

# Computer Studio Techniques

# EQ

PROFESSIONAL  
PROJECT  
RECORDING  
& SOUND

MAY • 1999

## REVIEWS:

Line 6 POD

Opcode DATport

Biamp MSP22 Processor

Galaxy CORE PA5000

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Alesis M1 Active Monitor

Otari RADAR II

HHB CDR-850

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From left to right:  
Jeff Balding, Dann Huff,  
and Megadeth's Dave  
Mustaine

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PROFESSIONAL PROJECT  
RECORDING & SOUND  
VOLUME 10, ISSUE 5  
MAY 1999



**ON THE COVER:**

(From left to right) Engineer Jeff Balding, producer Dann Huff, and Megadeth guitarist Dave Mustaine sit in Emerald Studios' "The Tracking Room."  
Photo by Beth Gwinn.

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# Are We There Yet...?

The EQ tour bus is back in the garage safe and sound, enjoying some R&R, sipping vital fluids, and preparing for the next tour. Once again, the nation's highways are safe for every man, woman, and child.

EQ's Surround Sound Road Tour was an outright success. (I hope you've been following along on our Web site.) We hit five major recording and sound programs coast to coast, sharing and disseminating information on surround sound. The five programs — Peabody Conservatory, Baltimore, MD; Middle Tennessee State U., Murfreesboro, TN; Full Sail, Winter Park, FL; Conservatory of Recording Arts & Sciences, Tempe, AZ; and Citrus College, Glendora, CA — treated us royally. Their sites, studios, equipment, and personnel were all outstanding. Program members and faculty came out in big-time support and asked important, informed questions. The combination of pros and pros-to-be in the audiences kept discussions flowing on many levels.

Our Tour objective was to get out there with some of the best young and veteran recording minds in order to pose questions and share information. For example, how will surround influence and affect our musical future? What gear do we really need to create surround mixes? What are the "correct" speaker placements and calibrations? Do we need encoding/decoding? What's best for your music mixes — point source, dipole, or tripole monitoring? Bass management? The questions flowed, and we believe we answered the call. After all, information sharing is EQ's reason for being.

Mike Sokol, contributing editor and engineer-producer (to know him is to love him...), was our seminar point man. No easy task considering the travel schedule, logistics, and the rapidly changing world of surround — the latest updates on speaker designations, DVD-A, Dolby Digital, and more came into us via e-mail on a daily basis. Despite being trucked and trailered across these United States during the month of February, the gear held up perfectly — much credit to Mike, who these days is "Mr. Surround."

Four manufacturers — JBL, Lexicon, Otari, and Panasonic — deserve special mention for sharing our surround vision and supporting the Tour with expertise, equipment, and resources. We installed the Lexicon DC-1 (2) processor, JBL LSR series monitors, Panasonic DA-7 console, and Otari RADAR II hard-disk system as the heart of our system. Everything worked brilliantly together. Those companies certainly walked the walk for this tour.

What now? We're taking a short break and then risking white line fever again with Phase 2. I am checking out more recording programs, so if you are on the faculty or are a program participant, drop me a line about bringing the EQ Surround Sound Road Tour to your door. You can write me at: EQ Magazine, 460 Park Avenue South, 9th Floor, NYC, NY 10016, or log onto www.eqmag.com, check out the site and then post an e-mail regarding the Tour. Manufacturers interested in sponsoring future tours should also contact us.

Surround sound is a new, exciting world that should be accessible to us all. It can open fresh, sonic vistas for us. EQ will be there to share the information you need to do the job right.

See you on the road.

—H.G. La Torre  
Executive Director

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## READER SUPPORT

I just want to apologize for Matt Fusello's letter that appeared in the March issue of *EQ*, concerning *EQ* selling out because you printed the article on David Lynch. Personally, I thought it was a great article, which definitely fit into the pages of your magazine. Apparently, Matt isn't familiar with all the fantastic soundtracks and independent music on which David Lynch works. If he were, I don't think he'd be so quick to judge.

