

# EQ

PROFESSIONAL  
RECORDING  
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EXCLUSIVE REVIEW <

SOUNDELUXE  
ELUX 251  
MICROPHONE



> EQ LIVE

DEALING WITH MUSIC FESTIVALS  
MEET MY RACK: CARL DAVINO

> FIRST LOOKS

NEUMANN DIGITAL MICROPHONE  
SADIE DVD-AUDIO

Guitarist Dave Navarro at  
Capitol Records' Studio A

# GUITAR RECORDING SPECIAL

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JULY • 2001  
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TESTED: TASCAM MX-2424 RECORDER

WorldRadioHistory



# RECORD! EDIT! PLAY!

## Save your computer for e-mail.

**P**lug in the HDR24/96 Recorder/Editor and start recording. No external computer to boot up. No hardware and software configuration nightmares. No compromises like settling for 20-bit audio or just 12 tracks at a time.

### Recording is easy with the HDR24/96.

Simultaneously record 24 tracks of 24-bit digital audio...without waiting for lock-up, tape shuttle or CPU lag. Drop up to 192 alternate takes into "virtual tracks." Record onto affordable, removable media that you can swap in and out for each project.

And do it all with your hands on a familiar, analog-style machine (or two sizes of wired remotes) instead of resorting to myriad mouse clicks. All basic functions are right on the HDR24/96 front panel including transport buttons and a Record Enable button for each track.

### Editing is easy with the HDR24/96.

Plug in an SVGA monitor, keyboard and mouse, choose from 2x, 4x, 8x, 12x or 24-track views and then watch them scroll smoothly past a centerline.

Mark hundreds of cue points and 4 locate points for looping and auto-punch-in modes.

Use the mouse to "scrub" individual tracks, Cue, Punch and Loop points with continuously variable velocity.

You can mark a segment (or multiple non-adjacent segments) as a *region* and then cut, copy and paste it anywhere — onto a blank track or right in the middle of an existing track without erasing anything. The part of the track after the insert just "slides down".

You can audition regions or modify their start/end points instantly, capture them as "sound elements" for later use or quantize them to user-defined time grids.

Create fade-ins, fade-outs and crossfades just by dragging and dropping them...and then set their length by dragging the mouse.

Then use Track Render to combine all or selected regions of a track just as you hear it — complete with crossfades, volume envelopes, mutes, etc.

### Play with the HDR24/96.

Play back 24 tracks of pristine digital audio — instantly without any pause or lag time. It will be synced rock-solidly to everything in your studio — from MIDI-based sequencers to VTRs (via SMPTE and video black burst). Then let your partners, clients and friends

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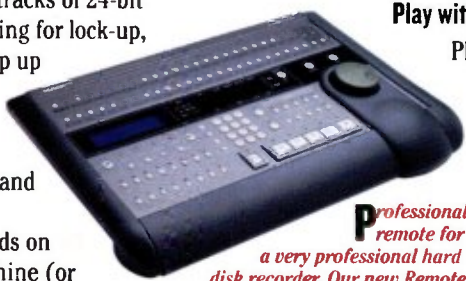
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\*based on average of length of current pop songs using 24 tracks @48kHz/24-bits and a liberal number of extra regions and virtual takes. Does not apply to extended track remixes. ©2001 Mackie Designs Inc. All Rights Reserved. Mackie and the Running Man figure are registered trademarks of Mackie Designs Inc. Mackie Media is a trademark of Mackie Designs Inc. ORB is a trademark of Castlewood Systems.

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# Get the MX-2424 Advantage!

“ The 'Golden Ears' all found the TASCAM performed extremely well, nearly beating out a unit priced four times higher. The listening tests confirmed what I already knew: the MX-2424 is a solid performer at a great price. ”

- Glen O'Hara,  
*Pro Audio Review Magazine*

“ ...the MX-2424 puts high-resolution sound quality and professional recording features at your fingertips. ”

- *Electronic Musician Magazine,*  
2001 Editor's Choice Award

“ ...the TASCAM MX-2424 is a rock-solid, excellent studio recorder that performs well, sounds great and is priced right. ”

- George Petersen,  
*Mix Magazine*

“ The machine alone is impressive enough to warrant close attention, but the implications inherent in the control and networking capabilities make it potentially astounding. ”

- Rob James,  
*Studio Sound Magazine*

You probably machines in is the What you advantages multitracks, transition just getting understand



\* based on an average 3 1/2 minute song of 24 tracks at 24-bit/48kHz. Your mileage may vary

† Offline CD-R backup is possible with an Ethernet-equipped computer. The \$749 (USD) reference is based on TASCAM's CDR-Pro Bundle.

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MX-2424 24-TRACK 24-BIT HARD DISK RECORDER/EDITOR

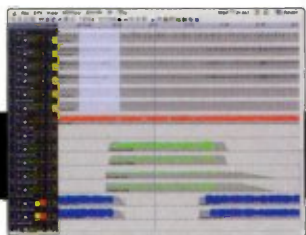
know that with thousands and thousands of use around the world, the **TASCAM MX-2424** most popular 24-track recorder ever made. What most people don't know is that the MX-2424 offers huge advantages that aren't available on other standalone hard disk recorders regardless of price. Whether you're making the transition from analog and tape-based digital recorders or jumping into recording, here's some info to help you truly appreciate the MX-2424 advantage.

### Ph.D. in Nuclear Physics Not Required

If you've ever recorded before, you'll find the MX-2424 as easy to use as any multitrack recorder. Flip the Power switch, arm a track and hit the Record and Play buttons. Voila...you're tracking to its internal hard disk. Since TASCAM has been the world leader in multitrack recording for over 25 years, we know how to create gear that's powerful and sophisticated without making the learning curve too steep.

### Edit How You Like: MX-View™ Waveform Graphic Interface and Extensive Front Panel Editing

One of the main reasons to get into hard disk recording is the incredible editing power versus tape. Running in native Mac and PC versions and connected via a fast 100Mb Ethernet interface to your computer, the upcoming MX-View is a powerful graphic editing interface that offers sophisticated, sample-level editing on par with full-featured digital audio workstations. You can drag and drop on the fly, get onscreen metering for up to six MX-2424s, set up custom configurable keyboard shortcuts, manage virtual tracks and much more. If you want to use the MX-2424 in the field, its



extensive built-in front panel editing tools let you edit without lugging around a keyboard, monitor and mouse.

### True Recording Power: Take the Punch-In Challenge

24-track, 24-bit digital audio requires a powerful hard disk recording engine. The MX-2424 is so strong that it allows for seamless, gapless punches across 24 tracks, with up to 72 tracks of throughput to accomplish this considerable task. If you're brave, try arming 24 tracks on any other standalone 24-track hard disk recorder and quickly punching in and out. It's just one example of the MX-2424's awesome dual-processor recording power and extremely fast SCSI bus. You can choose between TapeMode and Non Destructive recording, and access up to 999 virtual tracks per project with 100 locate points, 100 levels of Undo and much more.

### Sound Designer II, Broadcast Wave Files and SCSI Drives for Ultra Flexible Compatibility

TASCAM understands the reality that you may need to interface your audio with other pieces of equipment. Since the MX-2424 writes Sound Designer II™ audio files to Mac-formatted disks and

Broadcast Wave audio files to PC disks, it's easy to move sound back and forth between your computer and the MX-2424. With these standard time-stamped file types and professional SCSI drives, you're ensured sample-accurate compatibility with Pro Tools™, Nuendo™, Digital Performer™ and more. With compatibility being so important to MX-2424 owners, it's no surprise that its 24-channel interfaces are ready to connect to just about any console, digital or analog. Or that its analog, TDF and AES/EBU interface modules are 96kHz ready.

### Back Up Your Tracks: As Low As A Buck Per Song

Media	Cost of Drive	Media/10 Projects	Total Cost
90 Minute IDE Drive	\$299	10 Drives	\$2990
Orb Drive	\$299	1 Drive + 86 Disks	\$2879
<b>TASCAM DVD-RAM</b>	<b>\$599</b>	<b>1 Drive + 20 Disks</b>	<b>\$1739</b>
<b>Offline CD-R Backup</b>	<b>\$749</b>	<b>1 Drive + 290 Disks</b>	<b>\$959</b>

*If you're forced to use cheap disk drives to backup, you'll pay in the long run. DVD-RAM drives may be connected to the MX-2424's front panel or rear SCSI port, and offline CD-R backup via Ethernet transfer to your computer is the most cost-effective backup method available on any HD recorder by far.*

Hard disks are great for recording...but not so great for archiving and transferring audio. That's why the MX-2424 gives you choices like 9.4GB DVD-RAM discs for your backup solution. Or simply transfer your audio to your computer and backup to CD-ROM for as low as one dollar for an average pop tune\*.

### Get the Advantage of the Most Powerful and Most Affordable 24-Track Hard Disk Recorder Available Today

There's much more to the MX-2424 than what fits on this page, like its award-winning sound quality, professional built-in synchronization tools and TASCAM's amazing online support forums. So if you're getting into the hard disk revolution, you might as well take advantage of the recorder with all the advantages. Just go to [www.mx2424.com](http://www.mx2424.com) for the complete MX-2424 story, or check out the MX-2424 for yourself at any TASCAM dealer.

Available soon, the new MX-View graphic editing software offers DAW-style waveform editing power, drag-and-drop editing on the fly, control of up to six MX-2424s with metering and much more.

[www.mx2424.com](http://www.mx2424.com)

**TASCAM**  
a whole world of recording

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ON THE COVER:  
DAVE NAVARRO BY EDWARD COLVER

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## Almost There

Let's see a show of hands; how many of you have ever recorded an electric guitar? Wait, hold still while I count: one, two, three, four...okay, we'll just say that most (if not all of you) have spent some time pushing a mic around in front of a guitar cabinet. It can be a real challenge getting the exact tone you want on tape or hard drive, and, in some cases, it can take a significant amount of time and gear.

But over the past few years, an alternative to miking a speaker has emerged: modeling processors that attempt to duplicate the tone and vibe of a guitar amp using DSP. There are now a number of these devices on the market, and some variations, such as the Fender Cyber-Twin amp (reviewed by yours truly on page 94) are beginning to appear. As a guitarist, I'm increasingly happy with these products. The sounds continue to improve, and the "feel" of the amp models is also getting better and better. I expect this trend to continue as new and improved modelers and software upgrades are released.

As a composer and sound designer, I'm also happy with the current crop of modelers — what could be more fun than mangling a beautiful synth or drum sound by running it through a model of a Marshall stack cranked to 11?

And as an engineer, I'm impressed by the convenience and versatility of amp modelers and simulators; they're easy to use, affordable, and much more cost-effective than a room full of old tube amps and speaker cabinets.

But even though the current batch of modelers are perfectly excellent for many applications, as an engineer, I'm still waiting for a few key features to make an appearance — just a few key items that, in my mind, would make for a much more studio-friendly box. Call it my wish list for the ultimate guitar processor/amp modeler/speaker simulator. It comes down to three small things I have yet to see included on one unit:

- Balanced analog +4 dBu line-level I/O — preferably XLR connectors; both input and output, please.
- Digital I/O — several amp modelers have digital outputs, but where are the digital inputs?
- Word clock I/O — my opinion is that every device sporting a digital connection should have word clock I/O. Period.

Doesn't seem like I'm asking for all that much. How about it manufacturers? Anyone wanna make me a happy camper?

—Mitch Gallagher  
mgallagher@uemedia.com



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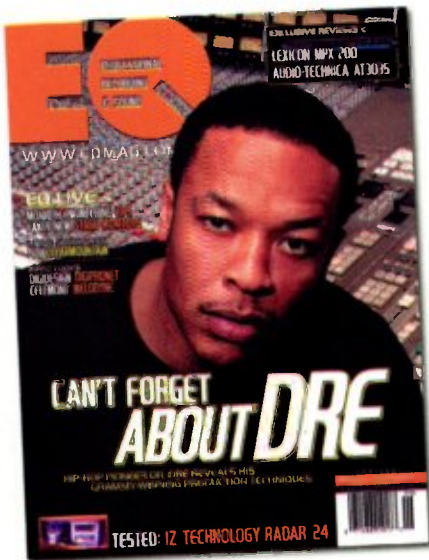
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## WE APPRECIATE THE APPRECIATION

I just wanted to take time out of my day and let your staff know how much I appreciate your magazine and the Web site. I have been involved in the adventure that is music production since I was 12. Now at 32 I have seen a few things, and your organization stands out. I (and I can't believe I am actually admitting this) actually read all of it. From articles to tips to advertising — everything. I can't wait for the next issue! Am I weird? I don't know. But I do know that you guys and gals make my job of keeping up a lot easier!

I just want you to know that you are making a difference — a huge difference. Don't stop!

Bob "Icky" Alumbaugh  
Somewhere in CA

## PRIDE IN RECORDING

Concerning the recent Charley Pride CD copy protection controversy, folks should know that the great majority of all recordings routinely go through several analog to digital conversions during the recording/mixing/mastering stages of production. A great percentage of music is recorded to digital to begin with, that's an analog to digital step. Then it is mixed, a digital to analog to digital step, then mastered, usually a digital to analog back to digital step. When done with reasonable care, these steps can result in a perfectly

**"ALL I CAN SAY IS ANY MOTIVATED PROJECT STUDIO OWNER OUGHT TO TAKE JIM BORDNER'S ARTICLE AND PIN IT TO HIS WALL."**

—JOE EHLINGER, GREY WORLDWIDE

professional quality recording. I wouldn't be surprised if Charley's CD had gone through this exact process. One more digital to analog to digital step to make this CD un-copyable by anyone would not necessarily reduce the quality of the original CD to the degree that it would be discernible by the average listener, indeed, not even by many "pros."

As a recording professional I am generally dismayed at the focus given recording quality as an accomplishment in and of itself instead of being viewed simply as a process that helps in the presentation of what should be the focus: the content, the music. Bad, and even moderately good, music that has been recorded perfectly will long be forgotten while music such as the Library Of Congress recordings of Woody Guthrie classics, which are barely passable in a technical sense, will be listened to for many years to come. The pointless exercise known as "shining sh\*t" has become so commonplace in our culture that it has given rise to an even more direct description in the studio musician world: "So many tur\*s, so little polish." Remember, Mozart's music was never even recorded, it is the depth and artistry of what he wrote that has kept it alive and vibrant for so many years.

My advice to those who attempt to feed their egos from behind a recording console is this: "Put a great microphone in front of a great musician and get the hell out of the way."

Brendan Harkin  
Wildwood Recording

## WRITE ON!

This is the first time I've written a response to an article, but I thought Jim Bordner's piece, "Come Blow Your Horn" [May 2001], was terrific.

I have a project studio, and have been working in advertising in NYC for about 20 years. (Some of the stuff I recorded for Coca-Cola has been used in South Africa and Germany.) I loved the way Jim solved his area agency objections by discovering new VO talent. I went through the same thing here

during the SAG/AFTRA strike. What's more, funny improv people almost always improve a script. In fact, a major comedy radio studio/creator here (McHale-Barone) doesn't even show a client scripts. They play them demos (that way the client doesn't go through the piece like they're grading a paper).

All I can say is any motivated project studio owner ought to take Jim's article and pin it to his wall.

Joe Ehlinger  
Associate Creative Director  
Grey Worldwide

## WARM RECEPTION

I just browsed my newsstand and picked up an issue of EQ to see what's happening in studio sound. Man, have things changed since I lost interest in audio production. What I mean is the way the pendulum has swung back to tubes and colored sound. For a few minutes I thought I was reading heresy, then I relaxed and enjoyed the reviews. You see, 12 years ago everything seemed to be about A/D conversion, getting rid of analog, and cleaning up sound to the point everything was clinically flat and precise. The less difference you could find between the input and the output, the better. Neil Young was a fringe lunatic ranting about cold heartless CDs. Maybe those are the reasons I lost interest.

Now I open up a magazine where the people talk about warmth, color, harmonics, mods; and the ads are full of retro looking gear with coils and tubes. Neat. Audio is fun again.

Charlie Ross  
Sutton, ON Canada

## PASSINGS

EQ is sad to report the passing of Dick Denney, creator of the VOX AC30 amplifier. Dick, 80, had recently been ill and died in Rye Memorial Hospital. Joining Tom Jennings at VOX in 1951, Dick designed the world-famous AC30, among many other great products.

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## SAMPLE RATE BLUES

*I messed up big time. I started a Pro Tools session the other day at 44.1. Yesterday we resumed the same session, but I forgot to switch the external clock from a different session back to 44.1, so the new tracks and mixing session were clocked at 48. There was never a glitch until I burned a CD and we listened to it — of course, it played slow. Anyway, after much fussing, I made an analog burn so we could FedEx it out this morning.*

*So, first, it would be nice if Pro Tools would warn me of my own stupidity. Second, does anybody know a way that I can fix the new files? —Jamie R.*

The same thing happened to me a couple of years back and it was a pain to deal with! After a lot of experimentation, however, I found a cure:

1. Load all of the sound files in Gallery's SampleSearch program ([www.gallery.co.uk](http://www.gallery.co.uk)).
2. Select all of the files and choose "Change Sample Header Info"
3. Tell the header that each file is at 48 kHz (which it really is, only it thinks that it's 44.1 because of the header).
4. Open all of the newly changed files in Gallery "Gearbox." Sample rate convert all of the files to 44.1 kHz.
5. Open all of the newly sample rate converted files in Pro Tools. —David Frangioni

## MIXING STRINGS/ ORCHESTRA IN POP/ROCK

*I am looking for tips on how to make strings/orchestra samples work in a pop/rock mix. I've got an Alesis QS8, and though the strings cut through okay, they sound artificial. I've also tried more realistic samples like the Advanced Orchestra, and though those*

*sound pretty good on their own, when I mix them in with the drums, guitars, and bass, they crumble. So mixing tips will be greatly appreciated. Style of music would be Beatlesque-type pop/rock, ranging from the way they used strings subtly on, say, "Here Comes The Sun," to bigger orchestrations like "I Am The Walrus" or "The End." —macle*

First off, getting "Walrus" out of synths is going to be tricky. Keep in mind that the Beatles would generally make their strings sound as unnatural as possible, which isn't the same aesthetic approach as the creators of our expensive string sample libraries have.

I've had good results when I've taken crafty string parts played on "nice" samples and enhanced them with the Mike Pinder Mellotron CD. That's a great library — probably the single sample disc I use most often.

Be careful with the bass register. If you're going to use bass notes, try using a solo cello (extend the sample range downward to get all the bass notes) or solo bass. Keep it dry. Leave holes (rests).

Think contrapuntally. Try to play against the band, not with it. I generally remove all the sweet-sounding "schmoo" and chorusing I can. If I'm using synthy string sounds (as you might find on various popular Korg and Roland synths), I usually reduce the top end with EQ. This helps diminish the "Wurlitzer-Organ-at-the-Roller-Rink" effect. —JW

I second the Mellotron sample idea, especially if you're after the Beatles vibe. I've had good results with it. If you don't want to spring for the whole Pinder Mellotron package, Sonic Reality has a less expensive disc called Vintage Timetraveller that has all the string

## WEBLINK

Have a question you'd like answered? Visit Roger Nichols, George Massenburg, Ed Cherney, and David Frangioni online at [www.gamag.com](http://www.gamag.com)

patches (Mellotron and Chamberlain), plus a lot of other groovy vintage keys and synths. For added "reality," use the individual note patches and overlay by changing the pitch of the sampler (or the tape machine) and playing the same note on a new key — this mixes up the fixed vibrato on the Mellotron patches and makes it sound more like multiple players. Also, try overlaying strings onto the two-mix, rather than during the main mix, like they did back then. —jrsg

## GRAPHIC EQ

*I do live sound as well as studio stuff. I walk into clubs all the time where they have perhaps 20 of 31 bands on the FOH EQ either boosted or cut and the system sounds like sh\*t. I immediately bypass the EQ and retune the system with the crossover, but still need to tailor the PA with the graphic. So, let's say I want to make a shallow but fairly wide cut in the lower midrange, centered at 400 Hz. Is it better to make a deep cut at 400 to widen the EQ bell or to make small cuts at 400 and a couple of bands above and below? Or, restated, it is better to make a few deep cuts rather than a bunch of little ones? —Will R.*

I know this won't go over big, but I'm afraid my answer is to avoid graphics at all costs. You're on the right track with re-balancing the crossover before EQ'ing. I'd go the extra step, though. Look at what sort of EQ you're hearing. Outside of the (admittedly large) variability in halls, the same peaks and dips probably crop up night after night, and most of them are likely to be more or less sharp or well defined (speaker/cabinet resonances; staging and rigging-related resonances). So wouldn't the best compromise be a parametric with many bands? Because, at best, a graphic is a compromise for either application. For sharp peaks you never can really tune in on the exact frequency, and for broad peaks, you're never getting a smooth, minimum-ripple curve. —George Massenburg

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## Neumann Solution-D

By Steve La Cerra

One of the most exciting announcements at the Amsterdam AES several weeks ago came from Neumann with the unveiling of their Solution-D — a digital microphone system that combines the dynamic range and audio fidelity of Neumann's respected analog studio mics with digital audio processing. The first three components in the Solution-D system include the D-01 digital microphone, the DMI-2 digital microphone interface, and RCS software, which permits remote control over microphone operations.

One of the problems with A/D conversion of a microphone signal is the lack of converters with sufficient resolution for such low-level signals. Although the best converters currently available provide a dynamic range of 115 to 120 dB (A-weighted), a high-quality analog condenser mic can easily attain a dynamic range of 130 dB. Extremely accurate A/D conversion is required to avoid adding noise or losing resolution in the signal. Also, the A/D process must be matched to the signal level and source impedance of the microphone (as opposed to that of a line-level signal).

While the D-01 maintains the classic Neumann look, the technology under the hood of the D-01 is quite different from previous microphones. The D-01's capsule is directly connected through an FET to an analog-to-digital converter specifically developed by Neumann for the low-level output inherent in a condenser mic capsule. This eliminates the need for an external

analog mic pre and A/D converter. Signal integrity is maintained through a 28-bit signal path with a dynamic range greater than 130 dB.

Components of the Solution-D system comply with the new AES 42-2001 standard, which defines digital interface parameters for microphones, including transmission of output signals, microphone power supply voltages, and remote control functions. As a result, the D-01 can be directly connected to any audio component supporting AES 42-2001. For situations requiring an AES/EBU digital data stream, the DMI-2 can be used to convert two microphone channels to an AES/EBU-compatible signal. To ensure reliable synchronization of the mic signal with a digital recording console, Neumann engineers developed a frequency-phase comparison feedback signal used to control a crystal oscillator inside the microphone.

Rear-panel connections to the DMI-2 include AES 42-2001 and AES/EBU digital I/O, word clock I/O, control bus ports, and an auxiliary user port. In addition to the word clock I/O, the DMI-2 incorporates a word clock generator that supports sample rates up to 192 kHz. When no word clock is detected at the input, the DMI-2's internal clock automatically synchronizes both mic input channels and routes clock data to the word output jack.

RCS (Remote Control Software) designed for the Solution-D system can either be run stand-alone on a computer or integrated into a digital console for control over D-01 functions. RCS allows a user to remotely adjust parameters such as polar pattern, pad, low-frequency rolloff, gain, polarity reverse, sample rate, synchronization mode, transient limiter, and soft muting. Operating systems supported include Windows 2000, Win 98SE, and Win ME; Mac OS is scheduled for release by the end of 2001. ■

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**PRICE:** TBA

**CONTACT:** For more information contact Neumann at 860-434-5220 or visit [www.neumannusa.com](http://www.neumannusa.com).

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CIRCLE 61 ON INFO CARD



By Steve La Cerra

## Sadie DSD Mastering Workstation

As high-resolution digital audio formats such as DVD-A and SACD are gaining popularity, the need is increasing for editing and mastering workstations accommodating the new formats. Sadie already manufactures the DVD-A Direct for use in DVD-A mastering and authoring. At the Amsterdam AES this past May, they announced their new SACD Mastering Editor. Intended for use in editing and mastering stereo DSD-format audio, the SACD Mastering Editor is the first digital audio workstation that can be used for SACD authoring to the Scarlet Book standard. Based on SADiE's popular user interface, the new DSD editor also supports down-conversion to 16-bit PCM for producing the standard Red Book CD mastering layer used in hybrid SACD discs.

SACD (Super Audio CD) is the relatively new, high-resolution digital audio format created by Sony and Philips to provide audiophile-quality stereo and multichannel sound. Differing from the existing "Red Book" CD format, SACD has the unique ability to store data

in the DSD (Direct Stream Digital) format. Unlike PCM encoding, DSD is a one-bit format with a sample rate of 2.8224 MHz (or 64 times 44.1 kHz!). DSD eliminates several stages in the recording process, enabling a one-bit signal to be directly written to the storage medium. The result is a frequency response extending out to 100,000 Hz, and a dynamic range

greater than 120 dB.

Three types of SACDs exist: single-layer, high density; dual-layer, high density; and hybrid. The first two types of discs are intended for use when only DSD data is to be placed on the disc. A hybrid disc contains two discrete layers of data — the top layer of data is Red Book audio compatible with existing CD players. The bottom layer is the SACD layer where the high-resolution DSD data is stored. When a hybrid disc is loaded into an existing CD player, the bottom layer is ignored and the disc is played as a 16-bit/44.1 kHz audio CD. When placed in an SACD player, the high-res DSD layer is read from the disc, yielding increased audio fidelity.

Due to the inherently different nature of DSD from PCM information, DSD data cannot be processed using "traditional" PCM-based processors. With that in mind, Sadie designed the SACD Mastering Editor as a turnkey system for SACD authoring. Audio data is routed into the SACD Mastering Editor via rear-panel, SDIF 3 connectors on BNC jacks, enabling the unit to share data with any DSD-compatible device, such as a Genex digital recorder or any DSD-format analog-to-digital converter. Through the use of outboard DSD-compatible analog-to-digital converters, multi-track recordings may be mixed directly to the SACD Mastering Editor via the SDIF 3 input connector.

The SACD Mastering Editor runs Sadie's proprietary software on a Windows platform, and includes rear-panel facilities for connecting a keyboard, mouse, and video monitor. The unit is entirely self-contained, so no additional computer is required for operation. SADiE plans to ship the SACD Mastering Editor with internal hard drives for audio storage. ■

### SADiE DSD MASTERING EDITOR

**WHAT IS IT?** The first digital audio workstation designed for editing and mastering of DSD audio, and for authoring SACD masters.

**WHO NEEDS IT?** Mastering facilities

**WHY IS IT A BIG DEAL?** In addition to its ability to produce an AIT tape for factory use in SACD production, the SACD Mastering Editor also includes dynamic and equalization processing for DSD audio.

**PRICE:** \$28,000

**SHIPPING:** Fall 2001

**CONTACT:** For more information, contact Sadie at 615-327-1140 or visit them on the Web at [www.sadie.com](http://www.sadie.com).

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By Howard Massey

# John Nelson

Conway Studios is not only one of the busiest and most famous studios in L.A., but it's also a renowned breeding ground for great engineers. So, it's little surprise that this month's Rising Star, John Nelson, is one of the studio's most talked-about assistants.

Nelson grew up in Lubbock, Texas and lived there until graduating from Texas Tech. After attending Full Sail in Florida, he followed the holy grail of engineering all the way to Los Angeles. Starting as a runner at Conway, he later graduated to senior assistant engineer when friend and colleague Barry Goldberg got called up to the majors a few years ago. "The second engineering gig has evolved so much in such a short time," says Nelson. "It still involves all of the classic responsibilities, but now involves far more interfacing with external systems, and calls for fast learning."

**EQ: How did you land your current gig?**

**JOHN NELSON:** I began as a runner (of course) at Conway, and worked feverishly to learn enough to remain there as an engineer. The traditional Conway approach has always been that the staff engineers must have experience before they come to work there, so I knew I was going to have to go the extra mile. Eventually it paid off, and they started letting me fill in and ultimately allowed me to work on an album.

**Where do you see yourself in five years time?**

I see myself engineering and producing records.

**Who are your heroes in engineering and record production?**

Mick Guzauski, Glen Ballard, Nathaniel Kunkel, Karl Derfler, Peter Mokran, Joe Barresi, Matt Serletic, Paul Northfield, Peter Asher, George Massenburg, Noel Golden, Michael Beinhorn, and

Elliott Scheiner. They all make great records, but each with a specialized approach.

**What are your favorite current recordings, and why?**

- Dave Matthews Band: Everyday [RCA, 2001]. A great musical collaboration between the band and Glen Ballard, and a tremendous recording by Karl Derfler. I assisted on this album, and it was an inspiration.
- Tool: Lateralus [CZ, 2001]. Tool rocks; it's that simple.
- Aerosmith: Just Push Play [Sony/Columbia, 2001]. Fabulous songs!
- Willie Nelson: (Forthcoming release). Whoever thought of Matt Serletic producing Willie Nelson deserves a Nobel Prize.
- Moby: Play [V2, 1999]. I'm getting better at appreciating the various textures in a recording and how sounds provide the colors and attitudes in a song. I think Moby does it as well as anyone, ever.

• Fenix TX: Lechuza [Drive Thru, 2001]. Jerry Finn and Sean Odwyer own this genre of music; nobody does it better.

**If you were stranded on a desert island and could only take five pieces of studio gear with you, what would it be?**

An SSL J9000, a Studer 827, a pair of Dynaudio BM15A Monitors, a TC Electronics M6000, and a Herman Miller chair.

**What's the single best piece of advice anyone ever gave you?**

It's always, always about the song.

**What's the single best piece of advice you can give our readers?**

Know when something great is happening, and make sure the red light is on! ■

**EQ questions an up-and-coming engineer**

**WEBLINK**

E-mail John at [HJOHNNELSON@cs.com](mailto:HJOHNNELSON@cs.com)



By Lisa Roy

# Samantha Mumba "Baby Come Over"

## SIGNAL PATH

Michael C. Ross explains, "For 'Baby, Come Over (This Is Our Night),' I recorded the horns through the mic pres on Royaltone's Neve 8078. I love their sound. I did a little EQ on the board — a couple dB, nothing significant. I put a little bit of top end on the trombone. On the room mic, I put a DBX 160. I set it for the minimum amount of compression at about four to one, and just a tiny bit off. So, basically, it's just preamp in, direct out, then through the DBX 160 across the room mic into Pro Tools. We ended up on two Pro Tools rigs because

there were over 100 tracks. There were like eight hi-hats, four tambourines, three kicks, and every background voice had it's own track and tons of stuff spread out. Then we put on two trumpets, Gary Grant and Jerry Hey, two saxes, Dan Higgins and Larry Williams, and a trombone, Bill Reichenbach."

## MIC POSITION

"The Neumann KM 54 has been my favorite trumpet mic for the longest time and in some cases still is," Ross continues. "However, the last few times I used the KM 54, I wasn't entirely happy with it — it sounded a little pinched for me on the horns. So, I put up one U 47 for the two trumpets. I liked it better because it sounded a little fuller and seemed not as stressed with the powerful level the guys play. I set it up about six feet back and low enough on the mic stand so the capsule was aimed right at the bell of the horn. I was going for an equal amount of room to all the close mics. It sounds bigger if you can get away with the room mic in there a fair amount.

"For the trombone, I used the Royer R121, which is a fantastic mic. I've used a C12 in the past, but when I put it up, this one sounded a bit overdriven and stressed. Bill actually suggested I try the R121, and it worked great. I positioned it pretty darn close, just a few inches from the bell of the horn.

"On the sax, I used a U 67, which happens to be my favorite sax mic. It handles level great and has a big full sound that helps round out the sound of the section. It was not quite on the bell, but above it a

**DATE:** January 10, 2001

**STUDIO:** Royaltone

**LOCATION:** Burbank, CA

**ARTIST:** Samantha Mumba

**PROJECT:** Gotta Tell You

**TRACK:** Horns on the song, "Baby, Come Over (This Is Our Night)"

**PRODUCERS:** BAG & Arnthor, Dino Esposito, E. Dawk, Ron Fair

**EXECUTIVE PRODUCER:** Ron Fair

**ENGINEER:** Michael C. Ross

**ASSISTANT ENGINEER:** Chris

**PRO TOOLS OPERATOR:** Tal Herzberg

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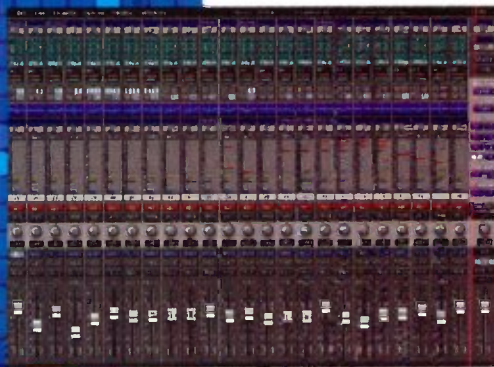
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Some of the team working on the second single from Samantha Mumba's *Gotta Tell You*: (l-r) Michael C. Ross, Samantha Mumba, and Eric Dawkins.

use the best mic you can, rather than worry about matching microphones.

"I used the Royer R121 for the room mic, set back ten to fifteen feet and around the height of the guys — about six feet. It was pointed at the middle section and aimed slightly toward the trombones and saxes, because the trumpets are so much louder. I had the guys set up left to right — trumpets, trombone, and then the saxes in a straight line with

little bit and parallel to the sax. I like the air you get out of the saxophone with the mic in this position. On the

second sax, I used an M 49 because it's similar and I didn't have another U 67 available. I find it's better to just

five baffles behind them and a carpet beneath them. The space around them is tight and kind of dead, but the

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World Radio History



room is wide open. I get a tight sound with the close mics and an ambient sound with the room mic. I have my pick later on, if I want an in-your-face sound."

## PROCESSING

Ross explains, "There's not much processing going on. I feel that, in this case, my job is to capture the sound as fast as I can because they're creating a tremendous sound out in the studio. Just get it on the hard drive. I did, however, use a tiny bit of the 31105 EQs on the console. I could use no EQ and it would be fine with me. I put the DBX 160 on the room and set it up 4:1, with the gain set at unity and adjusted it so that it moves just a little bit. Never more than 3 to 4 dB — certainly not above 5 dB. I feel it gives the room a little more presence and tightness. I've got the room on its own track running through the AMS nonlinear 2. I know it's the oldest trick in the book, but you can use it in ways that it doesn't sound like a gated reverb. I feel it makes the room sound bigger.

"When we played the track back for everybody, I put the Lexicon 480L across the horns using one of the plate settings. There's not much, just a little bit of decay to give it some tail on the sound."

## TRACK NOTES

Ross concludes, "Samantha's first single, 'Gotta Tell Ya,' went Top Ten, and Ron decided to see if there was more he could get out of the next single, 'Baby, Come Over.' We took the original masters, which were on three or four 24-track analog tapes. There were about 100 tracks, and we put them all into Pro Tools. Regarding Pro Tools, I think we're all learning how to make the best use of it and how not to overuse this amazing new tool. Jack Joseph Puig said at a recent panel, 'We're going to ruin a lot of records before we figure out the best way to use Pro Tools.' There's a part of that I agree with.

"We put additional guitars on with John Doux and percussion with Luis Conti. The horns were one of the last

things to go on. Ron got permission to use the riff from Kool & The Gang's 'Ladies Night' — that's why this is called 'Baby, Come Over (This Is Our Night).' In the breakdown section, we had Jerry Hey and his guys put a couple passes of trumpets, flutes, and a low trombone. We finished everything and decided we've got to have horns in the 'Ladies Night' section. We had the guys come back the following week to play eight bars. I had to match the sound, so I just did the same thing as the last time. Then we comped them onto a pair of tracks, did a stereo bounce, and the panning was consistent, so, in the final mix, it would sound seamless. At one point, one of the guys said he thought the horns sounded better this time. Actually, I think it's just because the other horns were mixed in with the rest of the track, and the new horns were very loud.

"Jerry Hey is awesome, and Ron Fair does everything first class; there's no two ways about that. It's great to work with these guys." ■

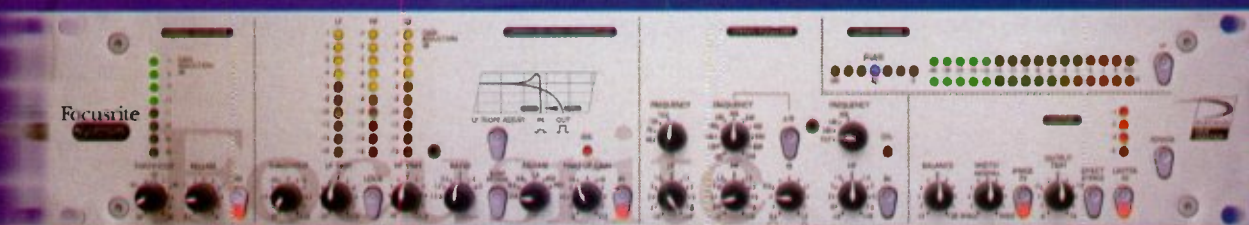
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Len Davies, Audio Media US - March 2001

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# ...TO FINISH



By Steve La Cerra

## Esoteria Sound Studio

### Rocking the Balkans

**STUDIO NAME:** Esoteria Sound Studio

**LOCATION:** Skopje, Macedonia

**KEY CREW:** Vlatko Stefanovski

**MIXER:** Soundcraft Ghost 32

**RECORDERS:** TASCAM DA-88 [1], DA-38 [2];

Panasonic SV-3800, TEAC DAP20 DAT, 32-2B

open reel; Revox B77 MkII, AIWA cassette deck

**MONITORS:** Wilmslow Audio (custom mains),

Tannoy System 600 and PBM6.5

**AMPLIFIERS:** Alesis RA100, Mesa/Boogie

Strategy 400 tube power amp

**EFFECTS:** Lexicon PCM70, MPX100; TC

Electronic M2000, Eventide Ultra-Harmonizer

H3500 DS/X, Rocktron Intellifex, Ibanez

DMD2000 Delay, Yamaha Pro R3, DG-Stomp

(guitar pre/effects)

**OUTBOARD:** Drawmer 1960 tube mic pre/com-

pressor, 241 compressor; CAD compressor, SPL

Charisma, Aphex Aural Exciter, Behringer

Intelligent

**MICROPHONES:** Groove Tubes L5C, AKG

C3000, C1000S, D112; Audio-Technica ATM25,

ATM10a [2]; Shure Beta 56 [2], SM57 [2], SM58 [2]

**KEYBOARDS/SAMPLERS/MIDI:** Akai CD3000i

sampler, 01 synth module; Kurzweil K2000VP

keyboard, Alesis S4 synth, Roland MC-303

Groovebox, GI-10 guitar-MIDI interface, GK-2

MIDI pickup; Midiman Midisport 2x2 USB MIDI

interface

**DAW EQUIPMENT:** MOTU 2408 mk II interface

**COMPUTER:** Pentium III 500 MHz with 9.1 GB SCSI drive

**SOFTWARE:** Steinberg Cubase VST 5.01, WaveLab; Syntrillium Cool Edit Pro, Sonic Foundry Sound Forge, Vegas, Acid

**GUITAR AMPS:** Fender Twin Reverb, tweed

Blues Deluxe; Mesa-Boogie Quad preamp,

50/50 power amp; Barcus-Berry XL 8, Line 6

Pod, Rocktron guitar compressor, Marshall 4x12

cabinet [2]

**GUITARS:** Gibson 1972 Les Paul Deluxe, 1974

SG Standard, 1979 ES-175 TD; 1991 Pensa-Suhr

electric guitar, Fender 1966 Telecaster, 1978

Stratocaster; Continental Dobro, Yamaha GC42-

C nylon string, APX-10 steel string; Radulovic

electric guitar, bass; Sakura nylon string guitar

**STUDIO NOTES:** Vlatko Stefanovski built

Esoteria sound studio "in 1992 as an extension to

my house in Skopje. I always like a lot of space,

so I tried to avoid building a studio in a basement.

