by Russ Long

While music mixed in surround has not taken the world by storm, it has experienced slow but steady growth over the last couple of years. I think most people would agree that the medium is not going to fizzle away like quad did back in the 1970s. It has already reached a point where you can purchase a car stereo equipped for surround. As the popularity of the medium increases, the pro audio industry has made efforts to provide specialized tools for surround productions.

Many DAWs and/or plug-ins can now do what once required two or three stereo busses using complicated routing schemes and matrices. The Waves 360° Surround Toolkit (\$2,400) is likely the most complete and sonically satisfying package of tools designed to both enhance and ease the surround sound production process. Each of the Toolkit's plug-ins was designed to be intuitive and friendly to use while retaining the highest possible audio quality.

Features

The Waves 360° Surround Toolkit includes the R360° Surround Reverb, S360° Surround Imager, S360° Surround Panner, C360° Surround Compressor, L360° Surround Limiter, LFE360° Low-Pass Filter, IDR360° Bit

Fast Facts

- **Applications:**
Post production
- **Key Features:**
TDM; R360° Surround Reverb, S360° Surround Imager, S360° Surround Panner, C360° Surround Compressor, L360° Surround Limiter, LFE360° Low-Pass Filter, IDR360° Bit Requantizer, M360° Surround Manager, M360° Surround Mixdown
- **Price:**
\$2,400
- **Contact:**
Waves at 865-546-6115,
www.waves.com.



Requantizer, M360° Surround Manager and M360° Surround Mixdown.

The R360° Surround Reverb provides a natural, rich and smooth surround space with a decorrelated reverb tail. The plug-in has special controls that offset filters and predelays between the front and rear stages. The R360° creates the highest quality diffused reverb tail reflections possible. This requires heavy processing equivalent to three stereo reverbs. To process this at 96 kHz requires a doubling of the processing power again. The R360° has two modes to address this high-DSP power consumption: the normal component and the Compact component. The Compact component consumes less DSP power for the same overall features and control set. The sound is slightly different but the tradeoff is less DSP consumption. The Compact component is available only on Pro Tools HD systems.

To pan in a surround matrix, most applications offer an X/Y panner. This type of panner allows the user to position the sound source in a square matrix. An X/Y panner is useful to designate discrete sources to discrete speakers, but when you have stereo information, designating the input to anywhere other than the left and right channels of the surround stage causes the stereo image and its contained directional phantoms to distort. In addition, using an X/Y panner for any setting that is not hard panned to a single speaker makes it more difficult to determine the exact direction of the phantom image because it will appear in perfect correlation in many speakers at once, creating simple divergence.

The S360° Panner and S360° Imager consider surround as a sound stage that surrounds the listener 360 degrees. If you desire

to position your sound source 43 degrees right and stretch it or spread it 1.8 times wider, then the S360° is the correct tool. The Panner and the Imager provide the option of pair-wise or triple-wise rotation pan pots to use speaker pairs or three-speaker panning. Both the Panner and the Imager offer a choice of Width pan pots that provide the means to spread an image either wider or narrower in relation to its rotation.

The Imager goes a step further to incorporate Distance Panning which offers statistical room modeled early reflections. These reflections are calculated according to the rotation of the direct signal. This helps to enhance localization and stabilize the direction of phantom images beyond the sweet spot. The shuffling of low frequencies is another sweetener integrated into the Imager to increase spatialization.

The Waves 360° Surround Toolkit includes the L360° Limiter and the C360° Compressor dynamics processors. Both have fast setup times and provide great results and both offer many choices and flexibility in their linking and coupling schemes. The plug-ins have up to three separate side chains and the Link Mode selector control can be used to define which channels are coupled to which side chain. The selected link mode provides separate threshold and Out Ceiling controls for individual groups, but global threshold and ceiling controls are available for linking all channels under control. Both of these tools are in the vein of existing Waves dynamics processors adding the Link modes, so the sound is familiar, but the Link modes provide the necessary controls for surround applications.

The LFE360° Low-Pass Filter is a steady 7th order filter with an extra steep response and no overshoot. This filter can be used on a mono or a

continued on page 26 ►

DS-M7.1

Doing 5.1, 6.1 or 7.1 surround mixes? Our DS-M7.1 Digital Surround Monitor Controller can make your work easier.

Back-lit 20x4 display shows parameters and unit settings such as monitor status, inserts and word clock.

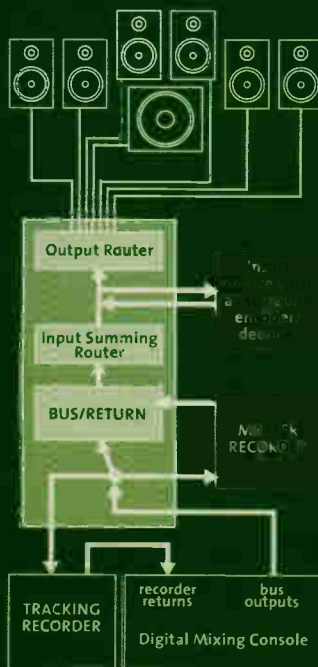
- ▶ 8-ch. TDIF, AES/EBU and ADAT® connections to stem recorder
- ▶ TDIF connections to console (AES/EBU, ADAT and analog available on optional cards)

No wonder TASCAM's DS-M7.1 has been nominated for a 2003 TEC award. It's the perfect solution for surround monitoring.

SPL reference indicator and level control.



Extra front panel 9-pin D-Sub remote input connector (there's also one on the back).



- ▶ 8 input channels and 8 output channels
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- ▶ LED SPL display
- ▶ Individual channel delay compensation
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- ▶ Surround Bass Management
- ▶ Integrates with existing console control room monitor outputs
- ▶ AES/EBU insert for through-encoder monitoring (analog available on optional card)
- ▶ Analog and AES/EBU surround monitor outputs

The DS-M7.1 duplicates the output buses of digital consoles and then routes the signal to both a stem recorder and multiple amp/speaker combinations.

It supports every surround format from LCRS to 7.1 (including 5.1 and 6.1) and can downmix to LR from any flavor of surround.

If you want more multichannel monitoring flexibility than any console or workstation can provide, visit www.tascam.com for more DS-M7.1 info.

Useful controls like Solo/Mute, Down Mix/Mono, Bass Mgt and Mute All. Also handy for impressing clients if you don't already own one of those *really* expensive machines that goes "ping!"

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► *Waves 360 from page 24*

5.1 multichannel insert, but it only affects the LFE channel (the .1 channel). Its default setting acts like filters used for the LFE channel when using common encoding technologies.

The IDR360° Bit Requantizer is an Increased Digital Resolution Dither and noise-shaping plug-in used to shorten the word length of a 24-bit master to 20 or 16 bits. The IDR preserves as much of the perceptual resolution of the source down to the designated bit rate.

The Waves M360° Manager assists in proper studio monitoring calibration and the application of precision Bass Management within the DAW. Using the M360° eliminates the need to purchase hardware for this purpose.

The M360° Mixdown allows you to audition or create a mixed down version of the discrete 5.1 surround mix. A surround mix can be converted to a mono, stereo, LCR or LCRS mix.

There are several conflicting views and opinions regarding surround mixing and playback. The Waves 360° Surround Toolkit follows the reproduction standards recommended by the International Telecommunications Union in the ITU-R BS.775 (1993). Most surround professionals agree that these standards are the best option that the industry currently has. The principle of the recommendation is based on five matched speakers placed at equal distance from the center of a circle (the sweet spot). The front speakers are positioned ±30 degrees of the center and the surround speakers at ±110 degrees.

In Use

I put the Waves 360° Surround Tools to work on an Allison Moorer live recording for Universal South and was extremely pleased with the results. In retrospect, I cannot imagine mixing a surround project without the Waves Surround bundle. With the exception of a Lexicon 960 and six channels of

Universal Audio 2-610, the bundle was responsible for all of the project's surround processing.

I was impressed to discover the S360° Imager and R360° Reverb presets were intended to complement each other. Both plug-ins have a "Virtual Spaces" factory presets mode with the same preset names. I found that it worked best to begin a mix with matching factory presets and tweak from there.

My Pro Tools rig is a bit DSP deficient so I did not have the power to start all of my mixes with the S360° Imager on every channel. The S360° Panner is thankfully quite DSP-efficient where the Imager is significantly more DSP power consuming. I found it helpful that the Panner and Imager can be hot-switched and all common controls will inherit the existing settings. This allows for starting with the Panner and stepping up to the Imager when the extra features are needed.

Since the L2 was released, I have used it on every stereo mix I have done. It sounds great and in small doses it is virtually undetectable. The L360° Surround Limiter does for surround what the L2 does for stereo. I had absolutely fantastic results inserting the L360° Limiter on the master bus before going through the line inputs of six channels of Universal Audio 2-610 on the way to my iZ RADAR, where I printed the master 5.1 mix.

Studio monitoring calibration is extremely important as it ensures that a studio mix accurately translates to the outside world. When I mix a stereo



C360 Surround Compressor Module

album, it is easy to burn a CD and listen on five or six systems to be sure the mixes are working. Surround mixes are a different animal. There isn't a quick and easy way to burn a surround mix and there are not as many surround systems readily available to listen to your mix. Among two cars, my home and my studio, I have over a dozen reference points for a CD of a stereo mix, but only one for surround. I was impressed with the way the Waves M360° Manager helps apply accurate bass management within the DAW and perfectly calibrate a studio for surround playback. As I begin to price hardware and software for my permanent surround setup, I am amazed at how much the M360° will save me in hardware expense without any sonic compromise.

I found the Waves manual to be extremely well written and informative. With so much conflicting information regarding surround, it is wonderful to have such well-researched reference material included with the product. Setup options, the difference between mixing for film and mixing for music, and bass management are a few of the many topics that are discussed in comprehensible detail.

Summary

I have purchased several Waves packages over the years since buying my first Pro Tools rig back in 1996. In every instance I initially felt that the product was on the pricey side, but once I worked with it and realized its potential I felt like it was a bargain. I found this to be the case with the Waves 360° Surround Tools.

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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Schoeps KFM360

Surround Microphone System

matrixes, which is then taken further.

It is possible to get into a right state of frustration (AKA knickers in a twist) due to the underlying complexity of the control unit and the printed operating instructions. The first thing to grasp is the two operating modes, determined by a fifth rotary front panel control. There is the "A" mode where you are recording, from the DSP's digital outputs, the raw omni and figure eight feeds for future processing. Then there is "B" mode where you are processing and recording simultaneously from either the digital or analog outputs.