I'll turn the tables, now, in a way that better illustrates what Matt tried to say at the end of his letter. Let's say Trent Reznor, an obviously well-known musician, decided to make a movie. I'm sure that more than one film or video magazine "geared for movie industry professionals" would pick up on it and write an article, and that its readers would find it as interesting as I found your article on David Lynch. Matt was off-base, and I'm sorry he criticized you when it wasn't necessary. Keep up the excellent work!

Tim Roberson  
Knoxville, TN

## GENE BELIEVER

I'm a record producer/studio owner/singer/songwriter in Australia, and I just wanted to tell you how much I enjoyed and related to your editorial titled "The DNA of *EQ*" in the March '99 issue.

There is always the temptation to get a "real job." It's incredibly difficult making family, friends, and everyone else understand why we do this; that is, follow this insecure career/dream. I guess it's just something that you can only feel by being a part of it. Your editorial helped to make a few of my harshest critics see things a little differently. It helped make it easier for them to see why I'd prefer to earn less but be so much happier.

I gave up my day gig at the start of last year, and it's only now that I'm starting to make ends meet doing music full time. In that time, I've managed to make it to the U.S. to participate in a pop festival, do 160 shows in a club band, make two major studio upgrades that have made my studio a wonderful working environment, help, I'd like to think, get three bands who I produced signed to good deals with majors, survived a flood, buy an apartment with my long-suffering fiancé, and, almost at the same time, land myself a deal to release my own album in the U.S.

It doesn't mean that I can start planning to buy a house in the Hollywood Hills,

but I've achieved more in the last 15 months by giving *everything* to music than I did in the 14 years before.

I'm sure there's a lesson in there somewhere.

Michael C  
via Internet

## COMES IN COLORS

As a producer myself, it was really heartening to read Bruce Swedien's interview in your March '99 issue. I just finished (well nearly) an album. Throughout the sessions, I caught myself thinking of the degree to which, in most instances, the instinctive response was indeed "the way" things happened best (don't punch where you could play it from the top, for example). While some hyper-conscious, minute manipulation is an essential part of the recording process from start to finish, the "wholeness" that is achieved in the end (hopefully) seems to be governed more by inspiration than intentional design.

By the way, the condition Bruce alludes to of seeing colors when hearing sounds is called "synesthesia." In fact, this condition appears with taste, touch, and smell as well, it is definitely not a "disease." (My own mom can see the red frequency component in a black-and-white charcoal drawing, but that's a whole other story.) In short, the experience of art can be so encompassing that it has its effects on levels we can only dimly envision as they are occurring to us. With someone as technically proficient and indeed masterful of the nuts and bolts of recording and music as Bruce Swedien, to come out as such an instinctive person must give great faith to all of us who seek to straddle the ever-changing line between traditional recording virtues and creative embellishment.

Aaron Luis Levinson  
Kosherican Music Ltd.  
Philadelphia (-on-the-Delaware), USA

## HEAD DOCTOR

After reading Steve La Cerra's April '99 techniques article on aligning analog tape machines using the Metric Halo Labs system, I'd like to add a few comments to further assist *EQ* readers.

First, Steve suggests using two edge tracks (1&8, 1&16, etc.), or second-to-edge tracks, while adjusting azimuth. In my experience, it always has seemed best to start with a pair of adjacent tracks in order to minimize the possibility of azimuth misalignment. For example, use tracks 2 and

3 on a 4-track tape machine, tracks 4 and 5 on an 8-track, 8 and 9 on a 16-track, etc. After you get the azimuth in the ballpark, you can choose a pair of tracks that are further apart for fine-tuning. If you are aligning a stereo cassette machine, you have no choice but to use the left and right channels — pink noise (via test tape) yields the best results.

Next, I reiterate: before placing a calibration tape on the machine, I strongly suggest cleaning and demagnetizing the heads, tape path, and tools.

Further, in the article's final paragraph, Steve discusses headwear problems. If you notice inconsistent level of the *high frequency* tones, especially on the edge tracks, the heads are worn and should be relapped (or replaced) before attempting any electronic adjustments.