My ceiling is almost six meters high at its highest

point and seems to be a natural bass trap. There

are four rooms. The control room is the biggest

one (5.50 m x 4.75 m). I also have one dead

room, one live room, and a gallery (which is my

guestroom, writing room, and working room).

"It has always been very difficult to find

ways of buying and importing gear here in the

Balkans, and even now it's an adventure.

There are no dedicated shops for pro audio. I

have the fortune of traveling a lot, so I can always obtain new toys from my tours around the world. In my studio I have scored 11 films, music for three ballet performances, countless theater projects, commercial jingles, six solo albums, and many demos. I work with musicians from Macedonia and the neighboring countries, and very often I make dedicated recordings of ethnic instruments. There are some great players around here!"

**PRODUCTION NOTES:** Stefanovski continues, "As a guitar player, I've been trying for years to record the

best possible guitar tone. I have blown many guitar amps and tubes in order to get the sweet sustain! I like the idea of amp modeling and direct recording, although I warm up the signal path with some tubes. When I record with a band, I use my Fender tweed Deluxe and the SM57 "rule." Sometimes, when I get decadent, I split the guitar signal with a mix bay and feed all my boxes to record with all possible weapons. I believe that tone is always in the fingers and in the feel of a moment. If you're in the mood, you can get the tone out of a tennis racket!" ■





PHOTO BY EDWARD COLVER

## Shure 51S

by Steve La Cerra

**MICROPHONE NAME:** Shure 51S  
**FROM THE COLLECTION OF:** Vinnie Zummo, VAZ Music

**YEARS OF MANUFACTURE:** 1947 through 1976

**TYPE OF MIC:** Dynamic, moving coil

**POLAR PATTERN:** Omnidirectional

**FREQUENCY RESPONSE:** 60 Hz to 10,000 Hz

**SENSITIVITY AT 1,000 Hz:** -144 dB low impedance; -143 dB medium impedance; -145 dB high impedance. Referenced to EIA Standard SE-105, August 1949

**OPEN CIRCUIT VOLTAGE**

**LEVEL AT 1,000 Hz:** -78.5 dB, low impedance, 0 dB = 1 volt per Dyne per square centimeter

**RATED SOURCE IMPEDENCE:** Low (25-50 ohms), medium (150-250 ohms), or high (35,000 ohms)

**DIMENSIONS:** 4.53 high, 3.125 wide, and 3.87 deep (inches)

**WEIGHT:** 1.75 pounds, less cable

**MIC NOTES:** Shure's 51S microphone was intended for the reproduction of music and voice. The 51S and its brother — the 51 (which lacked the on/off switch) — were recommended by Shure for use with "tape, wire, and disc recording, fixed or mobile public address paging systems, amateur communications, and general communication service." A frequency response chart of the 51S shows an upward bump of about 6 dB at 3,000 Hz, causing it to accentuate the vocal range; low-frequency response is down 10 dB at 100 Hz.

**USER TIPS:** Inside the Model 51S and 51 microphones is a small rotary switch used for modifying the output impedance. The three-position switch is labeled "L," "M," and "H" for low, medium, and high impedance operation, respectively, with specifications varying as noted above. Accessories manufactured by Shure for the Models 51S and 51 include the A95A line matching transformer, S39A vibration-isolation stand, S36A desk stand, and A47 quick-disconnect isolation unit. ■

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Steve Kipner.

Steve Kipner in his hillside studio with the AD-8000SE and Trak2.



**M**AYBE you haven't heard of Steve Kipner. But you've certainly heard his hit songs. For 30 years, he's penned hits for and co-produced some of the world's best-selling artists, from Olivia Newton-John to Christina Aguilera. And for many of those years, he's relied on Apogee.

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**One for the record:** Steve Kipner produced, recorded and arranged, with David Frank, Christina Aguilera's 10-million-selling hit, *Genie in a Bottle*. And it was all done with Apogee.

Apogee's Trak2 simplifies Steve's life. "Before I had the Trak2, I was always trying hard to make things sound better. Now it sounds great straight away," he says. "I record straight into Logic, so the Trak2's built in mic pre, 8-channel routing and direct Pro Tools connection make it an ideal solution."

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**APOGEE**  
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CIRCLE 10 ON INFO CARD

World Radio History

A good session begins with  
a professional assistant

## Service is KING

by Bobby Owsinski

Often what makes the difference between facilities isn't the gear, but the service, and the front line of service is a facility's assistant engineers. While good ones may not be enough to keep clients coming back, a bad assistant engineer can turn a studio with even the latest high-tech gear into an unprofessional facility that customers never want to return to. So

what exactly is it that makes a good assistant engineer world-class? The answers are not only for those who want to be assistants, but also for studio owners and managers who want their studio run like the major facilities.

Two incidents prompted this article — a comment from an intern stating that his recording school never taught him how to be an assistant, and some recent experiences that caused me to

compare the service (which mostly came down to the assistants) between studios. Since I never worked as one myself (I became an engineer/producer mostly as self-defense in my musician days), I give you my observations as someone who's around them all the time. I know what I like and I know what bugs me, and I discuss it all the time with studio managers and other engineers. So here we go with some



Great producers have great assistants: Producer Glen Ballard swears by assistant Rachel Cleverley. (Don't believe us? Check out the full story in our October 2000 issue.)

educated observations.

The assistants in a studio are like sergeants in the army; they have responsibility for many of the in-the-trenches decisions and are the major contact point of the studio to the public. That being said, we can break a great assistant's attributes down into two categories — attitude and responsibilities.

## ATTITUDE

**1. Great assistants have a great attitude.** They act like they want to be there. They act like they're interested. They act like they both love their job and the project they're working on. There's nothing that they don't like (at least outwardly). Nothing is worse than being in a session with someone who acts like he either doesn't want to be there or like he absolutely hates the music and treats the people who are paying his wages with disdain. Enthusiasm for the job goes a long way and usually results in an engineer or producer requesting the assistant the next time (providing all the following points are met).

**2. Great assistants always arrive early.** They're there at least an hour before the session is slated to start and have everything prepared, so when the principals arrive, everything is ready to go. If it's a tracking date, the assistant has all the mics set up, and in their general areas (the engineer will do the final placement) with cables run. If it's an overdub or mixing date, he has everything restored on the DAW or has the tape machine aligned and ready to go. He also has the console either recalled or returned to where the last session left off, thanks to the accurate notes that he kept from the last session (more on this later). Basically, everything is ready to go when the engineer or producer walks in.

**3. Great assistants are always prepared during the session.** They're always thinking ahead and don't have to be told things. If he knows that an overdub is coming up, he'll have the mic, headphones and cables ready to go before it happens. If a singer is

varying in level, he'll have the limiter patched before being asked. One famed but gruff chief engineer at a major Hollywood facility used to tell his assistants, "When you see my coffee cup half-empty, I shouldn't even have to ask you to fill it up."

**4. Great assistants are seen and not heard.** They blend into the woodwork, keep their head down, and just do their job. They never offer an opin-

**NOTHING IS WORSE THAN BEING IN A SESSION WITH SOMEONE WHO ACTS LIKE HE EITHER DOESN'T WANT TO BE THERE OR LIKE HE ABSOLUTELY HATES THE MUSIC AND TREATS THE PEOPLE WHO ARE PAYING HIS WAGES WITH DISDAIN.**

ion unless asked, and even then are cautious with their reply. The customer is always right, and he's not right if you give him the opposite opinion.

## RESPONSIBILITIES

**5. Great assistants make sure everything is clean.** Before the session even starts, the assistant has made sure that all trash cans are emptied, and no soda cans or candy wrappers from the last session (or even worse, from yesterday) are still around. Nothing turns a client off like a dirty studio.

**6. Great assistants have everything documented.** Everything from mic placement to patchbay patches to outboard settings should be written down

in the finest detail. All track and take sheets are filled in before the client even has time to ask about it (this is the *first* thing to do after setup). It is the most important duty of an assistant.

**7. Great assistants make great labels.** Yes, the studio has to have this ability first, but if it does (and it should in this day and age) the assistant should always take the time to make labels that look great for any tapes or CDs before they leave the studio. Great assistants never treat copies and labels as a burden, but as a necessary part of their job.

**8. Great assistants call ahead to find out the session requirements.** As soon as a session is booked, the assistant calls the client to find out the type of session, what type of gear or media they'll be needing, and what kind of mics are required and their respective placement, as well as any rentals that might be needed.

**9. Great assistants put things away after the session ends.** At the end of the day, any unused mics, cables, outboard gear, or synthesizers are put away. Mics should never be left out unless they're set in place for the following day, which is a good policy for studios of all sizes.

As you'll notice, I never once mentioned anything about an assistant having great ears and knowing both the room and the gear. That, in fact, goes without saying. But it's all the other things outlined that really make an exceptional assistant engineer. And only when the help rises above the pack can a studio be truly called "professional."

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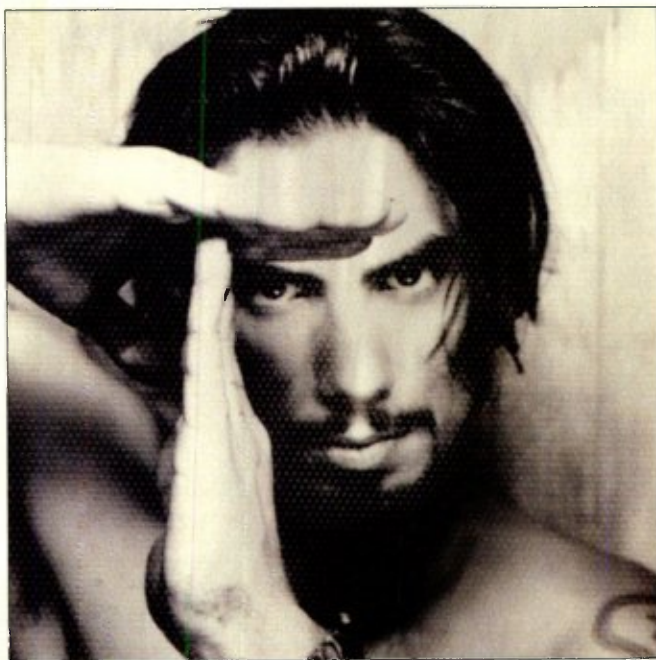
One of the first to delve into surround sound music mixing as far back as 1995, Bobby Owsinski has worked on surround projects for Jimi Hendrix, The Who, Dokken, Iron Maiden, Eddie Money, Christopher Cross, Todd Rundgren, Firesign Theater, ELO, Pat Benatar, Shadowfax, Tangerine Dream, Tuck & Patti, Yanni, and George Winston among many others. He is a partner in Surround Associates.



DAVE NAVARRO  
WORKS THROUGH  
HIS NEUROSES ON  
*TRUST NO ONE*



# DIGITAL THERAPY



"I'm definitely more comfortable in front of a console than I am in an isolation booth."

Dave Navarro laughs as he takes a seat behind a big board at Capitol Studios. "After doing the singing on my new record, I get really uncomfortable in isolation booths."

Best known for his metal-edged guitar work with Jane's Addiction and the Red Hot Chili Peppers, Navarro makes his vocal debut on *Trust No One*, his first solo album. It's a collection of melodic yet adventurous songs that Navarro puts across with a winning, tuneful vocal style. Dave plays a lot of guitar, bass, and keyboards on the album. Friends such as Los Angeles multi-instrumentalist Jon Brion, drummer Matt Chamberlain, and producers Danny Saber, Rich Costey, and Brendan O'Brien also pitch in.

Rather than delivering the unabashed noodle-fest one might expect from a prominent guitar-slinging sideman, Navarro steps forward as a thoughtful, unflinchingly confessional songwriter on *Trust No One*. The album probes the darkest corners of Dave's psyche, particularly feelings stemming from one catastrophic childhood event — the murder of his mother and aunt by his mother's boyfriend.

"The record is about how I spent the majority of my time not trusting people, running away from love and running away from uncertainty — focusing on potentially negative futures, instead of being in the moment. The whole process of making this record was a healing one for me, and

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CIRCLE 43 ON INFO CARD

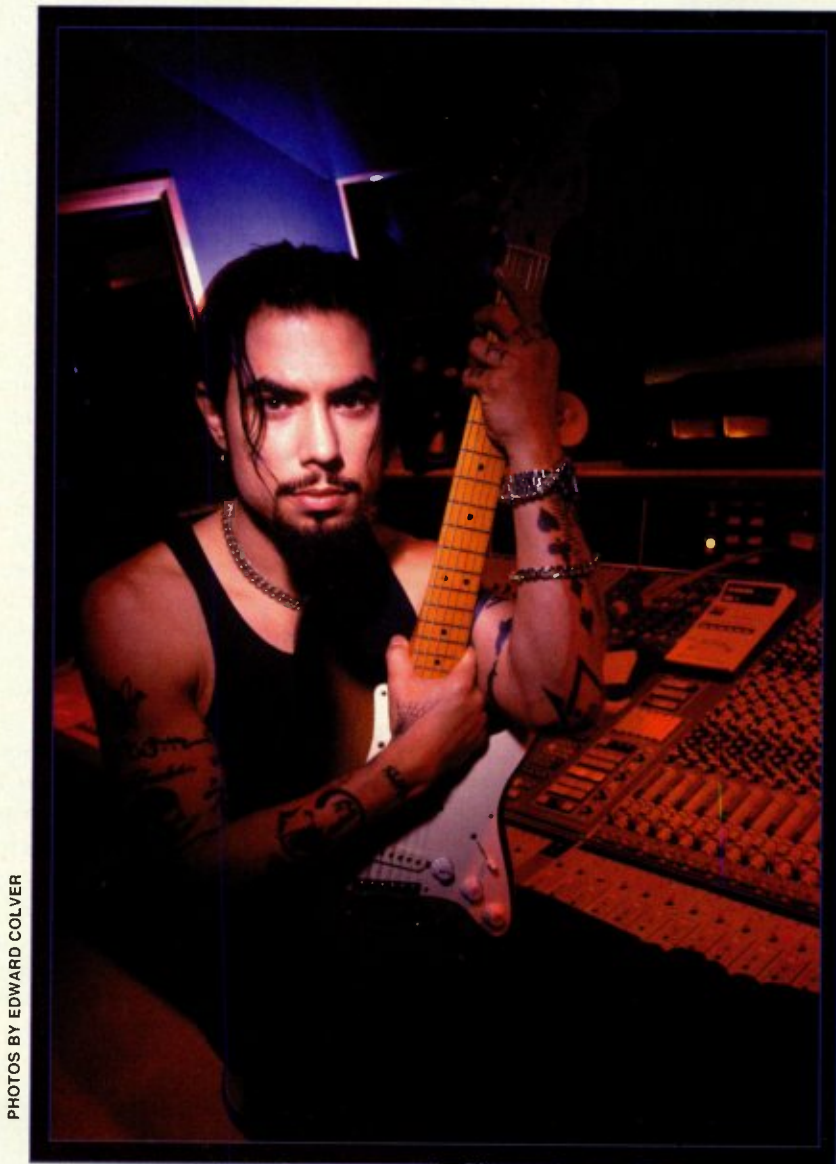
## DIGITAL THERAPY

ultimately a positive experience.”

The disc's production values ably reflect the inner turmoil expressed by the lyrics. Guitar textures are frequently distressed to the point of being unrecognizable via extreme signal processing, drawing the listener into the album's emotional maelstrom. The melodic nature of Navarro's songs is periodically disrupted by abrupt tempo shifts and noisy interludes, many of which were accomplished by cut-and-paste editing in Pro Tools. "I think part of my neurosis is what is captured in those arrangements," says Navarro. "And my neurosis is sporadic."

**EQ:** How long was this album in the works? Does it date back to when you left the Chili Peppers in '97?

**DAVE NAVARRO:** Yeah. But I did a lot of things in between. It's not like I worked on it continuously since then. I was working on it and then the first Jane's Addiction tour happened. So I put it down. Or I got interested in working on my book [Don't Try This At Home, 2001, ReganBooks/HarperCollins.] Or my relationship needed attention. Or I wanted to take a trip. That's the beauty of it. And I think that might have contributed to the reasons why it's a very eclectic-sounding record.



PHOTOS BY EDWARD COLVER



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CIRCLE 32 ON INFO CARD

**Where did you record it?**

At four studios basically. Some in New York and some in Los Angeles: Looking Glass, Village Recorder, Media Vortex, and NRG. We also did some recording at Danny Saber's house, and some at

my house. Some of it was at Larrabee, too. Again, it's a body of work that I paid attention to for a couple of weeks at a time and then not at all for a month or two. And there was no band involved — no organization. Because of that, it

wasn't like I had a deadline or a budget or any goal in mind other than just to make a record. And that's why it took the time it took and ended up being done in so many different studios and with so many different engineers.

**What was your basic working method like? Did you start by programming a drum track? Laying down a rhythm guitar?**

The majority of the songs were written on piano or acoustic guitar. And I'd record them that way, playing and singing at the same time. "Rexall," for example, was written on acoustic guitar with a voice. Then [Chili Peppers drummer] Chad Smith and I did a version of it that was very hard rock. I took the drums away, put an electronic kit to it, and added keyboards. Each song had its own metamorphosis like that, and each was very different. The only generalization I can make is that I'd start acoustically and then start to add elements and take elements away. It was like molding a piece of clay. In some cases, I had to retrack the drums. In other cases, I had to re-time the instruments that had been played to the original drums in order for them to stay in time with the new drum machine part. A lot of stuff like that was done after the fact.

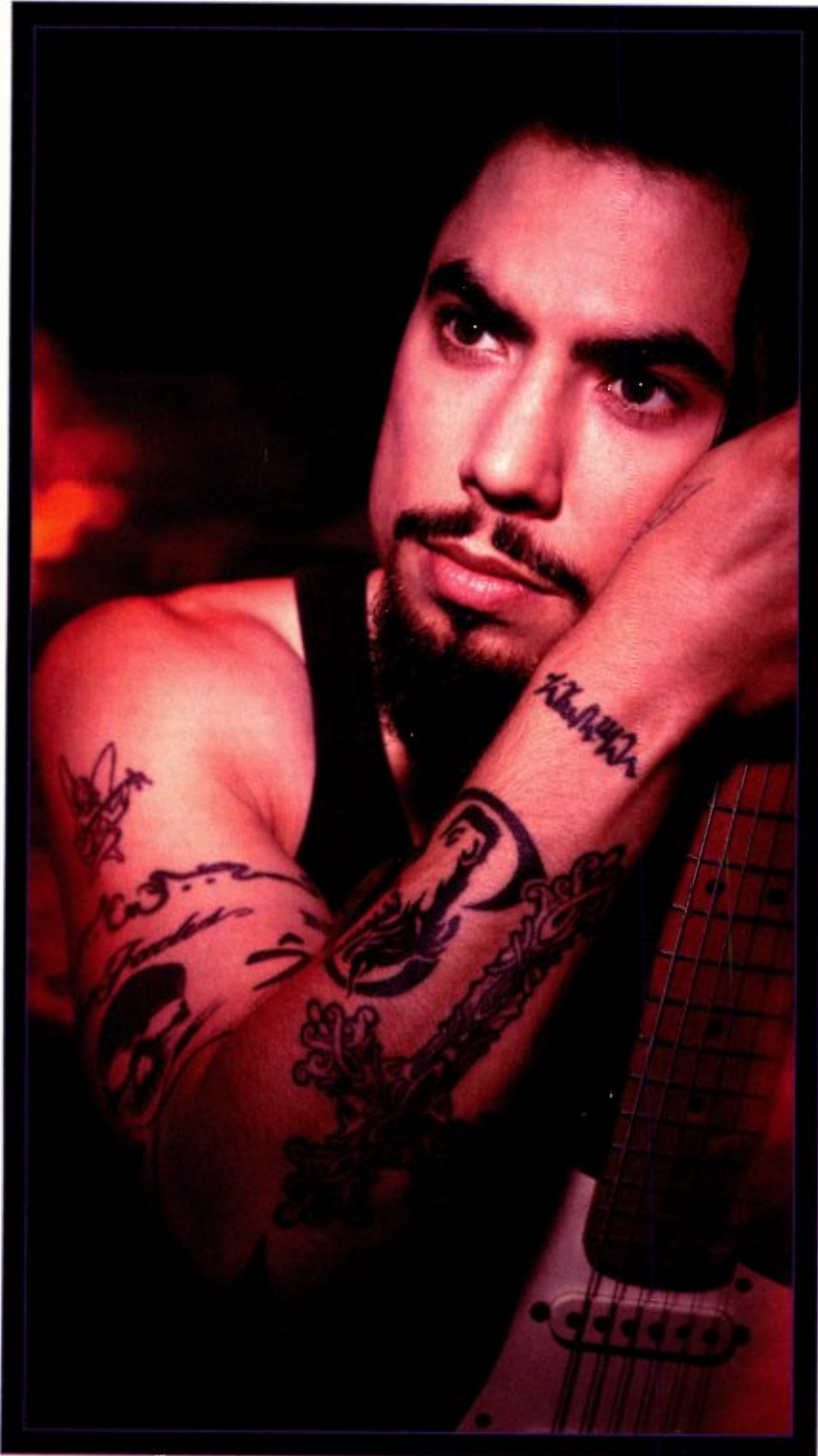
**Were you working in something like Pro Tools?**

Pro Tools and [E-magic] Logic. I literally had to chop up pieces of music. But, for me, the most creative part was coming up with original musical ideas in the first place, not the cutting and pasting.

**Were there any major stylistic influences on the album? Stuff you were listening to at the time that rubbed off on the album?**

No. I mean the major stylistic influences were mainly the people I was working with, whether it was Danny Saber or Matt Chamberlain. To be honest, I don't listen to a lot of music. And, I especially try to avoid that when I'm recording.

**What about the vocals? Was**



# The Shortest Path from A to D



FEATURES	Johnson J-STATION	Line 6 POD 2.0	Behringer V-AMP	ZOOM GM 200
Price (Estimated Street Price)	\$149.95	\$349.99*	\$199.99**	\$149.99***
S/PDIF Digital Output	Yes	No	No	No
Sample Rate	44.1 kHz	31.250 kHz	31.250 kHz	40.0 kHz
Amp Models	20 Guitar	32 Guitar	16 Guitar	11 Guitar
Bass Amp Models	3 Bass	None	None	None
Acoustic Models	2 Acoustic	None	None	None
A/D/A Conversion	24 bit	20 bit	24 bit	20 bit
Simultaneous Effects	5	4	4	1
Fully Programmable Effects	Yes	No	No	No
Flash ROM Upgradable	Yes	No	No	No
Editor/Librarian Software	Included	Included	Optional - Extra	None
Recording Software Included	Cakewalk® GuitarTracks™	No	No	No

There are many Amp Modelers on the market today, but the Johnson J-Station is the only one with S/PDIF digital out allowing you to record direct to DAT or computer without going through excessive, noise adding A-D-A conversions. The J-Station is also the only one that has a sampling rate of 44.1 kHz so you know you won't lose anything when it comes time to burn your CD. Most importantly, the J-Station utilizes proprietary Cabinet Imaging Technology (CIT), which makes it sound and feel virtually indistinguishable from the world's best amplifiers. But we didn't stop there, the J-Station is the only one that provides five simultaneous, fully programmable studio quality effects. And, to keep everything organized, we included the J-Edit editor/librarian software. J-Edit works seamlessly with Cakewalk Guitar Tracks recording software (a \$69.95 value) which comes free with every J-Station. Take the shortest path from Analog to Digital by visiting your local Johnson Dealer today.

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**that a difficult part of the project for you?**

It wasn't nearly as hard to deal with as I anticipated. The truth is, if you have a somewhat trusting relationship with whoever is engineering or producing, you'll do anything. There's always Erase, or Trash, or whatever. But while the vocals weren't as difficult as I anticipated, they were a lot more demanding. Ultimately, though, vocals were something I enjoyed doing. I think that's probably a key factor as to why this body of work is less guitar oriented than even I might have expected, because guitar wasn't my only avenue of expression. If I could tell you what I was thinking in a lyric, I didn't have to put it into the playing so much.

**But still, there are a couple of nice guitar solos on there.**

Yeah, there's definitely a lot of guitar on it. But, to me, it doesn't sound like what I would expect a guitar player's solo album to sound like. I mean there are versions of the songs that had more soloing on them — versions that I secretly love! But when it came down to it, that didn't fit with what was going on creatively.

**It got in the way of the words?**

It got in the way. It was unnecessary. There are plenty of times for unnecessary soloing. And, believe me, I take those times. I just think that, when it came to this, I wanted to stay sonically true to what was being said.

**Rather than using soloing as a vehicle for guitaristic expression, you seem to be doing a lot of extreme textural things with guitar on this album. For example, the noise guitar coming out of the bridge of "Sunny Day."**

That's a really old Korg guitar synthesizer that belongs to Jon Brion. It was put on some kind of random setting that was all broken up and we plugged into the board directly. After the fact we chopped it up a little bit to make it more in time.

*"We did a lot of screwing around with gear that was never meant to be screwed around with."*

What's coming out of the speakers in the final version is not what I was playing. I had a lot of fun doing that kind of stuff. I used a lot of old gear improperly. You know what I mean?

**What else besides the Korg guitar synth?**

Rich Costey had a chain of old stomp boxes, including a frequency analyzer. In the bridge of "Rexall," where it's those three chords going over and over again while I'm playing guitar, he was turning the knob on the "anal freak," as we called it. So, we did a lot of screwing around with gear that was never meant to be screwed around with the way we did. The funny thing was that the noise coming out of the speakers at the end of the chain was so unbelievably horrible. It was all these battery-operated things from the '70s. So, Pro Tools was imperative to get rid of that sh\*t.

**Clean it up.**

Yeah, and move it around. On the technical side of things, I've never really been into gear. But, what was exciting to me was that whole computer part of the production. It was intellectually stimulating.

**Since you were in the Pro Tools environment, did you use Amp Farm as well?**

We stayed away from Amp Farm. We had a couple of Marshalls, a Bogner, and an amp called Overbuilt, made by one of the guys from Matchless. So, it was all real amps, with the exception of a lot of direct guitar straight into the board — broken up sounds.

**With all the editing and revising that went on, you must have lots of alternate versions of these songs squirreled away somewhere.**

Definitely. There's a primarily acoustic version of each of these songs that exists somewhere — including the heavier songs like "Not for Nothing." The original versions were recorded with live drums and guitar — very simple sounding. And, on that version of the album, I played just about everything except drums. There are things about that record that I really like.

**Do you think some of those versions might surface as B-sides or something?**

I think you'll see that happen. Some of them are already up on Napster. And I think those versions capture something that isn't on the final product. They may not be as palatable to some. But for me, as a writer, in some ways those feel truer. They're a lot rawer. The vocals aren't that polished. There are definite time fluctuations and mistakes all along. But there's something naive about it that I really like.

**Do you regard this album more as an interesting side project, or as your bid to step forward as a solo artist in your own right?**

What would it be a side project of? I'm not in another band. This is what I'm doing. This is pretty much me. And I've never done anything like this before. There are a lot of different art forms I want to get into. I want to be involved in writing, art, and in music of course. And, with music, I don't have the confines of a band anymore — other people to be responsible to. I'm able to stretch out into whatever areas I want. I'm almost 34 years old. This is something I've been wanting to do for a long time. ■

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**W**ho'd have guessed that 20 years on from the release of infectious ditties like "Just Can't Get Enough" and a staggering 35 million album sales (and counting), that Depeche Mode would be releasing *Exciter* for Mute Records [Sire in the USA], their 10th studio album. It features dark, yet somehow uplifting soundscapes that have become the trio's — currently made up of vocalist Dave Gahan and keyboardists Martin Gore and Andy Fletcher — latter-day trademark.

Chosen to helm this latest project for the band was producer Mark Bell, an individual who had already made his own mark on the charts as co-founder of LFO, a Warp Records signing dubbed by several Web sites as one of the most influential techno acts of the early-'90s.

Though a relatively recent "A-list" inductee, Bell came with excellent credentials, fresh from working on Bjork's latest long-playing masterpiece, *Selmasongs* [2000, Elektra] (having previously produced *Homogenic* [1997, Elektra] for the Icelandic songstress). Indeed, it was these recordings that swayed Depeche Mode in favor of Bell. Yet, ironically, the refreshingly humble Leeds [northern England] lad wears his production crown with some discomfort. "I find it so weird being called a producer, because producer means different things to different people," he muses. "It could just be someone who takes artists out to parties all the time and never actually does any music at all. Or, it could be someone who does *all* the music. There are just so many variations — like the way it can cross over into programming. But I feel I'm still doing exactly the same as what I was doing 10 years ago with LFO; the equipment I used on the Depeche Mode album is essentially the same — sampler, computer, and loads of old analog stuff. I saw myself more as a musician then, and now I'm still doing musical things."

#### ◇ LONDON CALLING

*Exciter's* gestation period predates May 2000. Keyboardist Martin Gore was songwriting in early 1999 at his private studio sited in a double garage attached to his 17th-century Hertfordshire home in southern England. Designed and built in 1990 by Electric Eel's, it features a custom cabinet housing three classic ARP 2600 analog synthesizers in reverence to Depeche Mode's recording roots. Progress was slow — in October 1999 Gore enlisted the assistance of keyboard player/programmer Paul Freegard and veteran engineer Gareth Jones (whose association with the group extends back to 1983's *Construction Time*

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## PRODUCER Á LA MODE

making the effort for everyone else."

Depeche Mode took the month of August off. Unsurprisingly perhaps, production then reconvened in New York City at Sony Music Studios. Here, group and producer concentrated on song arrangements for another three weeks.

### ◆ BEACH BOYS

Gore and Fletcher reside in the UK, so an executive decision was made to collectively relocate afresh. And where better than Santa Barbara Sound Design in sunny downtown Santa Barbara, CA, a mere three blocks from the beach? "It's always good if you move somewhere new as a team," Bell declares. "I think it's good for building camaraderie. Santa Barbara's more like a holiday resort. We'd go to the local pub and play the pool team there — Depeche Mode against the bar staff! Even though we were concentrating very hard on the music, it was a social thing as well."

Two month-long bookings were made, split by a two-week break during which Gore and programming buddy Paul Freegard demoed two more songs while visiting Vancouver. If an on-location-style QuickTime

movie posted on the band's official Web site ([www.depechemode.com](http://www.depechemode.com)) in September 2000 is anything to go by, Sound Design's Neve 8048 Studio and live room proved to be a sound move for all concerned.

Such high spirits could be accredited to Bell — particularly the unique way he utilized Sound Design's facilities in pursuit of an equally unique recording. "We moved all our equipment into the live room and hired in two 32-channel Mackie desks, so Gareth [Jones] and myself were kind of working on a couple of bedroom setups," he reveals. "Martin worked in another room and we gave Dave the control room so he could hear himself on really good [Tannoy SGM-10B] monitors through the desk and all the best effects. He had a Pro Tools system set up in there so he could just sing until he was comfortable with the songs or try out different things by himself. It was a good way to work because we weren't always working on the same song at the same time. Even though the studio's divided into three areas, we could still see each other through the windows and walk in and out of the rooms. Everyone had the freedom to do what they wanted."



## EXCITER GEAR LIST

- ◆ **CONSOLES:** Neve 8048 with Neve Flying Faders (50 input channels); Neve 10:2 Class A line mixer; Yamaha 02R digital mixer
- ◆ **MULTITRACKS:** Aletris ADAT [3]; Studer A-80 Mk IV 24-track (with Dolby XP/SR); TASCAM DA88 [3]; TASCAM MX2424 digital 24-track
- ◆ **MASTERING EQUIPMENT:** Ampex ATR102 half-inch; Panasonic SV3700 DAT; Sony PCM3402; Studer A-80 half-inch; TASCAM DA30 DAT
- ◆ **MONITORING EQUIPMENT:** B&W CDM-1; Tannoy SGM-10B; Yamaha NS10
- ◆ **COMPUTERS/STORAGE:** Digidesign Pro Tools 5.0.1 with Apogee AD8000 24-bit A-to-D/D-to-A converters and MOTU MTP/AV synchronizer (running on 18 GB Apple G3 with Adaptec Ultra SCSI adapter); Steinberg Nuendo/Cubase 24-bit/96 kHz 5.1 surround sound mixing (running on a 750 MHz Windows 2000 PC with 384 MB RAM)
- ◆ **OUTBOARD GEAR:** AMS RMX16; Aphex 612 stereo gates; Aphex Dominator; Aphex Expressor [2]; dbx 160X compressor [3]; dbx 162 stereo compressor; dbx 263X; dbx 463X; Dynaflex NR; EMT 140ST plate reverb; Eventide H3000; Lexicon 200; Lexicon PCM70 [2]; Massenburg 8200 parametric EQ [2]; Summit DCL200 stereo tube compressor; Summit Element 78 preamp/EQ; Summit EQF-100 4-band tube program EQ [2]; Summit EQF-200B 3-band stereo EQ; Summit Modular Tube Rack; Summit TLA-100 mono tube limiter; Summit TLA-100A 2-channel tube mic pre/DI; Teletronix LA2A; Universal Audio LA3A; Urei 1178 stereo compressor; Valley People Gain Brain [2]; Valley People Kex gates [4]; Yamaha SPX90 II; Yamaha SPX900
- ◆ **MICROPHONES:** AKG 414EB [4]; AKG C12A [2]; AKG C24; AKG CE452EB [4]; B&K 4006 [2]; Beyerdynamic MB301 [2]; Electrovoice RE20 [4]; Neumann KM 83; Neumann KM 84 [4]; Neumann U 47; Neumann U 67; Neumann U 87 (with InnerTube mod.); Schoeps CMT35; Sennheiser MD421 [3]; Sennheiser MD441; Shure SM81 [2]; Shure SM57 [3]; Shure SM58 [2]; Sony C37A; Sony C500; Sony ECM50PS [2]; Telefunken U47



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## ◇ SWEET LULLABY

One of the most remarkable aspects of *Exciter* is Gahan's intimate, up-front-and-personal vocal approach to tracks such as "Dream On" (the first single) and the dreamy "When The Body Speaks." Both Gahan and Fletcher admirably attribute this to Bell. "I'm really crappy at taking compliments," he blushes, "but a lot of that was just down to making Dave feel comfortable. I got the impression that in the past he was nervous; obviously he was performing the songs, but not necessarily how he wanted to. So I encouraged him to do what he wanted, that's why I gave him his own room, though I'd still go in there and give him directions."

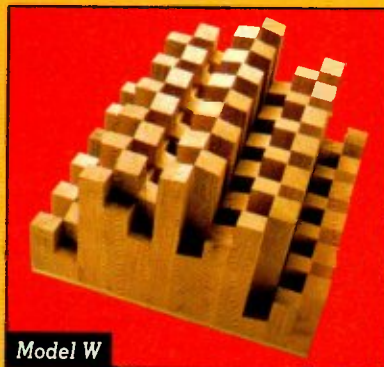
"For instance, he's got a seven-month-old baby daughter now, so I suggested he sing the album's closing track 'Goodnight Lovers' as though he was really singing it to her, like a lullaby. And I think that comes across. It's not role-playing, but something he could really feel. Also, we tried to do most of the vocals in one take, because I think your brain instinctively knows otherwise — even if it's an amazing crossfade, or whatever. That was really important to this album, and to Dave. He enjoyed the support. After all, he *can* sing; he's been doing it for 20 years!"

As for Bell's own musical role on *Exciter*, a shot of the man hard at work, taken by Daniel Miller during a November 2000 visit to Sound Design and posted on his company Web site ([www.mute.com](http://www.mute.com)), proves most revealing. Bell is seated at a makeshift workstation, surrounded by a variety of gear, including an Apple PowerBook G3 laptop, Clavia Nord Lead synth, and Akai's popular MPC2000 integrated sampler/drum machine/MIDI sequencer. Asked to expand upon this, the producer responds, "All that stuff was hired in, but I do use the MPC, G3, and an Emu E4 sampler at home. I also had exactly the same setup in my hotel room so I could work there if I didn't have any ideas in the morning or evening, or didn't want to come into the studio. I've also got loads of old analog stuff at home, like an ARP 2600 that I sample and mess about with in the Emu. You can do so much more that way."

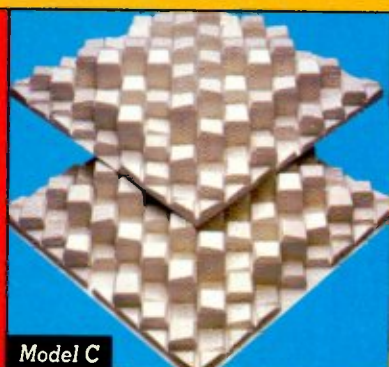
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Eigner is credited with playing on "I Am You," Bell's favorites are again responsible for much of the album's intricate rhythm. "I don't think much of what Christian did is actually on the album," concedes Bell. "Most of the percussion you hear is electronic stuff I did myself, either on the MPC or in Cubase. I just got loads of silly noises from the analog stuff and then made layers in the sampler so the sound would change depending on velocity. It sounds more organic that way, though it's definitely electronic."

Yet Bell is quick to credit where credit is due: "I didn't really copy Christian's parts, but rather I was influenced by the feel of his playing — be it aggressive or light, or the frequency he played in to fit with the track. That way, we could EQ the original electronic percussion into that range."

Speaking of rhythm, one of the world's top jazz percussionists is featured on "I Feel Loved" and "Freelove" — albeit accidentally. Bell smiles at the memory: "We were working on a song called 'The

Dead Of Night,' and we were having trouble with the bridge. Martin suggested using a kind of jazz/waltz sample he had, but it sounded like complete sh\*t. We were just about to take it off when in walks Aírto Moreira! It was really embarrassing, as the song was at its worst, but we still ended up playing him the other songs. He came back a week later with his toys and played some brilliant stuff that sat well with the tracks, whereas if it had been someone trying to sell themselves they might have gone completely over the top. It was good to have someone else's input for a change."