In the latter case you get the L and R, the center and LFE, and the Ls and Rs respectively over the three AES/EBU outputs and also on the analog five-pin XLRs. When in the "A" mode the third AES/EBU and the third analogue five-pin XLR allows individual monitoring of 12 useful aspects of the units processing, which you can

choose to use, or not, later.

The operating instructions do not really stress this enough early on, and should really do so. Also there are references and illustrations involving the similar looking Polarflex unit, regarding syncing their clocks. This did also confuse early on, as the illustration shows the necessary but different pairing of the mic feeds.

Each of the five rotary controls have two uses. Red lettering refers to one set of facilities and the green lettering to the other. Which set is in use is determined by a toggle switch and two associated red and green LEDs on the units front right-hand side. Only the green settings are storable by the preset store/recall arrangement, with up to ten setups available.

Assuming you want to process and record straightaway, have the toggle switch initially

continued on page 28 ▶

by Mike Skeet

The Schoeps KFM360 Surround Microphone System (\$12,250) is the fourth surround microphone system I have had the chance to use and evaluate. This one is an interesting adaptation of the KFM6 Sphere which Schoeps has in its catalog for stereo recording use. The stereo model had two omnidirectional capacitor capsules, flush-mounted either side of a 200mm diameter sphere and indeed is a useful stereo miking tool.

Features

Now with a smaller 180mm diameter sphere and its two CCM2S omnis, we have two CCM8L figure eights, associated with the omnis, one each side of the sphere facing front and back, each with its positive phase facing forwards.

An essential part of the package is the Schoeps DSP-4 KFM360 Digital Processor, used to derive the six 5.1 signals. This incorporates the initial phantom-powered mic amps, A/D and D/A converters, and a host of resultant facilities, as will be covered. This processor is closely related, especially physically, to the Schoeps Polarflex DSP-4P Microphone Modelling Processor.

Both analog and AES/EBU digital outputs are available. The unit can be used directly in the recording chain, or in post production. If the four mic signals are initially recorded separately, two five-pin XLR(F) inputs accept the mic feeds. The sphere omnis go to analog input one and the two figure eights to analog input two. Obviously the processing starts with two initial M/S



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Ross says



"I've used my Royer's on every recording I've done since 1998. These mics have made a huge difference to me in my quest for real sounding records. From blues to heavy metal, I keep finding new and effective ways to use the mics and by far they have become my main electric guitar mic. I just finished producing and engineering Ziggy Marley's new record and single and the Royers are everywhere. I used them on the drums, organ, percussion, the four piece horn section and of course the guitars. I brought in my old friend David Lindley to play his arsenal of stringed instruments and he was very impressed with the size and detail translated from the mics. 'Irie! I don't look back now, only forward and the bottom line is, I won't ever make a record again without these mics.'"

Ross Hogarth (Grammy winning Producer/Engineer - Ziggy Marley, Gov't Mule, Keb Mo, Coal Chamber, Jewel, Roger Waters, Black Crowes)

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► Schoeps from page 27

set for the red uses of the rotary controls, select "B" mode (called 'Gain/dB') with the fifth rotary switch. Then set the mics' gains to suit the signal levels with the fourth rotary control. This provides 33 dB of gain, in the digital domain, in 3 dB steps, but with the 24-bit processing you are still above the 16-bit CD standard. There is also, on the rear panel, a 10 dB pad for working in SPL situations greater than 120 dB.

Now go into the green range of uses for the rotary controls (called 'Pattern/Surround') and set the second rotary control to the first of its "Front Panorama" settings. At this point all six signals will appear on the recorder's channel level meters and you can proceed.

You have the choice of polar patterns for the front and separately for the rear. A delay of up to 50 mS, in 5 mS steps can be applied to the rear outputs. Also for the rear feeds, there is an HF rolloff slope, with 11 positions over a frequency range from 10 kHz down to 1 kHz. The Front Panorama control is involved with correlating the derivation of the centre feed from the front L and R. In effect it is a subtle width control. Note that in its 12th position, the center channel output ends up being muted.

In the red range of settings the following facilities are provided by the same five rotary controls. There is front/rear balance and left/right balance. Then there is the monitoring facility, mentioned earlier, when recording without processing in "A" mode.

Inherent in the processing is an HF lift for the two omnis in the sphere and, more interestingly, an LF lift to correct an inherent low-frequency rolloff in the two CCM figure eights, an aspect about these microphones I have noticed in my frequent use of them for stereo recording.

In Use

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. The processor's outputs were fed via a MOTU 828 to a G4 laptop with an external Lacie 60 GB drive, usually used with a couple of my own surround microphone rigs. Also involved was that recently discovered essential part of monitoring 5.1, the DK Audio MSD600C display, which straightaway visually tells you so much about what is going on.

The playback of several walkround test recordings was encouraging as the L and R

front imaging was just as I want to achieve in my stereo recordings. The acoustics of the room where the microphone was placed were 'transferred' to the playback room. There was a feeling of a "relationship" between the front and rear reproduction.

One proviso here: with the ITU layout of the 5.1 monitors and its more widely placed rears, you do have a greater distance in the rear movement, and the "imaging" is more diffuse, obviously suiting ambience portrayal. However, I do favor the ITU layout due to the advantage of a larger sweet spot listening area because of the wider placed rear monitors.

The review period coincided with a session at a North London church, St. Paul's, New Southgate. Gerald Place, tenor, viola, da



DSP-4 processor

gamba and cornamuse, along with Dorothy Linell, lute and theorbo, were to record some early music by Purcell, Dowland, and others.

In addition to the basic stereo recording, I and colleague Chris Allinson could come away with two separate surround versions of some of the performances. I delegated the review Schoeps to Chris as I was running the session with the stereo coming from a Pearl DS60 mic, which was also used to derive MSM 5.0 surround via my MOTU 828 to the G4 Mac.

The Schoeps DSP-4 KFM360 analog outputs went to an ADAT's unbalanced inputs with no problems. As part of an on-going "prejudiced" experiment, a separate stereo pair was placed near the back of the church and laid down, to each of our systems on Tracks 7 and 8, for future evaluation of such "distributed" rear acquisition.

As so often will be the case with location surround sessions, it was not practical to use surround monitor speakers on site, due to the "control" room acoustics, bad enough as they often are for stereo. So the DK Audio display was used for confidence. Would the Studer BRS surround monitoring on headphones have solved this problem?

In acoustic surround recordings of the type I am involved with, the aim is to obtain a good "stereo" balance and portrayal at the front, the center loudspeaker certainly not upsetting this in my experience, and having the acoustic reproduced around and behind the listener. Having the same performances on both of the

SURROUND

Production/Post Production

surround recordings allowed for comparisons.

Both "A" and "B" modes of recording were tried, so that with the former we could evaluate the processor's many facilities back at base. This proved to be the best approach at the playback. The ADAT's outputs were connected to the processors AES/EBU inputs. A bit of lateral thinking at this point concerns the use of any separately recorded spot mics on Channels 7 and 8. Would there be any latency discrepancies due to the processor's independent handling of the four surround mics?

Both Chris Allinson and I can report some fine results and a basic "similarity" in the two recordings we made. In the end we settled on both the front and rears having derived cardioids, although the effect of the pattern changes was greatest when the Panorama control (which is essentially a front width control) is set at its "lowest" setting. In some ways it is more or less automatic to choose cardioid as the rear pickup pattern, to differentiate as much as possible the front from the back.

Overall it was interesting to see that the "Jelly Fish" display and the level bar graphs on the DK Audio MSD600C ended up being very similar with both recordings "optimized" for playback. On average, having nearly a "full circle" shown on the display resulted when we had the playback set correctly, as we judged it on the ATC monitors in use.

Most of the evaluation playback was in 5.0 mode, without the separate sub feed. It is interesting to see the company's comment in the operating instructions: "it does not correspond in function to the LFE channel of a cinema surround sound system, i.e. special effects such as earthquakes."

The variable range of HF rolloff possible for the rear signals is an interesting facility. The acoustics at our church venue were, in fact, quite bright. We found using the rear slope set at 6.3 kHz was a listening option. There also seemed to be some merit, on the recordings we made, to delay the rear signals by some 15 to 25 mS. On the review kit it was a good idea to turn this delay control slowly, as we had the processor crash several times, after producing some loud squeaks from the rear monitors.

Regarding the experimental use of the distant pair of mics down the body of the church, it was easy to show how detached the rear ambience is with that approach. Another colleague, Graham Holliman, who has many interesting views and theories on the whole business of surround reproduction, suggested some chorus reverb effect be added to the distant mics fed to the rear monitors. Something worth considering we found, as trying this seemed to create a much more "front related" use of such distant ambient pickup.

Summary

This Schoeps KFM360 Surround microphone system certainly produces some very good results. It is complex and can be confusing with its double use of the rotary controls and the need to be sure you have made the appropriate choice of the two basic operational modes, "A" or "B."

More so than with stereo recording, it will be in post production where the location recordings will be finally mastered to get a "standard," as there are so many variables. That facilities' monitor loudspeakers, their layout and the room acoustics will have a big

effect on the judgments made.

The various flexible post production facilities with the Schoeps DSP-4 KFM360 system will certainly be appreciated.

Mike Skeet is a pure audio enthusiast — he has no TV! Location recordings, mainly in the classical music to brass band fields, are his main areas of activity, which involve various mid/side, dummy head and now 5.1 microphone techniques. See his website at www.skeetmusic.com.

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Phonic America MRS1-20

5.1 Surround Mixing Console

by Russ Long

Although the popularity of surround recording has been growing by leaps and bounds over the past few years, it is still out of the reach of most project studios. That is until now. Phonic has introduced the MRS1-20 Surround Mixing Console that offers extreme flexibility and a great sound at an extremely reasonable price.

Features

The MRS1-20 is a 20-channel console that measures 33.9 inches x 4.3 inches x 21.5 inches, weighs 31 pounds, requires 70 watts of power and has a list price of \$1,700

On the rear panel, each channel is equipped with a 1/4-inch TRS direct output, a 1/4-inch TRS insert (tip-send, ring-return), a 1/4-inch TRS line input (-20 to +60 dBu) and an F-XLR microphone input (0 to +60 dBu). An internal jumper determines if the insert is pre or post EQ. The default setting is pre EQ.