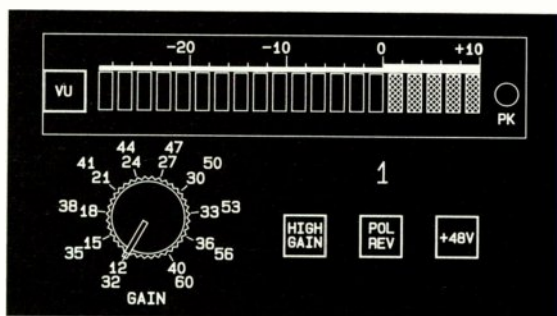
## ◇ ARE YOU SEQUENCED?

Another Daniel Miller-penned online photo shows Depeche Mode's Andy Fletcher also working on an Apple PowerBook G3. More enlightening, however, is an Emagic Logic Audio box positioned next to him with "Martin's Logic" scribbled on it and an Apple flatscreen monitor with a "Cubase work sync" note stuck to its side. Together with Bell's beloved Akai MPC2000, this implies the use of three different platforms during Exciter's Sound Design sessions.

Bell sheds light on the sequencing situation: "We used all of them because they each bring different things into a project. The problem with most sequencers is that someone else sets the limitations. What they think is interesting might not interest you, but you're still steered toward what that program does best. I think Logic just happened to be what Martin brought along with him, though he has got Cubase as well. I'm also really fast with Cubase, whereas with Logic I usually make loads of mistakes, but that can sometimes be a good thing. The MPC is really good because it focuses you — particularly when programming drums — so you're not thinking of anything else like chord progressions."

All those Apple laptops proved indispensable in Bell's studio *modus operandi* — above and beyond the call of sequencing. The producer soon shrugs off any praise for the smooth running of an undoubtedly complex production procedure, preferring to sing another colleague's praises: "Not only is Gareth a brilliant engineer — sorting out which microphones to use where — he's also so organized when it comes to the

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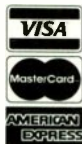


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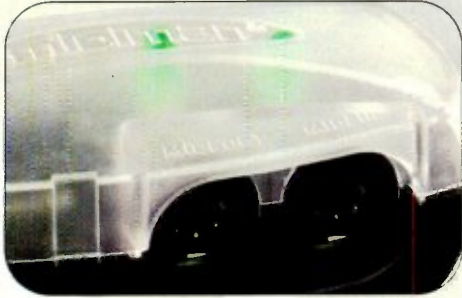
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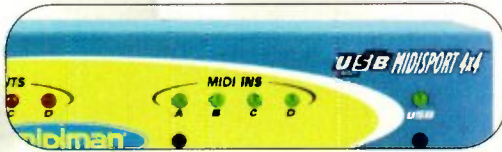
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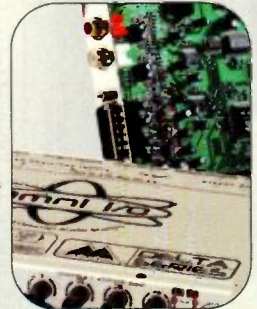
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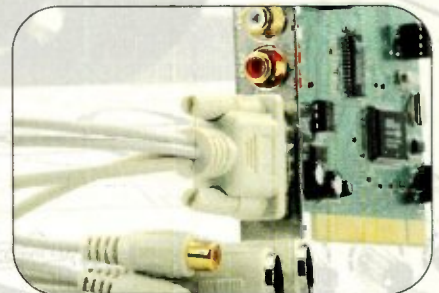


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# PRODUCER Á LA MODE

computer side of things. We'd often pass ideas around by burning a song onto a CD or by giving each other sample files. That's why it was brilliant having all those computers about so we could try out different things live and have lots of stuff playing at once. You could play any keyboard at any time and record it, and Gareth would instantly have it color-coded, labeled, and dated. If that were me at home, it would be chaos; all my samples are called 'Untitled 1!'

## ◇ TO KEY OR NOT TO KEY

In November and December 2000, band manager Jonathan Kessler also dropped in on the Santa Barbara studio sessions, again capturing the event on camera where some of Depeche Mode's traditional tools were on display — Access' Virus, the Clavia Nord Lead, Korg's MS2000 and Triton, and Roland's JD-800. Of course, no Depeche Mode album would be complete without a healthy helping of synthesizers. While *Exciter* is no exception to this unwritten rule, it

doesn't immediately come across as a synth-dominated recording. Such is the beauty of Bell's sympathetic treatment.

"Synths are still really important to them," counters Bell, "but it wasn't a case of us deciding this was going to be an electronic album, even though that's what I really liked about them before. Right at the beginning, the songs were written on a piano or guitar, just to get the basic chords. Then they were programmed into a computer to mess about with the structure. By the time I became involved, there were just so many keyboards around, plus Martin's got loads of guitars. I can remember each synth we used, but the list would be too long to mention. Just to give you an example, we used that new PPG soft synth [Steinberg/Waldorf PPG Wave 2.V] on 'Comatose' where it plays an arpeggiating part. We used loads of different synths on 'The Dead Of Night,' messing about with the envelopes and pitch controls. We just went completely silly and it became a jam session. Then, once we found something that worked, we made it into a sort of performance that really suited the song."

## ◇ THAT'S A WRAP!

Following a month-long mixing process at New York's legendary Electric Lady Studios with Steve Fitzmaurice at the helm, the *Exciter* production officially wrapped on January 20, 2001. The 13-track album is a testament to teamwork, Bell's production skills and Gore's songwriting talent — a talent rightly recognized with the May 1999 presentation of an award for International Achievement by the British Academy of Composers & Songwriters. Daniel Miller, the man who sealed a deal with Depeche Mode with a simple handshake — no written details, no formal contracts — some 20 years ago, made that presentation. What an awe-inspiring vindication of faith. And, with *Exciter*, Depeche Mode remains loyal to their indie label roots — globally, of course. "I just hope people can see that it's honest," concludes Bell. "It's not trying to be manufactured pop, and it's not trying to be weird."

Jonathan Miller is a British freelance writer living in...well, England. He specializes in the "ancient art" of the high-tech music interview, and can be reached at [jonathan.millermusicmedia@virgin.net](mailto:jonathan.millermusicmedia@virgin.net).

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# Digital Audio Essentials

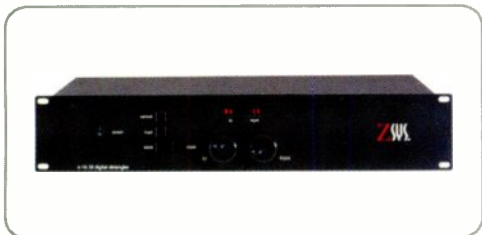
from the digital audio interface experts

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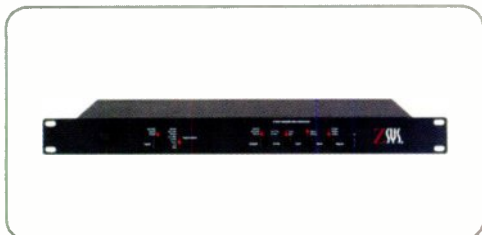
## **NEW! ADAT ↔ S/PDIF conversion**

z-8.8a Lightpipe Detangler is a Lightpipe patch bay and also converts bidirectionally between ADAT Lightpipe format and S/PDIF (AES/EBU optional). S/PDIF inputs also feature defeatable sample rate conversion, allowing four asynchronous stereo digital sources to feed an eight-channel Lightpipe destination.



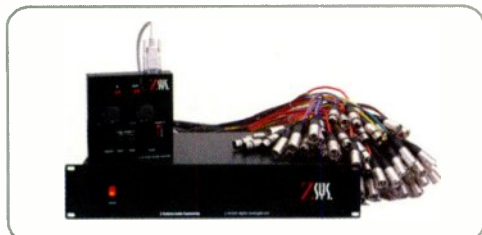
## **Digital Detangler automated digital audio patchbay**

Available with 8x8 or 16x16 inputs and outputs. Supports AES/EBU, S/PDIF optical & coaxial, ADAT Lightpipe optical (no format conversion to and from ADAT format). Mix and match port configurations to build the perfect solution for your studio (standard configurations also available).



## **Rack-mount sample rate converters**

With a full range of input and output formats, input and output wordwidths up to 24 bits at sample rates up to 96 kHz. Available in two-channel (z-3src) and eight-channel (z-8src) packages.



## **Digital Detangler Pro automated digital audio patchbay**

Available in 8x8, 16x16, 32x32, and 64x64 configurations. Can be controlled from dedicated remote controller, Mac, or PC software (network versions available).



## **NEW! 24/96 miniature sample rate converters**

z-link96 and z-link96+ support up to 24 bits at 96 kHz with user-selectable 16- or 24-bit output

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# SUMMER GEAR

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This year's NAB show and spring AES convention were a study in contrasts — one a gaudy extravaganza (with well over 100,000 attendees) held within shouting distance of the glitz and glamour of the Vegas Strip, and the other a rather subdued gathering of 10,000 or so propeller-heads amidst the canals of Amsterdam. But both were marked by a plethora of announcements and product debuts for the pro audio aficionado.

TWO SPRING TRADESHOWS BRING A BUMPER CROP OF PRO AUDIO TOOLS THIS SUMMER.

BY HOWARD MASSEY

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It wouldn't be an audio show without lots of mixers, and **SSL** unveiled their compact yet powerful **MT Production** digital console, which features extensive surround sound mixing and monitoring capabilities as well as flexible bussing and snapshot reset. At the high end of the spectrum, the company also showed a new series of "Plus" mixers — the **Aysis Air Plus**, the **Avant Plus**, and the **MT Plus** (optimized for broadcast, film postproduction, and music production, respectively); each adds higher-speed processing and enhanced faders and displays.

**Amek** countered with the **Galileo 360V**, which supports surround formats of up to eight channels and features mic preamps designed by Rupert Neve. **Soundtracs** debuted the **D4**, a large-format digital console available in configurations of up to 320 inputs assignable to 128 output busses (that oughta hold ya for awhile!). Support for surround sound and all major digital formats (including AES/EBU, TDIF, ADAT, and MADI) is standard.

**Publison** were showing their **8 x 8 MIX** digital console, which provides up to 64 channels of flying faders, two automatable joysticks, and support for a variety of mixing formats — up to and including 7.1 surround sound. All converters are 24-bit, and internal processing is 32-bit; custom configurations of I/O are available. **Calrec** offered two new digital mixers: the **Alpha 100**, which provides 48 multitrack/matrix outputs, 20 auxiliary busses, eight audio groups, and four main outputs; and the **C2**, which offers up to 56 inputs, six aux sends, and four VCA groups, as well as surround panning and a mix-minus output. **AEV SpA** unveiled **Matrix**, a 24-input, eight-channel digital mixer with 24-bit, 96 kHz converters, onboard

dynamics, and four voice processors available for mic inputs.

**JL Cooper** debuted two new compact controllers: **FaderMaster 4/100** and **FaderMaster 4/60**. Each provides four motorized faders (touch-sensitive in the FaderMaster 4/100), bank shift buttons, and user-defined function keys (FaderMaster 4/60 adds transport controls). Available in MIDI, RS-232, RS-242, and USB versions, each unit is capable of controlling just about any piece of software you may own.

But if your software of choice is Logic Audio, you'll definitely want to check out **Mackie's** new **Logic Control** hardware surface controller. It adds nine 100-mm Penny & Giles faders (eight channel faders plus a master fader), along with dedicated mute and solo buttons for each channel, full transport control (complete with scrub wheel), and 16 user-definable function keys.

**Digidesign** fans who've been running out of DSP horsepower will no doubt welcome the new **Pro Tools Mix<sup>3</sup>** ("Mix-cubed") system, which bundles the MIX core card with two MIX Farm cards, along with the latest version 5.1 software. And if you need more Pro Tools tracks, you might consider adding the new Studio Network Solutions fibre network, which can deliver 128 tracks at 24-bit/48 kHz.

**TASCAM** was demoing a working SX-1 (previewed in our May 2001 issue), and announced a software update for their MX-2424 hard disk recorder that adds support for sample rates of up to 96 kHz and Sony 9-pin control, as well as their new **MX-View** graphic editing software for both Windows and Macintosh computers.

The **Waveframe/7** is the latest generation of the workstation, adding 24-bit resolution and 5.1 support, as well as 32 channels of I/O. **Publison** were showing their **Totalstation** DAW, which is available in configurations of up to 48

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tracks (with I/O that includes balanced analog, AES/EBU, and MADI). Features include high-speed backup, 24-bit audio (with 32-bit internal processing), optional support for digital video, and a

comprehensive remote control, complete with alphanumeric keyboard, transport keys, jog/shuttle/scroll wheel, 10 clipboard memories, and dedicated buttons for all common functions (including 40

macros and eight user-definable "Softkeys").

Lastly, taking a completely different approach, the **Fostex DV40 Master Recorder** utilizes DVD-RAM to store up to four channels of 24-bit audio at sampling rates of up to 192 kHz. It comes with an Ethernet port for fast transfers of data to computer workstations, and there's full sync capability with all standard clock signals — there's even an onboard SMPTE timecode generator.

A new line of multi-channel converters was unveiled by Apogee — the **DA16 24/96 "Intelli-DAC"** and the companion **AD16 24/96**. Both provide eight channels of 24-bit conversion at sample rates of up to 96 kHz. A wide range of connectors include balanced analog, AES/EBU, TDIF,



Solid State Logic's MT Production Digital Console

## True blue.



### S-com plus Stereo Compressor/Limiter

It combines a feature rich Compressor/Limiter, Expander/Gate and Enhancer offering precise control. And its logical front panel layout with extensive metering makes it easy to use. The *plus* is for its useful De-Esser that removes sibilance from vocals and reduces overly bright audio. Most importantly, **S-com plus's** audio path employs super low noise VCAs with vast headroom and imperceptible distortion for transparency and sonic integrity.

And it carries S Class's assurance for intelligent design, superior functionality and unparalleled performance.

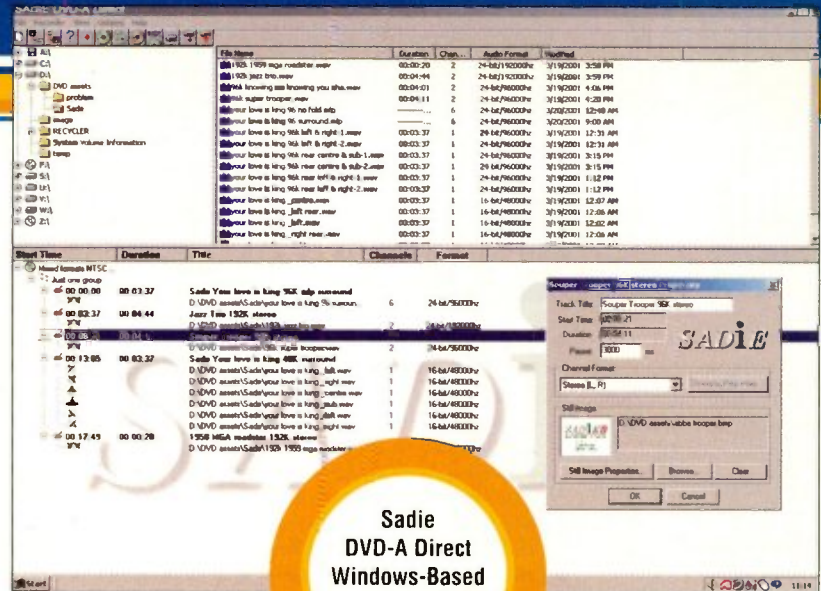
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and ADAT, with independent LEDs indicating signal status for each channel. Otari showed their new ND-20 networking device, which provides A/D and D/A conversion with options for both mic and line analog inputs, as well as AES/EBU, MADI, and mLAN I/O. Up to 16 ND-20's can be interconnected via fiber optics to provide an audio network of 128 channels. Also new from Otari is the FS-96 format and sample rate converter, which allows up to 24 channels of 24-bit audio (at sample rates of up to 96 kHz) to be distributed and converted into a variety of popular digital formats.

There were also a number of new signal processors to whet the appetite. Eventide's Eclipse marks the company's entry into the project studio market. Despite its modest price, there's a lot of bang for the buck: four independent digital



(AES/EBU, S/PDIF, and ADAT formats are all supported) and balanced analog inputs/outputs, a full complement of their famous Harmonizer (pitch change) processing, reverb and other special effects, and a simple user interface.

Drawmer debuted their Six-Pack surround dynamics processor, a

six-channel dynamics processor designed specifically for surround sound applications. Any combination of channels can be linked to track each other's levels, preventing image shift, and channel six offers a switchable 120 Hz low-pass filter so that a subwoofer (LFE) channel can be derived from a five-channel sur-

## Different shades of blue.



### S-phone Four Channel Headphone Amplifier

It's simply the most versatile and flexible four-channel headphone amplifier you can own. Each channel incorporates independent Level control, Two-Band EQ and a Stereo Aux Input. Listeners can also mix in more of their own signal for "More Me." Plus, the amplifier will power all twelve headphone outs.

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round mix. Each channel comprises a soft knee compressor with switchable Auto or Manual attack and release, a variable threshold limiter, and a "Programme Adaptive" expander/gate with a variable

release time. LEDs show link status and comprehensive bargraph metering displays all dynamic functions.

**XTA Electronics** unveiled their **DP324** multi-processor, which offers two channels of input and

dynamic equalization, high- and low-pass filters, multiband dynamics processing (compressor, peak limiter, and expansion/ gating), a harmonics generator (replicating tube sound), and an ADT module — all in one compact, single-rack-space unit. Optional Windows-compatible software allows remote control over all parameters.

There was big news in the world of microphones. **Neumann** led the way with their **Solution-D** digital system, which couples a **D-01** digital microphone with a **DMI-2** interface and Windows-compatible **RSC** control software. The mic incorporates a 28-bit (yes, you read that right) A/D converter (said to deliver an astonishing 130 dB of dynamic range) and an all-new large diaphragm capsule design, communicating with the interface via the new AES 42-2001 data format. The initial release of the interface is two-channel, accommodating two mics, with an eight-channel version planned for future release; mic preamps are built in, as are converters to AES/EBU, and there are both word clock inputs and outputs, with support for sample rates of up to 192 kHz. Finally, the software allows laptop remote control over polar pattern, pre-attenuation, pre-amplification, low-cut filter, mute, and phase reverse functions, as well as mic status. [See the First Look in this issue for more details.]

In other microphone news, **Schoeps** announced two new supercardioid compact mics — the **MK 41V** and the **CCM 41V**. Both are side-address and are designed to maintain a constant frequency response from signals

**Shure  
P4800  
System  
Processor**

## GAIN

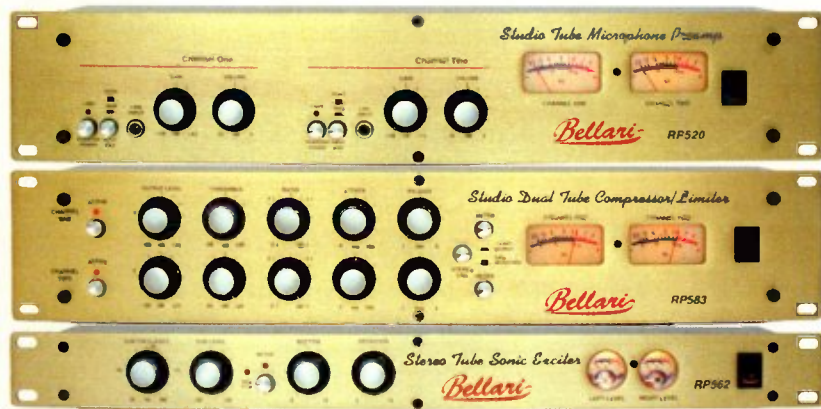
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**Drawmer  
Six Pack  
Surround  
Dynamics  
Processor**

coming anywhere from within 90° of the main axis, making them well suited for sources that are in motion as well as for surround miking applications. **AKG** debuted the **C 4500B-BC** on-air large diaphragm condenser mic, designed specifically to be immune to RF interference from sources such as computer monitors. Other features include an internal multilayered pop filter, transformerless output, and electromagnetic screening.

**Shure** introduced the **WL50** omnidirectional subminiature lavalier mic, which weighs in at a miniscule 0.34 grams but provides full-range frequency response from 20 Hz–20 kHz. Four equalization caps are included to provide boosts in selected frequency ranges. Also new from Shure is the **P4800 system processor**, which includes a 4 x 8 matrix mixing section with provision for adjusting levels and signal polarity, front-panel LED signal level and DSP usage metering, an automatic feedback reducer, graphic and parametric equalization, and dynamics processing (compression/limiting, gating/expansion, and automatic gain control).

**StudioProjects** showed three new mics — the **C1**, **C3**, and **T3**. All three are large diaphragm condensers; the low-cost C1 is cardioid only, the C3 offers three different polar patterns (cardioid, omni, and figure-of-eight), and the T3 is a cardioid that incorporates a vacuum tube. The company also unveiled the **VT1** tube preamplifier, which features a “Blend” control that allows you to dial in the precise amount of tube warmth and distortion. **Audio & Design** debuted the **ADR-DMA2**

**Junior** dual digital mic preamplifier, which provides analog gain (up to 72 dB) as well as 24-bit A/D conversion at sample rates of up to 96 kHz.

Lots going on in the speaker world as well. **Dynaudio Acoustics** and **TC Electronic** unveiled the **AIR Series** — a cool range of intelligent monitors that utilize DSP, networking intelligence, and digital amplifiers in order to provide optimum performance in any acoustic environment. One of the coolest features is a wireless central remote control, which allows parameters to be adjusted from the “sweet spot” listening position, as well as individual speaker muting and soloing. The built-in DSP enables compensation for traditional speaker inefficiencies and offers adjustment tools such as flexible bass management (with different cutoff frequencies) as well as independent equalization, delay times, and level adjustment. Numerous presets can be stored in memory and recalled at a touch of a button. The first AIR Series products include AIR6, featuring a 6.5-inch woofer and 1.1-inch soft dome, and AIR15, featuring a nine-inch woofer and 1.1-inch soft dome. Three different dedicated AIR subwoofers will be available, and a software package will offer advanced calibration tools for acoustic consultants and installers.

Perhaps one of the most interesting displays at AES was that of the Swedish company **EMES**, who were demonstrating their **OWL System**. Said to be the world’s first true stereo speaker, this single point source (which actually incorporates two speaker elements with a separating



"These mics are so good it's absurd!"

**Bruce Swedien** (Grammy winner, Michael Jackson, Quincy Jones, Duke Ellington)

"God, I love these (expressive deleted) things!!!!"

**Ed Cherney** (Grammy winner, Rolling Stones, Eric Clapton, Bonnie Raitt)



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"wall" and a clever phase manipulation processor) delivers true 180° stereo sound that seems to rival or even surpass that of two discrete monophonic speakers placed several feet apart. The two-way active bass reflex design incorporates dual eight-inch woofers and dual 28-mm Neodyme tweeters, with four dedicated 100-watt power amplifiers. Controls are offered for input sensitivity and high and low frequency response from 52 Hz to 20 kHz — an optional subwoofer is available.

On the software front, **Universal Audio** announced that its new Powered Plug-Ins will include **Vintage Compressors** — software emulations of their famed 1176LN and Teletronix LA-2A hardware compressors. Rather than simply modeling compression curves — the usual way of creating software emulations — UA's engineers modeled the actual circuitry of each compressor, successfully capturing not only their unique sound, but also their characteristic quirks. The initial release will support the VST/PC format for compatibility with Steinberg's Cubase and Nuendo as well as Emagic's Logic Audio; a future release will add Macintosh support.

**Steinberg's** new **Nuendo Dolby Digital Encoder** software plug-in allows full AC-3 encoding from within the workstation itself. Features include support for bit rates from 56 to 640 kbps and channel configurations from mono to 5.1-channel surround sound, as well as control over Dialog Normalization and Surround and Center Downmixing Level parameters.

**Sadie's DVD-A Direct** is a complete Windows-based authoring system for DVD-Audio. An intuitive drag-and-drop interface allows easy ordering of tracks to create an album playlist, and all file formats in the DVD-Audio spec (up to 24-bit, and up to 192 kHz sample rates) are supported, including MLP compression. The company also announced their **DSD Mastering Workstation**, which

enables editing and mastering (including full equalization and dynamics processing) of stereo DSD material as well as final mastering for Sony's Super Audio CD (SACD) format. Onboard down-conversion to 16-bit PCM will allow the simultaneous production of a standard Red Book CD. But SACD is also a multichannel format; to that end, **Sony** was showing their **Sonoma** multichannel DSD workstation, and **Philips** and **Merging Technologies** were demoing their co-developed **Pyramix** eight-channel recorder/editor.

Last but not least, if you're into surround sound, you're going to want to avail yourself of a surround metering system at some point. There were two new offerings at AES: **RTW** showed Version 4.0 software for their desktop **SurroundMonitor 10800**, which images the sound pressure level conditions in the surround soundfield in an adjustable coordinate system. In addition, the image width and direction of dominant surround signals and the ratio of real middles in the center channel to phantom middles is displayed. The analyzer can also be calibrated to a reference monitor loudness (in SPL or RMS), with the resulting overall loudness displayed on a separate bargraph. In addition, the correlation display has been expanded to include all channel pairs with switchable low-pass filters.

Another innovative new surround metering system was unveiled by the French company **Pinguin**. Their **PG-AM** Version 2.1 software enables graphic real-time monitoring of 5.1 signals on any Windows PC, using any standard 16-bit multichannel sound card as the interface. Features include 1/12-octave scaling of the frequency range, single sample attack time, adjustable decay times, a digital PPM and FFT display with selectable resolutions, a two-channel phase correlation meter (in standard -1 to +1 range, in degrees from 0 to 180, or as a numerical readout), and a stereo Phase Scope. ■

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IN REVIEW



# SOUNDELUX

## LARGE DIAPHRAGM TUBE MICROPHONE

# ELUX 251

### A CLASSIC IS REBORN

The last few years have seen major improvements in recording technology. However, the one area that has been slow to catch up with the low-noise, high-headroom world of 24/96 recording is microphone technology. In recent years, we've seen some great new models from Neumann, Audio Technica, Shure, BLUE, and others. David Bock at Soundelux has also shown us some great mics, with models including the U95S and U99. These mics offer vintage tone with specs that meet any demanding digital recording application.

The latest addition to the Soundelux line is the ELUX 251, modeled after the old Telefunken ELAM 251E manufactured in the '60s by AKG and distributed under the Telefunken badge. The original mics employed a triode tube circuit built around the 6072 tube. I found them to have the smoothest, open top end and the roundest, even low end of any tube mic. For me, this made ELAM 251's the perfect choice for vocals, acoustic guitars, piano, strings, and drums.

The Soundelux ELUX 251 uses the same 6072 tube circuit as the original. The mic comes complete with shock-mount, cable, case, and power supply. The capsule is a one-inch dual membrane — the same as the original. The power supply is also true to the original, unregulated type design. However, it's a solid-state design. Like the original, the mic cable is heavy duty, doesn't kink up when coiled, and the connector has a twist lock to keep it snug to the mic. Bock has even matched the turquoise color and slide switch pattern selector found on the original. The list price of the ELUX is slightly under \$5,000 — compare that with the going rate of \$10,000 to \$20,000 for an original 251.

### THE TESTS

When the ELUX 251 arrived for evaluation, I was in the midst of recording a project for Japanese artist Miyuki Nakajima. Her music is textured and layered, and has often been compared to Kate Bush. This gave me the opportunity to try the new mic in lots of different applications.

We were recording at O'Henry Studios in Burbank, CA on their custom-built API/Jenson console. The luxury here is that owner Hank Sanicola has one of the best mic clos-

BY JOE CHICCARELLI



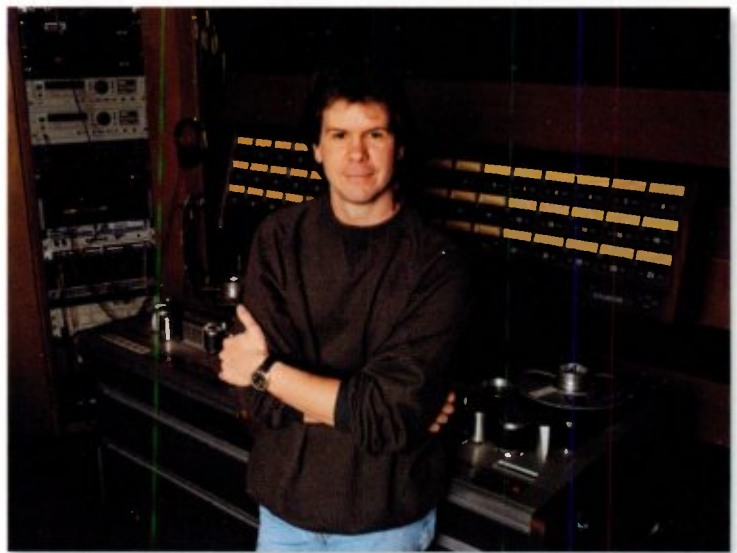
# Studio OBSERVER

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Volume 6 • Number 2 • June/July 2001

## JOHN PATERNO

### THE DIFFERENCE BETWEEN A RECORDING AND A PERFORMANCE.



John Paterno graduated from the University of Miami's music engineering program in 1990. But you are not long into a conversation with him before you realize that he's never stopped studying. With a growing and diverse discography that includes the acclaimed original music tracks by Vonda Shepard for the "Ally McBeal" television series and soundtrack albums, as well as album

"People do recognize when you've gotten a great performance on record," Paterno says. "It's not just about the way it sounds, but also about the way it feels. I've found that the whole psychology of making a record is actually as interesting to me as the sounds and technology are. I see my job as creating an environment to let a performance happen. Have you ever heard 'The Genius of Ray Charles,' the record he did with the Count Basie Big Band? There's distortion all over it, and

it's the loudest horn section ever recorded. But the performances are just amazing. The key, to me as an engineer or a producer, is getting the artist comfortable, to the point where they're not thinking about the microphone

or the headphone mix or the sound. If you can put them in that kind of a place, it becomes a performance, not just a recording."

Paterno readily credits other engineers and producers he's worked with as being as much tutors as clients. Soon after the Glen Cove, NY native came to Los Angeles after college, he landed a staff engineer position at Sunset Sound, and shortly thereafter was assisting engineer Tchad Blake and producer Mitchell Froom on a Los Lobos album at Sunset's satellite facility, Sound Factory, the same sessions that

produced that band's breakthrough album, "Kiko."

"Tchad and Mitchell are a fantastic team, and they taught me a lot during the five years that I worked with them," Paterno says. "One of the things that I learned was how to work quickly, yet stay focused on the performance."

That would become very useful down the road. When Paterno became one of the engineers used on Vonda Shepard's tracks for "Ally McBeal," he found that this philosophy helped him deal

**I've found that the whole psychology of making a record is actually as interesting to me as the sounds and technology are.**

credits for Los Lobos, Tim McGraw, Eros Ramazzotti, and Joan Osborne, among others, Paterno remains a student of not only the craft of getting signal to tape, but also of nurturing and capturing a performance.

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## TAPE TALK

by Jean Tardivono

Vice President of Sales and Marketing  
Studio and Broadcast Products, EMTEC Pro Media, Inc.

GET TO KNOW LTO. Not only is it a catchy phrase, but we also believe it's the future of large information storage solutions for the audio/video/multimedia entertainment industry. First things first – tape as a backup medium is here to stay for a long, long time. It's the only removable media that's dense enough to keep up with the skyrocketing growth of demand for storage capacity. Major players in the data storage industry agree, to the point where several formats have evolved for large-format data storage – DLT, AIT, and LTO.

We see LTO becoming the dominant format of the future of information storage. LTO has undeniable technical advantages. These include the format's 16-MB p/s transfer rate and 100-GB capacity – enough to store 20 feature length films or hundreds of LP audio recordings.



Furthermore, LTO utilizes proven technologies, including a linear operating mode, which is simple and straightforward, versus the more complicated helical-scan mode. And LTO uses a performance-proven metal pigment (MP) tape formulation. And unlike AIT and DLT, LTO is an open format that's been embraced by several leading drive manufacturers. When more manufacturers are involved in a format, users benefit from more options, broader compatibility, and more competitive pricing. From an operational perspective, LTO is a clear winner. EMTEC's LTO product has been a marked success in the media storage sector, and we fully expect it will see the same success as LTO migrates to entertainment.

with two different worlds: the fast-paced environment of music for television, and the soundtrack albums comprised of some of those same songs.

"When you're working on the tracks for the show, everything is rush, rush, rush," Paterno explains. "You're working on a tight deadline to get it to the production stage the next day. Yet I still want to make it sound like a record. Sometimes it's almost like a live sound gig, where you're just throwing up the faders and going for it. I don't have the luxury of talking with the drummer about experimenting with different snare drums. Then when it's time to do a soundtrack record for the show, we go back in and have the time to do a few fixes and sweeten it. The best preparation for this kind of gig has been working with Mitchell and Tchad. Mitchell focuses intensely, gets great musicians in the studio, makes decisions."

Those skills would also come in handy recently when Paterno worked in Nashville with producer Byron Galimore on records for Tim McGraw and Shannon Brown. "The great part about working on these records is that it's a bunch of people playing together at the same time, which is my favorite thing to record. The band comes in, talks over the arrangement, and then it's a free-for-all for the first half hour. Players are sorting out parts, and all of us are sorting our sounds, all at the same time. By the time they find their way into it, I have to be ready, too, because once they start doing takes, they get it fast."

The "Ally McBeal" sessions have also given Paterno insights that few others have seen. One of those came when he recorded a guest duet for the sitcom with Sting and show co-star Robert Downey, Jr. "He's a fantastic singer," Paterno exclaims. "Music is very important to him. He is ridiculously talented."

Sessions for Joan Osborne's long-awaited second record, "Righteous Love," produced by Froom and released last September, illustrate a lesson Paterno learned early on when it comes to recording vocals: "Find the right microphone, the right, preamp and the right compressor, then stay out of the way," he says. "Keep the path

between the performer and the performance as simple as possible." On Osborne's throaty vocals, Paterno used Froom's vintage Telefunken 251 microphone, Hardy M-1 mic-pre, and ADL compressor straight onto EMTEC SM 911, running at 15 ips with Dolby NR. It also underscores how Paterno plays the tape like a vocalist plays the microphone. "I vary the elements of

**"The moment I truly realized how important the tape choice is was the time I was doing transfers on a Vonda Shepard session.**

the signal chain depending upon what the project is, but I always include the tape in that process," he says. "Mitchell loves the sound of 911 at 15 ips, and it was great for Joan's record. Nashville is a digital town, but on the sessions there Byron let me cut analog – 911 at 30 ips. He lets me do my thing and likes the results."

Paterno established a preference for EMTEC's analog formulations several years ago, and he specifies either the SM 900 maxima or the SM 911 for every analog session he engineers. "Each tape has its particular characteristics," he says. "I prefer 911 for tracking, and the 900 for mixing." And he adds that the differences



between EMTEC and other formulations are easily discernible. "The moment I truly realized how important the tape choice is was the time I was doing transfers on a Vonda Shepard session. I had specified 911, but the assistant engineer put up a different brand of tape. I didn't know that until I heard the kick drum PLAYBACK through the monitors. I said, 'That's not what I recorded. This isn't 911, is it?'" Tape choice makes a huge difference. It's always part of my performance."

Tom Soares is instantly likable and immediately believable, even when your first encounter with him is through a phone line when he's a thousand miles away. So one can imagine the instant rapport and trust that he is able to establish with artists when all that separates them is a pane of glass between the control room and the studio. The Bristol, Rhode Island native has racked up an impressive discography since he started engineering in the late 1970s, covering more genres and styles than many engineers get to in a lifetime. His credits include such diverse artists as Foxy Brown, New Kids On The Block, John Cafferty, the Cro-Mags, Marky Mark and most recently, mixing the hit "Beauty" for Sisqo with Dru Hill, a track on Ice Cube's latest CD, and engineering Erykah Badu's highly anticipated second record, *Mama's Gun*. Soares talked about that record, and about what makes a good recording in general.

## IN SESSION WITH TOM SOARES

### SO: What got you into engineering?

Tom Soares: It's funny. My sister was a recording engineer, and she worked at Normandy Sound, in Warren, Rhode Island, in the mid-'70s. I began hanging around the studio with her, going for coffee and things like that. She quit the business, but I ended up staying on. I was working at a body shop during the day, and as an assistant at night at the studio. I wasn't getting enough sleep. So the owner of the body shop said to me, you better decide which career you want. And I chose the studio. So I went from making pretty good money at the body shop to \$2 an hour at the studio. But that was the best way to learn how to be an engineer, and I think it still is. I worked at Normandy till 1997, when I moved to New York.

### SO: Is there any particular artist or producer who taught you something that stayed with you from those days?

TS: Maurice Star, who created *New Kids On The Block*, taught some very crucial things about how to make hit record. One thing in particular was that making little, subtle moves in the mix is like making no moves at all, once it reaches radio and gets compressed. Maurice taught me about the dramatic aspect of records. He also told me to keep the good stuff down the middle of the mix, so it sounds good on both sides of the car. (Laughs)

### SO: Your discography has an interesting mix of classic rock, new wave, hip-hop, R&B and alt — how do you keep from getting pigeonholed?

TS: That's an issue for a lot of engineers. A good, well-trained engineer should be able to record anything. But it's true that people tend to categorize engineers. There was a period in the '80s when I was doing a lot of hard-core heavy metal, like the Cro-Mags; Howie Abrams, [A&R] at Relativity Records, liked what I did with that kind of music and kept sending me more. The way you get out of that rut is to make a conscious decision. You don't take every session that comes along, even if it means eating macaroni and cheese for a while, and I did that. Then I got the call from [studio manager] Mary Campbell at Electric Lady Studios in New York to do a Foxy Brown



session, which started the ball rolling for me in an entirely new area, with hip-hop and R&B.

### SO: And that led to Erykah Badu. How did you approach *Mama's Gun*?

TS: Working with Erykah brought me back that feeling you had when people actually came into the studio with a creative vision, not just a beat and a lyric. The first song I recorded with her was "Green Eyes." It's an 11-minute track, with just drums, acoustic bass, piano and her vocal, that goes through three movements: it starts like an old '40s jazz tune, moves to R&B and then gets hip-hop by the end, as it follows the phases of an emotional breakup. An amazing song, and she and the band played it straight through, 11 minutes, making all the style and emotional changes as they went. We had the track in two takes, and I'd say 80% of the vocal on the record is what she sang live.

### SO: Which mics did you use on her, and why?

TS: It depends on which songs. Different styles work better with different microphones. I don't necessarily think that you have to find one mic for one singer and always stick with that mic. On some of Erykah's tracks, I used a Neumann U-67 with a Neve 1081 mic pre and just a touch of a Summit Audio TLA 100 compressor. On the more sultry stuff, I used this very rare Sony C-500 that I have. It has an interesting low-mid curve, which was perfect for her for certain songs. I also used a Neumann M-269, which is an M-49 tube with a U-87 capsule. That's a very sensitive microphone. It catches every breath. With Erykah, each breath is part of the performance, and you want to keep that in.

### SO: You used EMTEC SM 900 *maxima* on *Mama's Gun* — what is it about that formulation that works so well for you?

TS: It's such a clear-sounding tape. I actually introduced the SM 900 on the first song I worked on. They had already done two songs for the album before I came on board, using another tape. I suggested the SM 900 to [co-producer] James Poyser, and he said, "You're the engineer." And the results were like night and day, in terms of dynamics, quietness and great bass response, and everyone heard the difference immediately. Needless to say, we stayed with SM 900 for the rest of the record.

### SO: Do you have any favorite studios? Which ones and what about them makes them special to you?

TS: In New York, where I live now, my favorites are Electric Lady, Right Track and Sony Music Studios. Electric Lady just has this vibe that made me feel at home, and singers who work in Studio A there also feel that. And Barry [Bongiovi] at Right Track and Tony [Drootin] at Sony know just what I need to make sessions go smoothly. And I love it when the session starts off on a perfect note like that.



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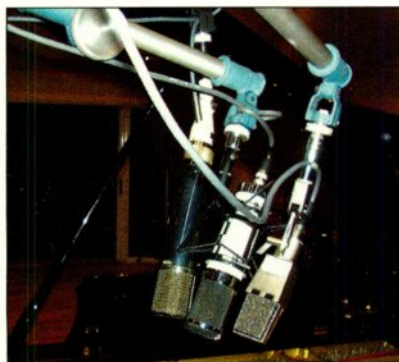




ets in Los Angeles. His collection includes four original 250 and 251 mics, as well as several AKG C12's, Neumann U 47's, U 67's, and M 50's.

**ELECTRIC GUITAR:** The first test was recording electric guitars with studio musician Tim Pierce. I set up my standard SM57 and U 67 combination, but added the Soundelux 251 and a randomly chosen original ELAM. The first shock came when I set up the preamp gains on the two 251 channels. The preamp gain controls were set identically, and yielded exactly the same output level. One great feature of O'Henry's custom API console is the ability to watch individual mic preamp levels on the respective channel VU meters. On an electric guitar, the meter ballistics were also identical on the two mics.

Sonically, the mics were frightfully similar. The original perhaps having a bit more openness to the tiptop 15–17 kHz and a little bit more edge in the 5 kHz area. The bottom on the new Soundelux, however, was a bit richer and heftier than the original 251 — perhaps about a 1 or 2 dB boost at 180 Hz compared to the original.



They both yielded clean, open, and full-bodied tones.

**PIANO:** Now on to the studio's Yamaha C-7 acoustic piano. We started with just a simple single-mic position just outside of the piano. We compared three mics — the original 251, the ELUX 251, and an AKG C414EB. Even though I find myself using 414's often on acoustic piano, in this comparison they were eliminated quickly — their top end was much too artificial sounding and the low end too boxy.

The original 251 was quite open and rich in the upper harmonics, and even in the bottom. The ELUX sounded equally clear and open on the top end, but at times the extra low-mid bump seemed a bit much.

Transients on the ELAM and ELUX were amazingly similar. We compared both mics in cardioid and omni. The ELUX cardioid pattern did seem a bit wider than the two original 251's we compared. However, when we switched all mics to omni, not only did the patterns seem more similar, but the tonal variations between the original and the Soundelux became much less apparent. In all patterns, the ELUX did seem to go down much lower in the 30 Hz neighborhood. Room-rumble and noise from the air conditioner was noticeable on the ELUX, but chopped off on the ELAM.

**STRINGS:** Two ELUX's were placed adjacent to a pair of vintage Neumann M 50's. The mics were placed about ten feet high above the ten-piece section. Although I wouldn't usually use 251's in this application, I thought it was worth the experiment. The ELUX was full and rich in the lower mids, but once I auditioned the mics in the track, I did prefer the extended top end of the M 50's. Where the ELUX did excel, however, was in the area of noise. Even though their output level is similar to that of a vintage ELAM, their self-noise level is substantially lower. (The spec sheet rates the equivalent noise at 27 dB unweighted.)

**FEMALE VOCALS:** I compared the ELUX 251 extensively to my favorite ELAM 251 on lead female vocals. At times I missed the extra air and top end of the original ELAM, however, the sweetness of the ELUX's upper midrange made it a strong contender. With a few dB added in the 15–17 kHz area, the ELUX managed to fool a few people.

## Soundelux ELUX 251

**MANUFACTURER:** Soundelux Microphones, 1147 North Vine St., Hollywood, CA 90038. Tel: David Bock at 323-464-9601. Web: [www.soundelux.com/mics](http://www.soundelux.com/mics).

**SUMMARY:** While not quite an original ELAM 251E, the ELUX 251 is very, very close.

**STRENGTHS:** Low noise. Sweet midrange.

**WEAKNESSES:** None to speak of.

**PRICE:** \$4,995

**EQ FREE LIT. #:** 109

**BACKGROUND VOCALS:** The next job was to record three studio background singers doing R&B-style backups. This is an application where I would normally use an ELAM 251, C12, or perhaps a 414EB. We tried two different ELAM's as well as a stock silver C414EB (original series with C12-type capsule). We then put up the ELUX, and it was hands-down the winner. It had the open, smooth top end, but the slight low-mid bump seemed to fill in the sound of the group. The upper midrange was smooth and the mic never folded or got nasty on the high notes.

We tried several different preamps for these auditions — an SSL 9000J, Neve 1073, Neve 1272, and an Avalon. The tonal differences between the mics did change with the preamps; for example, the transparency of the SSL made the differences seem slightly subtler.

## ON THE INSIDE

Before I concluded this review, I wanted to open the ELUX up and compare its construction to the original. Since this is an area beyond my expertise. Harold Kilanski, chief engineer at O'Henry Studios and custodian of the studio's extensive vintage mic collection, accepted the invitation to look under the hood. Here are his observations: "The original ELAM employed point-to-point wiring, as does the new ELUX. The construction uses heavy gauge steel and no internal connectors. The original ELAM, like all mics of that era, employed an output transformer. The ELUX uses a good quality Lundahl transformer. Soundelux went to great effort to be true to the original

► continued on page 146

# What Are *You* Looking for in a Passive Reference Monitor?

**A**sk just about any music store salesperson what their customers tell them they want in a studio monitor, and nine times out of ten the answer is something like, "I want the speaker my friend has," or "I own a bunch of Brand X equipment, so I want a Brand X speaker," or "I want that one with the white woofer." Oddly, few of them ask for a speaker that helps them do accurate mixes.

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World Radio History

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Want more? Maybe you're also looking for independent high and low frequency trim controls, so you can match the speakers' response to your listening environment (got 'em). Maybe you need independent gain controls (got them too). A power on/clip indicator? (Yep.) Fancy shmancy trim ring? (You betcha—just because they sound great doesn't mean they can't look great too.)



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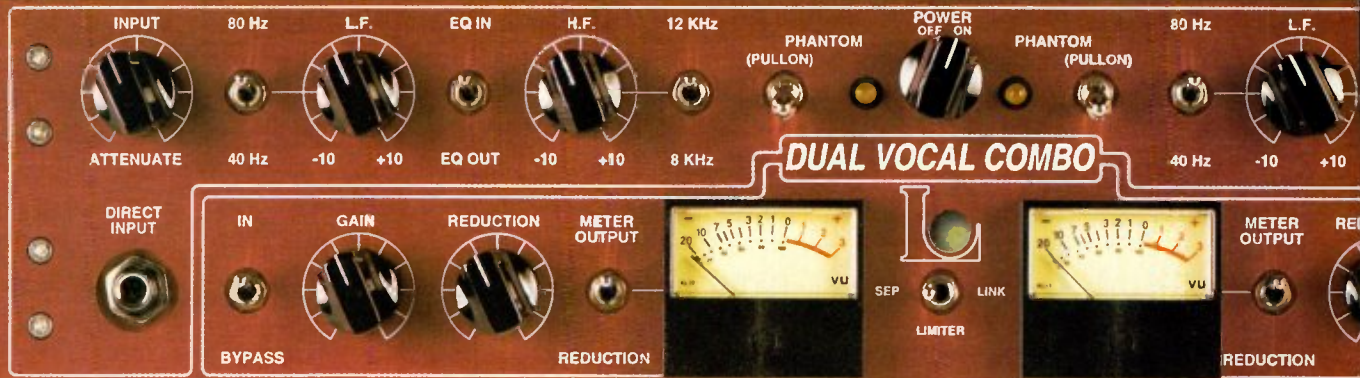
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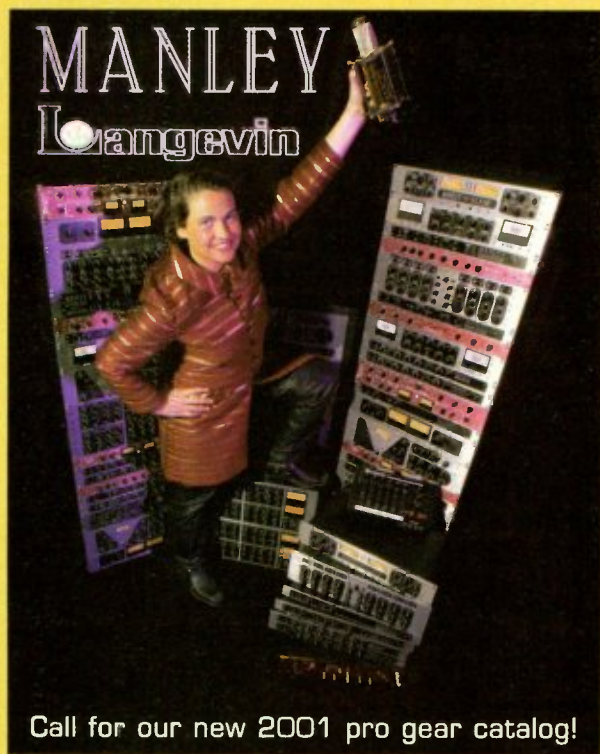
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# TASCAM

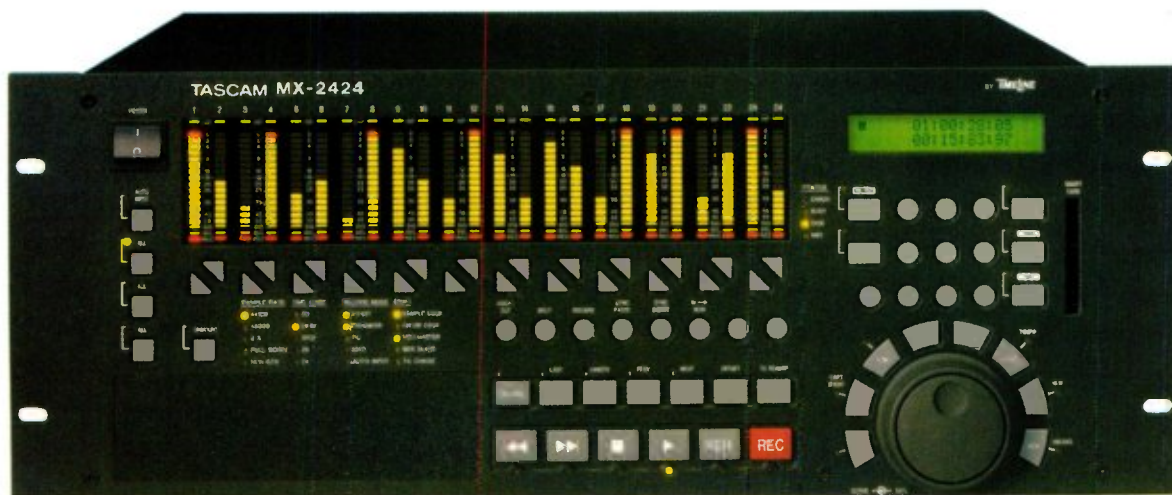
## IN REVIEW

**TASCAM's  
new  
offering  
combines  
excellent  
sound  
with  
convenience**

For years there was a clear delineation between hard disk and tape-based recording systems. You could opt for the speed, reliability, simplicity, and portability of tape-based recorders, or venture into the hard disk arena for more powerful editing, automation, processing, and no more waiting on tape. The caveat to this hard disk venture involved issues such as increased time in setting up sessions and tracking, an increased learning curve, concerns about sound quality, and the fear of crashes. Plus it was far more difficult to move projects to other studios for tracking and mixing. As technology marches on, the lines are beginning to blur, and the "problems" are being solved. The TASCAM MX-2424 records to hard disk, but acts like a tape-based system. In fact, from an operational standpoint, while tracking, the MX-2424 isn't appreciably different than three DA-88's (or three ADATs for that matter), yet it's faster, offers more powerful editing, and is more cost-effective.

### the basics

The MX-2424 is the result of a partnership between TASCAM and TimeLine. It's a 24-track recorder at either 16- or 24-bit resolution with sampling frequencies up to 96 kHz (it supports 12 tracks at 96 kHz). The sound quality is superb; among the best I've ever worked with. I utilized the MX-2424 synched to three ADATs (one 20-bit and two 16-bit), and the sound quality was unquestionably better on the MX-2424. As a test, I recorded tracks on the MX-2424 at 24-bit while simultaneously recording the same tracks to 16-bit ADAT, 20-bit ADAT, and 16-bit Pro Tools via Digidesign's 888I/O. I then digitally transferred the tracks recorded on the MX-2424 to both ADAT and Pro Tools. I listened to all of the tracks using the D/A converters of each ADAT and Pro Tools as well as the MX-2424. In all tests, the MX-2424 sounded indubitably better. >>>



TASCAM MX-2424 24-TRACK, 24-BIT HARD DISK RECORDER/EDITOR

# tascam

In addition to excellent sound quality, the MX-2424 is a rock-solid workhorse that seems to be gaining a reputation for reliability. The online forums at Musicplayer.com and on the TASCAM Web site confirm my own experiences as to the solid durability and reliability of the MX-2424.

## flexibility

A real strength of the MX-2424 is its all-around flexibility. When it comes to inputs and outputs, there's a multitude of options available. You can purchase an optional card to add 24 analog ins and outs, as well as cards to provide 24 channels of digital input and output in AES/EBU, ADAT optical, and TDIF formats. This flexibility allows you to pick the formats you need and not pay for formats you won't use. The MX-2424 can hold the

DVD-RAM and Travan as backup options.

TASCAM maintains a list of supported drives that seems to be updated regularly; when I checked it there were several readily available drives on the list. I purchased a 36 GB Quantum Atlas V internal SCSI drive for a little over \$500 that installed and worked without a hitch. You can format the drive in FAT-32, HFS, or HFS+ formats from the MX-2424 front panel and record SDII files or WAV files. The use of industry standard file and disk formats allows you to take a drive and mount it on a Mac or PC for backup, as well as providing an easy way to import tracks into a computer-based system such as Pro Tools, Nuendo, Digital Performer, and Logic.

The MX-2424 offers up to 999 vir-

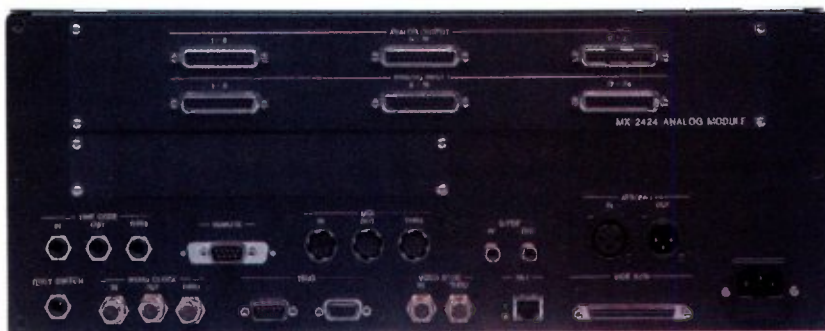
An interesting feature is the ability to create multiple user-profiles containing the machine setup information. This is similar to a feature found in many large-format consoles, and would be helpful in larger facilities where several engineers might use a single machine.

## tracking

Tracking is an area where the MX-2424 shines. I put it through its paces while recording the Bethesda Baptist Church choir and orchestra. The live concert was a little over 90 minutes long, and I recorded 24 tracks at 24-bit, 44.1 kHz on the MX-2424 using the 36 GB SCSI hard drive I'd mounted internally. While this was mostly a live recording; I had the luxury of spending two full days of recording rehearsals and dialing in the setup.

I also did a number of overdubs and edits after the concert to fix a few things and to get the concert to fit on a single CD. Throughout the process, the MX-2424 performed flawlessly. The transport was very fast and setting/recalling auto-locate points was easy. My only real complaint in the process was the lack of quality documentation. I was eventually able to figure everything out, but it would have been much easier with more thorough documentation. (TASCAM tech support tells me a new manual will be available soon.)

The user-interface is well thought out and easy to use once you familiarize yourself with it. You can do almost anything you want from the front panel or from the optional RC-2424 remote, which is basically a remote extension of the front panel. The LED-style metering on the MX-2424 is excellent, and even the RC-2424 remote has four LEDs per channel to show when a track is selected, armed for record, has signal present, and when clipping



IF-AN24 analog card and one of the digital cards (IF-AE24, IF-AD24, or IF-TD24) simultaneously. I was able to test the analog, AES/EBU, and ADAT cards, and all performed as expected.

Another area of flexibility is with recording and backup media. The MX-2424 ships with a 9 GB internal SCSI hard drive, and there's space to add a second internal SCSI drive. There's also a 68-pin Fast Wide Ultra 2 SCSI connector on the rear panel to allow the addition of external SCSI devices. The MX-2424 supports

tual tracks and allows the user to select either Non-Destructive Mode or Tape Mode for each project. Non-Destructive Mode offers up to 100 levels of record/edit undo and is similar to many other hard disk recording systems. The other option is Tape Mode, which works like an analog multitrack tape recorder, offering predictable track lengths and large single files that can easily be imported into computer-based recording systems. You can also convert Non-Destructive Mode projects to Tape-Mode projects at any time.

has occurred. What's more, you can easily control up to six MX-2424's from a single RC-2424 remote. The real magic of the MX-2424 is its simplicity. I placed the RC-2424 next to the console and didn't really have to think about it much at all.

## mixing & editing

Mixing with the MX-2424 is very simple; hook it up to your console and go. You can store up to 100 auto-locate points on the front panel or the RC-2424 remote. You can also store and access auto-locate points from the

MX-View software (see below). The MX-2424 can jump to any spot on its hard drives instantly, and the transport controls are just like those on an analog recorder.

As mentioned earlier, one of the beauties of the MX-2424 is the simplicity of its design and operation. Don't mistake this simplicity, however, for lack of functionality. The MX-2424 has excellent punch-in/out capability, cut/copy/paste editing, track or machine offset, etc. — all available from the front panel, the RC-2424 remote, or MX-View software. You can punch-in/out on the fly or program in points offline and test them in rehearsal mode. You can even instantly punch-in/out on all 24 tracks simultaneously, which isn't the case on many hard disk recording systems. The MX-2424 also sports a useful job/shuttle knob that allows you to scrub audio and select an event with surgical precision.

## synchronization

For all of the tracking in the orchestra/choir session, I had the MX-2424

# tascam mx-2424

**MANUFACTURER:** TASCAM, 7733 Telegraph Road, Montebello, CA 90640. Tel: 323-726-0303. Web: [www.tascam.com](http://www.tascam.com).

**SUMMARY:** The MX-2424 sounds great and is easy to use once you become acclimated with it. Its speed, simplicity, and overall flexibility make it ideal for tracking and mixing.

**STRENGTHS:** Outstanding sound quality. Full-featured remote. Quick access to commonly used features. Flexible sync and I/O options. Multiple MX-2424's can sync together for more tracks. MX-View software allows remote control from PC or Mac computer. Building a strong reputation for reliability.

**WEAKNESSES:** Poor documentation makes learning curve more difficult. Current version of software allows limited options for volume automation and crossfades on edits.

**VERSION TESTED:** v1.54 for most of the tracking sessions. 2.0 became available as the review was being finished up.

**PRICE:** \$3,999; RC-2424, \$1,599; IF-AN24, \$1,699; IF-AE24, \$999; IF-AD24, \$499; IF-TD24, \$499

EQ FREE LIT. #: 110



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# TASCAM

synced with three ADATs for a total of 48 tracks. The MX-2424 can be either the sync master or slave and supports all of the timecode standards along with word clock in/out/thru. Setting up synchronization is easy to do, and there are LED indicators on the front panel to let you see at a glance when synchronization is achieved.

On another session I synced two MX-2424's together and found that to be an excellent setup. After spending countless hours waiting on tape transports, formatting tapes, etc., the two MX-2424's are a breath of fresh air as the two machines would lock

and be ready to play/record seemingly instantaneously.

I also experimented with using the MX-2424 to chase SMPTE timecode. The MX-2424 would lock up within a few seconds and didn't seem to drift at all. I was very impressed with chase lock response times with the MX-2424 as a slave and, when utilizing word clock, I could achieve sample lock even faster.

## mx-view

TASCAM offers their ViewNet-MX software for both Mac and PC via download at no additional charge. You'll need a 100 Mbps Ethernet card

## tascam mx-2424 specs

**BIT RESOLUTION:** 16- or 24-bit

### SAMPLING FREQUENCY:

**INTERNAL (KHZ):** 44.056, 44.100, 44.144, 47.952, 48.000, 48.048, 88.112, 88.200, 88.288, 95.904, 96.000, 96.096.

**EXTERNAL (KHZ):** 38.5-108 via word clock input

**SUPPORTED TIMECODE RATES:** 25, 29.97, 29.97 drop frame, 30, 30 drop frame

**TIMING REFERENCE SOURCES:** Internal, Internal Varispeed, follow timecode in, Video (either NTSC or PAL), AES/EBU, S/PDIF digital clock input, word clock input, TL-Bus

**STANDARD INPUTS:** AES/EBU on XLR, S/PDIF on RCA

**STANDARD OUTPUTS:** AES/EBU on XLR, S/PDIF on RCA

### OTHER CONNECTORS:

**1/4-INCH TRS CONNECTORS:** Timecode In/Out/Thru, Foot Switch (standard momentary or Alesis LRC). **BNC CONNECTORS:** Word Clock In/Out/Thru, Video Sync In/Thru. **9-PIN:** RC-2424 Remote, TL-Bus In and Out. **MIDI:** In/Out/Thru. **RJ-45 Ethernet Jack** for 100 Base-T Computer interface. 68-pin Fast/Wide Ultra 2 SCSI Connector for external storage devices. IEC power cable

**PHYSICAL:** 19 inches wide x 17.5 inches deep x 7 inches high (4U rackmount); approximately 31 lbs.

## optional I/O cards

(THE IF-AN24 AND I OTHER CARD CAN BE INSTALLED AT ONE TIME)

**IF-AN24** (6) D-Sub 25 connectors that provide 8 inputs or outputs per connector for a total of 24 analog inputs and outputs.

**IF-TD24(3)** D-Sub 25 connectors that provide 8 inputs and outputs per connector for a total of 24 TDIF digital inputs and outputs.

**IF-AE24(3)** D-Sub 25 connectors that provide 8 inputs and outputs per connector for a total of 24 AES/EBU digital inputs and outputs.

**IF-AD24** (6) ADAT optical connectors that provide 8 inputs or outputs per connector for a total of 24 channels of ADAT optical digital inputs and outputs.



and either a hub or a crossover cable to connect to the MX-2424. I connected my 400 MHz Dell laptop with 96 MB RAM and a 3-COM 10/100BaseT PCMCIA network card directly to the MX-2424 with a crossover cable, and it worked great. ViewNet MX took longer to load than most programs and did seem to hog most of the system resources, thus I couldn't have many other programs running in the background.

The forthcoming MX-View gives you control of most of the features on the MX-2424 from a computer. This is great for configuring setup options, naming projects, setting up auto punch-in/out points, etc. MX-View also features a graphic view of the waveform for all 24 tracks, which is particularly helpful when editing tracks. Much like the MX-2424 remote, MX-View can also deal with up to six MX-2424's at one time. I found the cut/copy/paste style of editing to work very well regardless of whether it was handled from the front panel, the RC-2424 remote, or via MX-View software. Current versions of ViewNet MX have limited ability to automate levels and control cross-fades, but this will be addressed in MX-View, which is due out later this year. They will also be adding on-screen metering.

At the NAB show in Las Vegas, TASCAM was demonstrating an unreleased version of MX-View that had breakpoint-style volume automation similar to that found in many computer-based packages such as Pro Tools. I personally am a big fan of this style of automation, and I'm sure it will be a welcome addition to users who crave this level of control — especially those without console automation.

## conclusions

The MX-2424 will likely find a welcome home in recording studios of all levels, live recording trucks, and broadcast facilities. It's a great value: You can buy a well-equipped MX-2424 with a second hard drive and backup system for less than you would have paid for two ADATs or DA-88's just a few years ago.

For those looking to replace an

aging analog multitrack or a stack of digital tape-based multitracks, to create a portable rig, or for those who just don't want to deal with a computer-based system, the MX-2424 has a great deal of appeal. When you combine its ease of use with its features, sound quality, flexibility, and cost-effectiveness, it becomes clear that TASCAM has created an excellent all-around recording/editing solution.

**Editor's Note** Eagle-eyed readers may have noticed that Rob has joined the staff of *EQ* magazine as midwest sales representative. To prevent conflicts of interest, no one associated with sales, publishing, or marketing for *EQ* may be involved in any product evaluations. However, this review was completed while Rob was a freelancer, before he joined our staff.

**weblink**

Check out the MX-2424 forum at [www.mx2424.com](http://www.mx2424.com).



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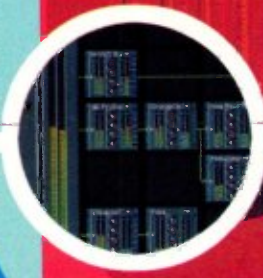


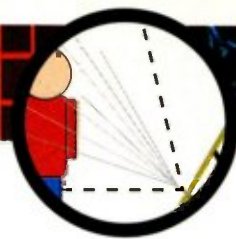
# GUITAR RECORDING

## SPECIAL

*EQ's* annual look at the techniques and equipment that will get you that six-string sound you're looking for (and make all of your engineer friends jealous of you).

Including tips from Craig Anderton, Jon Chappell, and Randy Neiman, plus reviews of guitar gadgets from DigiTech, Johnson Amplification, Behringer, and Fender.



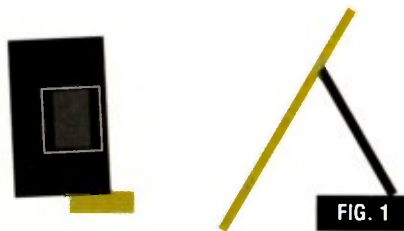


# Divergent Paths

OTHER OPTIONS FOR MIKING GUITAR AMPLIFIERS

By Randy Neiman

What could be easier than miking an electric guitar amp? Just slap a '57 a couple of inches from the grille, slightly off-axis from the speaker cone, and let her rip. Sound familiar? It should. This time-honored method of using cardioid dynamic mics to record electrified guitars spans



nearly the entire history of recording amplified signals, and is the only technique mentioned in many recording texts, including the popular *Modern Recording Techniques* by Huber & Runstein. However, I can offer some different miking techniques to help you achieve a spacious, more natural electric guitar sound than you may be getting now.

Since the ear relies on certain clues about timing to reveal localization and space, there are some techniques that can fool the mind into believing that the recording took place in a much larger, more open space, and yield great recording results with a minimum of processing.

This method uses hard, portable surfaces — so start scouring around for large pieces of wood, glass, Plexiglas, metal, etc. Size is somewhat relative (although not altogether unimportant, in spite of what your girlfriend might say); it should be about three feet square at the minimum and four-by-eight or so at the largest (a hardwood door, for example). Be careful when using glass, metal, or composite products (such as upended tables), not only for safety, but also to be sure that there are no resonant vibrations

or rattles. Different materials, due to composition and density, create slightly different transfer functions on the reflected sound, and thus subtle changes in timbre, so experiment freely.

Begin by placing the amplifier/speaker towards the middle of one side of the room, away from the corners if possible. If the room is unusually shaped or has a cantilevered ceiling, work along the lines instead of against them, and, if the roof is slanted, place the amp in the smaller end. Tilt the speaker back about 5 degrees by placing a book or other small, solid object under the front of the cabinet.

Place whatever item you've found, the surface (here we're using it as a diffuser panel, so we'll call it the diffuser), four to six feet away from the direct throw of the speaker cabinet at a 35–60° angle upwards (see fig. 1). This allows for most of the frequencies coming off the cone to complete at least one cycle (A220 takes a little more than five feet) and create some frequency diffusion; optimum distance will depend on speaker and room size. Try to make sure the diffuser is securely in place so it doesn't move during recording, and again make sure there's no rattle if you're leaning it against a chair or other object.

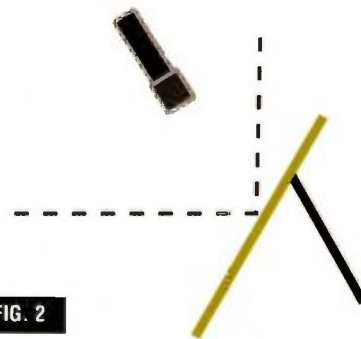
The diffuser should now be near the speaker's optimum dispersion pattern (unless it is very large or specifically designed for longer throw), absorbing some of the energy and reflecting the rest. Remember that higher frequencies, like light, tend to travel in rays, so that the angle of incidence equals the angle of reflection. Simply put, that means that when sound bounces off the diffuser, it does so at the same angle as it came from the speaker.

Place a microphone six to eight inches away from the diffuser panel with the

capsule facing down at nearly a right angle (see fig. 2). Any microphone will work, but I usually choose a large or medium diaphragm tube condenser due to their high degree of sensitivity and often flattering coloration. It's a good idea to start with a –20 dB pad on a condenser, but, at this distance, overloading the mic electronics is less of a problem.

The microphone is now positioned to pick up the reflected (and somewhat diffused) sound from the panel, as well as some ambient reflections from the ceiling above and behind it — effectively “seeing” a larger acoustic space. Further, the diffuser almost acts like a parabolic mic, catching the sound and focusing it toward the mic. If you stand between the speaker and the surface, close your eyes and you will swear the sound is coming from the panel. This is because you have perceptually localized the sound based on apparent loudness, and the reflected sound off the diffuser panel is more focused toward you, thus it seems louder (fig. 3).

Cardioid is the easiest configuration to begin with, giving a more controlled but

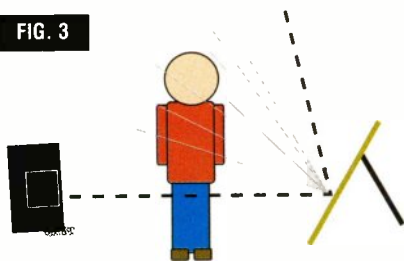


less open sound than omni or figure of eight — these patterns tend to exaggerate the effect of a more spacious room to that of a large hall, but are somewhat more difficult to manage. When using figure of eight, place the microphone so that

one side of the pattern faces the diffuser panel; the other will be focused at the reflected sound from the ceiling (enlarging the sense of spaciousness). Using omni configuration, move the microphone closer to the panel, thus increasing direct versus ambient reflected sound.

For an even brighter, still more spacious sound, place more solid surfaces flat on the floor between the speaker and the diffuser surface (fig. 4). This increases the number of transfer functions in the acoustic path, and, again, the net result is the perception of a larger acoustic space. To give an even greater sense of depth, a second microphone can be added to this

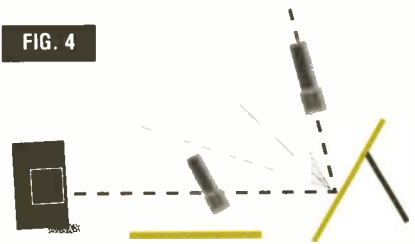
FIG. 3



configuration, facing almost directly at the floor panel, about three times the distance from the diffuser panel as the first mic is from the panel. (In other words, if your diffuser panel mic is eight inches from the panel, this second mic should be about two feet back from the panel, facing the floor). This prevents phasing and comb filtering between mics; a 10–25 ms delay on this second mic can further increase the apparent acoustic size of the room.

This methodology relies on the properties of transducer dispersion patterns, ambient versus direct sound, and natural transfer functions to “cheat” physics into creating the perception of a larger acoustic space through auditory localization. It works simply because we translate delay and ambient sound as cues to the size and nature of the acoustic space — using the diffuser panel in this way creates a longer path for the sound waves to travel, allows the speaker to reach optimum dispersion, and gives the sense of recording the guitar amp in a much larger room

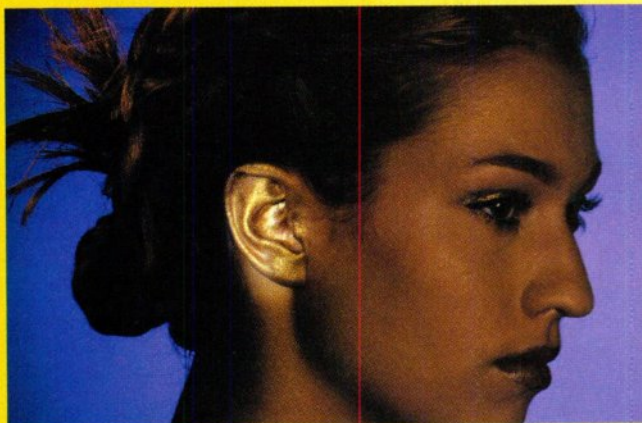
FIG. 4



than actually used. Experiment freely with placement of the panel (I’ve given it a 20° tilt on axis to get further reflections off a long wall, for example) and the microphone. Remember that very slight adjustments in mic placement can yield quite different results, so listen and make those adjustments until you’ve found the spot that’s right for you. The secrets of the universe? Nope. But you will get a pretty darn good guitar sound.

Randy Neiman is an independent audio consultant and engineer living and playing golf in Los Angeles. You can share war stories and golf tips with him at [audioguru@mail.com](mailto:audioguru@mail.com).

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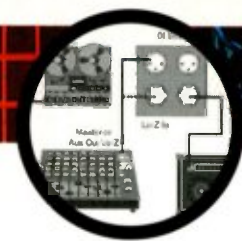
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# 12 Amazing Guitar Recording Tricks

A DOZEN TECHNIQUES THEY DON'T TEACH YOU IN RECORDING SCHOOL

By Jon Chappell

Here is a collection of twelve guitar recording tricks and studio techniques that fall outside the normal or orthodox recording practices.

## 1. WRONG-NOTE REVERB

Here's a neat trick that's subtle enough to turn the heads of the attentive, but won't distract from the musical impact of the primary signal. Start by recording a lead passage onto one track. Then have the guitarist double the line by playing it onto a second track as an overdub, but have him take care not to play it exactly like the original. Allow him to take a few liberties with the tempo, the articulation (where he slides into a note instead of striking it, etc.), and maybe even the choice of a note or two (but have him do this sparingly, as it will come back to haunt you). Then run the second part through a delay or reverb and have only the effected signal sound against the original guitar track.

Typically, you'd use a pre aux send for this. Remember, the "pre" means that the level going out to the aux send jack is not influenced by the channel's fader; it's predetermined at the channel's trim control. Moving the fader up increases the dry-to-wet ratio and moving the fader down decreases it. If you bury the fader on the second, overdubbed track, you're left with just the ghostly effect sound.

This is precisely what we want here. Combined with the original track, but at a lower level, the effect-only signal sounds like "wrong-note reverb," where the effect seems to "misbehave" and deviates slightly from the original signal. This technique is great for atmospheric effects.

## 2. TIME WARP YOUR SIGNAL

One of the coolest, most retro, and loopy effects you can apply to a guitar sound is reverse reverb. This is where the normal life of a reverb signal is played backwards, resulting in a diffuse, distant sound that ends in a giant sucking shoop and sharp cut-off. It's a common setting on many effects processors, and when used in ambient or atmospheric passages, it can be quite effective. But it's even more dramatic when the reverb precedes the original signal. With a simple digital delay, and a separate reverb box that features a reverse preset, you can easily set up a signal path that outputs the reverb before the main signal.

Using two aux sends, feed one line into the reverb unit (set to the reverse setting) and one to the delay (see fig. 1). The idea is to combine the sounds at the output and have the delayed signal arrive after the reverb. Set the delay for a healthy millisecond delay (350 or greater) and set the feedback at 0 (to produce one repeat only). What you're getting then is the exact input signal outputted 350 milliseconds after the original — with no fancy stuff added on. For an even more dramatic effect, use the guitar channel's trim control (the fader's resolution is too fine for this purpose) to mask or roll off the guitar's attack, as this contributes to the psychoacoustic illusion of sound traveling in reverse.

## 3. RE-AMPING FOR FUN & PROFIT

Re-amping is a technique that allows you to take a direct-recorded guitar signal and run it back through an amp and onto a different tape track. Consider just some of the scenarios where it would be handy to get the performance down and worry about sonic niceties later:

- Your guitarist has to leave in five minutes and can't wait around while there's a change of amps, re-miking, and EQ tweak at the mixer.

- You don't have the right amp or mic available for that session, or the one you do have has broken down.

Any of these situations (and others) is a case for re-amping. You can capture the performance through a direct-to-tape recording, and,

at a later time, run that signal back through an amp with the proper gain, mic placement, and board setup — as long as the amp receives a signal that is electronically guitar-like. It doesn't know if it's Jimi Hendrix or an ADAT on the other end. The trick is getting the tape signal to masquerade as an instrument signal.

All that's involved in re-amping is an ordinary, run-of-the-mill passive direct box (also known as a D.I. box). A direct box simply converts high-impedance signals to low-impedance ones and vice versa. What we'll be doing is converting a low-impedance line-level signal to a high-impedance "guitar" signal. From the mixer, take the low-impedance line-level signal via an XLR or 1/4-inch balanced jack and go into the low-Z (XLR or balanced 1/4-inch) of the direct box. Then, on the other side of the box, connect a guitar cord to the hi-Z 1/4-inch jack and hook the other end to the amp's input (see fig. 2).

## 4. THAT DDL CASCADE THINGY

The cascade effect is where your guitarist plays eighth notes and the delay spits back notes of equal-amplitude on the second and fourth sixteenth notes, creating a steady stream of sixteenth

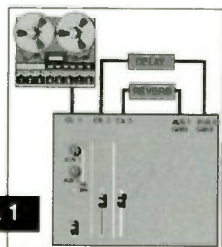


FIG. 1

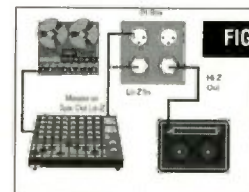


FIG. 2



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**RAISE THE LEVEL**

notes. This doubles the rate at which notes come from the guitar, and you can achieve some spectacular results with this trick. (Van Halen's "Cathedral" from Diver Down is a well-known example.) Best of all, if you do it on the engineer's side of the board, you don't risk your guitarist becoming disoriented by having to learn a new playing technique.