A female 25-pin D-sub connector provides 5.1 and two-channel returns and a male 25-pin D-Sub connector provides 5.1 and 2 channel outputs. The D-sub's follow the TASCAM DTRS and iZ RADAR standard pin-out; 1-5.1 left, 2-5.1 right, 3-5.1 center, 4-5.1 LFE, 5-5.1 left surround, 6-5.1 right surround, 7-stereo left, 8-stereo right. The 5.1 and stereo outputs are also available via eight male XLR connectors. Six 1/4-inch TRS jack provide the auxiliary sends and a second set of six 1/4-inch TRS jacks provide the effects returns. Four 1/4-inch jacks provide control room monitoring. Control room Left and Right each have a 1/4-inch jack, a 1/4-inch TRS jack provides the Center (tip) and LFE (ring) and a 1/4-inch TRS jack provides the Left Surround

Fast Facts

- **Applications:**
Post production, live sound
- **Key Features:**
20-channel; dedicated surround sound; three-band EQ; talkback section; tricolor meters
- **Price:**
\$1,700
- **Contact:**
Phonic America at 800-430-7222, www.phonic.com.



(Tip) and the Right Surround (ring). The rear panel is also equipped with a 12 volt gooseneck lamp socket, a three-pin power socket and a power switch.

The gain control on each channel adjusts the channel signal level. The mic/line input selector chooses whether the channel's signal comes from the microphone or the line input. Each input channel is equipped with a three-band EQ. The high band is a shelving EQ that offers ± 15 dB at 12 kHz. The mid band is a sweepable bell curve that offers ± 15 dB at 100 Hz - 8 kHz. The low band is a shelving EQ that offers ± 15 dB at 80 Hz. The Low Cut switch inserts an 18 dB/octave low-cut filter at 75 Hz.

Four knobs provide Auxiliary sends. The first two knobs are sends 1 and 2 and the second two knobs are sends 3 and 4. If the Aux 5/6 switch is engaged, sends 3 and 4 become sends 5 and 6. Aux sends 1 and 2 are pre fader and aux sends 3 - 6 are post fader.

One of the MRS1's strengths is the three-knob Surround Panning Control System. The three-knob system determines the 5.1 positioning of each channel. The L/C/R knob controls the panning across the front three speakers (unfortunately there is no way to control divergence), the F/B knob controls the balance between the front speakers and the rear speakers and the Ls/Rs knob controls the balance between the left surround and the right surround speakers. Using the three knobs allows a sound to easily be placed anywhere within the surround spectrum.

The On/Mute Channel Switch activates the channel when pressed. A yellow LED illuminates to indicate that the channel is on. The LFE button sends the channel's low frequency information to the LFE mix bus. The master section's LFE Source switch determines the source of the low frequency effect output. The user can choose from inputs channels, one of the six aux sends or the sum of other 5.1 output channels. There is a low-pass filter in the path after the LFE source

select with a default setting of 120 Hz (this can be changed to 80 Hz by changing an internal jumper). Each channel's solo switch allows the isolated monitoring of any channel. The Solo Pre/Post switch located in the master section determines whether the signal is pre or post-fader listening. The solo section is also equipped with a 12-segment LED meter and a Solo to Control Room switch that determines whether the selected solo signal goes to the left and right channels of the center channel of the control room monitors. I wish there was a solo indicator LED to notify the user when a solo button is pressed. With so many solo options, it would be nice to have a way to tell at a glance if a solo was selected. This would also be helpful when troubleshooting why signal is not coming out the stereo bus. Each channel's output is controlled by a 60mm long-throw linear fader.

On the meter bridge, each input channel is equipped with an individual 12-segment LED level meter. The phantom power activation switches are also located on the meter bridge. There is one phantom power switch for every five channels. The eight master output level meters offers a visual display of the 5.1 surround and the stereo mix output levels (from -30 dBu to +20 dBu).

The master section is laid out very intuitively. The six effect returns offer level control, the same three-knob panning system found on each channel, two aux sends (Aux 1 & 2) to send the effect to the monitors and a solo button. The 6T Input provides for 5.1 Surround (L, R, C, LFE, LS and RS) input. There are independent level controls for all six inputs. The CTRL RM button routes the input signal to the control room section for monitoring purposes. The 5.1 button routes and the input signal is routed to the 5.1 output (helpful if you have a surround effect processor and you do not want it to use up all six effect returns on one device. The 2T input provides

continued on page 32 ►



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SURROUND

Production/Post Production

► Phonic from page 30

for stereo input. The CTRL RM button routes the input signal to the control room section for monitoring purposes. The ST MIX button routes the input signal to the stereo output.

Each channel of the 5.1 Surround output is equipped with a fader, a solo button, a pan control and a level control. The 60mm fader controls the final output of the 5.1 surround output. The solo button allows the isolated monitoring of any of the 6 surround outputs. The pan and level control provide for easy down-mixing to stereo. The stereo bus has a single 60mm fader to control the final output of the down-mix derived from the 5.1 mix. There are two headphone jacks and a single level control. The headphone output signal comes from the control room monitor output.

The console features a built-in omnidirectional talkback microphone. The

musical and while it is fairly limited in options, it sounds amazingly good. I found the three-knob surround panning control to be very intuitive and easy to use. My biggest complaint about the MRS1 is the lack of divergence control. If a channel is panned to the center, it is only coming out of the center speaker. This is often the desired result but just as often I prefer a phantom center with no signal coming out of the center speaker and equal levels of the signal coming out of the left and right speakers. The only way I was able to achieve this effect with the MRS1 was to mult the signal into two channels and pan one hard left and one hard right. Creating a stereo down-mix from the surround mix was relatively easy and I was pleased with the results.

To check the mic preamps I listened to an acoustic guitar through my Earthworks SR-77. The sound was clean and full. The EQ allowed

Each channel of the 5.1 Surround output is equipped with a fader, a solo button, a pan control and a level control. The 60mm fader controls the final output of the 5.1 surround output.



Detail of the output section

effectively handle both stereo and 5.1 mixing at an extremely affordable price. Anyone looking to update their studio or live equipment list to be 5.1 compliant should consider the Phonic MRS1-20.

Product Points

Phonic America MRS1-20 5.1 Surround Mixing Console

Plus

- + Sounds good
- + Fantastic price
- + Well-made
- + Extremely quiet

Minus

- No Q adjustment on the EQ
- No way to control divergence
- No solo indicator LED

The Score

The MRS1 is a fantastic sounding and extremely economical way to enter into the world of either studio or live surround mixing.

Review Setup

TASCAM DA-88 recorder; iZ RADAR 24 w/Nyquist 96 kHz card; Lucid Gen-X-96 clock; -PMC TB1. Yamaha NS-10M monitors.

microphone features a volume control for microphone output level and three routing switches for sending the talkback signal to the aux sends, the 5.1 surround output, and/or the stereo mix output.

The console appears to be very well built and the Phonic Corporation takes pride that every Phonic product is carefully tested and scrutinized before it leaves the factory. The console's manual is thorough and easy to read.

In Use

To put the MRS1-20 to the test I hooked up a live recording that I recorded to a couple of TASCAM DA-88s. I decided to mix to six tracks of my iZ RADAR and thanks to the foresight of the Phonic engineers, all I had to do was run a single female D25 D-sub to male D25 D-sub snake from the MRS1 6T + 2T OUT to the track 1 - 8 RADAR input and I was ready to print. I also ran a male D25 D-sub to male D25 D-sub snake from the track 1 - 8 RADAR output to the MRS1 6T + 2T IN so I could listen back to the mix after it was printed. I found the console's noise floor to be extremely low for any console much less a console in this price range. The EQ is very

me to easily mold the sound into the desired texture. I found the channel meters to be particularly easy to read. Each tricolor meter is equipped with eight green, two yellow and two red segments so it is easy to tell at a glance just how hard the channel is being pushed.

I have only encountered Phonic equipment for the last eight or nine years so I was unsure about the company's history. After a small amount of research, I was happy to discover that the Phonic Corporation has been a part of the professional audio industry for over 25 years and that the company is committed to innovation, quality and usability. Phonic employs dozens of sound engineers and musicians that work in conjunction with the Phonic R&D department to produce products to satisfy the needs of the modern audio engineer.

Another possible use for the MRS1 mixer is live sound applications. Surround mixing is still an obscurity in the live arena but with innovative artists like Bjork making it a part of their shows it will only grow in popularity.

Summary

The Phonic MRS1 console is a good sounding, feature packed console that can

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NEW PRODUCTS

Skywalker Sound has an inventory of over 50 **Blue Sky** 2.1 speaker systems and five 5.1 surround sound speaker systems. The monitoring systems have been used in post sound for such films as *Finding Nemo*, *The Hulk* and *Lara Croft Tomb Raider: The Cradle of Life*.

Also at Skywalker a **Z-Systems** Detangler Pro z-128.128r digital router was installed to keep various edit bays, scoring stages and mixing consoles working together. Also for Z-Sys engineer Bernie Becker used a z-Q6 equalizer and z-CL6 dynamics processor to master Neil Diamond's Live Retrospective album

DK Audio has provided a new Dutch post house, CIRIS in Hilversum, with many of the company's meters including two of the famous Jelly-Fish-style (MSD600C surround sound). Also in the package were PTV PTS5664/50 SDI analog waveform monitors and vectorscopes.

NT Audio Film Labs of Santa Monica, Calif. has installed several **Lake Technology** Contour system processors. The units are configured to handle up to 8.1 surround sound in a new screening/quality control room.

The Library of Congress recently acquired a **Cube-Tec** Quadriga digital audio workstation for archiving duties. Fullersound in Miami has added a Cube-Tec AudioCube 5 DAW for mastering work.

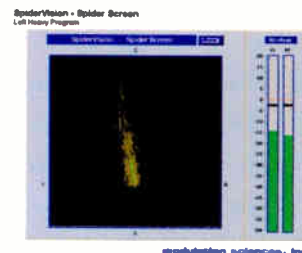
Scoring mixer Simon Rhodes rented a Super Pro Tools HD DAW system from **DMT Rentals** for use on the soundtrack of the movie, *Radio*.

Sennheiser SK 5012 bodypacks, MKE Platinum miniature lavaliers, MKH 50, MKH 60 and MKH 70 microphones were used on the set of *Runaway Jury*.

Engineer Tommy Vicari used a **Neumann** M 149 for recording the main title for HBO's "Six Feet Under" television show.