Mathematically, you can calculate how to set your delay just by knowing the tempo. The formula is 45 divided by tempo equals seconds (e.g.,  $45 \div 120 = .375$ , which is 375 milliseconds). Set the feedback (number of repeats) to one, and set the output to match the original signal. Have the guitarist lay down a passage of scalar or arpeggiated

the D found on the second string, third fret, is 293.6 Hz and the open, dropped sixth string D is 73.4 Hz.

## 6. WITH DEEPEST SYMPATHY

You can use a speaker cabinet or a combo amp to excite the strings of a sympathetically tuned guitar (whose pickup output is then fed to a mixer channel) placed in proximity to the speaker. This is a great way to add eerie or ambient effects, especially if the music favors one chord or key. If you're really feeling experimental, create a "prepared guitar" by attaching safety pins, paper clips, and bits of aluminum foil to the strings, so that when they ring, they produce creepy metallic sounds.

## 7. CONTROL ROOM FEEDBACK

Here's a great technique using feedback to increase a guitar's sustain, but where the feedback doesn't get recorded onto a track. Run an unused aux send from your mixer's guitar channel into a smaller amp that you keep in the control room with you. Have the guitarist use the small amp to generate feedback at desired spots during his solos. But don't record the amp. In this way, the control-room amp acts only as a "string exciter" (see fig. 4).

There are two ways to initiate feedback: either by having the guitarist turn the face of the guitar into the amp when feedback is desired, or by having someone actually turn up the amp's volume at the appropriate point in the music. This way an assistant "plays" the amp as the guitarist plays the guitar. Again, no level change will be apparent in the final track, because this amp is not being recorded; it's merely acting as a string vibrator. Have the guitarist and assistant practice with the track until they get their feedback moves down. Even a little feedback-induced sustain will not only enhance the sound, but will inspire a guitarist's performance. There's a lot of magic that happens in that fringe area between crunch and feedback.

## 8. POOR-MAN'S MIXER AUTOMATION

Here's a good trick for MIDI users without a programmable mixer who must mix

multiple guitar tracks and face the problem of noisy channels. You can use a MIDI sequencer to squelch those noisy guitar tracks when they're not sounding and masking the background noise. By incorporating a simple MIDI-controlled volume fader unit, such as the MixMaster by JL Cooper Electronics, you can selectively mute channels at will. Just plug however many channels your volume fader box comes with (eight is typical) into the insert points of your mixer. This allows you to automate your mixer's volume levels through MIDI commands and beats having to put multiple gates on all those noisy guitar channels, or trying to constantly ride the faders and mute buttons.

## 9. SPLIT PERSONALITY

Many guitars come configured with both a piezo pickup and a magnetic pickup system (the Parker Fly, Hamer Duotone, Brian Moore C-90, and Godin LGX are but a few). Rather than blend the sound (which is the most common application), split the signals and process the guitar's piezo and magnetic outputs separately. This presents a more flexible approach to blending and for processing possibilities, but you can actually use the split signal

for a nifty doubling effect: In a rock or electric-blues context, take the magnetic output and run it through a wah-wah, while leaving the piezo

output fairly dry and unprocessed. This will create the illusion of an acoustic guitar doubling the wah part.

## 10. NOISE-ABATEMENT TECHNIQUES FOR SLIDE GUITAR

On slide guitar parts, a metal or glass slide will often make an unacceptable level of noise as the guitarist drags it over wound strings. A little noise is acceptable, but sometimes it gets to be too much, especially if the music is not raunchy and blues based, but more atmospheric and melodic in nature.

Guitar Open-String Frequencies	Frequencies from 5th Str. A - mid. C
⑥ = 82.4	A = 110.0
⑤ = 110.0	A# = 116.5
④ = 146.8	B = 123.5
③ = 196.0	C = 130.8
② = 246.9	C# = 138.6
① = 329.6	D = 146.8
	D# = 155.6
	E = 164.8
	F = 174.6
	F# = 184.9
	G = 195.9
	G# = 207.7
	A = 220.0
	A# = 233.1
	B = 246.9
	C = 261.6

FIG. 3

eighth notes. Then run a tape return of that passage through a DDL with the appropriate settings. (If the tempo is  $q = 132$ ,  $ms = 341$ ,  $feedback = 0$ ,  $output = unity\ gain$ .) Voilà — instant cascade. You can even do this with sequencer tracks simply by copying the original track, pasting it to a new location, and then pushing the copied track to the right the appropriate number of clock ticks (the duration of three sixteenth notes).

## 5. TURNING THE TABLES

Over the years, I've created various tables and charts to make my life a little easier by not having to tax my dwindling cranial powers calculating things I could just find up on my wall. One of the most useful is a chart of the open-string frequencies of the guitar and bass, and a 1-1/3-octave frequency chart of the chromatic scale, starting on the low A string and ending at middle C (see fig. 3). Knowing a musical pitch's frequency allows you to adjust your EQ (parametric or graphic) with a high degree of accuracy and based on the actual musical pitches of your material. Is the open D string on that nylon-string causing runaway feedback? Look at your chart and dial out 146.8 Hz. Remember, an octave, by definition, is half or twice a given frequency, so



FIG. 4



Flatwounds may not have the brilliant character of wound strings, but they are far quieter when moving the slide around. And often a client won't recognize the missing sproing of a wound string, but will freak out if there's a lot of extraneous noise going on ("It sounds like the guitarist is using a hacksaw on the strings!"). A compromise is to use half-rounds, which retain some of the brilliance of fully round wound strings (and sound more "acoustic"), but are not quite as noisy.

## 11. SLIDE POWER

If the guitar drops its low E to D, it can make a power chord (root-5th-root) by fretting straight across the lower three strings. And anything played straight across the frets can be easily executed with a glass or metal slide. For example, in drop-D tuning, playing the 6th, 5th, and 4th strings at the second fret produces an E5 (E-B-E) power chord. Have the guitarist use a slide on power-chord passages to get a super legato sound. Unlike fretting, playing with a slide means the strings never stop vibrating as the guitarist changes frets. Sliding between chords with no break in sound can be especially effective on slower numbers where the portamento (continuous pitch change) is pronounced, and, for faster passages, the sliding sound provides a sort of sonic "glue." Also, a slide lets you create a wider and faster vibrato than is possible with just the left hand alone. If things get too "rattly," try putting on half-round or even flat-wound strings.

## 12. WHO LET THE MOSQUITOES IN?

This trick is not applicable if you're working with a split-signal, piezo-magnetic-configured guitar. But if you don't have a split-output pickup configuration and want to get some acoustic snap from your electric, mic the strings of the electric guitar acoustically. If you're in the control room, close mic the strings of the electric with a small-diaphragm condenser at a distance of only a few inches. You have to be sure there's no other noise, like phones ringing, clients talking, and, of course, control room monitors blaring. Run the miked signal to its own track, and then mix judiciously with the principal electric guitar sound. You'd be surprised how this sound, anemic on its own, adds a whole new dimensionality to the sound when applied judiciously in a mix.

Jon Chappell is the author of *The Recording Guitarist — A Guide for Home and Studio* (Hal Leonard Publishing) — soon to be a major motion picture starring Angelina Jolie.

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CIRCLE 68 ON INFO CARD

# Due Processing

THE INS AND OUTS OF PROCESSING GUITAR WITH PLUG-INS

By Craig Anderton

Electric guitars love processing — even the purists who say “I don’t use any effects, just a tube amp” are taking advantage of the amp’s natural compression, distortion, and speaker cabinet equalization. But, for recording studios, the landscape is changing as plug-ins initially supplement, but sometimes replace, hardware processors. This goes hand-in-hand with two other trends:

**1. Using high-level studio processors instead of guitar FX** — That stomp box reverb sounds fine when you play the local club, but why not patch into a

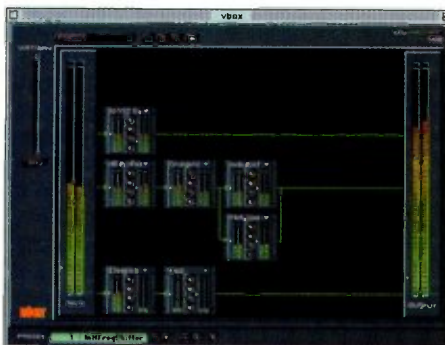


FIGURE 1: VBox from BIAS.

Lexicon, TC Electronic, or similar high-end box — or plug-in — in the studio? Distortion requires a heap o’ DSP, which often doesn’t leave much left for such niceties as high-definition reverb tails.

**2. Re-amping** — As fewer and fewer recordings take place in real time, decisions about tone, effects, and the like are often left for the mixing process, after all tracks are in place and a tune’s direction is finalized. Re-amping records the basic guitar signal direct, then, during mixdown, feeds this into an amp, guitar processor, or whatever is needed to tweak the sound.

However, using plug-ins for guitar processing requires a strategic shift in how you record parts. Here are some tips for maximizing the potential of plug-ins.

## That All-Important Basic Track.

Although some guitarists record a totally straight guitar sound and add all processing later, that doesn’t work for me. If I’m laying down a dirty, fuzzy part, I have to hear that dirt or the part won’t come out right. If you lack the right kind of recording amp (or the right kind of neighbors), a guitar preamp/overdrive device (Pod, J-Station, DG Stomp, V-Amp, et. al.) will do the job if you’re into going direct. When using these, I disable all effects except for compression, which is often an integral part of the basic sound.

Still, I don’t commit to super-dirty parts early on for two reasons. First, it’s easier to mess up a clean part than clean up a messy one. Second, my favorite distortion box remains the multi-band Quadrafuzz, and now that it’s available as a plug-in from Steinberg, I find it ideal for taking a slightly distorted part and making it really filthy. (Full disclosure: I spec’ed the plug-in and receive royalties on it.)

**Parallel Effects.** If you have TC Works’ Spark, rejoice: its FX Machine module is a matrix with a bunch of slots into which you can place VST-compatible effects in series, parallel, or series/parallel. This works with any VST-compatible program, not just Spark, because the FX Machine itself is a VST-compatible effect. BIAS makes a similar plug-in called VBox (fig. 1) that works within other programs, or as a stand-alone processor; both programs are Mac-only.

Of course, with hard disk recording systems you don’t necessarily need a special program to create parallel effects; here’s the workaround.

1. Make two copies of the track you want to process (i.e., you want three versions of the same track).

2. Add one line of effects to one of the

copied tracks. If the effects have wet/dry mix controls, set all of them to wet (processed sound) only.

3. Add a parallel line of effects to the other copied track. Again, set all effects to wet only.

4. Use the original track as your dry signal.

5. Use the software’s mixer to set the correct mix of the three tracks.

There are two reasons for taking this approach. First, putting two identical tracks in parallel could result in tonal weirdness if there are any delays between these tracks as they play back. Even a delay of a few microseconds can be enough to mess up the sound. Second, splitting the tracks allows creative panning options. Start with panning the straight signal to center, one effects chain left, and one effects chain right — but, of course, this is just one of many possible stereo placement scenarios.

**Fun With Plug-In Vocoder.** Regular readers know I like to use guitar with vocoders, but triggering the vocoder with drums and other rhythmic instruments instead of voice. Plug-in vocoders usually let you specify an audio file as the modulator, so it’s easy to try the vocoder effect with a variety of modulators — just select different files and see what happens. This is much faster than patching and re-patching into a mixer when using a standard hardware vocoder. Best of all, you can create “custom modulators” by bouncing tracks. One of my favorites is snare mixed with bass (no kick or other drum sounds) as a sparsely-played, rhythmic bass part, which gives a more “pitched” effect than using a kick drum.

**Preset Management.** Save the various effects settings used in a song. Of course,



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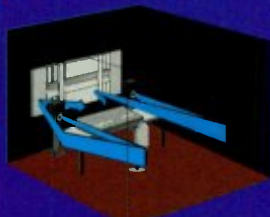
Primacoustic is based on a modular concept whereby precision-cut acoustical absorbers are combined to resolve the four main problems common to all square rooms: The Europa Flutter Wall controls 'front to back' flutter and works with the Scandia Scatter Blocks to reduce standing waves. The Orientique Washboards reduce side wash and powerful primary reflections. The Australis Bass Trap is a corner wedge that tightens up bass and brings balance back into your room.

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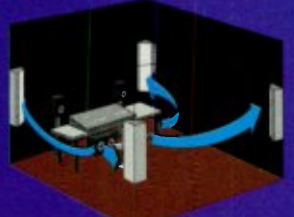
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- 2 **Scandia Scatter Blocks**  
Affordable alternative to diffusion. Keeps room live and reduces standing waves. Over 12 creative patterns to choose from. Prices start at \$100\*.

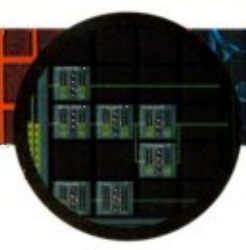


- 3 **Orientique Washboard**  
Absorbs primary reflections and side-to-side flutter. Six creative patterns to choose from. Prices start at \$80\*.



- 4 **Australis Bass Trap**  
Effective down to 45Hz, tightens up bass and reduces smear. Can be used in corners or on walls. Priced at \$100\* each.

\*Suggested US retail price.



saving a bunch of presets is more or less useless if you can't find the ones you want when you need them, so I give presets the same name as the song they're used in. This is because I find it much easier to remember the sound used in a particular song than what I meant by giving something a more "descriptive" name.

**Save, Save, Save.** When you're done perfecting the plug-in's sound, the usual procedure is to "apply" the effects. This edits the waveform destructively to permanently reflect the results of any processing and frees up any DSP power that the plug-ins were using. However, before you hit the "Apply" button, make sure you save a copy of the original, unprocessed track. You never know what the future may bring; with more and more songs being subject to remixing, the remixer might want to start from scratch with the unprocessed track. Or,

after listening to the final mix a few times, you might decide that the chorusing you used really was over the top. A safety copy can save your butt.

**Widen Your Scope.** There are several native plug-in formats, mainly DirectX and VST on Windows, and VST, MAS, Premiere, and RTAS on the Mac; not all programs are compatible with all types of plug-ins. Fortunately, software "wrappers" for both platforms exist that allow programs with limited plug-in compatibility to accept other plug-in types.

**Gimme Pedal!** Okay, so you want to work a footpedal in real time...as well you should, but usually the only way to hook into plug-ins is via MIDI, and even that is not a given.

Nonetheless, if you do use a MIDI-compatible plug-in and need a footpedal, most of the time a synth's footpedal can

be pressed into service. In general, synths I've worked with transmit the footpedal as a controller number, which you can then (hopefully) map to the desired controller number, either at the plug-in or the synth.

As a companion to this article, I've posted a piece in MusicPlayer.com's Recording channel titled "Guitar Processing Step-by-Step." It takes an unprocessed guitar part and shows how, with a few judicious plug-ins, you can turn it into something much bigger and better-sounding. Audio examples demonstrate the difference each additional effect makes.

Craig Anderton is the author of the classic texts *Home Recording for Musicians* and *Multieffects for Musicians* (AMSCO). He maintains the Sound, Studio, and Stage forum at MusicPlayer.com.

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# The Studio Guitar Patch

PAUL OROFINO ON MIXING AND MATCHING GUITAR HEADS AND CABINETS

By Steve La Cerra

"My guitar amplifier rack/shelf is really no big deal," says Paul Orofino, describing the setup he's developed at Millbrook Sound for recording guitars. "It's something that came to me one day after setting up many different amplifiers and heads, and miking all of them for a recording session. It became obvious to me that I could make this process easier and more flexible in a relatively inexpensive manner."

The reputation Paul has developed at Millbrook Sound Studios is based largely upon his ability to get killer drum and guitar tones. "We mostly record heavy rock bands here," he explains, "which require big guitar and drum sounds — so I have set up my facility to do this type of recording very quickly, with no fuss. My guitar amplifier setup consists of nothing more than a shelving unit in my control room, which I built with slots to hold ten amplifier heads. The slots were made in different sizes to accommodate the different-sized heads. Every amp's speaker output is connected to a simple 10x4, 1/4-inch patchbay. Each of the ten jacks on the top row of the bay is connected to the speaker-level output of an amp head. Each of the bottom four jacks on the bay is connected to a breakout panel mounted on the front wall of the studio, underneath the control room windows. Wiring is by Belden, supplied by Redco Audio, Bridgeport, Connecticut.

"During the course of a session," Paul continues, "I will have all four cabinets wired and miked up, some in different rooms or booths. Using the breakout panel, I can easily run a cable to anywhere in the main room or to either of the two iso booths. My standard procedure when recording heavy

rock guitar is to use three mics on a 4x12 cabinet, usually placing one microphone per speaker. The Shure SM57 is always included, along with two newcomers: a Royer R-121 ribbon microphone and the Audix D3 dynamic mic. The Royer gets that beautiful warmth and fatness that only a ribbon mic can capture (in the past I used a Beyer M160, but I got tired of replacing the ribbons when they'd blow out). I think that the Audix D3 is fabulous on rock guitars! The D3 is similar to an SM57, but with a much smoother response and better overall frequency extension.

"At the console, I will blend the three microphones together to achieve the desired sound for that particular guitar part. I recently used this microphone setup while recording guitars with Donald 'Buck Dharma' Roeser, Eric Bloom, and Allen Lanier for the new Blue Öyster Cult release *Curse Of The Hidden Mirror*. We placed four different speaker cabinets (two 4 x12's, one 1 x12, and a 2 x12) in different areas of the studio. One cabinet was set up in a dead iso booth, another cabinet in a live iso booth, a third in our big room, and one more cabinet in a storage room.



PHOTO BY WES BENDER

"On occasion I will also set up an ambient mic to get a little more of the room sound. For that purpose I might use a Neumann M149 tube microphone. When it comes time to mic up, one of our vintage amps or any kind of a small combo amp, I usually use only two of the three previously mentioned microphones for a heavy guitar sound [since most combo amps have only two speakers —Ed.]. But on a clean guitar sound, with a small combo amp, I'll use a condenser mic like a Microtech Gefell UM-70 or a Neumann U 87, U 89, M 149, etc.

"As we start overdubbing from song to song, or part to part, the guitarist, producer, or engineer can quickly use the 10x4 patchbay to mix and match the various heads and cabinets, getting hundreds of combinations in a matter of minutes! This is a very simple setup, but it's just something I thought would help keep the sessions flowing."

As of the writing of this article, the guitar amplifiers in Orofino's rack/shelf include a Mesa/Boogie MK-1, Fender Bassman (blonde), Fender Bassman (black face), Fender Bandmaster (black face), Marshall JTM-45, Marshall JMP-50, Hughes and Kettner Tri-amp, Ampeg B-25B, VHT Pittbull, and a Roland (JC-120) Jazz Chorus.

According to Paul, "These amps are all part of the studio's collection of more than 45 new and vintage model guitar amplifiers. At the start of a session I will ask the artist if they have a favorite head or brand of amplifier, and then we will load the rack with whatever amps they want — including their own amps. This way we're ready to roll, with everything available to us at the start of overdubs! It's really nothing fancy, but a lot of the artists, producers, and engineers that come in and out of Millbrook Sound Studios have told me that I'm the only one with this type of setup. Seems too obvious to be true!" ■

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Paul Orofino may be reached via email at [Millbrksnd@aol.com](mailto:Millbrksnd@aol.com).



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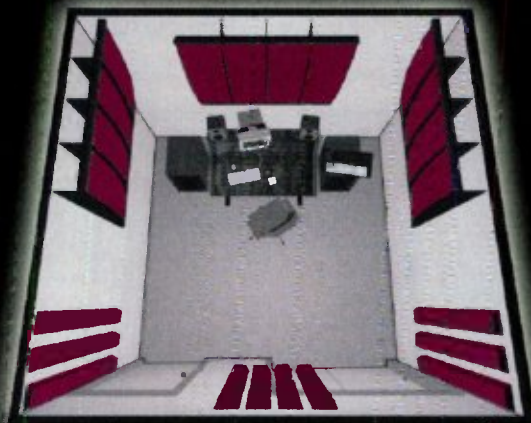
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# Johnson J-Station Amp Simulator

THE VIRTUAL AMP TRAIN HEADS FOR THE STATION

By Mikail Graham • mgrahamEQ@onemain.com

**MANUFACTURER:** Johnson Amplification, 8760 S. Sandy Parkway, Sandy, Utah 84070. Tel: 801-566-8800. Web: [www.johnson-amp.com](http://www.johnson-amp.com).

**SUMMARY:** Useful tonal tool for guitar recording needs.

**STRENGTHS:** Lots of tone possibilities. Three bass amp models. Good effects section. Easy-to-use interface. Digital output.

**WEAKNESSES:** Deep Level editing is confusing and awkward. Amp models could offer better interaction with EQ.

**PRICE:** \$449

**EQ FREE LIT. #:** 116

The J-Station, a smart looking tabletop virtual amp/effects processor, is Johnson Amplification's answer to the Line 6 Pod. It offers more effects, plus a digital output that's useful for DAW users — all at a price that's hard to resist.

## FEATURES, I/O, OPTIONS

Twelve well-known guitar amps have been modeled, including vintage Fender, Hiwatt, Marshall, Mesa Boogie, and Vox guitar amps, three bass amps, including Ampeg SVT, SWR, and Trace Elliot rigs, two acoustic guitar models, two other models that emulate a '60s fuzz tone, and a 1978 Marshall Master Volume. Twelve cabinet emulations offer a wide array of speaker combinations. A compressor, noise gate, delay, and reverb (12 different types) can be used simultaneously along with a choice of one of the following: chorus, flanger, phaser, tremolo, rotary (Leslie speaker FX), auto wah, and pitch/detune.

Outputs include a S/PDIF digital connector (44.1 kHz only), headphone jack, and a stereo analog output and mono

input, plus MIDI in/out (switchable to thru) connectors and a J3 jack. The MIDI out jack doubles as a phantom power source for the optional J8 controller. The J3 has three switches for bank up/down and preset selection, the J8 has eight switches plus an expression pedal for accessing effects such as wah. A Utility mode accesses various parameters such as the digital output level.

The J-Station has considerable editing possibilities using the Deep Level edit mode, but you'll need the well-written manual on hand due to the limited two-character display. The Shift button is a handy feature that toggles between two separate parameters such as with the delay FX where the data knob alone adjusts the delay level and the data knob/shift key combination adjusts the delay regeneration — nice. Also included is J-Edit, a PC-based editor/librarian that simplifies the editing process; a Mac version should be available this summer.

## THE SOUND

I've been a fan of the Johnson Millennium amps since they first hit the street. Perhaps that's why I was surprised that many of the J-Station's factory presets sounded more like an overdone effects box than a modern virtual amp simulator. Having said that, there are some great starting points here for creating your own presets, and, in that regard, the J-Station offers some nice possibilities.

The amp models' EQ functions weren't

as accurate as I expected — the EQ settings didn't affect the sound nearly as much as the real thing. Tweaking the middle and bass EQ of the Mesa Boogie Mark IIC model, for example, certainly made a change, but not the same change as in my actual Boogie amp.

For those who also do bass guitar recording, I'd recommend checking out the J-Station bass amp models. Of the three provided, it was a toss up between the Modern (based on an SWR amp) and the Rock (based on an Ampeg SVT). The Modern has that clear DI sound that's clean and crisp, whereas the Rock has a more throaty sound with lots of punch in the low mids and highs. No matter which you choose, having this option clearly separates the J-Station from the rest of the pack.

## BOTTOM LINE

The J-Station is a powerful guitar/bass recording tool, especially with its built-in effects and digital out. At its current street price of \$149, it's an amazing value indeed.

Mikail Graham is a composer/performer, and a consultant to many audio and software companies.





# Behringer V-Amp Modeling Guitar Processor

IS BEHRINGER'S V-AMP A POD KILLER?

By Mikail Graham • [mgrahamEQ@onemain.com](mailto:mgrahamEQ@onemain.com)

**MANUFACTURER:** Behringer, 190 West Dayton, Suite 201, Edmonds, WA 98020. Tel: 425-672-0816. Web: [www.behringer.com](http://www.behringer.com).

**SUMMARY:** A worthy contender in the virtual amp arena. Am I going to be selling my Pod? Nope, but I'll keep the V-Amp to keep it from getting lonely.

**STRENGTHS:** LED indicators ring every storable control. Aux input. Affordable.

**WEAKNESSES:** Interaction between amp models and EQ controls could be better. No power switch.

**PRICE:** \$269

**EQ FREE LIT. #:** 117

Behringer has a reputation for taking an existing idea, expanding upon it, and most often selling it for less money, which is certainly the case with the V-Amp. At first glance it looks like a Pod knockoff in a blue plastic guitar-shaped body, but, on closer inspection, I found it to be much more than that.

## THE VIRTUAL TOUR

The V-Amp is made up of ten knobs, nine buttons, a two-character LED,

mono in, stereo line and headphone out, aux input, footswitch jack, MIDI in/out, and an aux level control. A ring of LEDs surround each knob (except the Master volume), indicating its parameter's exact position. A stereo aux input with level control for playing along with a drum machine or CD player spares the cost or need of a separate mixer. A cool gig bag is included, and having 125 preset locations (plus lots of great starter examples) with access to any five without having to change banks is handy. Behringer called on Procol Harum's Geoff Whitehorn and Saga's Ian Crichton to create some of the variety of presets.

## SOUNDINGS

The V-Amp sounds quite good. I found the presets to be a bit biased toward heavier distorted rock, yet with good bite and enough crunch for most any recording project. Fifteen speaker cabinet models offer choices ranging from a single eight-inch Vintage Tweed to a 4x10-inch to a custom 4x12-inch configuration. The 16 amp models range from classic amps such as a Fender Bassman 4x10-inch combo to newer hotrod amps such as the Rectified Hi Gain (a Mesa/Boogie Dual Rectifier), and custom models such as Fuzz Box offer more grunge-type tones. However, I didn't find much interaction between the amp models and the EQ. The V-Amp models

deliver a good range of choices, making them a great solution for recording needs.

Ten multieffects are included, with my favorite being the punchy auto wah. Three types of delays are provided: analog tape, tempo-based, and ping-pong. Six "combo" variations such as flanger and delay, phaser and delay, chorus and delay, and chorus and compressor help expand the possibilities. Nine reverb types offer a good range of in- and out-of-this world tonalities. Last in the effects line-up is a very musical sounding noise gate. The included footswitch can select any five presets from the current bank or access the chromatic tuner. A copy of Emagic's SoundDiver editor librarian is available optionally for saving and loading of presets on a Mac or PC. An optional FCB1010 MIDI foot controller is also available, which includes two expression pedals. Don't expect a very detailed manual, as it is basic info at best and could really use a good tutorial section.

## REALITY CHECK

As a direct-recording tool, the V-Amp is almost perfect, though a digital out and a power switch would be nice. When compared to the Pod and its 32 amp models, the V-Amp's 16 feel just a bit lacking. Yet looking at its expansive feature set, low price, and included footswitch and gigbag, I'd say Behringer clearly has a winner here.

Mikail Graham is a composer/performer, 23-year veteran producer, and host of a weekly radio show called *The Other Side*, which can be heard at [www.KVMR.org](http://www.KVMR.org).





# Fender Cyber-Twin Variable Topology Guitar Amplifier

CAN VIRTUAL TONE INTERPOLATION GET THE TONES YOU NEED?

By Mitch Gallagher • mgallagher@uemedia.com

**MANUFACTURER:** Fender Musical Instruments, 7975 N Hayden, Scottsdale, AZ 85258. Tel: 480-596-9690. Web: [www.fender.com](http://www.fender.com).

**SUMMARY:** An excellent guitar amplification system capable of re-creating many desirable vintage and modern amp tones.

**STRENGTHS:** Authentic-sounding amplifier re-creations. Many excellent presets. Motorized knobs. Easy to create and edit presets. Musical-sounding noise gate. Stereo line outputs. Digital output. Extensive MIDI control. Good built-in effects.

**WEAKNESSES:** No mute switch for speaker outputs. No external speaker outputs. No word clock input. Output level of line outs is anemic. Line outs and digital out sound "direct."

**PRICE:** \$1,699.99

**EQ FREE LIT. #:** 125

Most studios own at least one guitar amplifier for use by their clients — or even a large collection of amps designed to provide a broad tonal palette for their clients to draw from. This can get expensive, plus it can be a pain to maintain and store all those amps. Wouldn't it be cool if you could find one amp that could convincingly re-create the tones of all those other amps? As you know if you've glanced through this issue, a number of manufacturers are offering solutions to this; now veteran guitar and amp manufacturer Fender has thrown their hat in the ring with the new Cyber-Twin combo amp. Let's take a look at how it holds up as a guitar-recording tool.

## ROBOT IN A BOX

Unlike virtually all of the competition (no pun intended), the Cyber-Twin doesn't

use DSP to "model" the response and tonal characteristics of other amplifiers. It uses Virtual Tone Interpolation, which is a fancy way of saying that it literally reconfigures itself to have similar circuits and component values as the amp it's re-creating. All of this is under the control of DSP, but the actual tone generation is accomplished with preamp tubes and analog circuitry (the stereo 65-watt power amp is solid-state).

Other capabilities are added that allow the amp to emulate different speaker cabinets — the amp has two Celestion 12-inch speakers in an open-backed cabinet. For example, for some small cabinets, the two speakers are thrown out of phase. This can lead to weirdness when you're miking the amp; I had best results using two mics, one on each speaker, even when I was after a mono result. There's no way to plug in external speakers, so I couldn't, for example, use my real Marshall 4x12 cabinet with the Cyber-Twin's Marshall amp re-creations.

## COOL FACTOR

The most eye-catching thing about the Cyber-Twin is its row of motorized front-panel knobs. As you change presets, the knobs move to the appropriate setting automatically. Fortunately, the preset changes instantly, so there's no lag while the knobs catch up. You can grab a knob as it turns if you feel the need to make a change.

The amp has built-in digital effects, which cover all the bases

normally used for guitar, such as reverbs (11 modeled types, including vintage spring types), various delays (with tap tempo), tremolo, phaser, chorus, flange, touch wah, pitch shift, and ring modulation. These all sound fine, especially those that emulate vintage effects, such as the tape delay, the tremolo circuits from various Fender amps, and so on. Also included are a guitar tuner, a compressor, and a very unobtrusive noise gate.

Editing the effects and amp presets is simple; there's a 40-character LCD, a data wheel, and Amp Edit and FX Edit modes. I was able to create and modify presets even before cracking the excellent manual. A four-button footswitch is provided, or you can use MIDI to select presets and for control over an assignable parameter or for recording knob movements into a sequencer.

## IN THE STUDIO

As a guitar amp, I was very pleased with the Cyber-Twin. The amp re-creations are excellent; I started to compile a list of my favorites from the 85 permanent presets (there are also 85 user presets available), but the list became too long. The



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amp is capable of ranging from twangy vintage tones to thick, singing tones such as "Think Floyd," to gritty Americana-tinted tones such as "Tex-Mex," to modern, high gain sounds. The 35 amp types are also stored as dedicated presets; you can call up a '49 Champ, a '68 Vibro Champ, or a '65 Twin Reverb, as well as newer amps such as a '96 Hot Rod Deville, a Sunn Model T, a Vox AC30, Mesa Boogie Dual Rectifier, or one of several types of Marshalls. These straight amp tones were some of my favorites in the Cyber-Twin.

However, as much as I liked the Cyber-Twin as a guitar amp, as a direct recording or reamping tool, it falls down in several areas. First, you can't turn off the speakers — the only way to disable them is to plug-in a set of headphones. This would be fine, except that the output of the XLR stereo line outs is so anemic that I generally had to run the amp on

"10" to get a decent level into my Pro Tools rig, which made the headphones loud enough to be easily audible in the control room. (Fender's suggested alternative is to use a 1/4-inch dummy plug inserted in the headphone jack.)

The stereo coaxial S/PDIF output also suffers from some shortcomings. First, there's no word clock input. I don't know about you, but the thought of clocking my Pro Tools rig off of the clock in a guitar amp makes me cringe. Second, the tone of the digital out, like that of the line outs, leaves something to be desired. It sounded direct, rather than like a miked speaker. I also had a problem with digital distortion on peaks in the S/PDIF signal; after a great deal of experimentation, I could only ascribe this to the converters in the Cyber-Twin. (Fender tells me this will be fixed in the next software revision.) Finally, it would be nice if Fender would spec the digital output; there's no indication of sample rate or

bit resolution given anywhere. (The company verified that the S/PDIF resolution is 44.1 kHz/24-bit.) Lest you think the S/PDIF out doesn't have its cool points, a big bonus is that it can be switched to carry the direct (dry) guitar signal, without any amp tone or processing. This is great for reamping applications.

Of course, there's an easy solution to all of these complaints: Stick a mic or two in front of the amp and record it the old-fashioned way. This works great — although you do have to watch for presets with out-of-phase speakers, as mentioned earlier. Used in this manner, the Cyber-Twin is a solid winner. It's more real feeling and sounding than many of the "modelers" out there, plus any guitar players coming into your studio are more likely to feel better about plugging into a real Fender amp than into a little box or rack unit. And don't forget about those cool motorized knobs.... ■

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Here are a few of the innovative software developers who offer support for the US-428. Cakewalk, Sonar and more virtual synth support coming soon. See the TASCAM web site for the latest info.

CIRCLE 58 ON INFO CARD

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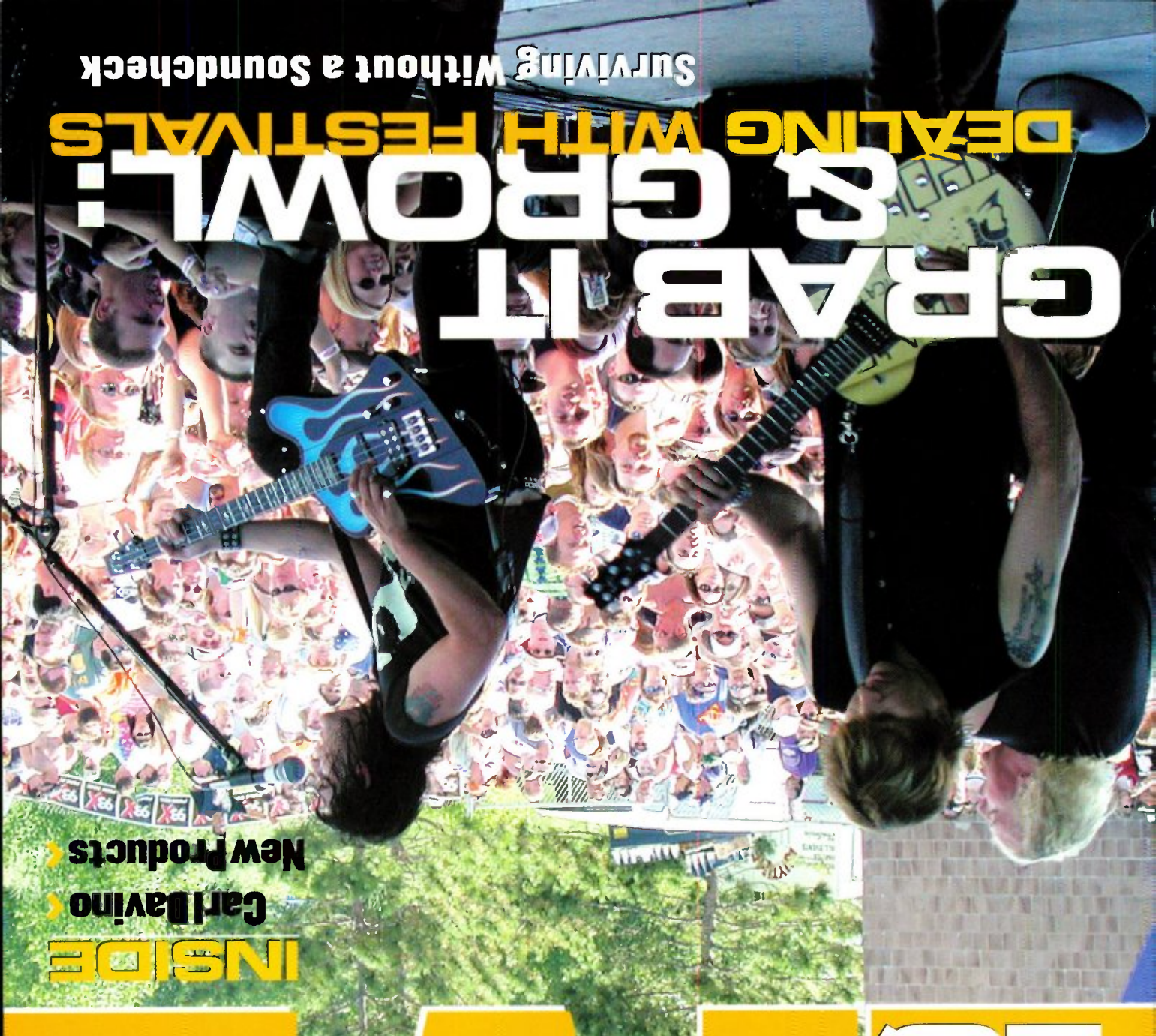
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World Radio History







Surviving Without a Soundcheck

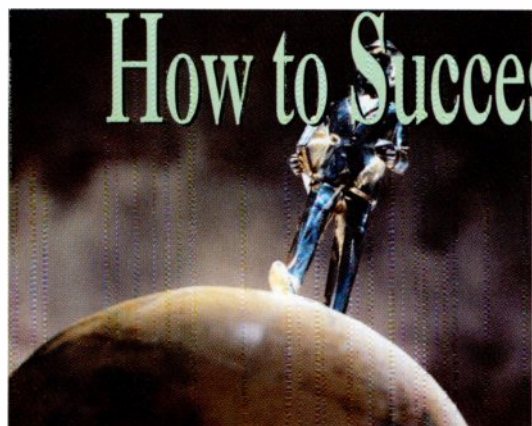
# GRAB IT & GROWL: DEALING WITH FESTIVALS

**INSIDE**  
Carl Davino  
New Products

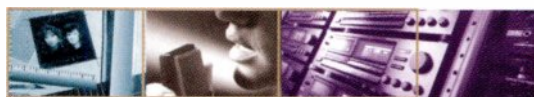
# FM



Some thoughts from Oasis Duplication:



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1. THINK "RETAIL-FRIENDLY" WHEN PACKAGING YOUR CD. Your CD needs to look as good as it sounds. Here are a few tips to help you get your project in the door and onto retail display shelves. **Affix top spine stickers** to your packaging, just like the major labels do. (A top spine sticker is the strip of white tape along the top of a CD package that displays your name, album title and bar code number.) Order a bar code for your CD. (Oasis offers free bar codes to our clients.) **Make sure the packaging fits in standard-size CD holders and displays.** (All of Oasis' eco-packaging—except the unique Rough-Look—fits into standard displays. What's more, we give you ten retail-ready counter displays with every CD duplication order.)

2. MAKE THEIR EYES POP! To create the most eye-catching package you've ever seen, substitute Oasis' exclusive aluminum-coated jewel-box trays for standard jewel-boxes in your packaging design plans. Your CD will practically pop off the shelf!