Modulation Sciences SpiderVision

The increased usage of HDTV programming has put many broadcasters into a pickle – how to monitor a 5.1 surround signal one minute and then catch the basic stereo and mono signals the next without having to set up differing signal path side chains? SpiderVision from Modulation Sciences hope to be the answer. Consisting of a rackmounted processor along with an LCD screen to show multichannel signal levels and sound field construction, SpiderVision handles the gamut from 5.1 through mono at the push of a button. Price: \$3,850.



Contact: Modulation Sciences at 800-826-2603, www.modsci.com.

Grace Design m906 5.1 Surround Monitoring System

Grace Design is jumping into the surround sound business with a rackmounted 5.1 surround sound monitoring processor for control rooms lacking surround capability. The m906 is based on model 901 headphone amp. It has a rackmounted processor, remote control and separate power supply. Features include 192 kHz A/D, system controls, calibration tools, talkback functions and a full line of digital inputs (AES/EBU, S/PDIF, optical) along with analog. Price: \$5,495.



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

API Vision Surround Mixing Console

Turning heads at the AES show was the new API Vision Surround Mixing Console. The concept from API's Paul Woolf is to marry traditional API quality performance with the format of the near future – 5.1 surround sound. The very busy Legacy-based board is stuffed with the familiar API modules. But it has several tricks up its sleeve. Each channel features it's a dedicated 5.1 mix buss along with full five-channel panning. It also has two 100mm Moving Faders, a choice of equalizers (four-band parametric or 10-band graphic) and optional dynamics. Other goodies include surround monitoring, automation, machine control and optional module upgrade.



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

Minnetonka SurCode for Dolby Digital

This new plug-in from the SurCode family is a 5.1/AC-3 surround sound encoder designed for audio use with Adobe Premiere video workstations. It is functional with MPEG-2 files and can be utilized from within Premiere's surround mixing environment. Price: \$295.

Contact: Minnetonka Audio Software at 952-449-6481, www.minnetonkaaudio.com.

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BY MEL LAMBERT

Since its introduction some five years ago, the AMS Neve Digital Film Console (DFC) has cut a wide swath throughout the movie post production industry not only here in the United States but across Europe and other major film centers around the world. (And picked up an Academy Award in the process.) But nothing stands still. AMS Neve was careful not to jeopardize, however, the system's acceptance by making changes for change's sake. Opting to follow that tried-and-true design philosophy of "Don't Fix It If It Ain't Broke," the talented team of designers in Burnley, England, has focused its attention on reacting to feedback from the long-form TV and film re-recording community, and implemented incremental rather than revolutionary changes. Major upgrades for the DFC2 are in automation, control surface features, DSP capabilities and the latest I/O options.

USER-FRIENDLY CHANGES

In addition to the industry-proven Encore automation with integrated MADI router and intuitive Desk Editor software, DFC2 features new EDL Automation Conforming Software that is designed to enhance project workflow by enabling multiple picture changes to be quickly applied to any project, in addition to the ability to import Change Lists. Remaining fully aligned with its philosophy of offering the "most user-friendly channel strip on a digital console" – including patented Logicators that provide instant visual reference to each knob position, touch-sensitive controls, flexible eight-band EQ, intuitive machine control and multipartition mixing that allows a console to be split to meet the specific demands of a mix project – DFC2 now features fiber-optic meter backlight technology with variable brightness control which, unlike fluorescent and incandescent technologies, retain its illumination level. And, drawing from a function already available on Capricorn and Logic MMC consoles, a new Banks feature enables six user-programmable sets of control-surface layouts to be recalled at the touch of a button. Within the dynamics section, an automated multiband compressor and powerful look-ahead compressor have also been added.

A new enhanced XSP Signal Processing Engine provides more horsepower for the DFC2, enabling 500 signal paths to be accommodated per processor tower. XSP operates at



AMS Neve DFC2 Digital Film Console

up to 96 kHz sampling rates; for enhanced flexibility, the latest 96 kHz-capable MADI I/O Suite includes MIOS (Modular I/O) with four-channel, dual-mic/line, 16-channel A/D converters, 16-channel D/A, or AES format ports. The SHARC-based XSP Engine also enables the powerful look-ahead compression, plus new signal processing features to be added. And the new AES960 features sample rate conversion on both the AES-format input and output ports, with configurations that can be saved. (Earlier-generation Digital Film Consoles can also be upgraded to DFC2 status via software and hardware additions.)

ETHERNET READY

Encore Studio Computer now offers several options for easier transfer and interface to other systems via Ethernet or archiving, for example, to rewritable CD-ROMs. Now standard fare on 88R, Libra, DFC and Logic MMC consoles, Encore enables mix data to be transferred seamlessly between AMS Neve systems. (Encore will also read Flying Faders data files.) And the already feature-rich automation system now incorporates an Off-Line Mode that allows system information - I/O designations, for example, and control surface channel labels - to be entered into a database that can be uploaded into the DFC2. And Version 3.0 software will soon offer a powerful EDL Conform Mode, whereby picture changes can be applied to the automation data – automatically copying, deleting and inserting automation data. Also available is remote control of I/O interfaces via MADI ports, using Channel 55 of the 56-channel bitstream. (For example, each MIOS unit can provide up to 48 channels of 24-bit/96 kHz A/D-D/A converters with bidirectional sample-rate conversion that can be addressed from the DFC2's control surface.)

The new snapshot storage-and-recall of Path Layouts (similar to that available on AMS Neve's Logic MMC Consoles) is a powerful and extremely flexible tool, since it enables the operator to design up to six console surface layouts that can be recalled at the touch of a button. Layouts reflect the current control requirements – bringing channel sections into the center ('sweet spot') of the console surface, or moving elements (FX, Foley, Dialog, etc.) according to the mixer position's, or selecting channels one at a time to develop just the degree of control precision that is needed to get the job done.

The control surface's familiar alphanumeric displays of parameter values are retained, with servo-driven faders and assignable access to four layers per channel strip. Color-coding enables users to find the appropriate control easily, and once the topology has been learned it becomes extremely intuitive. All rotary controls and switches are touch sensitive, allowing changes to be made simply by grabbing the relevant knob and changing the settings.

THE VERDICT

All in all, while the new enhancements to AMS Neve's DFC2 Digital Film Console are subtle in execution - the system, after all, already boasts a number of enviable technical and user features – but are advances which will ensure that TV and film mixers around the world continue to be offered some of the sharpest tools in the mixing and processing toolbox.

Mel Lambert heads up Media & Marketing, a consulting service for pro-audio firms and facilities (www.mel-lambert.com).

For further information contact AMS Neve at 212-965-1400 or 818-753-8789, www.ams-neve.com.

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World Radio History

Pro Audio Review – November 2003

Various members of **Sennheiser's** Evolution microphone family are scattered across the country with various shows and tours. Dashboard Confessional (Chris Carraba) and country artist Jennifer Hanson are using E 935 cardioid vocal mics on their respective tours. Dashboard is also using an E 903 (backup vocals), E 609 (guitar amps), E 604 (toms) and an MD 421 (kick drum) along with a Neumann KMS 105 (vocals). Other Evolutions on tour include Liz Phair with an E 903 (vocals), E 835 and E 845 (backup vocals) and an E 602 (kick drum). The All-American Rejects tour uses E 865 (vocals), E 609 (rhythm guitar), E 602 (kick drum) and MD 421 (bass).

Short of a downpour or snowstorm, the Three Tenors, Luciano Pavarotti, Placido Domingo and Jose Carreras, had little to worry about at their free benefit concert in Bath, England. Why? **Meyer Sound's** new LD-3 processor took into account humidity, temperature and altitude as it rode signals out to Meyer Sound M3D line arrays, subs and MSL-2 speakers. Sound Hire of Surrey provided the system.

The Rats at Rat Sound are using **L-Acoustics** V-DOSC and dV-DOSC speaker systems on the latest Red Hot Chili Peppers tour (see picture below).



Keeping Disco alive and well is **Innova SON's** Grand Live digital mixing console on the Get Up 'N Dance tour headlined by KC and the Sunshine Band. Concert Systems of Ocean Springs, Miss., is running the tour which also features the Village People, Thelma Houston and various members of The Trammps, the Weather Girls and The Pointer Sisters.

At the opposite end of the 1970s/1980s musical spectrum, a SARS benefit concert in Toronto featuring AC/DC used a **Sabine** Power-Q ADF4000 digital signal processor to squelch feedback.

NEW PRODUCTS

AKG TriPower Series

Hoping to mix the best of all worlds, AKG's new TriPower series mics combine wireless and wired powering technologies in one microphone package. The D 3700M (cardioid) and D 3800M (supercardioid) are both dynamics from the live sound side with AKG's Varimotion technology. The D 3800M also has a humbucking coil for noisy environments. The C 5900M is a supercardioid condenser mic with a studio background and six dB pad. Available with each mic is the TM 40 plug-on wireless transmitter. Prices: D 3700M - \$195; D 3800M - \$252; C 5900M - \$398; TM 40 - \$198. Contact: **AKG Acoustics** at 615-620-3800, www.aggusa.com.



Community Loudspeakers M12 Stage Monitor

The M12 from Community Loudspeakers is a two-way stage monitor designed for operation between 55 Hz and 18 kHz. Driving the monitor is a 12-inch ferrofluid-cooled woofer and a two-inch compression driver with an asymmetrical horn. The low-profile rounded cabinet is fiberglass and features cable channels. Other features include hidden handles, heavy-duty steel grille and a choice of finishes. Price: \$2,150. Contact: **Community Loudspeakers** at 610-876-3400, www.loudspeakers.net.



Apex Intelli-X System Processor

Hailing from Belgium, the Apex Intelli-X joins the crowded market of super-powerful digital system processors. Rated at 24-bit, 48 kHz, the Intelli-X packs graphic EQs, parametric EQs, adjustable crossovers, delays and limiters into its



arsenal. Crossover routing can handle four-way systems and up to four two-way systems. I/O is four inputs and eight outputs. Filter types are industry standard Butterworth, Bessel and Linkwitz/Riley. USB, RS232 and RJ45 ports facilitate PC control.

Contact: **Apex/Transamerica Audio Group** at 702-365-5155, www.apex-audio.be.

Yamaha PM5000 Console

Replacing a legend is what the Yamaha PM5000 console is all about. Seeking to build upon the PM4000's popularity by adding in the digital operating power of the PM1D, the PM5000 aims to be the go-to console for monitor or FOH duties. Available in 28-channel, 36-channel and 52-



channel configurations, the console offers increased performance specs, improved ergonomics, digital recall and a host of channel features such as 26 dB pads, four-band fully parametric EQ, high-pass filters, panning and inserts. Price: \$74,000. Contact: **Yamaha** at 714-522-0911, www.yamaha.com/proaudio.