3. CONSIDER ALTERNATIVES TO THE JEWEL-BOX. The cardboard packages recently developed by Oasis can give your product a unique and eye-catching appearance. The Oasis Jewel-Free™ Box (six graphics panels of cardboard plus a patent-pending tray), the Oasis Rough-Look™ (funky brown, very-recycled cardboard), and the Oasis Soft-Spot™ (an unprecedented EIGHT graphics panels of cardboard plus a hexagonal hub to hold the CD securely) are three of the top alternative eco-packages offered in the industry.

4. CONSIDER UPGRADING TO AUDIOPHILE-QUALITY GLASS CUTTING. Glass cutting is a critical step in CD replication, and many experts and "golden ear" listeners believe that using direct, single-speed glass produces the highest level of audio integrity and the best fidelity. Oasis offers the standard high-speed glass (which is the only type of glass you can get from any of our major competitors) at no additional charge, but will also—for a modest fee—upgrade your project to direct, single-speed glass. (If you choose single-speed glass, be sure to let people

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CIRCLE 92 ON INFO CARD

# Soundcheck? What's that?

Running live sound at a music festival or similar event where multiple acts share the same stage and sound system can be a serious challenge. You have to work fast, be efficient, organized, and accurate, and be able to deal with a variety of personalities and pressures without losing your cool. Oh, and you'll rarely get the luxury of a soundcheck — but who needs one, right? Flying without a net is what makes a live sound engineer's job so interesting....

These days it pays to be prepared for festivals and other similar gigs, such as short tours and "one-off" events. In fact, in a recent conversation with the owner of a major national sound company, I was told that one-offs and special events were a large — and growing — portion of his company's business. While the larger acts continue to mount major tours around the world, many smaller acts are doing shorter tours or special one-night appearances at various venues, often in conjunction with several other acts. There have also been a number of recent short "special appearance" tours by non-music acts (a large purple dinosaur comes to mind), as well as an increase in certain types of corporate events. All of these gigs require a different approach to live sound than a traditional touring concert gig.

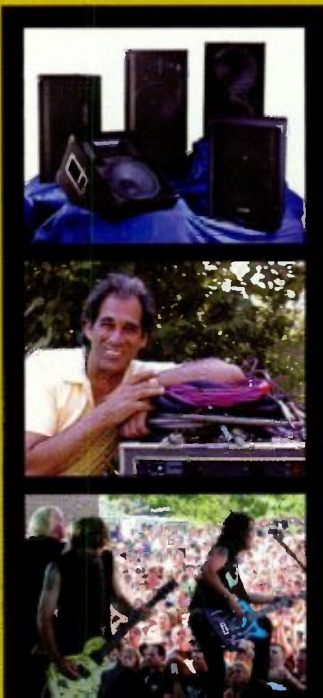
If you're finding festival sound reinforcement a challenge to deal with, check out "Grab It and Grow!" on page 106. EQ Live editor Steve La Cerra has become the master of one-off, festival and short tour gigs in his role as FOH engineer for classic-rock stalwarts Blue Öyster Cult. Put his tips and tricks to work, and your next one-off will happen much more smoothly!

Enjoy the issue, hope to see you at Summer NAMM in Nashville later this month.

—Mitch Gallagher  
mgallagher@uemedia.com

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# EQ LIVE: NEW PRODUCTS



## TELEX COMMUNICATIONS

**THE PRODUCT:** Telex Communications UT-102

**THE BASICS:** Plug-on transmitter for ENG-100 UHF receiver

**THE DETAILS:** Want to use your old reliable mics for wireless applications? This device gives engineers the ability to convert standard wired dynamic microphones into wireless-capable transducers. It comes in the form of an all-metal alloy plug-on that also provides +6-volt phantom power and operates on a 9-volt battery. Providing a frequency response of 50 to 15,000 Hz with less than 2% THD, the UT-102 matches two channels on the ENG-100 receiver. It lists for \$1,080.

**CONTACT:** Visit Telex Communications at [www.telex.com](http://www.telex.com). Circle EQ free lit. #118.



## COMMUNITY XLT500

**THE PRODUCT:** Community XLT500 Series

**THE BASICS:** A line of multi-application loudspeakers

**THE DETAILS:** Community has just added five new products to their XLT500 Series. These include stage monitors (the XLT502 and XLT505), a compact, dual-15 inch subwoofer (model XLT509), a three-way, bass reflex trapezoidal enclosure that is well suited for mobile PAs (model XLT530), and a trapezoidal three-way device also well-suited for mobile PA situations (model XLT525). Suggested retail prices for the new XLT500 Series components begin at \$779 (model XLT500) and run up to \$999 (model XLT525).

**CONTACT:** Visit Community at [www.loudspeakers.net](http://www.loudspeakers.net). Circle EQ free lit. #119.



## JBL MPRO 200 & 400

**THE PRODUCT:** JBL MPro 200 Series and MPro 400 Series

**THE BASICS:** Two lines of sound reinforcement speakers

**THE DETAILS:** These two-way, full-range speakers (with the exception of subwoofers) feature SMC Laminar Flow Baffle, which integrates horn, ports, baffle, and woofer mounting in one piece. The 200 series offers the MPro MP215 (15-inch two-way speaker system) and the MPro MP255S (dual 15-inch subwoofer in dual-tuned, band-pass enclosure). The 400 series offers the MPro MP410 (10-inch two-way speaker system), the MPro MP418 (single 18-inch, compact bass-reflex sub), and the MPro MP418SP (powered single 18-inch sub in bass-reflex cabinet with Crown amplification).

**CONTACT:** JBL at [www.jblpro.com](http://www.jblpro.com). Circle EQ free lit. #120.



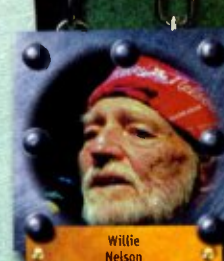
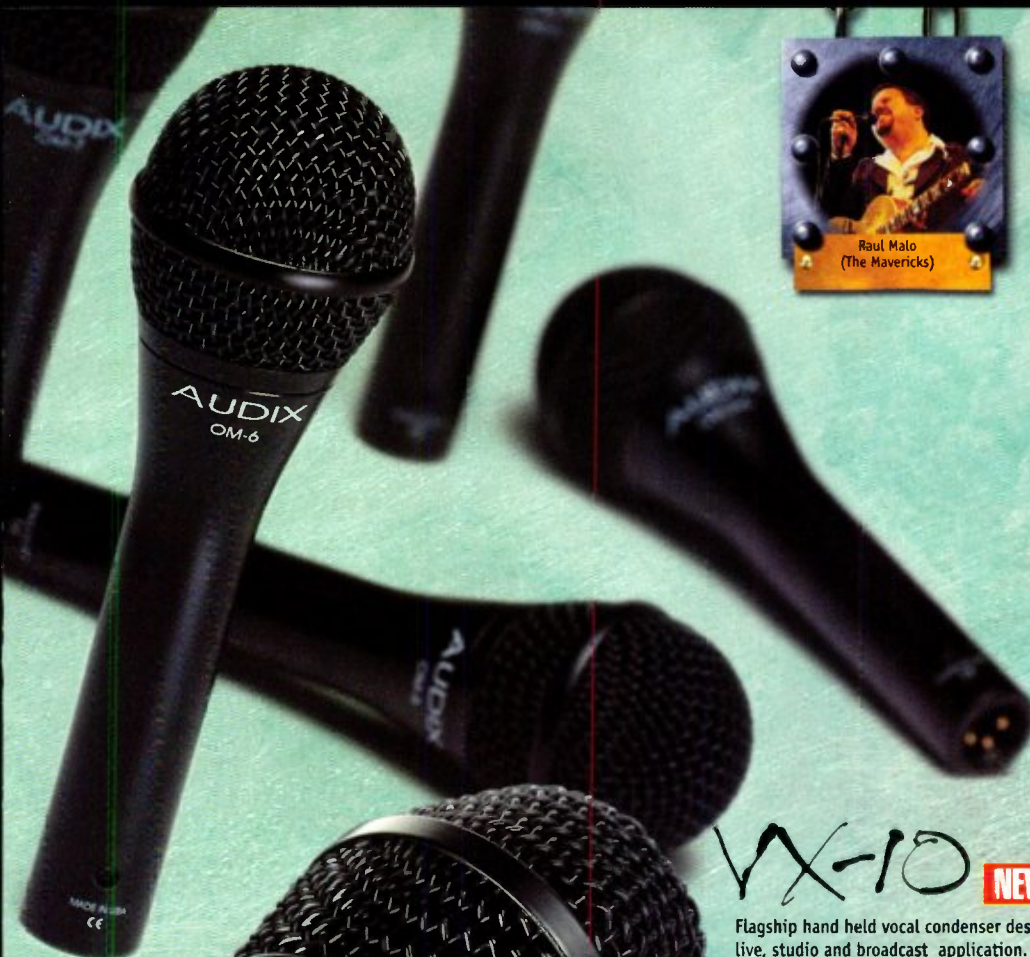
## DPA 4066

**THE PRODUCT:** DPA 4066

**THE BASICS:** Adjustable Miniature Microphone Headband

**THE DETAILS:** DPA's new flexible 4066 headband microphone headset takes the convenience of the 4065 headband microphone (designed for single users) a step further with increased flexibility, allowing multiple users of the headset to quickly and easily adjust the 4066 to their specifications. It utilizes a prepolarized, omnidirectional cartridge element with a 5.4 mm diaphragm. The variety of connection adapters allows the 4066 to be usable with most professional wireless systems. It lists for \$549.

**CONTACT:** Visit DPA at [www.dpamicrophones.com](http://www.dpamicrophones.com). Circle EQ free lit. #121.



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# CARL DAVINO

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**RANK:** Front of house engineer

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**PRIOR ASSIGNMENTS:** Prince, Cinderella, Sophie B. Hawkins, Megadeth, White Lion, Danger Danger, The Replacements, Giant, Saraya

**TRANSPORT:** 12-space, shock-mounted rack

**HARDWARE:** Furman PL-8 Power Conditioner, ART DMV-PRO, Pro-VLA, Tube Channel [2], Dual Levelar; Roland DEP-5, Yamaha SPX90 II, Valley People Dynamite, Gatex; 1/4-inch patch bay in rear of the rack

**CABLING:** Whirlwind

**COMMENTS:** "The three cardinal rules to live sound are consistency, consistency, and consistency," says engineer Carl Davino. "The band hires you to make them sound consistent. As long as it's not consistently *bad*, then you're okay!," he laughs. "That's why I carry my rack with me. We do a lot of fly dates, so rack space is prime real estate. I need to get the most out of what I'm carrying. That's one of the reasons I like the ART DMV Pro. It's a true-stereo, 24-bit processor in a single rackspace with separate inputs and stereo outputs for each engine. I'll use the DMV processor along with the Roland DEP-5 for drums. I set the DEP-5 to a nonlinear, gated reverb. Then I'll set the one of the DMV Pro processors to a plate program, and add the plate reverb on top of the gate so it doesn't sound like a hard-gate program. Sometimes I'll use a prede-

lay to imply a larger room, then have the plate do the tail on the reverb. It gives the drums some size. You can also add a little to the guitar or even the vocal, depending on the song.

"I return my effects to input channels (instead of dedicated stereo returns) so that I can send the return of one effect into another effect via aux send. I get the gated sound coming back from the DEP-5 into a channel, and then use an aux to send the DEP-5 into the DMV for the plate sound, giving me infinite control over how much of the gate goes to the plate. I try to make the band sound coherent — not like the drums are in Madison Square Garden and the guitars are in a club.

"I use a small rack because that's all I trust for a fly date. I definitely believe in shock-mounted racks. Even if you've seen airlines handle your luggage, you *still* won't believe what they do with your gear (oops...there go the tubes!). In this case, the entire inner rack is surrounded by foam. When only the rails are shock mounted, they usually loosen and they really don't protect the entire unit. If someone puts the rack down the wrong way, you get a bent faceplate because the rails don't support the whole rack unit. The rack within a rack is much safer.

"In the back of the rack is a 1/4-inch patchbay. I carry four looms for patching my gear into whatever console I have for the day. One loom is 1/4-inch to 1/4-inch — for consoles that don't have XLR connectors for the effect sends. This loom does double-duty on pro consoles where the insert sends and insert returns are on separate jacks (a console that has XLRs for the effect sends/returns usually also has separate 1/4-inch ins and outs for the insert points). I also have a loom with the typical TRS-to-dual-1/4-inch TS for consoles that have insert send and return on one jack. Finally, I have two XLR looms — male and female to 1/4-inch — to coincide with my patchbay. From the four looms, I can get configurations to accommodate any situation.

"All the looms are 20 feet long, because you *know* that on a club gig you're going to have to wrap the looms around the waitress station to reach the effects rack! Reminds me of that gig I mixed from behind the bar where I could actually pour myself a drink...." ■



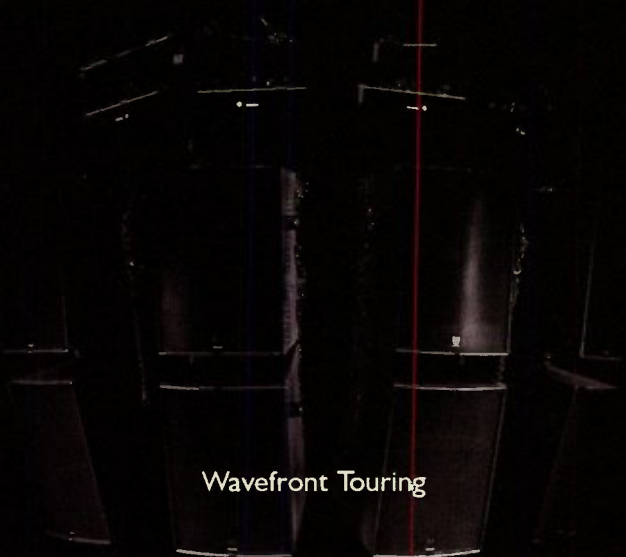
## WEBLINK

Contact Carl Davino via email at [Carlwine@mhonline.net](mailto:Carlwine@mhonline.net).

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'Ode' (1874)

Poet, Arthur O'Shaughnessy



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CIRCLE 64 ON INFO CARD

BY STEVE LA CERRA

# MASTERING THE ART OF “GRAB IT AND GROWL”

## A NO-NONSENSE ENGINEER'S SURVIVAL GUIDE TO SUMMER FESTIVAL TOURS AND LIFE WITHOUT A SOUNDCHECK

Ah, the wonders of the summer touring season. Outdoor shows, fans taking their clothes off, multi-stage festivals with ten acts on a bill. Oh joy. Hectic tour schedules and multi-act shows — often with co-headliners — leave little or no time to soundcheck. Add to this the fact that most support acts don't have the luxury (read: budget) to carry production, and you have what I call “grab it and growl” — you take what you get and do your best under the circumstances. In light of the fact that even headliners get limited set times, you've got to dial it in quick. Here's some tips to help under battle conditions.

### PREPRODUCTION

Advance the show with whoever is supplying PA to reduce incidents of surprise. Advancing also allows you to spot potential problems (such as not having enough cabinets to cover the area) and notify management before it's too late. Find out what kind of desk is being supplied. In the event it's a desk you've never run before, a call to a manufacturer or a visit to their Web site might get you a manual.

Ensure that the sound company has the correct input list as soon as you arrive on-site. At four of the last eight shows I've done, six-year-old stage plots and input lists showed up. Don't assume that the band's management has incorporated your input list into their rider. Carry extra copies of your requirements at all times.

### COMMUNICATION IS KEY

Insist on having talkback from FOH to the stage. Given the fact that many festivals are on a tight schedule, every minute of changeover time is precious. Carry two-way radios to circumvent problems with talkback. I've been using Motorola Talkabouts, but so have a lot of other people, making it tricky to find an open channel. This is a viable communication alternative to talkback, so you can make sure that the lead vocal isn't coming down the channel labeled “triangle.” Don't laugh. (Okay, laugh a little.)

Talk about monitors when the monitor engineer is not busy (doh!). Let them know what instruments are needed in each musician's mix, as well as what each musician does not want to hear in his or her mix. Write up a chart showing these requirements. Identify the name and position of each person in

>>>>>



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CIRCLE 88 ON INFO CARD

# MASTERING THE ART OF “GRAB IT AND GROWL”

the band, assign a number to their monitor mix, and then list the input(s) that go to each mix. If you're carrying your own mics, inform the monitor engineer of this before they ring monitors. Also, let them know if a musician wants

are poorly lit, making it difficult to ascertain status in daylight.

- Turn off all mute groups and turn on the L/R master fader.
- Set all VCA and audio subgroup faders to their nominal level, whether



one or two wedges at their position, because this can have an effect on the way wedges need to be EQ'd.

## USE YOUR EYES FIRST

When you run into an unfamiliar console, certain features need quick attention. Forget about tweaking the EQ on that triangle mic for now (it's coming down the channel labeled "lead vocal" anyway) — go for the important stuff first and fine tune later. Here are a few things to examine when you step up to the desk:

- Look for channel numbers on the desk. Can you read them or have they been covered with board tape? Can you read the handwriting on the board tape identifying each input? Make certain there's board tape at FOH for labeling purposes. Little stuff like this becomes huge when all of a sudden your vocal channels are not patched in the same order as your input list.

- Find the mic/line switch, trim control, and L/R assign switch. Check status of these switches and be sure all channels in use are assigned to the L/R bus.

- Determine if channels are switched using mute or on/off switches. Pay particular attention to consoles with soft-touch mute switches. Some of these

you think they're being used or not. You may not have time to check VCA and audio subgroup assignments before the start of the first song. Let's say a vocal channel has been assigned to VCA 6 by the previous engineer, and that VCA 6 is down all the way. You might be pushing the channel fader around, expecting to hear this vocal — but, due to the fact that the VCA is shut down, you won't hear anything at all. By setting all VCA faders to their nominal level, you ensure that the VCAs are electronically transparent to your mix process. At least you'll be able to start mixing the show from the channel faders. After you have roughed in a mix, you can always re-assign channels to the VCAs per your preferences on the fly, or between songs. Ditto for the audio subgroups assignment.

## PAINT BY NUMBERS

Ask the systems engineer which input channels have processors patched in, and label them. A compressor labeled with useless information such as "Joe Vocal" doesn't help when no one in your band is named Joe. Write the channel number on the processor and vice versa. While you're at it, engage the insert switches (I knew I wasn't

hearing that compressor — maybe because the insert was bypassed). When you're labeling your comps and gates, eyeball the bypass switches and the stereo link switches commonly found on many two-channel processors. There's nothing worse than having the compressor on a lead vocal slave to the bass compressor next to it (okay, there is something worse — but don't bring my ex into this).

Identify all effect sends and their physical layout. Don't assume that a console's effects sends are numbered with send one at the top. Some desks have "send one" at the bottom of the channel. Label each rack effect with the number of the send that is feeding it, and make sure there aren't any bizarre delay times or reverb decays left over from the previous act.

If you have song-specific delays or other "gags," such as pitch shifts or long reverbs, program them before your set while other acts are changing over. That's a time when you can noodle at FOH without getting in anyone's way. Ask the other engineers if they've written programs in the unit that you want to use, and write your programs to different memory slots.

Some PA systems are set up so that an aux send feeds the system's subwoofers. Typically it's the highest-number send. If your system has been patched like this, find the kick drum, rack tom, floor tom, and bass channels, and set the subwoofer aux knob to nominal ASAP — before you've started line-checking channels. You don't want to start looking for a problem with the system's low end when, in fact, you just need to feed a signal to the subs. Sounds like basic stuff, but, when you're under the gun, it makes a huge difference.

In addition to being *EQ's* senior editor, Steve La Cerra is the front-of-house engineer for Blue Öyster Cult. They will be on tour this summer in support of their new CD, *Curse of The Hidden Mirror* [Sanctuary, 2001], grabbing it and growling the entire way.

## WEBLINK

Steve may be reached via email at [slacerra@uemedia.com](mailto:slacerra@uemedia.com)

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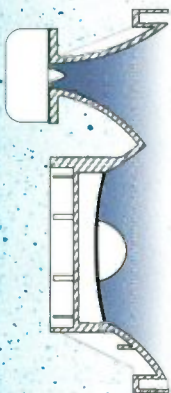
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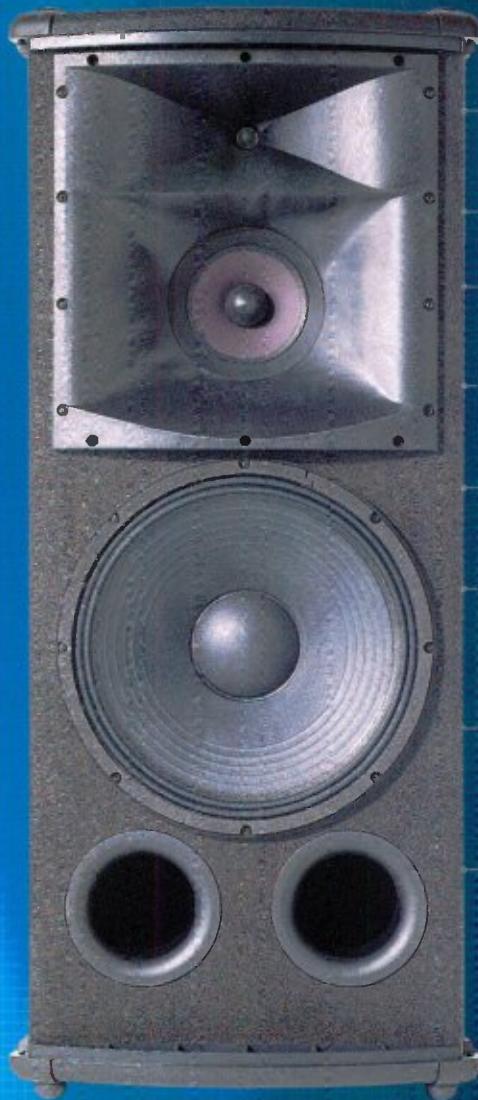


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included, with up to four definable paths to find them, although no support is offered for TDM plug-ins, which would make a great addition for Pro Tools users in a future version. Multiple plug-ins can be assigned to individual regions or to the entire mix. And by using the Plug-In Manager, presets for each plug-in can be saved and loaded, making it easy to use settings from one project in another.

It would be very useful if WaveBurner Pro was compatible with the integrated plug-ins included with Logic Audio, as there are some real gems there that could be of use. But, still, the seven plug-ins that do come with WaveBurner Pro are certainly useful audio tools.

#### CREATING CDS

WaveBurner Pro will create Red Book-compatible CDs up to 80 minutes long, let you add UPC/EAN and copy protection codes and ISRC numbers, and has useful features such as pre-emphasis or frame offsetting for CDs being played on older-model CD players. Perhaps one of the most underrated yet useful features is support for CD Text. This includes the CD or album name, track names, and artist-related information. All of this information shows up within the display of a supported player — you gotta love that! Disc At Once mode is supported, as is session burning for Hybrid CDs that include data other than audio, though WaveBurner Pro does not offer any computer data burning tools itself. A variety of both SCSI and forthcoming FireWire CD burners are supported (see Emagic's Web site for the full list).

Recording new audio directly is a great feature that saves you the time of having to open yet another application and is automatically appended to the end of the current list. Assembling tracks is done within the list window by dragging into the order you choose. As I mentioned earlier, the waveform editor really separates WaveBurner Pro from the rest of the pack, allowing for easy graphic-based editing and viewing of audio tracks, as well as real-time visual crossfades, which are truly a godsend at this stage of CD creation. All you need do is drag a mono or stereo pair of tracks either left or right in relationship to the adjoining tracks and, bingo, you have a crossfade. The curve of

the crossfade, or just a plain fade in/out for that matter, can be easily adjusted, plus tracks can be cut, trimmed, or duplicated. You can freely change the start/end time graphically or numerically. The entire disc, or even individual tracks (new in version 2.01), can be quickly previewed with the press of a key using pre/post roll settings stored in the preferences section.

If your Mac can't keep up with its DSP processing chores, just use the bounce function. Three types of bouncing are offered: *Save As Disc Image* writes a new file, including markers and all plug-in effects, and is automatically opened as a WaveBurner Pro document ready to burn to a disc. *Bounce To Disk* is essentially the same thing but doesn't include the pause from track one that must be added manually. And *Bounce Region To Disc* does just that, but doesn't include any plug-ins assigned to the mix path, only those assigned to the region itself. Automatic peak detection (a user preference) is a nice touch when creating a disc image, as it will stop the process and alert you so you can correct an error before burning a proverbial coaster. You could also insert a Levelmeter plug-in, which clearly indicates if any audio is clipping, and then use a volume plug-in to adjust the level of an individual region.

#### THE FINAL WORD

WaveBurner Pro is clearly the application of choice for what many consider to be an almost trivial task these days. The manual is written for new users and tweakheads alike, with useful tutorials, though it does lack the list of supported CD burners, as Emagic wants you to go to their Web site for this info. I did find some rough edges such as using the Direct I/O EASI driver, which currently doesn't allow monitoring until you first enter record, making it rather hard to check your source level and cue points. I also encountered an odd extension conflict I have yet to track down that causes any new recording's waveform not to be drawn when using this same Direct I/O EASI driver. Emagic has assured me a fix is in the works for a future update.

The really great news is the addition of FireWire support, which adds a fairly large list of supported burners and should be available by the time you read this. ■

# RAVE REVIEWS

*The Røde NT1000 Launches With Rave Reviews*



"...the lowest noise floor you can get."

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- Bruce Richardson

Bruce Richardson - ProRec Recording Magazine  
The complete review is available at [www.prorec.com](http://www.prorec.com)

"The U87i was woolier, the NT1000 clearer and slightly brighter. Over time, I became bothered by the self-noise of the U87i, because it veiled the low-level detail that was audible with the NT1000 and NTK."

"In every situation, both the NT1000 and NTK had lower self noise than either U87."

- Ty Ford

Ty Ford - Mix Magazine  
The complete test report is available at [www.mixonline.com](http://www.mixonline.com)  
and in the June 2001 issue of MIX magazine.

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World Radio History

# MOTU I296 High-Resolution Hard Disk Recording System

Mark Of The Unicorn makes the move to 24-bit/96 kHz

Mark of the Unicorn's 1296 is a computer-based hard disk recording system for Mac OS and Windows 95/98/2000. It's capable of 16-, 20-, or 24-bit recording at up to 96 kHz. It offers 12 simultaneous +4 dBu XLR input and output channels from its two-space, 19-inch rackmountable I/O unit, connected via AudioWire to the PCI-324 card, which mounts in a PCI slot in your computer.

Included in the core system are a 1296 I/O rack unit, a PCI-324 audio card, a 15-foot AudioWire cable, and a CD-ROM containing software. Setting up the system couldn't be any easier. I plugged in the 1296, installed the PCI-324 card into a slot on my Mac G4/466, connected the single AudioWire cable, and loaded in the software. In fact, setup is so quick it almost took more time to fill out the registration card than to get the system up and running. The aforementioned CD-ROM includes AudioDesk Workstation (Mac only), as well as drivers, support utilities, a demo file, and the 1296 Setup Wizard. The Setup Wizard is an interactive program that helps you connect your system, and will even configure the 1296 driver for you when you're finished. It worked flawlessly for me, and I'd love to see other manufacturers take the time to create such a helpful product.

For Windows, a Wave driver is included, and the ASIO 2 drivers for both Mac and Windows allow such ASIO-compliant programs as Cubase and Logic to be used. Staying within the MOTU family, Digital Performer 2.7 supports the 1296 under MAS. I chose to use the included AudioDesk software to test the unit.

The back of the 1296 rack unit is quite simple, featuring 12 analog +4 dBu XLR inputs and outputs, an AES/EBU input and output, word clock I/O, AES Word In, and an AudioWire jack for



## ► MOTU I296

**MANUFACTURER:** Mark Of The Unicorn, 1280 Massachusetts Ave., Cambridge, MA 02138. Tel: 617-576-2760. Web: [www.motu.com](http://www.motu.com).

**SUMMARY:** A 19-inch, two-space, 24-bit, 96 kHz computer-based hard disk recording system offering 12 I/O channels for Mac and Windows.

**STRENGTHS:** Great audio quality. Easy to set up and use. Flexible expansion path. Mac and PC support. Real-time sample rate conversion.

**WEAKNESSES:** No indication of bit resolution setting on front panel. No bundled software for PC users.

**MINIMUM SYSTEM REQUIREMENTS:** (Mac) G3 Power Mac, OS 7.6.1 or later, 128 MB of RAM. (PC) 200 MHz Pentium (Pentium II suggested), Windows 95/98/2000, 128 MB of RAM.

**PRICE:** \$2,095 core system, \$1,795 expansion system.

**EQ FREE LIT. #:** 102

connection to the PCI-324 card. Around front are twelve 19-segment ladder LEDs with over indicators for both input and output and a comprehensive clock section that displays sampling frequency, bit rates, and basic clock status. A cool feature on the over LEDs is the top LED will light when the signal reaches full scale "for even just one sample," and must be cleared via software. The second over LED lights momentarily, allowing you to adjust levels after clipping has occurred.

The brains of the 1296 system lie in the PCI-324 card, which features a custom VLSI chip, three 1394-type AudioWire jacks, an ADAT Sync input, and a DIN-8 socket. Each AudioWire port on the card can support up to 12 channels of 96 kHz in and out and can carry 24 channels of 48 kHz audio. The PCI-324 can achieve sample-accurate digital audio transfers with both TASCAM and ADAT digital multitracks, allowing you to transfer back and forth with no



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**CIRCLE 11 ON INFO CARD**

## WHAT'S IT GOT?

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- 44.1, 48, 88.2, or 96 kHz sample rates
- Word clock I/O
- 19-segment LED meters on all 12 I/O channels
- 2-channel AES/EBU I/O
- A-weighted dynamic range of 117 dB
- ASIO 2, WAV, and Sound Manager drivers included
- Dedicated word clock input for AES/EBU
- AudioDesk software included for MAC OS
- PCI-324 card offers sample accurate digital audio transfers with ADAT and TASCAM digital tape decks

drift. The card is also capable of a total of 36 channels of I/O at 88.1 or 96 kHz, or 72 channels at 44.1 or 48 kHz, making it quite a powerhouse. (The total number of available simultaneous channels depends on the power of the host computer.) Increasing the flexibility of the system, the 1296 uses the same PCI card as the 2408 and other MOTU core systems. This would allow you to mix and match the 1296 with a 1224, 24i, and/or the all-digital 308 I/O. These interfaces are even hot-swappable — which is a blessing for those of us sick of restarting.

The 1296 features stereo AES/EBU digital I/O with built-in sample rate conversion; I'd like to see more digital I/O on this unit, but, as I mentioned, it integrates easily with a digital 308 I/O if needed. Each of the 1296's inputs and outputs have an independent sample rate converter, allowing them to send and receive signals at different sample rates than the rest of the system. This allowed me to output my 96 kHz mix digitally at 44.1 kHz to my CD burner, without thinking about sample rate conversion (I hate thinking about that!). At the same time, I had the AES/EBU input clocked at 48 kHz to my digital mixer, although I had to use the analog inputs. This useful clocking feature alone is worth the ticket price.

## IN USE

Using the AudioDesk software, I opened up a session and began a quick setup for a 96 kHz/24-bit recording. I had to dig into the manual at this point to understand the digital audio and I/O setup, but I was up and running within a few minutes. AudioDesk is easy to use, and Digital Performer users will feel right at

home immediately. The program comes with some plug-ins such as reverbs and EQs, but I recorded and mixed dry.

I captured a vintage jumbo Guild acoustic using Earthworks TC-30Ks and an Aphex 1100 preamp. Since the 1100 has both analog and digital I/Os supporting up to 96 kHz, I captured several sample rates and bit depths. I did notice, as expected, the top and bottom of the acoustic had a finer resolution at 96 kHz/24-bit than it had at 48 or 44.1 kHz. The difference was not overwhelmingly dramatic, but, on a male voice overdubbed later, the 96 kHz really did shine with clarity. The 16-bit/48 kHz recording sounded fine — until you compared it to the 96 kHz versions. The 96 kHz A/D and D/A converters on the 1296 sounded good.

During my sessions, I experienced no latency problems, but MOTU does provide their Cue Mix utility with the 1296, giving you control over the PCI-324 driver's low-latency path. As more overdubs progressed, the 1296 handled them flawlessly, never choking or locking up. The unit's meters are very easy to read and reacted quickly to the peaks presented. Eventually, I filled up all 12 channels at 96 kHz and dropped a 44.1 kHz mixdown out of the AES/EBU output. It's really that easy to go 96 kHz.

## CONCLUSIONS

The 1296 offers a low-cost, high-quality solution to 24-bit/96 kHz recording. It's a sonically pleasing system to work with, and the internal sample rate conversion is incredibly useful. Combine a good surround software platform such as Digital Performer 3 (DP3) with 36 possible high-resolution 1296 channels, and MOTU may help give DVD-A a boost! ■

## COMING UP IN EQ AUGUST

- Behind-the-board revelations from Josh Abraham (Staind, Orgy, Limp Bizkit), Toby Wright (Alice In Chains, Korn, Slayer), and Marcus Miller (solo artist, Miles Davis, Take 6)
- Recording drums with Korn
- Location recording in Samoa

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# Native Instruments Spektral Delay

Create effects from heavenly to hellish

The Spektral Delay plug-in/stand-alone signal processor (VST or DirectX, Mac or Windows) slices a signal's frequency spectrum into 160 bands, then lets you adjust each band's delay (with sync to tempo) and feedback. There's also an input filter with variable EQ curve, a bunch of modulation and resynthesis possibilities, and a cool-looking user interface that makes adjusting all these parameters relatively effortless.

However, trying to imagine the sonic end result is difficult, as there's no precedent for this effect. Fortunately, you can hear some examples at [www.eqmag.com](http://www.eqmag.com).

## BASICS

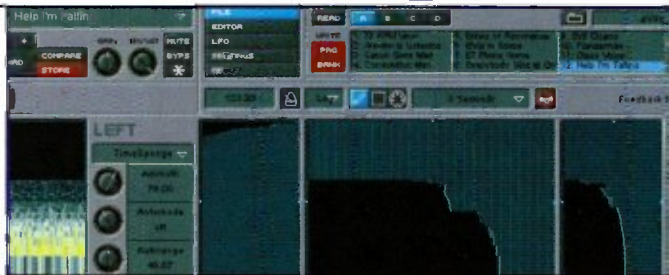
Installation is via CD-ROM, password entry, and the occasional CD insertion for verification. On Windows, I installed it as both VST and DirectX, as the VST performance is somewhat better. Spektral Delay (SD for short) also works as a stand-alone program (compatible with MME, DirectSound, Sound Manager, and ASIO) that can process a file (from disk or live) and record the processing directly to disk.

## IN ACTION

You enter delay times for various bands by drawing lines or curves in a graphic matrix (X axis = delay, Y axis = frequency). For example, if you draw a line diagonally from the lower left corner to the upper right, higher frequencies would be delayed progressively more. You can quantize



The input and output sonograms show the signal's spectral distribution. Other modules (from left to right) modulation section, input filter, delay matrix, and feedback matrix. The upper control strip can show file management, editors that apply mathematical operations to the parameters, and LFO settings that modulate various matrix parameters.



## ► SPEKTRAL DELAY

**MANUFACTURER:** Native Instruments, Schlesische Str. 28, 10997 Berlin, Germany. Web: [www.native-instruments.com](http://www.native-instruments.com)

**SUMMARY:** Innovative plug-in isn't for everyone, but it can create effects from heavenly to hellish.

**STRENGTHS:** Highly innovative. Dramatic modulation processing. MIDI control. Stand-alone, DirectX, or VST operation. Graphic interface makes it easy to control a huge number of parameters.

**WEAKNESSES:** Interface requires a lot of screen real estate. Low delay time resolution at short delays. Fairly processor-intensive.

**SYSTEM REQUIREMENTS:** (Mac) G3 300 kHz, Mac OS 8.6 or higher, 64 MB RAM, (Windows) W98/ME/NT/2000, Pentium 400 MHz, 64 MB RAM.

**PRICE:** \$199

**EQ FREE LIT. #:** 103

the delay times to rhythmic values or modify the curves by various mathematical functions to create shapes that would be tedious to draw by hand. Each channel allows separate or linked settings, or you can copy any channel element's settings (input filter, delay/time matrix, or delay feedback) to the other channel.

The input filter matrix (X = amplitude, Y = frequency) includes an attenuator for each band. Thus, you can pull down high frequencies, midrange frequencies, random frequency bands, etc. A similar feedback matrix uses X = feedback amount, Y = frequency.

All these controls demand screen space; in fact, SD won't fit in Acid's graphic boundaries at 1024 x 768 screen resolution. Perhaps a future version could include tabs to "tuck away" sections that aren't being tweaked.

## SO WHAT DOES IT DO?

SD does synchronized delay effects, as expected from a standard delay. It can also create different synchronized delays at different rhythmic values for different frequency bands; the sound is

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# Grace Model 101 Microphone Preamplifier

Grace Design's new solid-state mic preamp is about accuracy — not colorization

Grace Design has deservedly earned a reputation for producing very high-quality audio gear for professional applications. With the introduction of their Model 101, Grace Design has produced a mic pre that shares heritage with their high-end Model 801 and Model 201 pres, yet at a price that is realistic for those on a more modest budget.

The Model 101 is a straightforward mic pre. Its slick, chromed front panel features a high-impedance 1/4-inch instrument input, switches for high-pass filter, +48-volt phantom power, and power on/off; and a detented knob for gain adjust and a continuously variable trim control. Front-panel LEDs are provided for indication of power on/off and signal present/overload. Rear-panel connectors include XLR input and output jacks, a TRS output (which may be used simultaneously with the XLR output), and a jack for the power supply. The Model 101 comes with a short manual containing useful suggestions on setting gain, along with all of the usual technical specs.

Operation of the Model 101 is very easy: set the trim control to 0 dB (fully clockwise), use the stepped gain control to get your level "in the ballpark," and then use the trim control as a fine-tune adjustment (an effective combination). The first time I used the Model 101 was with a Shure SM57 on snare, which produced a sound smooth through the low-mids and mids, with excellent impact. Overall timbre was a touch on the dark side (no surprise given the mic), but adding in the overhead mics eliminated any hint of darkness. As I expected, switching the mic to a Shure SM85 totally opened up the top end of the snare, taking



## ▶ GRACE MODEL 101

**MANUFACTURER:** Grace Design, PO Box 204, Boulder Colorado, 80306. Tel: 303-443-7454. Web: [www.gracedesign.com](http://www.gracedesign.com).

**SUMMARY:** Single-channel, solid-state microphone preamplifier.

**STRENGTHS:** Uncolored reproduction. Quiet operation. Direct-coupled signal path.

**WEAKNESSES:** No polarity reverse switch. Wall-wart power supply.

**PRICE:** \$699

**EQ FREE LIT. #:** 104

advantage of the Model 101's extended high-frequency response. The Model 101 easily handled the output level of an Audix D4 on kick without so much as a hint that a pad was needed on the input — though I did feel that the lowest octave was a bit shy as compared to my Avalon AD2022 (which does cost quite a bit more).