The New P-Series Power Amplifiers From Yamaha LONG ON POWER, SHORT ON DOLLARS



There's no question that the cost of power has dropped significantly in recent years. Unfortunately, quality and reliability have often suffered as a result. The trick is to not sacrifice features and performance simply for a lower price. That's where the new Yamaha P-Series amplifiers come in . . .

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30th
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BY ROGER WILLIAMS III

Carvin Corporation, the California-based musical instrument/pro audio dealer-direct phenomenon has been in business since the middle of the last century, defying the prevailing philosophy that the market needs a typical consumer style distribution chain. The company circulates a slick catalog to the gear-starved masses and sells straight out of the factory, eliminating the middleman and therefore serving up low prices. What I have seen lately from Carvin has peaked my interest. When the DCM2500 arrived on my doorstep, I decided a closer inspection was in order.

FEATURES

The DCM2500 (\$599) is a three rack-space dual channel amplifier, which is claimed to deliver 500 watts RMS continuous power per channel into an 8 ohm load on up to 2,500 watts RMS bridged mono at 2 ohms. The amplifier features internal opto-isolator peak limiting circuitry to increase useable headroom before clipping. The outputs are five-way binding posts, 1/4-inch phone and Speakon connectors. Inputs are balanced XLR and 1/4-inch phone jacks, with through XLRs to daisy-chain units. A high-input impedance (20 kohms) facilitates good impedance matching with most source equipment. Rear panel switches include ground lift, parallel (for combining inputs), low-cut, bridge, and limiter. Front panel gain controls accompany input signal presence and clip LEDs for each channel, along with the power switch and its power and thermal protect indicators. Soft start relays prevent in-rush currents from blowing

Carvin DCM2500 Power Amplifier



circuit breakers.

After popping the lid, internal inspection revealed a massive toroidal power supply transformer to the left, input/output PC board behind it, and the conjoined fan/power transistor/heatsink unit at the back. The various sections (power supply, input/output PC, front panel control PC and power transistor) are connected with Molex terminated ribbon wire harnesses facilitating quick replacement, if need be. Everything about the internal architecture is secure and solid, and the 16-gauge steel chassis should be able to take a solid helping of road abuse.

IN USE

I applied the DCM2500 to subwoofer duty at a local benefit concert with acts varying from acoustic folk to power trio rock, and the amp performed well under some pretty sweltering (mid 90s) outdoor venue conditions. Driving a system encompassing a Mackie 1604 VLZ console and Rane AC24 crossover with JBL SRX series speakers, the Carvin amplifier provided tight, punchy interpretations of varied low-frequency source signals. From a 22-inch kick drum miked with an AKG D12 to a Countryman Dled Fender Jazz bass, it had no problem with quick transients or throbbing continuous drop D-tuned strings. This amp definitely has the power reserves to deliver those long sine waves.

Over the long haul, though, I might consider adding a filter to the cooling fan,

those tightly spaced heatsink fins might be a dust magnet. And the internally accessible-only fuse could be a problem: its holder is facing the rear chassis lip and could be a bear to change. At 45 pounds, it is not a light mount.

SUMMARY

I liked what I heard from the DCM2500. At \$599, and with a three-year warranty, it is a solid performer and a solid bargain that should find favor with the MI crowd. After all, who does not love the convenience of ordering out of a catalog?

Roger Williams III, a systems designer for MAS Audio, longtime NSCA, ICIA member and Syn-Aud-Con grad, is a regular contributor to Pro Audio Review.

Product Points:

Carvin DCM2500 Amplifier

Plus

- + High power reserves
- + Rugged build
- + Economically priced
- + Made in the USA

Minus

- Heavy (45 pounds)
- Inaccessible fuse

The Score

Rugged, high power amp at a great price.

Fast Facts

Applications:

Live sound reinforcement

Key Features:

High output power, modular design, built-in limiter, soft turn on

Price:

\$599

Contact:

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

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Pro Audio Review – November 2003

NEW PRODUCTS

Drawmer equipment is part of a renovation of an answer to a rock'n roll history trivia question.* The Surf Ballroom in Clear Lake, Iowa is undergoing the installation of its first house sound system. Front Row Productions, the contractor, is installing Drawmer DL241 and DL441 comp/lim/gates, DL251 compressors and DS501 gates.

At the Flamingo Showroom in Las Vegas, Gladys Knight and the Pips regular show is heard through newly installed **L-Acoustics** ARCS speakers and 115FM floor wedges. ProMix ElectroTec of Las Vegas performed the installation. In Baker, La. the Bethany World Prayer Center's north campus is the recipient of a dV-DOSC line array system along with 112XT speakers, SB118 subwoofers and MTD115b monitor wedges. The installation was by Loud & Clear, Inc. of Cincinnati.

Eight **Lake Technology** Contour digital speaker processors were recently installed into Maranatha Hall at Northwestern College in Minneapolis, Minn.

Rossi's Blue Star Steakhouse, Tavern and Jazz Room handed a hefty order to several **Telex** companies for putting in a sound system. The centerpiece of the system is the Blue Star Jazz Room. Designed to be a minimal setup venue Telex provided everything from hardwired mics to room processing. Included in the inventory are a **Midas** Venice 320 console, **Klark Teknik** DN9340 Helix digital processors, **Electro-Voice** Dx38 processor, Electro-Voice CPS3 amplifiers, Electro-Voice SxA100 monitors, QRx-153 speakers and an Xsub/f subwoofer. In the dining areas are EVID speakers and a **Dynacord** ProAnnounce paging/zone system.

For **Symetrix** SymNet users version 3.5 is posted on the website, www.symetrixaudio.com.

Event Tech, an event production company based in Maryland, has been using **Radian Audio Engineering** MicroWedge monitors in a series of fundraising events over the past few months.

Rane PEQ 55 Parametric Equalizer

Aimed at installation and live sound professionals the PEQ parametric equalizer from Rane is packed with features. The dual-band box is a five-band fully parametric EQ

with Rane's three-band Accelerated Slope tone controls per

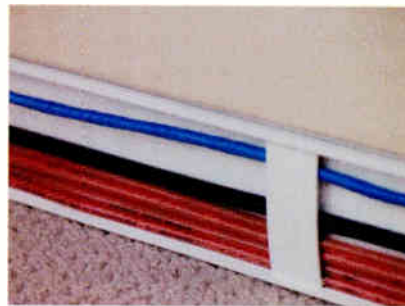


channel added. In mono mode it can operate as a 10-band unit and it is also linkable for expanded operation. Also onboard are high and low-pass filters. The rear offers XLR, 1/4-inch and Euroblock I/O. Price: \$999.

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

WireTracks

WireTracks is a cable channel system designed for homes and offices desirous of performance and décor. Requiring only basic carpentry tools for installation, the WireTracks system consists of a plastic channel which usually mounts at a wall base and a plastic channel cover. The two pieces interlock for a tight fit. However the lock is not permanent so cabling can be quickly changed without tools or destroying previous work. The system is also usable with ceiling and crown moldings. Price: starts at \$13.45 per five-foot section.



Contact: WireTracks at 206-361-6110, www.wiretracks.com.

Inter-M PT-9107S AM/FM Tuner

It's getting hard to find tuners these days but one company, unfamiliar to many, Inter-M has a new tuner. The 9107S is an

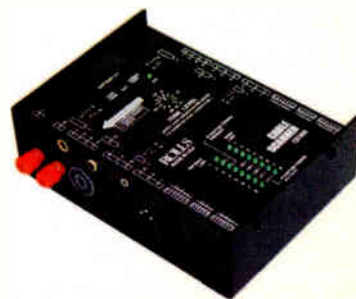


AM/FM tuner with 30 programmable presets and an autoscan function. The AM section is 522 kHz – 1611 kHz. Price: \$560.

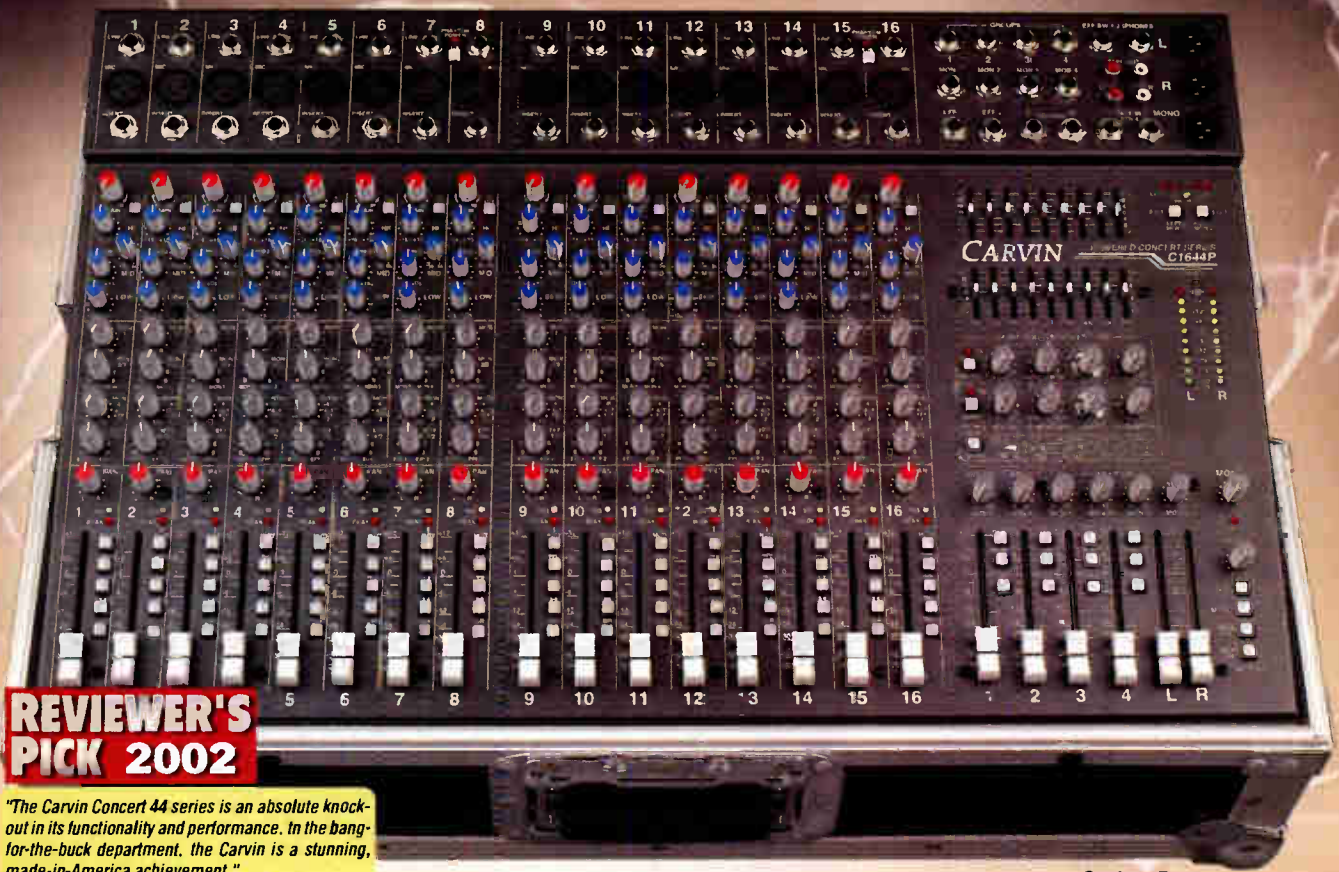
Contact: Inter-M at 610-874-8870, www.inter-m.net.

Rolls CS1000 Cable Scanner

Need a cable tester? Rolls has a new one out, the CS1000. The handheld unit handles all major connector types including Speakon, MIDI five-pin, RJ11 (telephone-type) and RJ45 (Ethernet and CAT5). It also sports phantom power, 1 kHz test tone, polarity test, level control and a headphone jack. Price: \$120.



Contact: Rolls at 801-263-9053, www.rolls.com.



REVIEWER'S PICK 2002

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 - Pro Audio Review, May 2002

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BY WAYNE BECKER

If there is one thing we are not short on in this industry it is microphones and amplifiers. It is hard for one to truly understand how we need another new microphone or amp. Well, Sennheiser designers - being the relentless innovators that they are - have developed a series of gooseneck microphones aimed at meeting the demand for customized installations for both facility conferencing and sound reinforcement system.

FEATURES

The ME back-electret condenser microphone series, made for use with Sennheiser MZH goosenecks, provides various options of capsules, goosenecks and mounting hardware. The installer can put together a combination to meet the demand for a specific situation. Capsules presented in this line are the ME34, a cardioid and the ME35, a supercardioid. Both are based on Sennheiser's KE10 capsule used in the MKE 40 lavalier microphone. The ME36, a mini shotgun capsule, is based on the ME 105 modular series.

These capsules screw rigidly onto three available goosenecks: the MZH3015, a 15cm gooseneck; the MZH3040, a 40cm and the MZH3042, a double-bend 40cm gooseneck. The double-bend option in the MZH3042 can come in handy for those challenging situations where the microphone needs to be directed a specific way. All contacts on the capsules are gold-plated to resist corrosion. The 6mm

diameter gooseneck is thin but sturdy. All goosenecks connect with an integral standard XLR-3 pin connector. With a frequency response of 40 Hz to 20 kHz, the microphones have an impedance of 50 ohms and a sensitivity of 10 mV/Pa with a noise spec of 26 dB-A. All capsules power up with phantom voltage from 12V - 48V.

The small capsules weigh about 9.5 grams with the shotgun capsule weighing in at 17 grams. All are housed in a tough matte black metal housing. Mounting accessories available for the goosenecks are the MZS31 shockmount, the MZT30 table mount and the MZQ100 quick-release mount, all ruggedly designed. All microphones, goosenecks and accessories come with manuals in six different languages. Sennheiser is also offering a nice attaché demo case that houses two goosenecks, all capsules and mounts to prepare your installer/remote sound engineer for the gooseneck unknown.

IN USE

Typically the biggest problem with gooseneck microphones is that they sag over time. All models of the goosenecks in this series stayed in place, even when shaken up and down with the shotgun capsule, the heaviest capsule of the lot. The handling noise is on par with most other quality gooseneck micro-

Sennheiser ME Series Gooseneck Microphones



phones and the mechanical connections were easy to make and seemed very rigid. The microphone capsules sound good with relatively low noise. I was impressed by the consistency of the shotgun capsules' frequency response over an extended distance of about 13 inches from the capsule. I purposely used a preamp with a 12V phantom power supply to see if it created any noise or distortion artifacts like some other units exhibit. It did not. The rejection on all three capsules was consistent with the type: cardioid, supercardioid and shotgun. On and off-axis frequency response and sensitivity was consistent as well.

SUMMARY

The ME series capsules and gooseneck hardware make for a solid, great sounding solution for podiums, sound reinforcement systems and conferencing systems. The sleek look of the microphone will not get objections from anyone and mounting the units is a breeze.

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, Penn. He can be contacted at wbecker@systemsbycsi.com.

Fast Facts

Applications:

Contracting, sound reinforcement

Key Features:

Interchangeable variable pickup pattern capsule; rugged metal housings

Price:

start at \$299

Contact:

Sennheiser Electronic Corporation
at 860-434-9190,
www.sennheiser.com.



BY WAYNE BECKER

ATM Fly-Ware

Pole Mount Series Mounting Hardware

The ATM Fly-Ware Pole Mount Series of hardware is a product aimed at providing the most absolute secure installation possible. ATM Fly-Ware can provide brackets for pole diameters from 2 – 30 inches. The product is available in high-strength stainless steel and structural aluminum for corrosion resistance. The mount is made up of several pieces and is precision machined for a clean, well-integrated installation. All required parts of the system are determined by the manufacturer to provide a secure installation.

Upon removing the components from the box, I noticed there were no instructions. Although one could probably figure out how to connect the pieces, I called the factory just to be sure. All units ship with instructions,

this was a prototype so they emailed me instructions and helpful links to their website.

ATM Fly-Ware is very clear about its request to have the contractor call their technical support department to ensure the proper products get selected for the application and type of device that it will be responsible for supporting. They also query the contractor regarding their experience and skill level, as their products are exposed to a high liability. Over all, when completed, the installation looks worthy of a lifetime of reliable and secure support. The ATM Fly-Ware website offers a complete catalog of parts and installation information to make the job a success.

Assembling the unit was easy. The pieces fit together very cleanly. No nasty or rough edges to contend with. The entire system can be installed using standard wrenches and tin snips.

The bolting hardware used for the “L”

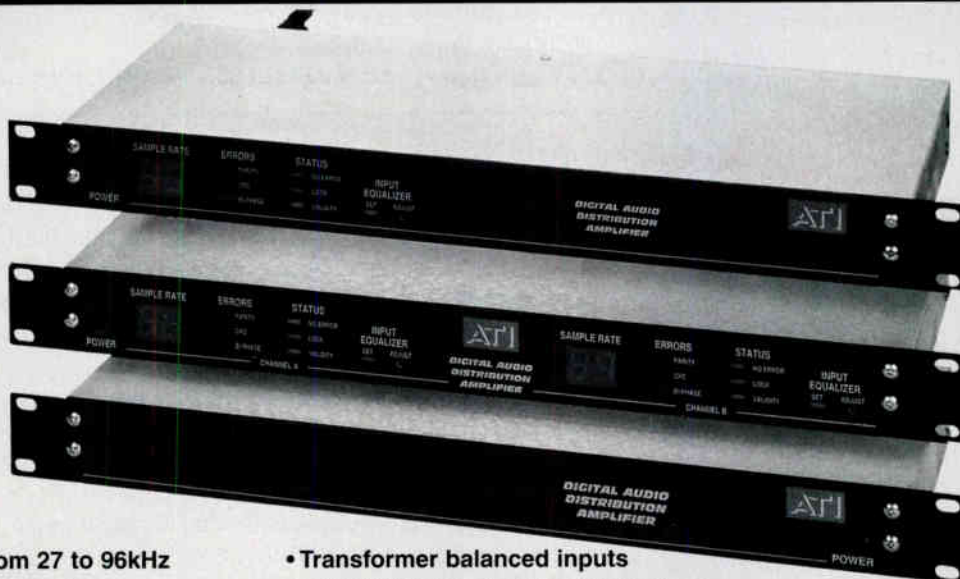
brackets fit snugly and tightened in place with no fuss. Affixing the bracket to the pole is pretty straight forward. You slip the bands through the pole mount, and then through the slits in the tightening “alum form” bolt. Make sure you have at least 6-8 inches poking through the tightening bolt and then bend them around to wrap around the inside of the pole. Once the bands are in place, simply tighten the bolts with a wrench. The end result was a very rigid (and heavy; about 17 lbs) mount. The pole mount plate can also accommodate directly mounting an omni mount, although I did not have one to try. The bracket affixed to the pole very rigidly, and did not appear as if it could ever come down (even when I hung from it). Striking the “L” bracket with your wrench makes a pretty good dinner bell as well!

Contact: ATM Fly-Ware at 888-744-6673, www.atmflyware.com.

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NEW PRODUCTS

BitHeadz Unity for Mac is up to 3.2. This version sports a new GUI, compatibility with Core Audio and several bug fixes. www.bitheadz.com.

Edirol recently released an explosion of updates, notably for its line of controllers. Top of the list is a series of control maps for the UR-80 (Cakewalk Sonar 2, Digidesign Pro Tools LE, MOTU Digital Performer 3, Emagic Logic Platinum 5 and 6, Propellerheads Reason, Steinberg Cubase VST and SX. www.edirol.com.

In case you live under a rock and have never seen a picture of Alan Parsons in an audio magazine... Parsons is using **Acoustic Sciences Corp.** (ASC) Tube Traps to clean up those ugly noise reflections in his home studio. He's working on a new solo album.



Owners of **Digidesign** Pro Tools 6.1 may upgrade to 6.1.1 LE for free at www.digidesign.com.

Minnetonka Audio Software is releasing version 2 of the discWelder Steel DVD-A mastering program. Version 2 offers improved menu graphics support, more fonts and styles for menus and Gapless PCM Track Play. www.minnetonkaaudio.com.

B4 is now biformatted! The B4 synth from **Native Instruments** is now Mac and Windows-compatible. For the Macoids it supports OS X and Core Audio (Core MIDI, too!). For Windows users it is XP-compatible. www.ni-b4.com.