Over the course of several weeks, I used the Model 101 to record a series of male lead vocal tracks using a variety of mics that included a Neumann U 87, MBHO 608 "Lollipop," RCA 44BX, Lawson L47, and BLUE Dragonfly.

Results were "all good," but certain combinations fared better than others due to the nature of the Model 101's transparency. The RCA44BX — a tough mic to amplify due to its low output level — could have benefited from a bit more gain. And, in fact, Grace

Design offers a factory option for an increased gain range of 20 to 70 dB — which I recommend if you are a fan of ribbon mics.

The most noticeable characteristic of the Model 101 is its lack of coloration. You're not going to get a "tubey" or "warm" sound out of the 101. You're going to get accuracy, revealing the true character

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## SPECIFICATIONS

- **Frequency Response, Mic In:** 4.5 Hz to 400 kHz (–3 dB)
- **Frequency Response, Hi-Z In:** 3 Hz to 300 kHz (–3 dB)
- **Gain Range, Mic In:** 10 to 60 dB, 5 dB steps
- **Gain Range, Hi-Z In:** –10 to 40 dB, 5 dB steps
- **Common Mode Rejection Ratio at 1 kHz:** greater than 75 dB
- **Phase Deviation:** less than 6°, high-pass filter off, 50 Hz to 25 kHz
- **Maximum Output Level:** +25 dBu into 100 kohm load, 0.1%THD
- **Peak Meter Threshold:** –20 dBu green; +16 dBu red

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# IN REVIEW

## SHORTS



## IZOTOPE VINYL

By Craig Anderton

**BASICS:** This DirectX plug-in, billed as “the ultimate weapon in the war against hi-fi,” “vinylizes” your pristine audio into a hip-hopper’s dream. Also available as a Winamp plug-in, it has parameters for turntable motor rumble, electrical noise (e.g., grounding hum), record wear, amount of dust, number/depth of scratches, warping amount (including edge warps), stereo/mono, and six choices of record player vintage (from 1930s phonograph to 1980s linear-tracking turntable). The sound is convincing, and it even has a pro-looking interface. Yet it’s really free.

**PROS & CONS:** There’s no Mac version, and not all programs can support the warp function (it’s grayed out if your software can’t handle it). Also, the scratch is the least convincing of the processes; turning down the scratch level too far gives more like a dropout than a faint scratch. However, when turned up to fairly prominent levels, it sounds fine.

**BOTTOM LINE:** Download it now, before they change their minds.

### IZOTOPE VINYL

**PRICE:** FREE

**CONTACT:** iZotope, Suite 436, 362 Memorial Dr., Cambridge, MA 02139. Tel. 617-225-7186. Web: [www.izotope.com](http://www.izotope.com). Circle EQ free lit. #105.

**Web Link:** Go to [www.EQMag.com](http://www.EQMag.com) to hear an example of a loop before and after being vinylized with iZotope’s Vinyl.

## MAM WARP 9

By Craig Anderton

**BASICS:** Warp 9 is a mono, one-unit, rack-mounted signal processor for filter freaks. Its multimode, 12 dB/octave low-pass filter with variable resonance — which is modulatable by a variety of parameters (such as incoming audio, internal ADSR envelope, or the internal LFO) — can add a variety of resonance/filtering/VCA effects to individual tracks, instruments, or mono program material.

Additionally, many of these effects are rhythmically coherent. The LFO can be reset according to incoming triggers, and the filter can “mask out” certain triggers (such as responding only to every four triggers). It also does sample-and-hold effects, and, of course, you can “play” the filter with a MIDI keyboard while controlling other audio.



It would be nice if the filter also had a 24 dB/octave slope, but the multimode response (LP, HP, BP, notch) and superb exploitation of the LFO functions are a fair tradeoff.

### PROS & CONS:

The interface takes some getting used to. Most of your program tweaking will be done with five knobs (the good news) that do the work of 15 due to a bank select system (the bad news). There’s no LCD; your visual feedback comes from several LED indicators. And, while you can store 32 programs, recalling them is tricky: the numbering scheme uses five LEDs, whose patterns seem to have little in common with numbering systems used on this planet.

Okay, so the interface isn’t a home run. But, once you master the thing, the sounds you can get out of it, especially for rhythmic-oriented material, are outrageous. Some of the functions are extremely esoteric, but can nonetheless be useful; an additional VCA function, while much simpler than the filter, is useful as well. The Warp 9’s price is right, too.

The main competition would be the Electrix Filter Factory, which is stereo, better at real-time manipulation, and more expensive. The Warp 9 excels at MIDI-related modulation options (including the extremely versatile LFO), and can store patches. Both are fine units, but each has its own emphasis.

**BOTTOM LINE:** If you want to add novel, rhythmic filter effects — and are willing to invest some time scaling a learning curve — this cost-effective signal processor offers exceptional filter modulation capabilities.

## MAM WARP 9

**PRICE:** \$239

**CONTACT:** Music and More, 407 Stony Point Rd., Santa Rosa, CA 95401. Tel: 707-60-3341. Web: [www.ucik.com](http://www.ucik.com). Circle EQ free lit. #IC6.

## RADS VOLUME 4 ACOUSTIC HIP-HOP DRUM LOOPS

By Craig Anderton

**BASICS:** RADS (Rhythmic Architectural Design Systems) Volume 4 contains over 200 hip-hop drum loops (and 30 “bonus” loops) in WAV format. These were played by a human drummer on acoustic drums, not programmed into drum machines. Sounds designed to work well together are organized into individual folders, but this is a guideline, not a rule.

**PROS & CONS:** There is no indication of tempo or number of measures per loop, either in the sample titles or the minimal documentation. As tempo varies for the different loops,

this would have been helpful. Of course, this doesn't really matter if you're using Acid, Sonar, or other programs that can stretch time based on the “Acidized” data.

Because these are not machine-generated loops, hits don't necessarily fall exactly on the beat. This human quality is refreshing, but requires care when splitting loops into pieces (or layering with machine-generated grooves), as you may have to split a little before or after the beat.

The sound quality is clean, neutral, and “old school,” with no significant EQ or limiting, so there's a healthy dynamic range. Some prefer more “mastered” loops, but I welcome the opportunity to add my own processing. Listen to the sample RADS loops at [www.eqmag.com](http://www.eqmag.com) and judge for yourself, as their sound quality is representative of the sounds on the CD.

**BOTTOM LINE:** Even though the CD-ROM contains only 173 MB of samples, the price is fair, and you don't have to wade through filler to get to the good stuff. And, those interested in a wider selection of samples can download free additional loops from the weekly-updated database at the Pocket Fuel Web site.

## RADS VOLUME 4 ACOUSTIC HIP-HOP DRUM LOOPS

**PRICE:** \$39

**CONTACT:** Pocket Fuel, PO Box 563, Prince Street Station, New York, NY 10012. Tel: 888-643-8263. Web: [www.pocketfuel.com](http://www.pocketfuel.com). Circle EQ free lit. #IO7.

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Dr. Al's audiophile experience  
with retail hell

## Customer X Strikes Back

I have trouble shopping for new gear online or in catalogs. I wanna read the box, hear a discourse by a knowledgeable salesperson, and, last but not least, see a live demonstration of something for which I'm potentially paying thousands of dollars. Now I know I can do all of the above stuff and then, after the test drive, cyber-order that item, perhaps a little cheaper, but I have fantasies about them shipping me intentionally damaged goods because I'm not there to check them out.

And is it my imagination, or are salespeople in retail stores today ten times more obnoxious than ever before? "The customer is always right" is definitely a retired catchphrase from a Jurassic generation of retail, when friendly, intelligent salespeople walked the earth.

I recently frequented one of those giant supermarket-type music stores in my area. A friend sent me one of the store's \$250 gift certificates, and I went there to cash it in posthaste. I was interested in quite a few items for purchase. After walking the endless aisles for over thirty minutes, I was unable to find *even one* of my potential purchases among the voluminous shelving. A search for a salesperson was akin to looking for one in an actual supermarket. I guess you're supposed to serve yourself — not what I like to do in music stores. So, after finally cornering one of these slacker salespersons and finding they actually had none of my desired toys in stock, I, as a last resort, inquired about their selection of VST plug-ins. He led me to a *locked* glass case. Jeez, couldn't you just leave the boxes displayed without the discs in them so we could *browse*, or are you afraid we're gonna steal the empty boxes?

In this miles-of-aisles *übershop*, they had four measly Mac plug-ins; one of which I actually desired; three of which were already obsolete. I grabbed the one I wanted and proceeded to the cashier. I plunked down my gift certificate, instantly stumping him. "I need to get the manager for this," he replied over his shoulder as he headed away for eight minutes to who-knows-where, only to return with said manager who was visibly younger than my son.

"You have to spend the whole amount to use this," he countered, smiling authoritatively

and handing me back the \$250 gift certificate that I was using to pay for the \$139 plug-in. I was incredulous, and I snapped: "If you had any current stock here (raising my voice a half-octave and 40 dB), I could spend ten times this amount in thirty seconds. How dare you ask me to spend the entire amount — I'm actually trying to! Either go get your boss or get real and ring me up some store credit, *now!*" I asserted angrily, unfortunately losing my cool.

"Hang on a sec," implored the manager, departing the cashier station for the pre-req-

**"THE CUSTOMER IS ALWAYS RIGHT" IS DEFINITELY A RETIRED CATCHPHRASE FROM A JURASSIC GENERATION OF RETAIL, WHEN FRIENDLY, INTELLIGENT SALESPEOPLE WALKED THE EARTH.**

uisite eight minutes, as I began to stew in the under-ventilated premises. Fortunately for him, he returned with a receipt for my plug-in and store credit. Hope I get to use that store credit while there's still electricity on earth.

I mentioned a few issues back about the death of tape as a storage device in pro audio recording. We must also at this time note the death of camera film; trampled underfoot by the ubiquitous hard drive. What I find particularly ironic is our inability to provide basic electricity to run all these improvements and the old ones as well.

Californians are the first to feel the effects of random rolling blackouts. This must be a lot of fun for pro audio enthusiasts in the area. If this gets worse, will it threaten the already-taxed economics and format-vulnerable professional recording studios on the West Coast? A grim thought for those already fighting the good fight to stay in business. Hang on in there, babies.... ■







Insuring your property properly

## Cover Me, Part II

A few months back, we talked about insuring yourself. This month, let's take a look at insuring your gear.

Just in case you're one of the small-studio owners who don't think insurance is a good idea, let me tell you a story. A friend of mine once ran a very successful production room in my town. He was the first to go digital, the first to go nonlinear, and he got excellent results for clients and was on the verge of putting his competition to bed in this market. And then the garage that housed his studio burned down, taking all his gear with it. Local wiseguys joked that he'd done it for the insurance money, but, soon afterward, the truth came out: There *wasn't* any insurance money. So instead of rebuilding and continuing his dominance of the local production market, he took a job with a larger studio and moved away. Today he's doing well in his own post room in a much larger city (you can't keep a good man down), but he might have gotten there faster and easier if he had been properly insured.

If you're a project studio pro, you need to be insured because it doesn't take a catastrophic loss to temporarily put you out of business — just losing one key piece of gear is enough. And even if you're not making money with your rig, special insurance for your studio isn't a bad idea, because your homeowner's insurance probably doesn't cover your gear. Most home policies have a cap on "electronic devices," and that's what they'll call your recording gear if your house burns down. (My homeowner's policy has a \$2,500 cap on electronic devices, and won't pay anything to replace devices used professionally.)

So, you need to get that gear covered. Here's what to look for when you're shopping for business insurance:

**1. AN AGENT WHO UNDERSTANDS YOUR BUSINESS.** Or at the very least, an agent or broker who is enthusiastic about your business and is willing to learn. An insurance company (the entity that actually writes the policy) bases its pricing on a set of

formulas, and, for business insurance, those formulas are usually created by averaging the kind of loss suffered by all kinds of businesses in your area. As far as they're concerned, your recording studio really isn't much different than a bakery or a drug store. So if you buy the stock business policy from Megalith Corp., the specialized needs of your operation are going to go ignored, a fact you might not realize until you have to make a claim. But a good insurance agent is a kind of translator — he or she listens to your needs, understands how your business works and what your real risks are, and turns all that into language the insurance company can understand. (And turns their language into something *you* can understand.) Your agent or broker should be willing to take the time to learn your operation.

### 2. A PACKAGE THAT COVERS YOUR SPECIFIC OPERATION.

Not a cookie-cutter business policy, but a tailored plan that really covers your needs. For example, my agent noticed that a large number of expensive items in my studio were connected to my computer...and that the computer was connected to a cable modem. If a lightning strike came down the modem line and smoked my main Mac, it would probably take a whole bunch of audio interfaces and a digital console with it (and if the voltage continued out the console, well, you could kiss the whole room goodbye). The standard policy had a very low limit for "computers and peripheral devices," which is what the company would have called all the connected devices in such an event (never mind that a digital console can hardly be called a "computer peripheral"). So we decreased coverage in less critical areas and radically increased the numbers for C&P devices, and Bob's your uncle. Now the entire chain is protected against electrical mishap, which is much more likely to occur than a fire or flood.

**3. REAL REPLACEMENT COST COVERAGE.** It might say you're covered for replacement cost, but, thanks to some arcane



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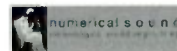
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"co-insurance" formulas, you may be under-covered without knowing, and your idea of replacement cost versus the insurance company's idea may be off by 40% (guess in who's favor). You may own some gear that can't be readily replaced, or replaced at all. And maybe if your master controller blew up, you'd rather replace it with something else. Take the time to explain to your agent exactly what you'd expect when you file a claim and get his assurance in writing that it will happen that way.

**4. LIABILITY COVERAGE.** A business policy should cover more than gear: it should cover the health and safety of people working in your studio. What if somebody slips and falls on a slippery sidewalk while carrying a Marshall amp into your place? You are liable for the medical bills. And

**WEBLINK**  
Have a question or comment for Jim Bordner? Email him at [jim@gravitymusic.com](mailto:jim@gravitymusic.com).

## THE RECORDING STUDIO INSURANCE PROGRAM

I got some good information while writing this piece from Joe Montarello, an insurance agent at the Capitol Region Insurance Agency in New York. Joe has started a program called The Recording Studio Insurance Program, aimed at the specialized needs of large and small studio owners. He did it because he's a project studio guy himself.

"After putting my own studio together," says Joe, "I started looking around and found that, in a lot of areas, you either take the cookie-cutter policy or you get nothing." He adds that, "Being a musician myself, I know what this gear is all about...so I started talking to a few of our carriers, telling them, 'Here's what I'd like to see getting covered in a studio policy.' Most of them said they'd get back to us."

But one of his regular carriers was interested, and developed a specialized program with Joe's guidance. "We're covering equipment breakdown, electrical disturbances — we're even covering for viruses."

And each policy is tailored to the individual business. "See, one thing I know is that your studio is very unique to you. So you're very gear-conscious. But not *claims* conscious. That's our job."

As a result, Joe is covering many of the major studios on the Eastern seaboard, and is branching out into other areas, notably Nashville. Now almost four years old, the program is growing slowly, which is just as Joe wants it. "We're not looking at this as a short-term market, where we just write a lot of business and let it die. So we're growing slowly, screening clients carefully."

Joe can be contacted at 1-800-560-8965.

don't think, "Oh, these guys are my buds, they won't sue me." My lawyer says, "In over 20 years of practice, every time — and I mean every time — somebody said, 'He's my friend, he won't turn on me,' that's when the lawsuit started." A million dollars of liability coverage is built into most

business policies — make sure that includes yours.

These are just the basics. There's a lot to learn about business insurance, but if you find a good agent who has an interest in the business and will take the time, you won't have to learn it all yourself. ■

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# The John Lennon

## SONGWRITING CONTEST



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Country Latin

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SONG TITLE \_\_\_\_\_  
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Mail your entry to: **John Lennon Songwriting Contest**  
620 Frelinghuysen Avenue Suite #131  
Newark, NJ 07114

#### Each entry must consist of:

- Completed and signed entry form (or photocopy). All signatures must be original.
- CD(s) or audio cassette(s) containing one song only, five (5) minutes or less in length.
- Lyric sheet typed or printed legibly (please include English translation if applicable). Sheets not required for instrumental compositions.
- Check or money order for \$30.00 per song (U.S. currency only) payable to John Lennon Songwriting Contest. If paying by credit card, \$30.00 per song will be charged to your account.

Entries must be postmarked no later than September 28, 2001.

Please read all rules carefully, and then sign your name in the space provided. If entrant is under 18 years old, the signature of a parent or guardian is required.

2. Prizes: Twelve (12) Grand Prize Winners will receive \$2,000 in cash, \$5,000 in Yamaha project studio equipment, and a \$5,000 advance from EMI Music Publishing. One (1) Grand Prize Winner will receive \$20,000 for the "Song of the Year" courtesy of Maxell. Thirty-six (36) Finalists will receive \$1,000. Seventy-two (72) Runners-up will receive \$100 from Guitar Center Stores.

3. Contest is open to amateur and professional songwriters. Employees of JLSC, their families, subsidiaries, and affiliates are not eligible.

4. Winners will be chosen by a select panel of judges comprised of noted songwriters, producers and music industry professionals. Songs will be judged based upon melody, composition and production (when applicable). The quality of performance and production will not be considered. Prizes will be awarded jointly to all authors of any song; division of prizes is responsibility of winners. Void where prohibited. All federal, state, and local laws and regulations apply.

5. Winners will be notified by mail and must sign and return an affidavit of eligibility/recording rights/publicity release within 14 days of notification date. The affidavit will state that winner's song is original work and he/she holds all rights to song. Failure to sign and return such affidavit within 14 days or provision of false/inaccurate information therein will result in immediate disqualification and an alternate winner will be selected. Affidavits of winners under 18 years of age at time of award must be countersigned by parent or legal guardian. Affidavits subject to verification by JLSC and its agents. Entry constitutes permission to use winners names, likenesses, and voices for future advertising and publicity purposes without additional compensation.

6. Winners will be determined by January 15, 2002, after which each entrant will receive a list of winners in the mail. CDs, Cassettes and lyrics will not be returned.

I have read and understand the rules of the John Lennon Songwriting Contest and I accept the terms and conditions of participation. (If entrant is under 18 years old, the signature of a parent or guardian is required.)

- Check one category only
- rock  world  gospel/inspirational  children's  
 electronic  pop  folk  r&b  
 jazz  country  latin  hip-hop

[www.jlsc.com](http://www.jlsc.com)

1. Each song submitted must be contestant's original work. Songs may not exceed five (5) minutes in length. No song previously recorded and released through national distribution in any country will be eligible. Songs may have multiple co-writers, but please designate one name only on the application. Contestant may submit as many songs in as many categories as he/she wishes, but each entry requires a separate cassette, entry form, lyric sheet, and entrance fee. One check or money order for multiple entries/categories is permitted. (Entrance fee is non-refundable. JLSC is not responsible for late, lost, damaged, misdirected, postage due, stolen, or misappropriated entries.)

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

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Shaking down the encoding process and explaining the ins and outs of converters

## Digital Dabbling

Lately, the Studio Tech Web Forum has been receiving a lot of questions regarding synchronizing an ADAT to the outside world, and most often to Pro Tools. Ironically, in the middle of writing this column, I got an emergency tech call to fix an ADAT-locking-to-Pro Tools problem! I went to the client's studio to find out what was wrong. Here are my findings....

### ALL IN A DAY'S WORK

Upon arriving, I evaluated the setup. It was connected via the following clock/TC signal flow:

#### Master Clock (W/C 48 kHz):

AardSync II → BRC

AardSync II → USD

#### Pro Tools Slave Clock setup (Interfaces connected in the same order to the Mix Cards):

USD → ADAT Bridge → AD8000SE  
→ 888I24

#### ADAT Sync Setup (9-Pin):

BRC → ADAT XT20 #1 → ADAT  
XT20 #2

#### Pro Tools and ADAT digital audio signal flow:

ADAT XT 20# 1 lightpipe digital ↔  
ADAT Bridge 1-8

ADAT XT 20# 2 lightpipe digital ↔  
ADAT Bridge 9-16

#### TC Setup (SMPTE):

BRC → USD

Technically, if the USD and BRC were set to clock to the AardSync II, everything should work fine, right? That's what the client thought, and he was right, sort of.... You see, if a BRC is the master remote in an ADAT system, then the BRC is the device that needs to sample-accurately synchronize the (word) clock for all of the ADATs. Once clocked properly, the ADAT system will function as a single, sample-accurate, giant tape deck, clocked to a common word clock. So why didn't this work, then? Simple — well, kinda....

### IT'S ALL IN THE PUSH

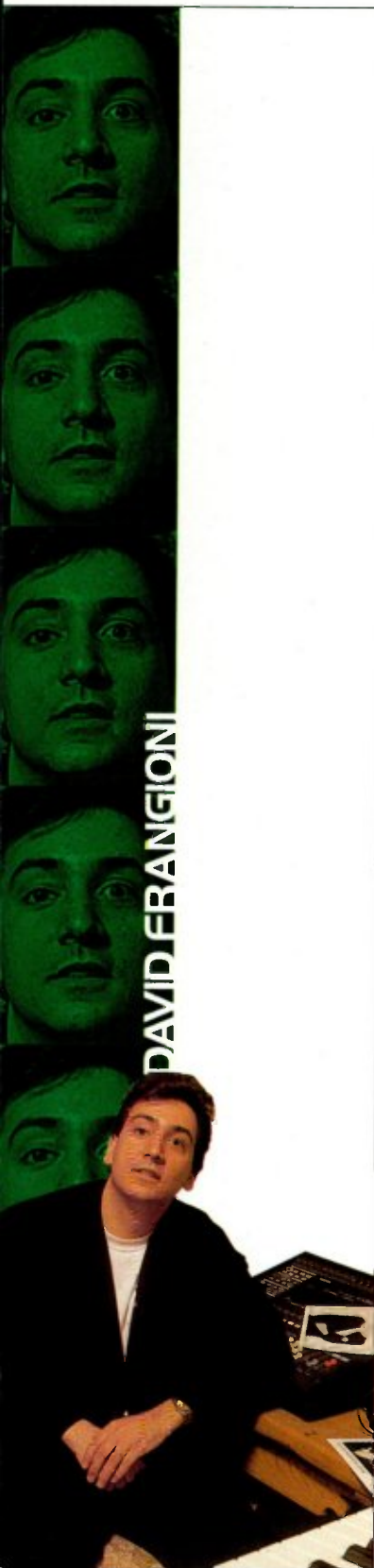
A combination of front-panel buttons on the

BRC were not set properly. Yes, the "Ext Sync" mode needs to be enabled (which it was — the LED stays lit solid when active and clocked). Yes, the mode was set to resolve to word clock (other choices include Internal, Video, and SMPTE). However, two critical modes were not set: Digital I/O and Gen Sync

The **Digital I/O** button on the BRC is there for one primary reason: to interface with an AI-1 digital AES/EBU digital I/O. At the time that this unit was released (early '90s with black-face ADATs), the design was to clock the BRC to incoming digital data from the

**IN ANY CASE  
OTHER THAN THAT,  
WHERE AN AI-1 IS  
BEING USED, THE  
DIGITAL I/O INPUT  
SHOULD BE SELECTED  
ON THE ADAT ITSELF,  
NOT ON THE BRC.**

AES on the AI-1 (say that ten times fast!). However, many people mistakenly push that button when they want to digitally transfer tracks from one ADAT to another or from one ADAT to an ADAT-compatible device. In any case other than that, where an AI-1 is being used, the Digital I/O input should be selected on the ADAT itself, not on the BRC. When turned on, the Digital I/O light signifies a clock source being received from the AES input (which is only found when an AI-1 is properly connected). That was mistake number one as to why the transfer failed.



## WEBLINK

For more "tech talk," visit the Studio Tech web Forum at [www.eqmag.com](http://www.eqmag.com). There's always tons of valuable information to gather, free giveaways contests, and lots of cool people.

Mistake number two was more straightforward. The Gen Sync light was not turned on and set properly. The first thing that you do when generating timecode from the BRC is press Edit, then Gen Sync, and set the SMPTE output to either -10 or +4 (either setting enables SMPTE timecode output). Next, the Gen Sync light can be toggled on or off to begin generating or stop generating SMPTE timecode. In the aforementioned case, the Gen Sync light was set to Off (no SMPTE generated) and was not lit. Once this was fixed, SMPTE timecode flowed to the USD without a problem. By setting the BRC and Pro Tools in the following configuration, everything worked perfectly with no clicks or pops in addition to perfect timecode lock-up:

### BRC only set to:

Ext Sync 48 kHz  
Gen Sync On (+4)

*no other lights on the BRC were lit*

### Pro Tools Session Status only set to:

Clock Reference: Word Clock

Sync: Internal

Positional Reference: LTC

*All other settings were standard PT configuration settings (USD Setup, proper interface setup, etc.)*

### WHAT IF I DON'T HAVE AN ADAT?

If you're using a setup that passes digital audio through lightpipe (ADAT optical 8-channel format), then the clocking theories discussed here still apply. However, the sync flow will be different because there will not be a BRC. Some other device will have to clock the ADAT signal to avoid artifacts or digital clicks and pops. In some cases, you could even clock to the incoming digital data embedded in the lightpipe digital audio. Remember that there is word clock data in every ADAT lightpipe data stream, it's just not the *best* setup to use for two primary reasons:

1. Higher jitter than using a dedicated clock.

2. Not versatile — only use the data as the clock if there is *one* point-to-point connection from Device "A" to Device "B" via lightpipe optical.

When troubleshooting clocking problems, first off, always simplify the setup to two devices. If two devices can sync, then multiple devices can almost always sync without a problem (note that I said *almost!*). Start with one master and one slave and listen for any artifacts. Then begin following the rules of clock: One master, the rest slaves; all slave devices set to *external* clock; master device set to *internal* clock; very high-quality cable interconnecting all device clock connections (remember that proper impedance is important — use 75-ohm cable for word clock).

There's a lot more to discuss when it involves clocking and digital audio. If you have any questions, be sure to visit the Studio Tech web forum. There's lots of clocking questions being answered on a daily (hourly) basis. Stay in sync and visit often — [www.eqmag.com](http://www.eqmag.com). ■



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An ear-friendly option for MP3 users

# Variable Bitrate MP3 Encoding

To those with trained ears, much of what passes for Internet audio is defined by its limitations. Some sanguine engineers, realizing the value of balancing speed with pristine sound, have incorporated an oft overlooked but eminently usable MP3 encoding technology called variable bitrate (VBR). VBR is used for many other encoding systems and codecs, especially video. Part of the MPEG standard, VBR was first implemented for MP3-encoded files by Xing Technologies (the developer of AudioCatalyst — now owned by Real Networks) and has been available long enough that all recent MP3 players support it. Our context here is for MP3 files.

Simply put, VBR technology allows better sounding MP3 files in the same space taken up by your garden-variety constant bitrate (CBR) encoded song. To those who value small file size more than sound quality, think of it as providing the same sound quality in a smaller file or, conversely, better sound quality in a similar file size.

Let's take a closer look at how VBR works. Standard MP3 files are encoded at a single bitrate through the entire file (hence the CBR moniker). In contrast, VBR encoding looks at the audio file and chooses what bitrate to encode based on how much audio information is present at any given moment. A song that begins quietly or with a single musical instrument will, during that section, be encoded at a lower bitrate than the middle of the song when all the instruments are playing together and the volume and frequency range is high. As a result, most songs will be encoded at several different bitrates corresponding to fluctuations in dynamic range.

The key conceptual difference between CBR and VBR is that in CBR encoding you specify your compression by space, with VBR you specify it by quality. With CBR, sonic quality is consistently reduced to maintain the bitrate you specify. With VBR, the bitrate is changed to meet the quality level desired. CBR is inefficient in that 10 seconds of silence encoded at 128 kbps requires the same file size as 10 seconds of full-on opera. VBR encoded files of the same audio would result in a very small file for quiet sections

and larger sized files for loud sections (depending on the quality you chose). Like CBR, VBR encoding parameters are set at the time the song is encoded.

The MP3 standard is designed so that information about the encoded bitrate level is included throughout the file. This makes it easy for VBR-enabled MP3 players to seamlessly decode and play VBR files. In fact, users are likely to have a more consistent listening experience with frequent bitrate changes in a VBR file than with CBR. In a CBR file, if you suddenly reach a more dynamic piece of a song, you're stuck with the same bitrate. This can result in audio artifacts (most noticeable when encoding to lower bitrates — 64 kbps and less).

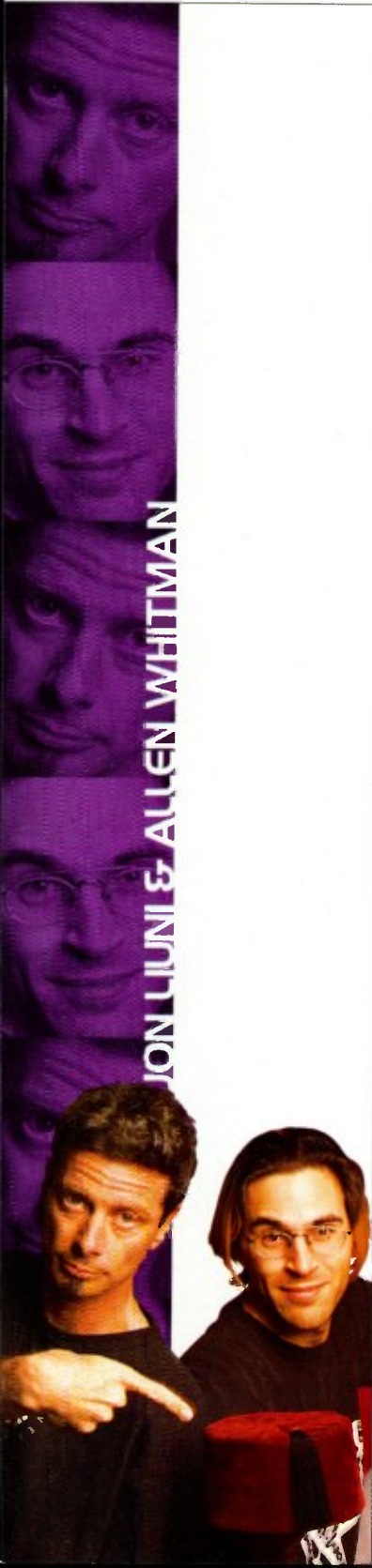
## VBR COMPARISONS

VBR encoding offers the ability to compress audio more efficiently by specifying the desired sound quality level rather than by setting a flat, numeric bitrate. Sounds great — yes! Alas, there's no standard for how to select this "quality" in your encoder and that results in different settings for each encoding application. To help you figure things out, we've included a comparison between some common encoders for Windows and Mac. For each setting available we list what we'll call the "base bitrate" — the starting point that VBR uses to encode. Compared to the same rate used for CBR files, a VBR-encoded file will sound better because it switches to higher bitrates as needed. We assume you Unix users can figure this out yourselves!

## WINDOWS ENCODERS

**AudioCatalyst** ([www.xingtech.com](http://www.xingtech.com)). VBR slider setting quality options available:

- Low — 96 kbps (Near CD Quality — Acceptable for portables)
- Low/Normal — 112 kbps (CD Quality — Best for portables)
- Normal — 128 kbps (CD Quality — Best for most)
- Normal/High — 160 kbps (Archival Quality — High-end stereos)
- High — 192 kbps (Archival Quality — Highest-end stereos)



JON LUNI & ALLEN WHITMAN



## TABLE 1

	CBR (128k)	VBR (96k+)	VBR (128k+)	VBR (256k+)
Bach.....	470 kb	368 kb	513 kb	983 kb
Mutton Birds.....	470 kb	333 kb	485 kb	973 kb

### MusicMatch ([www.musicmatch.com](http://www.musicmatch.com)).

VBR "Custom Quality" percentage slider options available:

- 10% = ~95 kbps
- 25% = ~105 kbps
- 50% = ~128 kbp
- 75% = ~170 kbps
- 100% = ~220 kbps

Note: MusicMatch wins two prizes this month: (1) The "Cross Platform Award" for adding Macintosh and Linux support and (2) the "Bad Boy of Media Types Award" for setting itself as the default player for all audio formats during regular installation (even after letting us specify not to).

### MACINTOSH ENCODERS

#### AudioCatalyst ([www.xingtech.com](http://www.xingtech.com)).

VBR slider setting quality options available:

- Low — 96 kbps (Near CD Quality — Acceptable for portables)
- Low/Normal — 112 kbps (CD Quality — Best for portables)
- Normal — 128 kbps (CD Quality — Best for most)
- Normal/High — 160 kbps (Archival Quality — High-end stereos)
- High — 192 kbps (Archival Quality — Highest-end stereos)
- Very High — 224 kbps
- Ultra High — 256 kbps

Note: AudioCatalyst (Mac version only) has a glitch where, if you have "CBR Quality" set to 24 kbps or less, it overrides the "VBR Quality" regardless of which you have selected in "MP3 Mode."

iTunes ([www.apple.com/itunes/](http://www.apple.com/itunes/)). VBR quality options available: Lowest, Low, Medium Low, Medium, Medium High, High, Highest

iTunes has a preference called "guaranteed minimum bitrate" to control the VBR encoding. We couldn't find detailed documentation on how iTunes's VBR works, but trial and error showed the minimum bitrate setting drives the encoding. Setting it to 8 kbps resulted in 8 kbps files at all quality levels. We suggest using one of the tables from the other apps listed here to base your preferred settings on.

### TEST CASE

For our tests, we chose two 30-second samples of music: Bach's Brandenburg Concerto No. 2 in F Major ([www.jsbach.org/brandenburggustav.html](http://www.jsbach.org/brandenburggustav.html)) and "Anchor Me" by The Mutton Birds (pop-rock; [www.muttonbirds.com](http://www.muttonbirds.com)).

For Windows encoders, we used a PIII/600 with 256 MB RAM and for Mac

encoders we used a G4/450 with 256 MB RAM.

**Encoding Speed:** Across all encoders, the difference between VBR and CBR 128k was only about one second. The fastest encoder was AudioCatalyst for Windows (averaging 5.9x real time) and the slowest was AudioCatalyst for the Mac (due to its loading the track from the CD first, and encoding afterwards).

**File Size:** Table 1 shows the difference in file size for both clips at a few  
▶ continued on page 146



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## NATIVE INSTRUMENTS

► continued from page 118

ple and hold effect. Setting small delay variations among bands yields glissando and harp-like sounds, as well as pseudo-filtering effects. The only major limitation: resolution is limited at short delays, so flanging effects are non-existent, and chorus effects are limited.

SD's effects work in a variety of contexts, from trancey, ambient washes to tight or long delays. But that's not all; SD is based on *resynthesis*, where the sound is broken down into frequency-based pieces, modified, and then resynthesized. An additional set of modifiers affects this process, and can produce extremely bizarre variations, from subtle tremolo to state-of-the-art industrial effects.

When I first saw this program at AES 2000, my jaw dropped. After having worked with it for several months, I'm even more impressed (full disclosure: I wrangled an early copy in return for contributing a bunch of presets, many of which are included on the distribution CD; I received no compensation other than a copy of the final program). Few processors are equal-

ly at home producing sounds of haunting beauty as well as sounds that would fit into a horror movie, but SD manages to do just that. This may not be a plug-in for everyone's taste, but the sonically adventurous will flock to it. ■

## GRACE DESIGNS

► continued from page 120

of the mic and remainder of the signal chain. With the MBHO 608, the Model 101 was too honest for lead vocal. Ditto for electric guitar. But, when used with the Dragonfly, I could clearly hear the mic's subtle low-mid coloration adding just a little bit of weight to the voice. The "magic patch" came when I connected a Peavey PVM-T9000 tube mic into the Model 101, followed by an Anthony DeMaria Labs ADL 1000 tube compressor. I slammed the input of the Model 101, letting the signal LED go red every now and again (no distortion audible), and then hit the ADL 1000 hard, typically getting 10 to 15 dB of compression. This chain sounded great with a breathy-ness that made the vocal very immediate and up-front. No question, the colors of the

PVM-T9000 and ADL 1000 were coming through loud and clear, and both the vocalist and I loved it.


For a couple of sessions, I used the 1/4-inch instrument input for electric bass and guitar. On one occasion, the output from an active Carvin bass overloaded the 101's front end even with the gain turned down all the way. But, generally, the Model 101 just gets outta' the way of the instrument's pickups. Inserting a 1/4-inch plug into the instrument jack automatically disconnects the rear-panel XLR jack from the input path, ensuring there won't be any odd interactions between the two. Very smart.

If your arsenal of mic pres includes a few that add color to the signal path, you'll find the Grace Model 101 a refreshing change. It's not at all about coloring sound. It's about accuracy, and getting your tonal colors from mics and mic placement. As such, it's a welcome addition even to studios that already have outboard mic pres. And, if you're making your first move from a console mic pre to an outboard mic pre, the Grace Design Model 101 will provide an unbiased reference against which to judge other units. ■

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## COMPUTER-BASED AUDIO

**MOTU 828**  
**Firewire Audio Interface**

- Total of 18 simultaneous ins and outs • 8 channels of 24-bit analog I/O with 40dB of trim (2 XLR-balanced mic preamps w/ phantom power, 6 balanced 1/4" TRS ins and 6 balanced 1/4" outs), 8 channels of ADAT optical (switchable to S/PDIF optical) and RCA S/PDIF digital I/O
- ADAT SYNC input • CueMix Plus zero-latency live input monitoring w/ front-panel volume control • Connects to any FireWire-equipped Windows PC or Apple Macintosh computer via standard 1394 FireWire
- Includes an ASIO driver for compatibility with all major audio software on both computer platforms • Also includes AudioDesk audio workstation software package for the Mac

**Steinberg Cubase VST 5.0**  
**Complete Pro Music Recording System**

- Contains high-resolution MIDI recording with auto recording in either 16 or 24-bit formats
- Up to 72 audio tracks • Includes lots of VST Plug-Ins • Access the world's largest range of add-on real-time audio effects and sample accurate synth plug-ins • True Tape analog sound recording built in • Supports ASIO audio cards - accessing the latest low latency audio cards
- Includes the Universal Sound Module VST instrument with over 70 MB of sound data
- Also Available: **Cubase VST 2.5.0**
- Up to 128 Channels of Audio • 32-24-20- and 15-bit recording
- Up to 96kHz • Apege AY-22 dithering included

**digidesign DIGI001**  
**Digital Audio Workstation For Mac & PC**

- Completely integrated digital recording, MIDI sequencing, mixing and editing environment for the MacOS and Windows
- Sample-accurate simultaneous editing of audio & MIDI
- 16 simultaneous, 24-bit ins and outs with support for 44.1 and 48 kHz sample rates
- 2 XLR mic/line line inputs with -26 dB pad, 48v phantom power, gain knob, and HP Filter at 60Hz
- 6 1/4" TRS balanced/unbalanced line ins w/ software controlled gain
- +4dB balanced 1/4" main outputs and balanced 1/4" monitor outs with front panel gain knob
- 1/4" unbalanced line outputs channels 3-5
- Headphone output with independent gain control knob
- 2 channel S/PDIF coaxial digital I/O and 8 channel ADAT optical I/O (switchable to 2 channel S/PDIF)
- Includes Pro Tools LE software, based on Digidesign's world renowned Pro Tools software, supports 24 tracks of 16 or 24-bit audio and 128 MIDI tracks
- Supports both RealTime AudioSuite (RTAS) and AudioSuite effects Plug-ins — Bundled RTAS plug-ins include: 1 and 4-band EQ, Dynamics (compressor, limiter, gate and expander/gate), Mod Delay - short, slip, medium, and long delays with modulation capabilities for chorus or flange effects and other AudioSuite plug-ins include Time Compression/Expansion, Pitch Shift, Normalize, Reverse.
- All mixing parameters including effects processing can be fully automated

**MOTU Digital Performer 3**  
**Digital Audio MIDI Sequencer For Mac**

- Complete virtual recording studio with fully automatable mixing, effects and EQ • Unlimited audio tracks • Sample-accurate waveform editing
- 32-bit realtime effects • 64-bit MasterWorks Limiter and Multiband Compressor • POLAR window - interactive audio loop recording
- New in EP 3 —
- Redesigned user interface based on Apple's OS X
- Apple G4 Multi-processor support • Pro Tools import/export via DigTranslator and OMF with all tracks, regions, crossfades, and time-stamps in tact • Open architecture surround compatibility with support for mono, stereo, quad, LCRS: 5.1, 6.1, 7.1 and 10.2 surround formats
- VocAlign ADR (Automatic Dialog Replacement) support

**cakewalk Sonar**  
**Digital Multitrack Recording System**

- Unlimited digital audio and MIDI tracks
- 24-bit/96 kHz audio • 32-bit, real-time effects
- Multi-processor and dual monitor support
- Audio loop construction and editing tool, with automatic beat matching and full support for importing ACID loops • DXi (DirectX Instruments) software synthesizer plug-ins
- Fully-automatable DirectX 8 audio effects Plug-ins from Power Technology • Includes DXi-compatible soft synths from Roland, Applied Acoustic Systems, Live Update, and Audio Simulation • Optimized for Windows 2000/ME/98 SE systems
- Compatible with Microsoft's WDM low latency audio driver technology

**GLYPH X-Project Firewire**  
**30GB Firewire Hard Drive**

- 7,200 rpm 30GB drive optimized for digital AV
- IEEE 1394 (FireWire) interface - drive automatically mounts, drives on your desktop
- Record, mix & edit 144 minutes of 24 track audio at 24 bit, 48kHz
- Tablet or rack-mountable configuration
- Hot-pluggable dynamic reconfiguration allows re-cabling peripheral devices without re-booting
- Includes: Rack ears, feet, firewire cable, power cord

**emagic Logic Audio Platinum 4.7**  
**Music Production Software For Mac & PC**

- Imitates MIDI tracks • Up to 64 audio tracks (128 with multiple hardware) • Supports 24-bit/96kHz audio resolution • Support for up to 24 audio instruments • Includes 46 native effect algorithms • 32 effects buses • Up to 8 effects inserts per track or bus • Plug-in support for UST 2 and DirectX (Win) and ReWire
- Arrange and edit MIDI and audio tracks with a comprehensive set of tools • Draw controller data directly into the arrangement with HyperDraw
- Instantly switch between 90 Screens containing customized window configurations • Built-in Stereo Sample editor • Supports all currently available Surround formats • Hardware support for AIO, (3) Audiokeys, ProTools TDM (Mac), DIGI001, Yamaha DSP Factory and more

**MotorMix**  
**Automation Desktop Motorized Fader Worksurface**

- Eight 190mm long-life action sensing motorized faders with dedicated Mute, Solo & Rec/Play switches • Eight high quality rotary pots with display for control of Pan, Aux Sends, EQ, and Plug-ins • 40 x 30 Backlit LCD display with fader labels, pans, send levels and plug-ins • Control levels, mutes and plug in parameters in real-time
- Automate fader moves and mutes into your sequencer • Bank select switches and the LCD display let you control an unlimited number of channels and many plug-ins in each channel • Create a custom console tailored to the way you work • Pro Tools supports up to 4 Motor Mixes for 32 channel banks • Play, Stop, Fast Forward, Rewind/transport keys

**WAVES Version 3.0**  
**Native & TDM Plug-In Bundles**

Waves Bundles feature some of the hottest software processing plugins for tracking, mixing, rembing, mastering and sound design. Choose from the precision dynamics and spatial processing capabilities of the **Native Power Pack TDM Bundle** for ProTools, the vintage processing characteristics of the **Renaissance Collection** and the extreme sound shaping capabilities of the **Pro-FX Plus Bundle**. Also available is the **C4 Multiband Parametric Processor** which provides 4 discrete bands of dynamics and EQ. The **Waves Gold Bundle** features all of Waves processors in one affordable package.

**RealVerb**  
**Reverb Plug In For TDM & MAS**

- Uses complex spatial and spectral reverberation technology to accurately model an acoustic space
- Choose from a graphic menu of Room Shapes and Sizes (from 0.5 meters to 99 meters) as well as Materials with adjustable thickness
- Two different room shapes/sizes & materials can be blended and even morphed in realtime
- Control intensity and timing of early reflections and late-field reverberation
- Into live graphic control over: Resonance, EQ, timing and diffusion patterns
- Stereo Soundfield Panning uses psychoacoustic principals to allow spread and control of the signal between stereo speakers creating an impression of center and width

**TC | WORKS PowerCore**  
**The DSP-Turbo For Your Native Audio Workstation**

- Crossplatform PCI card with 5 hi-end DSPs (2400 MHz WORTH OF DSP POWER)
- World class: Reverb, Modulation FX and EQ right out of the box
- 24/96 compatible • Works with any VST/MAS-compatible application
- Works with all sound cards supported by the host software • Includes TC TOOLS/96 PLUG-INS — TC MegaReverb, TC Chorus/Delay, TC EQ SAT
- Also includes SPARK LE Mastering Software • One complete set of TC TOOLS Plug-Ins (MegaReverb, Chorus/Delay and EQ) only requires one DSP to run • Optional TC MASTER X 4x5 multiband mastering processor
- Open processing platform allows future Plug-in compatibility by 3rd party developers

**serato Pitch 'N Time**  
**Intelligent Sound Algorithm (AudioSuite)**

- Performs a sophisticated auditory-scene analysis based on the human auditory system and uses a patented mathematical algorithm to speed up or slow down music without artifacts • works on solo instruments, voice and complete mixes
- Completely cross-platform code works with both Motorola and Intel architectures
- Preserves sample accurate timing
- Works with all bit depths, and sample rates
- Multi-channel phase accurate processing works with 5.1 and 7.1 surround stems without loss to the surround stage

**M-AUDIO USB Audiosport Quattro**  
**4-in/4-out Audio Interface w/ USB and MIDI**

- 24-bit/96kHz compatible • Multitrack recording and mixing without PCI card installation • Zero-latency direct monitoring
- Balanced 1/4" TRS connectors
- Selectable input and output levels provide compatibility with both pro and consumer equipment • 1x1 USB MIDI interface
- Ships with ASIO drivers for Mac & PC - more drivers are on the way
- Add even more professional connectivity with the optional Omni I/O which provides 2 mic preamps with phantom power and independent gain and pad, 8 additional inputs, 2 headphones sends, an FX send and return, dedicated monitor and record outputs, and more.

**ANALARES Auto-Tune 3**  
**Pitch Correction Plug-In**

- Realtime pitch correction without distortion or artifacts • Preserves all of the expressive nuance of the original performance
- New features in Auto-Tune 3
- Source Specific pitch detection and corrector algorithms including Soprano Voice, Instrument, Bass Instrument, and more
- Phase-oblivious pitch correction of stereo tracks • Bass Mode allows the lowest detectable frequency to 25Hz • Set target pitches in real-time via MIDI from a keyboard or sequencer track • Make Scale From MIDI function allows you construct a custom scale from a MIDI keyboard or sequencer
- Sample rates of 88.2kHz and 96kHz are now supported • Available for TDM, RTAS, MAS, VST and DirectX compatible digital audio applications

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## COMPUTER-BASED AUDIO

### TASCAM 788 12-Track Hard Disk Recording System

- 6-track simultaneous record • 250 virtual tracks • 24-bit A/D/A converters
- 14-channel mixer • 3-band EQ
- Dual effects processor • 10 scene memories per song • S/PDIF digital out • (4) 1/4" TRS mic/line ins • RCA main and monitor outs
- (2) 1/4" aux sends and returns
- 1/4" headphone output • MIDI In/out • Optional CD burning kit
- **Non-destructive editing** with 999 levels of undo
- Jog scrubbing and Shuttle with real sound • Dedicated locate and editing buttons • Wave form display • Title edit functions
- +6% pitch control • Built-in metronome



### KORG D-12 12-Track Hard Disk Recording System

- 12-tracks of uncompressed 16-bit playback or 6-tracks at 24-bit • 16-track mixer with 3-bands of EQ per channel
- Comprehensive editing and DSP functions with 99 levels of undo • 20-bit A/D/A converters • 4 analog inputs including a dedicated guitar input • 24-bit optical S/PDIF I/O • 106 REMS effects types
- 11 simultaneous realtime effects — 8 insert, 2 master and 1 master bus effects • Powerful scene memory and realtime automation capabilities
- Internal 6GB hard drive allows up to 18.6 hours of 16 bit recording
- Optional internal CD-RW drive • 50-pin SCSI-2 connector
- Built-in auto-chromatic tuner and metronome



### KORG D-1600 16-Track Hard Disk Recording System

- Korg's top-of-the-line fully integrated hard disk recording system
- 16 tracks of 16-bit or eight tracks of better than CD quality 24-bit recording
- 24x8 mixer • 3 bands EQ with a sweepable mid per channel
- 24-bit A/D/A converters • 8 analog inputs including a dedicated guitar input
- 24-bit optical S/PDIF I/O
- 106 REMS effects • 11 simultaneous realtime effects — 8 insert, 2 master and 1 master bus effects • Massive 20GB internal hard drive provides 31 hours of 24 bit/44.1 kHz • Optional internal CD-RW drive
- 50-pin SCSI-2 connector • Editing functions are controllable using the 240 x 64 pixel TouchView waveform display



### AKAI DPS 16 16-Track Hard Disk Music Production System

- True 24-bit 96kHz recording capabilities provides up to 144db dynamic range
- Record up to 10 tracks simultaneously
- Coaxial S/PDIF Digital I/O
- 56-bit internal processing
- 8 analog inputs including 2 XLR mic inputs with phantom power • 10GB IDE internal hard drive • 16 track faders with pan, 3-band EQ, 4 aux sends and mute per channel • Optional EB4M 4 bus EFX card can be assigned to any of the 4 aux sends or inserted on any channel • Large flip-up graphic display and user-friendly interface makes editing and navigation a breeze • Built-in scene memory as well as dynamic automation capabilities via MIDI



### YAMAHA AW4416HDC 16-Track Digital Audio Workstation

- Record, edit, mix and master to CD in one machine • 16 tracks of 16 or 24-bit recording with 8 virtual tracks each
- 32-bit internal signal processing
- 44 input mixer with 20 mix buses
- 16 motorized faders and full mix automation • 4-band fully parametric EQ and dynamics per channel
- 2 built-in effects processors • Optional I/O interface cards provide connectivity with all types of digital and analog gear • 8 sampling pads provide realtime playback of samples • Internal 10GB IDE hard drive • Built-in CD-RW drive for creating audio CDs and archiving • Word Clock I/O



### E-MU XL7 Command Station Tabletop Groove Station

- Combines the synth engine of E-MU's Probus 2000 and XL-1 sound modules in a new multi-track sequencer • Designed for Electronic High Energy Dance styles • Equipped with a one octave, velocity sensitive key pad with aftertouch, a touch strip along with numerous knobs, buttons and switches • Easily expandable with 3 additional ROM slots • Easily rack mounted into a 6-space rack • 512 presets, 128 voices and 128 Factory Sequences with hundreds of user locations • Dual effects processor
- Compatible with external MIDI devices via its Sequencer, Arpeggiators, Controller Knobs, Trigger button section and Key Pad



### SONY CD RW66 Standalone CD Recorder

- Supports Standard CD-R, CD-RW & consumer audio discs • Built-in 32kHz - 96kHz sample rate converter • On-board DSP functions: Parametric EQ, Limiter & Super Bit Mapping which provides near 20-bit dynamics • 24-bit A/D/A converters • CD-Text support (up to 23 characters per name) • AES/EBU input, optical & coaxial digital I/O and RCA analog I/O • Word Clock input
- 2x finalize • 2x duplication with 2 CD-RW66s
- Full status fluorescent display • Includes wireless/wired remote



### MARANTZ CDR-500 Standalone CD Recorder / Duplicator

- (2x) CD duplication from the internal CD player • Pro and consumer CD-R and CD-RW compatible • CD-TEXT editing • Memory buffer
- Menu selectable SCMS copy protection • Digital and analog record level/balance control • XLR-Balanced and RCA unbalanced analog ins
- Coaxial and Optical digital ins • Unbalanced (RCA) analog and Coaxial digital outs including Coaxial loop-out for unprocessed connection to other digital equipment • IR remote control included



### MICROBOARDS DSR-1600 Series CD Duplicators

- 16X record speed
- Compact footprint
- One-touch operation
- Disc to disc, or disc to multiple disc for higher volume requirements
- Caching image files is done on-the-fly, to multiple writers simultaneously
- LED error detection prevents bad disc duplication
- Available With One To Eight Recorders
- Supported Formats: CD ROM Mode 1 and 2, Form 1 and 2, CD DA (Red Book Audio), CD 1, Mx Mode, Multisession & Video CD



## Panasonic

Streamlined Version 2.5 operating system with more than 70 new or improved features including new shortcut control features, advanced MIDI faders, new panels for LCD and LED areas, and enhanced software features, such as improved visuals and navigational controls.

#### FEATURES-

- 32 fully featured inputs and 6 auxiliary send/returns
- 8 buses (sub-groups) can be digitally routed using a built-in patchbay for a total of 24 digital and analog I/O's
- 32-bit internal processing and 24 bit A/D/A converters yield a dynamic range 110 db
- 21-100mm Motorized Faders, Jog-Dial, Cursor keys and 10 key Keypad
- Moving fader dynamic and scene automation with instantaneous recall
- Multi-layer fader layout for controlling input channels, Aux sends and returns and buses as well as a fourth layer that adds user-assignable MIDI faders
- Built-in 16-bit dithering to 23 outputs
- Connectivity**
- 16 balanced XLR and 1/4" TRS Mic/line analog inputs with 16 pre A/D analog inserts
- AES/S/PDIF (2 Ch.) digital I/O, Word Clock In/Out, MIDI, In/OUT, MIDI Machine Control (MMC) RS-422/485 standard
- Expandable with up to (3) 8-ch I/O cards
- Optional SMPTE/Video-sync card

- Optional Tandem card allows dual-console operation providing a total of 76 inputs
- EQ & Dynamics-**
- Four true parametric bands of EQ on every channel and 2 bands of parametric EQ on the Aux returns
- 42 full function Compressor/Gate/Limiter or Expanders
- Delays up to 300 ms on every channel
- Automation and Control-**
- 50 independent EQ, dynamics and channel libraries plus 50 snapshots of the entire console can be stored for instant recall
- Four up/down/left/right sensor keys can output MIDI Machine Control commands to MDMs, sequencers and DAWs
- Dedicated undo/redo button and a built-in Talk Back mic
- Large backlit LCD screen displays all channel parameters
- **Optional** High resolution Meter Bridge and Automation software for Mac and PC
- Built-in Surround Mixing-**
- Equipped to mix 5.1 surround through its buses (does not tie up auxes) with full dynamic control of panning

### WR-DA7 MKII

#### Digital Mixer



#### OPTIONS-

- WR-ADAT 8-channel ADA™ digital I/O card
- WR-TDIF 8-channel TDIF digital I/O card
- WR-AESS 8-channel AES/EBU and S/PDIF digital I/O card
- WR-ADDA 8-channel A-to-D, D-to-A card
- WR-TNDM Tandem (dual-console) connection card
- WR-SMPT SMPTE and V-sync card
- WR-MTBR Meter bridge (included)
- WR-WRRC Remote control software

### TASCAM MX-2424 24-Track Hard Disk Recorder



- Records 24 tracks of 24-bit audio at 44.1 or 48 kHz or 12 tracks at 88.2 or 96 kHz • Up to 24 tracks can be recorded simultaneously using any combination of digital and analog I/O • 999 virtual tracks per project
- Includes ammonia 9GB hard drive • Wide LVD compatible SCSI port on the back and a front 5-1/2" bay available supports an additional drive, or an approved DVD-RAM drive for back-up • Record to Mac (SDI) or PC (WAV) formatted drives • Open TL format allows compatible software to recognize virtual tracks without having to load, reposition and trim each digital file • Jog/scrub wheel • MIDI In, Out, and Thru for MMC & MTC
- Built-in editing capabilities include cut, copy, paste, split and ripple or overwrite • 100 levels of undo • Supports destructive loop recording and non-destructive loop recording which continuously records new takes without erasing the previous version • TBUS protocol can sample accurately back up to 32 machines together • Can generate or chase SMPTE timecode or MTC • Word Clock In, Out, and Thru ports
- Includes ViewNet Java-based Graphic User Interface software

#### I/O Options-

- Optional analog and digital cards provide 24 channels of I/O each. There is one analog slot and one digital
- IF-TD24-T/DIF module
- IF-AD24-ADAT Lightpipe module
- IF-AE24-AES/EBU module
- IF-AN24-A-D-A I/O module with DB-25 connectors



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## COMPUTER-BASED AUDIO

**PreSonus DIGIMAX**  
**8-Channel Mic Preamp With Digital Outs**

- 8 Dual Servo Mic Preamps with UltraWide dynamic range and very low noise operating levels
- Dual Domain limiter on every channel
- EQ enhance, Pad and Phantom Power on every channel
- Instr. inputs on channels 1 & 2
- Phase reverse on channels 1 & 2
- Eight 24 bit ADC converters
- 24-bit Light Pipe and S/PDIF digital outputs
- AES/EBU digital outputs are available as an option
- External clock sync input and Master lock output
- 1/4" thick, mill-d aluminum panel with blue anodized knobs

**ANALOG DESIGN AD2022**  
**Dual Mono Pure Class A Preamp**

- 4th generation fully discrete, symmetrical Pure Class A mic preamp
- Mic and hi-Z instrument inputs
- Selectable mic source loading for optimized cable/mic matching
- Gain switched in 40dB steps with a 30dB fine output trim
- Regulated +48v phantom power supply
- Phase reverse
- Unclippable passive HPF
- 20dB pad
- Large illuminated analog VU meters and twin peak LEDs
- High headroom +36dB input before overload
- Fully discrete Class A regulated audio power supplies
- Tallentire wiring and doublet plated circuit boards for superior low level signal transfer

**Focusrite ISA 110**  
**Channel Strip**

- Release of a single channel strip from the legendary Focusrite Studio Series recording console
- Ultra high-end transformer-based Class A mic/line preamplification and EQ circuitry design originated by Rupert Neve, provides a warm, yet transparent sound
- Line input included in preamp section with +/-18dB gain control
- High and Low shelving and two separate bands of parametric EQ
- High and Low pass filters remove unwanted high or low frequency content

**Lexicon MPX-200**  
**24-Bit True Stereo Dual Effects Processor**

- Powered by Lexicon's proprietary Lexichip
- 24-bit A/D/A converters
- 1/4" analog I/O
- S/PDIF digital inputs and outputs
- A newly designed digital compressor is built-in to all presets
- 19" rack, 1U high processor
- 240 presets and 64 user locations with classic Lexicon reverb programs including Ambience, Plate, Chamber and Inverse as well as Tremolo, Rotary, Chorus, Flange, Pitch, Detune, 5.5 second Delay and Echo
- Dual-channel processing provides two independent effects in a variety of configurations — Dual Stereo (Parallel), Cascade, Mono Split and Dual Mono
- Up to 8 adjustable parameters are available in each program
- Fully controllable over MIDI
- Delay times and modulation rates can lock to Tap tempo or MIDI Clock

**ANTARES ATR-1a**  
**Auto-Tune Intonation Processor**

- Automatically corrects pitch in realtime while preserving the integrity of the original performance
- Includes factory programmed chromatic and standard diatonic scales and has the ability to create custom scales
- Bass Mode detects pitch down to 25Hz
- Make Scale from MIDI function allows you to construct a custom scale using a MIDI keyboard or sequencer
- 20-bit data path, 56-bit internal processing and balanced I/O

**TC-HELICON Voice Prism**  
**Vocal Formant Pitch Processor**

- Built-in mic preamp with 48V phantom power
- 24 bit digital converters
- 4 voice backing vocal harmony with independent gender- and humanizing controls
- Lead-voice double tracking
- Complete vocal processing including Compression, EQ, Delay, Tape Delay, Chorus, Flange and Reverb with Pre-delay
- Ultra-easy interface
- XLR mic input, 1/4" unbalanced TRS balanced I/O and S/PDIF stereo digital outs
- Optional Voice Craft card adds human voice modelling DSP algorithms as well as AES/EBU and S/PDIF digital I/O

**audio-technica AT3035**  
**Cardioid Condenser Microphone**

- Large diaphragm provides exceptional detail
- 148dB max SPL
- 136dB dynamic range @ max SPL
- 12 dB octave bass roll-off @ 80Hz
- 10 dB pad
- Requires 11 - 52v phantom power
- Custom shock mount provides superior isolation
- 20Hz - 20kHz frequency response
- Includes shockmount and protective pouch

**RØDE NT1000**  
**Cardioid Condenser Microphone**

- Externally polarised 1" pressure-gradient condenser
- Ultra low noise transformerless circuitry
- > 134dB Dynamic Range
- > 140dB SPL Max SPL
- Requires 35 - 53v phantom power
- Internally shock mounted capsule
- 20Hz - 20kHz frequency response ±6dB
- Includes zippered pouch, M2 Stand Mount, 3/8"-5/8" Thread Adaptor
- Optional SM2 shockmount

**SHURE KSM-44SL**  
**Multi-Pattern Condenser Mic**

**Premium Vocal And Instrument Microphone Built Without Compromise**

- Dual 1-inch gold-layered Mylar diaphragms
- Class A, discrete, transformerless preamplifier
- Cardioid, omni and bidirectional polar patterns
- Includes ShureLock elastic-suspension shock mount and swivel mount, protective pouch and locking aluminium carrying case
- 20 Hz - 20 kHz frequency response

**Hafler TRM-6 & TRM-10**  
**Complete 5.1 Surround Monitoring Solution**

**TRM-6 Bi-Amplified Studio Monitors**

Offering honest, consistent sound from top to bottom, the TRM-6 bi-amplified studio monitors are the ideal reference monitors for any recording environment whether tracking, mixing and mastering. Supported by Hafler's legendary amplifier technology providing a more accurate sound field, in width, height and also depth.

- 1" Tweeter, 6" Woofer
- Bi-amplified (50 W LF, 33 W HF) w/Crossover
- 55Hz - 21kHz frequency response
- Electronically and Acoustically Matched
- Magnetically shielded

**JBL LSR Series**  
**Linear Spatial Reference Monitors**

**Ideal For Surround Sound Applications**

**LSR28P Near-Field Monitors**

- Bi-amplified design— 250 watts for the low frequency and 120 watts for high frequency
- 8" woofer and 1" tweeter
- XLR 1/4" combo input connectors can accommodate balanced and unbalanced signals
- 50 Hz - 20 kHz frequency response

**YAMAHA MSP-10**  
**Bi-Amplified Monitor Speakers**

- 40 - 40k Hz frequency response (-10dB)
- 120-watt power amplifier for the low/mid driver and a 60-watt power amplifier for the tweeter
- 8" woofer and 1" titanium-dome waveguide tweeter
- Balanced XLR inputs
- Magnetically-shielded enclosures
- Green power on and red clipping LEDs
- Master volume control for each speaker
- 3-position low and high trim switches
- Switchable low-cut filter optimizes performance when used with a subwoofer system
- Available in Black (MSP10) and Maple-Sunburst (MSP10M)
- SW10 powered sub-woofer also available

**TRM-10s Active Subwoofer**

Combining Hafler's legendary amplifier technology, with a proprietary woofer design, the TRM10 active subwoofer provides superb bass definition required in today's studio and surround sound environments.

- 10-inch cellulose fibre cone driven firing woofer
- 200 watt low frequency amplifier
- 30Hz to 110Hz frequency response ±2dB
- 24dB/octave Linkwitz-Riley crossover variable (40Hz to 110Hz)

**LSR25P Near-Field Monitors**

- Bi-amplified design— 100 watts for the low frequency and 50 watts for high frequency
- 5.25" woofer and 1" tweeter
- Shielded
- XLR balanced and RCA unbalanced inputs
- Front Panel Volume and Power Controls
- Built in 80 Hz HPF for use with optional subwoofer
- 70 Hz - 20 kHz frequency response

**LSR12P Powered Subwoofer**

- Incorporates the 252F low-frequency transducer and the LSR12P Amplifier which provides 250-watts of continuous power
- Designed to be compatible for both the LSR28P self-powered speaker system
- Multifunction compatibility with Dolby AC-3, DTS and other surround audio systems

**MAGNIE HR-824**  
**Bi-Amplified Studio Monitors**

- 150W LF amp, 100W HF amp
- 8.75" mineral-filled polypropylene cone woofer
- 1" aluminum dome tweeter with ferrofluid-cooled voice coil
- Every set is a "true" matched-pair with a signed certificate from Magnie designs to prove it
- Full space, half space and quarter space placement compensation
- 39Hz to 22kHz frequency response ±1.5dB
- Broad "sweet spot"
- 1/4" and balanced XLR inputs

**CD PACKAGES**

www.bmmi.com

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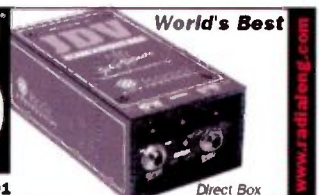
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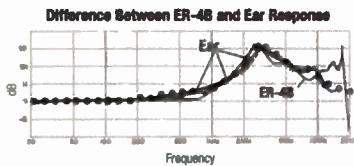
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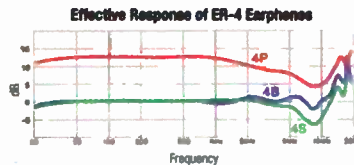
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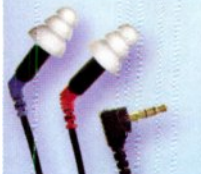
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## FEZGUYS

► continued from page 133

different VBR settings and how they compare to the typical 128k CBR. The number with each VBR listing is the "base bitrate" previously mentioned.

**Quality:** We feel the 96k VBR files are roughly equivalent in sound quality to the 128k CBR files. This is because, when the music needs it, VBR-encoded files bump up to 128k (or more). Most encoders tend to increase rather than drop bitrates, so "base bitrates" we've shown indicate (especially in iTunes's case) the lower-end used throughout the resulting file.

**Other Observations and Notes:** The file size chart demonstrates the effect of a wide dynamic range on VBR technology. Using standard CBR encoding, file sizes were (of course) identical for both the Bach and the Mutton Birds. However, in VBR, file size difference becomes noticeable with the Bach requiring more bits to represent the same sonic experience than the Mutton Birds.

VBR is a good idea and now makes us want the MP3 players to have their groovy visualization plug-ins change as the music changes. If the bitchin' graphics could react in some way as they detect bitrate changes in VBR-encoded files, it would be cool. We noticed that Winamp does have a handy feature on VBR playback — you can see the bitrate changing as the song plays.

A caution: Some older MP3 players may not be able to play VBR MP3 files. However, they're somewhat rare and there are a wide variety of current free players that work fine. Make sure the links you provide to MP3 players on your Web site work properly.

Even modern players that play VBR might still have problems displaying accurate track lengths and seeking to the right place in the file. It's a result of the method used to figure out how long a song is and doesn't affect playback quality of the song. With CBR files, players can perform simple division of file size by bitrate, but that becomes more complex with VBR — a small detail, and not likely to cause any real grief.

Of course, quality is in the ear of the beholder, so we encourage you to do your own tests or check out our resulting clips for yourself. You can find our results with this column's text on our Web site: [www.fezguys.com/columns/057.shtml](http://www.fezguys.com/columns/057.shtml). ■

## SOUNDELUX ELUX 251

► continued from page 67

mic, and included the use of a ceramic tube socket as opposed to the plastic ones used in most mics today. Even the wires to the tube were coiled to help eliminate any vibration transmission. One slight difference is the use of Teflon wire versus the copper used in the original mic. The Soundelux uses a polypropylene blocking capacitor, where the original has a tantalum."

Overall, the ELUX 251, like all the models I've heard in the Soundelux line, is a wonderful sounding microphone. Although the focus of this review has been a comparison to the original, the ELUX 251 has its own character and sound, yet fits well into the C12 family.

If I were trying to punch-in on a vocal track that was recorded on an original ELAM, the overall tonal character of the ELUX is close enough that, with a little added "air" EQ, I could make the ELUX match up with the original sound.

Joe Chiccarelli is a Grammy winning producer/engineer. His credits include Beck, Tori Amos, U2, Shawn Colvin, The Cult, Elton John, Rufus Wainright, Cafe Tacuba, and Frank Zappa. He owned an original Telefunken 251E, but regretfully sold it in 1983 for \$2,500.

## NICHOLS

► continued from page 150

with different types of noise shaping.

Here comes the tough part — explaining noise shaping. These are the basic fundamentals for noise shaping, but, as with any complex methodology, you can accomplish the task in numerous ways, but the underlying principles are the same.

Oversampling digital filters are the basic premise behind noise shaping. An oversampling filter adds interpolated samples, symmetrically, between the existing samples using mathematical algorithms. If you use a 4x oversampling filter, then three samples are added between each actual sample. The spectrum of the oversampled signal is exactly the same as the original spectrum. With me so far?

The quantization noise produced during digital sampling is spread evenly over the entire audio spectrum. When the 4x

oversampling filter gets done with the data, the same noise is spread over a larger frequency, which means that only 1/4 of the noise is in the audible region. This is a 6 dB reduction in noise. If we used an 8x oversampling filter, then we end up with an additional 6 dB of noise reduction.

During the oversampling process, a longer internal word length is used for accurate mathematical processing. The results of the math are dithered back to the desired word length. The remainder is delayed and subtracted from the next sample. This reduces the noise by an additional 1 dB in the audio range, but adds 1 dB of noise at 1/2 the sample frequency. At 4x oversampling, the extra noise is piled up at two times the sample rate, where it can be easily filtered out of the audible spectrum. The final result is a more accurate representation of the original signal we were trying to record.

## OUTPUT WORD LENGTH SELECTION

Every processor, DAW, and digital console allows you to select the output word length and the use of dither. If the destination device is a 16-bit CD recorder, select 16-bit with dither turned on. It does no good to select 24-bit as the output resolution if you are recording to a 16-bit DAT or CD recorder. If you are recording to a 24-bit device like a Masterlink, 24-bit DAT machine, or another DAW set to 24-bit, then set the output word length to 24-bit and turn dither on. Remember that the internal word length is 32 bits or higher, and dithering retains some of that resolution in your final output. Put a little sticky note on your DAT machine that says something like "REMEMBER TO SET WORD LENGTH." I have so many sticky notes around that I even have one that says "REMEMBER TO READ STICKY NOTES."

## ONLY THE BEGINNING

This is just a very cursory overview of what goes on during dithering and noise shaping. If you want to know more about the subject, check out Ken Pohlmann's book, *Principles of Digital Audio*. Another more technical source is *Digital Signal Processing, A practical Approach* by Emmanuel Ifeachor and Barrie Jervis. If both of these are over your head, try *How To Buy Foreclosed Real Estate For A Fraction Of Its Value* by Theodore Dallow. ■

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The Radical Technologies SAC-2K sets a new standard for hands-on control of Digital Performer. The SAC-2K's custom plug-in for Digital Performer gives you easy, one-touch access to every element of the recording process in Digital Performer with responsive, touch-sensitive automated controls. Within minutes, you'll achieve a whole new level

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## SAC-2K™

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## DigiMax™

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—Electronic Musician, January 2001



# MOTU Dream Studio 3



- **MOTU 1296™**— 12-channel expandable 24-bit / 96kHz PCI audio interface
- **Digital Performer™ 3.0** — award-winning workstation software with MIDI sequencing
- **HUI™**— automated, touch-sensitive control surface for Digital Performer
- **PowerCore™**— DSP accelerator for TC Works MAS plug-ins (and other advanced 3rd-party MAS plug-ins)
- **MAS STOR™**— reliable, high-performance SCSI storage and backup for MOTU Audio System based studios

## FULLY AUTOMATED WORK SURFACE

HUI™

The Human User Interface (HUI) from Mackie is so tightly integrated with Digital Performer, it's like placing your hands on Digital Performer itself. Sculpt your mix with HUI's silky smooth motorized faders. Tweak effects parameters with firm, yet responsive V-Pot rotary encoders. Instantly locate to any position and track in your mix. You can even

call up plug-ins on-screen directly from HUI. Keypad and transport controls let you locate Digital Performer's main counter instantly, just like the familiar keypad on your computer keyboard. HUI is an advanced hardware workstation console, complete with built-in monitoring and the user-friendly ergonomics that Mackie mixers are known for. Boost your productivity through direct hands-on control.



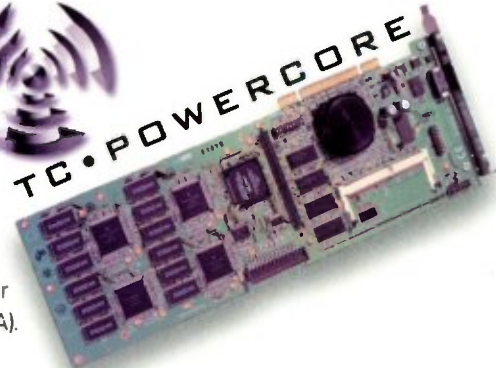
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## DSP TURBO™ FOR MAS•POWERCORE PLUG-INS

TC•PowerCore™

TC•PowerCore is a major breakthrough for Digital Performer's real-time MAS plug-in environment because it provides DSP-turbocharged plug-in processing. At last, the renowned TC TOOLS/96 studio-quality FX package (included), with TC MEGAVERB, TC Chorus/DELAY and TC EQ<sup>sat</sup>, can be at your fingertips in Digital Performer, plus other TC I Works plug-ins such as TC MasterX (sold separately). These powerful TC plug-ins

appear in DP's mixing board, just like regular native plug-ins, but they run on four powerful 56K DSP chips on the TC•PowerCore PCI card. It's like adding four G4 processors (equal to 2.8 gigahertz of extra processing power!) to your computer. Run 12 studio-quality TC plug-ins with no hit on your CPU power, and run other native plug-ins at the same time! TC•PowerCore is an open platform, so it will also run plug-ins from other respected 3rd party developers, too (details TBA).



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CIRCLE 56 ON INFO CARD

A look at the I's and O's of dithering

## A Little of This, a Little of That

This month I am going to try to clear up some points that seem to come up often. I overheard a conversation in a bar that must have been about digital recording: "Word. Length does matter."

### MORE ON DITHERING

My wife dithers over where to go for summer vacation. "Let's go here, or maybe we should go there, or how about just staying home this summer...maybe, or not." Dithering is a complex problem. Sitting somewhere on the fence, you can't quite polarize your decision to decide one way or the other. This is much like the least significant bit in a 16-bit sample.

A bit becomes a "1" or a "0" depending on whether or not the input signal crosses a threshold. For argument's sake, let's say that the each bit is worth one volt and the threshold is exactly 0.5. When the input signal gets above 0.5 volts, the bit turns on and becomes a "1." When the input signal gets below 0.5 volts, the bit turns off and becomes a "0." As the signal level increases, nothing happens until the level gets above 1.5 volts, at which time the next bit turns on and the first bit turns off. This works just like counting to ten in a decimal system. When you get past nine, the ones column turns off and you put a one in the tens column. 9 (nine) becomes 10 (ten). In digital numbering, 1 (one) becomes 10 (one-zero). In our digital example, there is no way to tell accurately what the input signal is when it is more than 0.5 but less than 1.5. The bit shows "1" anywhere in that range.

Let's add some dither to see if that helps us determine the level of the input signal. Dither is a signal that is added to the input signal. The dither signal can be random noise, a triangular waveform, or some complex mathematically derived waveform. We will add a triangle waveform to our signal that is exactly 0.5 (peak-to-peak voltage). This is half of the value of our "bit." This triangular waveform that we are adding to the signal makes our bit keep flipping from "0" to "1" as the combined signal crosses the 0.5 threshold. If the level of our input signal was exactly 0.5, and we counted the ones and zeros for exactly one second, we would have 22,050 zeros and 22,050 ones (at

a 44.1 kHz sample rate). The average signal level during that second would be 0.5, which is exactly what our input signal is.

Now we change the input signal level to 0.75. When we count the zeros and ones for one second, we get 33,075 ones and 11,025 zeros. This means that 3/4 of the time the signal registered as a "1", and 1/4 of the time the signal registered as a "0." The addition of the dither signal has increased the accuracy of our digital system without adding additional bits. Dither signals can be added in the analog domain to increase the signal capture resolution of the A/D converter, or it can be added digitally to increase the resolution after a 32-bit DSP plug-in, or after a level change or addition of reverb. By the way, when you transfer analog tape to digital, the noise floor of the analog tape makes the signal self-dithering.

If dithering is done correctly, there are no drawbacks to using dither at every stage of bit-depth change. The dither during addition of reverb signals should add to the dither from earlier operations. I have seen some devices that ignore dither information encoded from a previous operation. As always, the best test instrument is your ears. Make sure that what you're doing sounds good to you. Listen to quiet passages or the section of the recording before the count-off or after the ending when signals are low. Listen for fizzing or buzzing. If the noise sounds smooth, then you are fine.

### NOISE SHAPING

Here is where you have to be careful. Noise shaping is a step up from dithering. It's pretty easy to come up with a good dithering signal, but it takes a room full of DSP experts and mathematicians to produce a great noise-shaping algorithm. Because of the artifacts produced, noise shaping should only be done once at the end of the stream. Most of the time, this means "mastering." If you get in a pinch, you can do it twice, but, after that, you could start getting some weird whistles and high frequency hissing that may be worse than the benefit from noise shaping. Different noise shaping methods have different effects on the music. Different types of music sound better

► continued on page 146


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