PreSonus Eureka Channel Strip

Archimedes aside, the PreSonus Eureka channel strip might just be the solution to many problems. Eureka offers a preamp compressor and equalizer. The preamp



offers gain, impedance and tube saturation controls along with 48V phantom power, phase reverse, instrument DI, 80 Hz low-cut filter and a 20 dB pad. The compressor has threshold, ratio, attack, release and gain controls. A side chain offers a high-pass filter. The three-band EQ is fully parametric. A VU meter occupies the center of the 1RU box. Price: \$699.

Contact: PreSonus at 225-216-7887, www.presonus.com.

Native Instruments Vokator

The Vokator from Native Instruments is more than a simple vocoder. With 1,024 Vokator offers far more control over processing than the typical multiband vocoder, which might have a couple of dozen bands at most. Vokator also offers synthesizing synthesizing, granular sampling and sound fusion. Available for Mac and Windows. Price: \$299.

Contact: Native Instruments at 866-556-6487, www.ni-vokator.com.



Earthworks Audio QTC30 Microphone

If Earthworks Audio's QTC1 was just a little too pricey for you at around \$1,000 maybe the \$795 QTC30 will be a bit more within range. The QTC30 gets close to the QTC1's sensitivity (30 mV/Pa) and low self-noise along with a frequency response of 6 Hz to 25 kHz, ±1 dB. And like the QTC1 it has a stainless steel measurement mic-style body. Price: \$795.

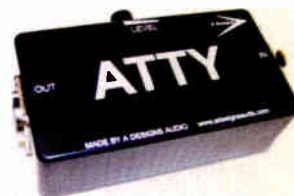
Contact: Earthworks at 603-654-6427, www.earthworksaudio.com.



A Designs ATTY

Despite having an abbreviation for a lawyer as a product name, the ATTY from A Designs might actually be a useful product. This simple, little box is designed to add a volume control over items such as powered desktop speakers. Besides a level control the ATTY features a "Panic" button for muting during those unfortunate powering-up blasts. It has Neutrik combo jacks. Price: \$95.

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



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-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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BY ANDREW ROBERTS

Shure KSM137 Condenser Microphone Stereo Pair

A recent addition to the popular KSM line from Shure, the KSM137 pencil condenser is now available as both a single unit and a stereo pair. With bountiful professional features, the KSM137 promises to be as productive as its KSM stablemates, the KSM32 and KSM44.

FEATURES

The KSM137 pair comes in a compact plastic briefcase (about 9 inches x 7 inches x 2 inches) with plastic latches. Inside, the mics ship with two foam windscreens and two stand clips. Like the other KSM mics, the shell has a satin champagne finish. The mic's fuselage measures 4.8 inches long and 0.8 inches in diameter and weighs 3.5 ounces.

The 137 is an end-address cardioid condenser designed primarily for studio use, but it is claimed to be rugged enough for live sound work. The mic has a 2.5-micron, 24-karat gold-layered Mylar diaphragm. It employs a Class A transformerless preamplifier and has gold connectors throughout. The 137 has a subsonic filter to eliminate rumble below 17 Hz. The 137 also has a three-position pad (0, 15 and 25 dB) and a high-pass filter that can be configured flat, -6 dB/octave at 115 Hz, or -18 dB/octave at 80 Hz.

IN USE

The first place I used the KSM137 pair was in my studio, where I have been working on a recording project with a local band. We needed to add some acoustic guitar tracks and after auditioning several instruments, we

settled on my 1968 Gibson J45 dreadnought. The J45 has a big, boomy sound that is warm and powerful. I often get good results using my small-diaphragm condenser mics on acoustic guitars like the J45 and the KSM137 pair proved to be no exception. The mic was undaunted by the Gibson's powerful sound and, with the close mic's low rolloff engaged, proximity effect was mitigated enough to get a highly detailed image complete with string rattle and pick attack. I positioned the second 137 back a few feet to capture a little room ambience. During this session, I observed that the 137 has very little self-noise too - a real plus when recording acoustic music. Overall, I was very pleased with the recorded sound that this pair facilitated.

Next I took the KSMs out on the road. I used them as a spaced pair to capture the voices of a small gospel choir. Since there was a lot of foot stomping going on, I opted to engage the mic's more aggressive LF cutoff at -18 dB/octave. I also used a pair of my suspension mounts to minimize additional rumble. For situations like this, I would highly recommend purchasing suspension mounts for the KSMs. As this was strictly a reinforcement scenario, I did not have the chance to review the results in a controlled studio environment. However, I feel that the results obtained were excellent with clear, detailed reproduction of the voices.

Next, I used the KSM137s at a day-long outdoor folk festival. The first assignment for the KSM pair was a solo mission on an accordion. I was mixing a group called the Jennifer Cutting Ocean Orchestra - an eclectic

group led by Cutting, a former member of Washington, DC's popular Brit/Folk group, New St. George. Since it was an outdoor gig with a slight breeze, I put on the foam windscreens and placed the mic about 8 to 10 inches from the bellows.

Admittedly, I do not work with accordion players often but I must say I have never heard a squeezebox sound so good. The KSM captured the essence of the instrument and it sat majestically in the mix with nominal EQ. Later in the day, I mixed a group called Lulu's Fate. Lulu, featuring singer/guitarist Tom Espinola, is a traditional American string band (think *Oh, Brother Where Art Thou?* soundtrack). Tom plays an old, small-body Martin single 0 model that has lots of mid-range punch and a surprising amount of bottom for such a small guitar. The KSM137, pointed at the end of the guitar's fingerboard, produced a spectacular sound even with a heavy dose of guitar and vocals in the monitor a couple feet below it. Listening back to the board mix revealed a gorgeous, rich sound with just enough high-end detail that it did not sizzle, even during aggressive flat-picking.



SUMMARY

I cannot recall when I enjoyed using a pencil condenser review unit this much. The KSM137 is another great product from Shure. It yields excellent reproduction with a minimum of noise and, at \$1,150 for a stereo pair, it is a super deal. I may have to make this a new "go to" in my mic box.

Andrew Roberts, a regular contributor to *Pro Audio Review*, is a sound reinforcement and recording engineer.

Fast Facts

- **Applications:**
Studio, live sound
- **Key Features:**
Cardioid pattern; condenser element; Class A preamp; gold-coated Mylar diaphragm; pad; high-pass filter
- **Price:**
\$1,150 (Pair)
- **Contact:**
Shure at 800-257-4873,
www.shure.com

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WE SHIP WORLDWIDE

BY STEPHEN MURPHY

Although German microphone manufacturer MBHO has been making hand-built microphones for quite a while, not many people in the U.S. have even heard of the company. Part of the reason is that much of the MBHO microphone design work has been for other, better-known manufacturers.

MBHO President Herbert Haun and chief engineer Manfred Schneider are well-established mic experts in Germany, having been on the scene for more than 40 years. In the recent past, MBHO has partnered with Telefunken, Schoeps and others. MBHO manufactured the capsules for the impressive Brauner VM tube microphone series.

MBHO manufactures a wide range of products including large- and small-diaphragm condensers, sound reinforcement-oriented dynamics, PZMs, Jecklin discs and interchangeable capsule systems. Reviewed here is the MBNM-440 CLS cardioid condenser mic.

FEATURES

The MBNM-440 CLS (\$439) is a small-diaphragm, single-pattern instrument microphone. MBHO also manufactures an omnidirectional version called the MBNM-410 CLS (\$439). Both versions of the mic are available in consecutively numbered matched-pair sets for \$878. The matched set includes the two mics, two microphone clips and a black vinyl-covered vintage-style hard case. According to MBHO, the 440 CLS, like all its microphones, is 95 percent hand-

Fast Facts

Applications:

Recording studio, sound reinforcement, theater, broadcast

Key Features:

Cardioid pattern; condenser element; gold-plated connectors; made in Germany; available in matched pairs

Price:

\$439

Contact:

MBHO/MTC at 718-963-2777,
www.mbho.de.

MBHO MBNM-440 CLS Cardioid Condenser Microphone

built in its facility in Germany.

The 440 CLS is short, stocky and built like a rock. The matte-black, all-metal casing measures 3.75 inches by 0.75 inches, including capsule and gold-plated XLR connector. Etched into the metal casing are the company logo, microphone model and serial number.

The mic features an automatic current switching circuit that enables consistent operation with phantom power ranging from 22 volts to 48 volts. This feature makes the 440 CLS ideal for location work with battery power sources.

The MBNM-440 CLS features a switchable 10 dB pad and high-pass filter (no cut-off frequency or slope is specified for the filter). The manufacturer's stated specifications for the 440 CLS are a flat frequency response from 40 Hz to 20 kHz and a sensitivity of 7 mV/Pa. (1 Kohm at 1 kHz). Signal-to-noise ratio is 80 dBA (A-rated at 1 Pa.), maximum SPL is rated at 126 dB and the mic's impedance is 200 ohms.

IN USE

For this review, I received a matched pair of MBNM-440 CLS microphones. The accompanying case and mic clips were of good quality, but I was very impressed with the build quality of the mics themselves. The mics are fairly heavy for such a small size and are built in the same tradition as classic high-end German-crafted mics – not a lot of frills and built to last. In fact, MBHO provides a limited lifetime guarantee for all of its products.

Over the course of several months, I had the opportunity to use the MBHO pair on numerous recording sessions and in a variety of settings. It was not long before certain favorite uses emerged, and comparisons to other mics I own became appropriate.



The MBHO MBNM-440 CLS can be generally and favorably compared to the sound of the AKG 451 (original), the AT4051 and even the Neumann KM184 (which it most closely resembles). The fact that these mics all cost at least \$200 more than the MBHO mic is definitely a bonus for those on a budget looking for a high-quality mic.

There are some important differences, however, between the comparison mics

mentioned and the MBNM-440 CLS. When used in specific ways, the mics sounded very similar – similar enough to render choosing one over the other a difficult proposition.

But in other applications, the MBHO would be the last mic of the bunch I would reach for. I state this for two reasons: first, the other mics can handle high SPLs much better than the MBHO. The 440 CLS tends to distort much easier (yes, even with the pad in) with high SPLs and with sources having severe high-frequency transients (tambourine, claves etc). The second reason is that the MBNM-440 CLS, when used outside of its proximity range, loses far more bass response than the other mics.

The bottom line is that the MBHO MBNM-440 CLS is a very good mic – and sounds quite close to the others mentioned – when used for close miking and on instruments that do not require reproduction of very low bass frequencies. The range from the low mids to the top end is fully and accurately reproduced by the 440 CLS.

For many applications this is exactly the type of mic that is called for. With that in mind, I frequently reached for the 440 CLS for miking mandolins, acoustic guitars, lap steel guitars, flutes and piccolos, oboes, concertinas and so on. In all these cases, the mic was an excellent performer and I did not need to worry about shelving out rumble and low-frequency bleed after the fact.

An associated property of the 440 CLS' specific characteristics was that sources destined to be part of a mix (i.e. not a solo recording) fared very well in the mix without use of additional high-end EQ sweetening and low-end roll-off. Instruments sounded present and had no trouble playing nice with the other players in the mix.

I have one minor quibble that many other manufacturers are also guilty of: although I did not use the low shelf often, why is the knee frequency not labeled on the mic (let alone in the documentation)? I admit this is a pet peeve of mine, but independent engineers should not have to guess or ask or

open a manual to find out such a basic property of the tools we use.

SUMMARY

Overall, this mic is an excellent performer – when used on sources appropriate to its characteristics, it really shined. Considering its very economical price, the 440 CLS is an affordable way to significantly improve the quality of recordings made by those on a limited budget.

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

Review Setup:

Steinberg Nuendo and Digidesign Pro Tools; API 212L mic preamp; Westlake 8.1, SP Technology Timepiece studio monitors; Hafler, Carver amplifiers; Audience audio cables; TASCAM DS-M7.1 monitor controller.

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Contact: Alesis at 401-658-5760, www.alesis.com.

TASCAM MX-2424 Hard Disk Recorder

Applications: Studio, film.

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port; optional DVD-RAM drive; I/O options; Mac and PC compatible; Sound Designer II, BWF, AIF, WAV, OMF, HFS compatible; tape style transport controls; numeric keypad; optional remote control. Price: \$3,999.

Contact: TASCAM at 323-726-0303, www.tascam.com.

Otari DR-100

Applications: Studio, post production.

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Contact: 800-300-3055, www.otari.com.

Fostex D-2424LV Hard Disk Recorder

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Contact: Fostex at 562-921-1112, www.fostex.com.

Mackie Designs HDR 24/96

Applications: Studio, live sound.

Features: Hard disk format; 24-track; 24-bit, 96 kHz sample rate; onboard removable hard drive; basic editing/mixing functions; NTSC, PAL, SMPTE; word clock; LED meters. Price: \$4,999.



Contact: Mackie Designs at 800-258-6883, www.mackie.com.

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

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Applications: Studio, post production.

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shuttle wheel; MMC; LCD; LED screen and meters; linkable; optional remote control. Price: \$6,999.

Contact: TASCAM at 323-726-0303, www.tascam.com.



Genex Audio GX9048 Digital Recorder

Applications: Studio, post production.

Features: Removable hard disk drive format; 48-track; 24-bit; 192 kHz sample rate; basic editing, mixing functions; DSD compatible; SCSI, FireWire ports; onboard sample rate converter; PC controllable. Price: \$19,000.



Contact: Genex Audio at 310-828-6667, www.genexaudio.com.

TASCAM 424MKIII Portastudio

Applications: Studio.

Features: Analog cassette format; four-track; recorder/mixer/editor; inserts; three-band EQ per channel; ±12% pitch control; dbx noise reduction; 48V phantom power; 1 7/8, 3 3/4 IPS tape speeds. Price: \$499.



Contact: TASCAM at 323-726-0303, www.tascam.com.

Roland VS-2400CD

Applications: Studio, post production.

Features: Hard disk format recorder/mixer/editor; 24-track; 24-bit; up to 96 kHz; 40 GB hard drive; control surface; motorized faders, tape-style transport controls, scrub wheel; onboard DSP; onboard CD-RW drive. Price: \$3,295.



Contact: Roland at 323-890-3700, www.rolandus.com

Fostex PD-6 DVD Recorder

Applications: Field, studio.


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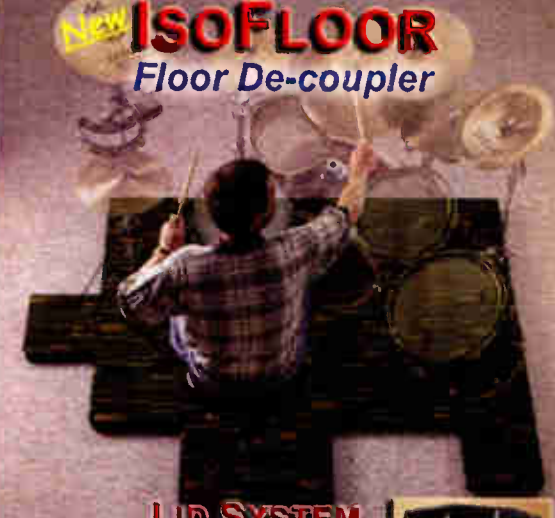


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Nickelback

"Someday"



Single
Slice

BY CHUCK TAYLOR

SINGLE: "Someday"

ALBUM: *The Long Road* (Roadrunner Records)

DATE RECORDED: April 2003

ENGINEER: Joey Moi

OTHER PROJECTS: Santana, Default, Theory of a Deadman,
Kid Rock, Nickelback

SINGLE SONGWRITERS: Nickelback

SINGLE PRODUCERS: Nickelback, Joey Moi

RECORDING STUDIO: Greenhouse Studios, Burnaby, B.C.

MASTERING STUDIO: Sterling Sound, New York

MASTERING ENGINEER: George Marino

CONSOLE: SSL 4000E

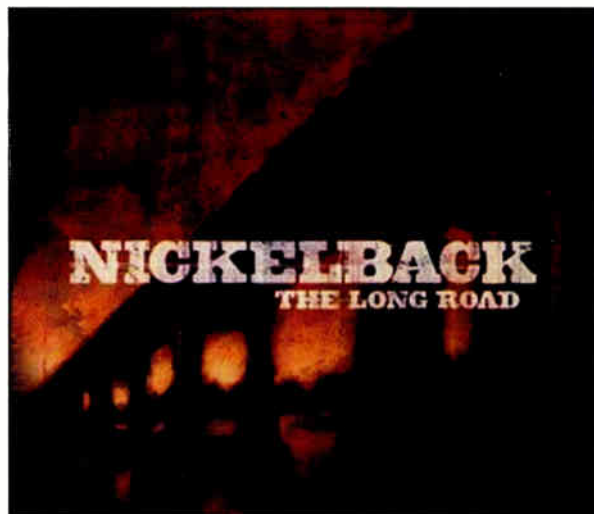
RECORDER: Pro Tools

MONITORS: Yamaha NS10

MICROPHONES: AKG D112 (kick drum); Shure SM57 (snare, toms, high hat, guitars); Rode NT5 (snare, acoustic guitar, ride); Rode NTK matched pair (overhead); Rode NTK (vocals); Rode NT1000 (room) matched pair; Sennheiser 421 (toms, guitar amp); Coles Ribbon (acoustic guitar, room); Neumann KM184 (cymbals); Neumann M147 (acoustic guitar)

MICROPHONE PREAMPS: Neve 1084, Jensen JDI (bass guitar)

PROCESSORS: GML 8200 stereo EQ, SSL G384 processors, Empirical Labs Distressor EL8 compressors, UREI 1176 compressor, Avalon 737SP vacuum tube processor



Engineer's Diary

There aren't a lot of occasions where you can hang out with your buddies and be well paid in the process. But after the mammoth worldwide success of Nickelback's previous *Silver Side Up*, producer/engineer Joey Moi found himself in just such an enviable situation.

"Before these guys became a famous rock band, we had a strong friendship," he says. Of course, with such acclaim comes the innate pressure to recreate the magic the next time around, in this case for new Roadrunner album *The Long Road*. "Sometimes songs just fly right out and you record them really fast," Moi says. That was not the case with first single, "Someday." "We worked on it for a couple months, really," he says. "Everyone in the band put their two bits in at the beginning, then we came back in and added harmonies and other parts. We were still working on that song two days before we went to mixing." It certainly seems the team got it right: "Someday" easily scored top-of-the-charts airplay on mainstream and modern rock and top 40. "That's the thing," Moi says. "We could tell this one would be considered as a single. It's pretty easy to figure out which songs are best molded for radio."

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

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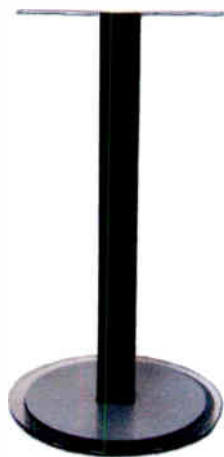
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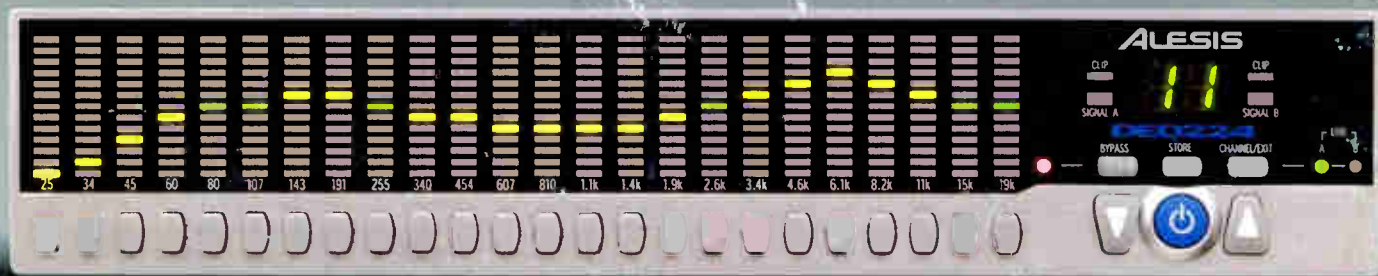
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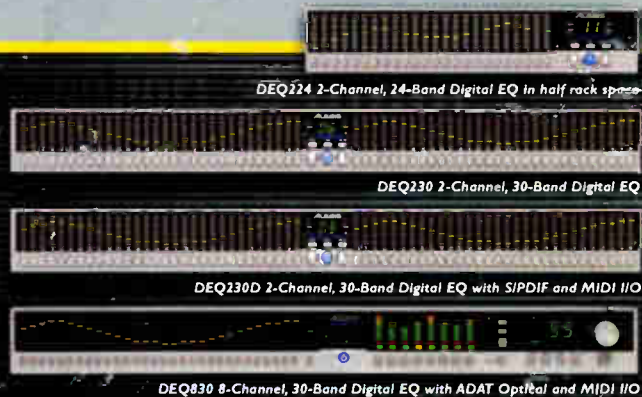


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