While headwear decreases or destabilizes high frequencies, it also increases low-frequency anomalies. This is a particular problem with narrow format machines, which often have no low-frequency playback adjustment, resulting in a common misperception that noise reduction doesn't work. In fact, noise reduction systems require a more critical alignment than "no noise."

One final note: Most test tapes are full track and not "compensated for multitrack reproduction." For this reason, the low-frequency playback level should be adjusted after first recording a bass sweep from 200 Hz down to 20 Hz. While either monitoring via repro head during record or afterwards on playback, note the peaks and dips. Pick a "center-frequency" somewhere between 40 Hz and 80 Hz that, when set to "0" VU on playback, symmetrically places the peaks and dips on either side of zero.

Now, go align your machines.

Eddie Ciletti  
Contributing Editor  
EQ magazine

## CORRECTION

The April issue's Performing Engineer special had two photos misidentified:

- On page 90, the picture of Sheldon Drake is actually of Frank Heiss.
- The picture on page 72 shows Dr. Walker (Ingmar Koch) on the left; he's the driving force behind the Cologne music scene. On the right is LL Nino (Si Denbigh), the co-developer of the Notron live performance MIDI sequencer.

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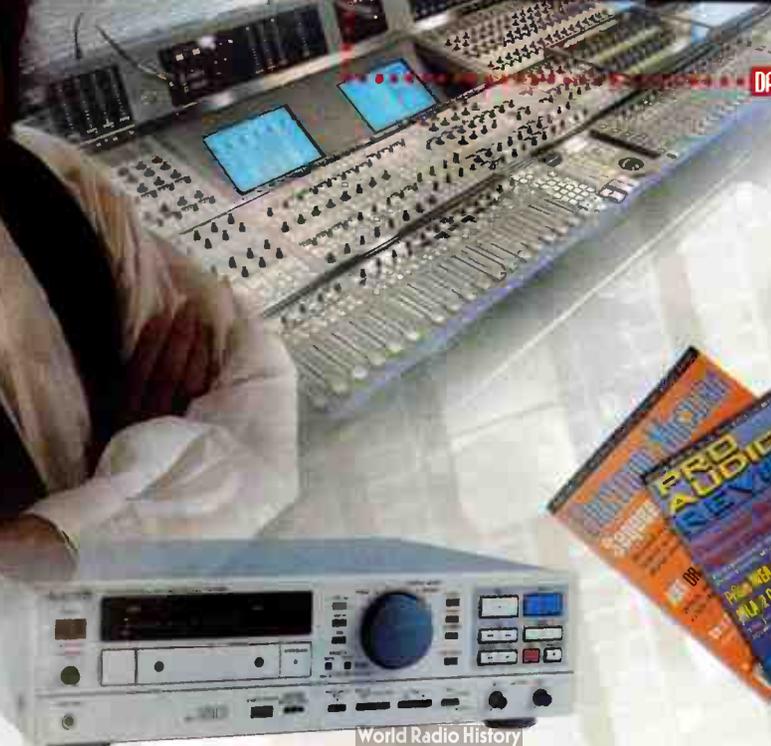
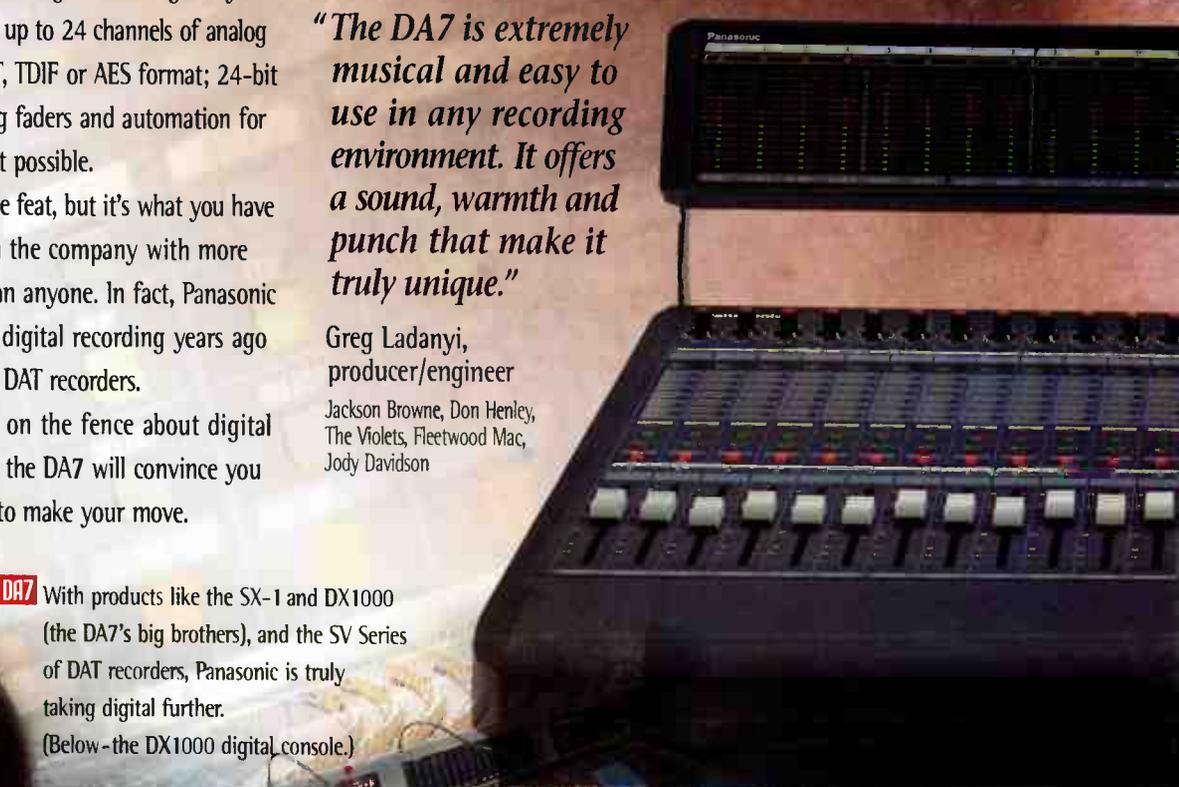
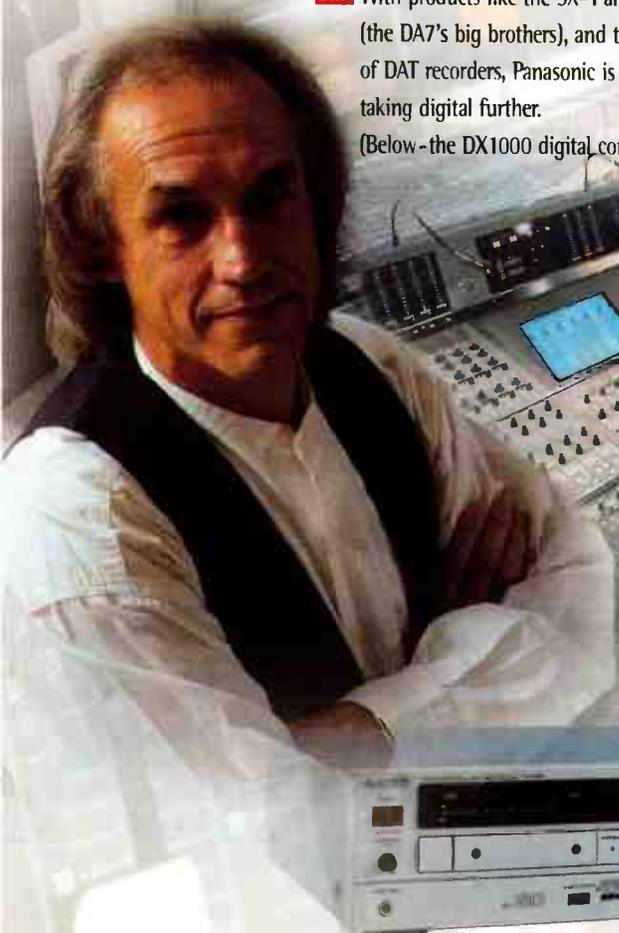
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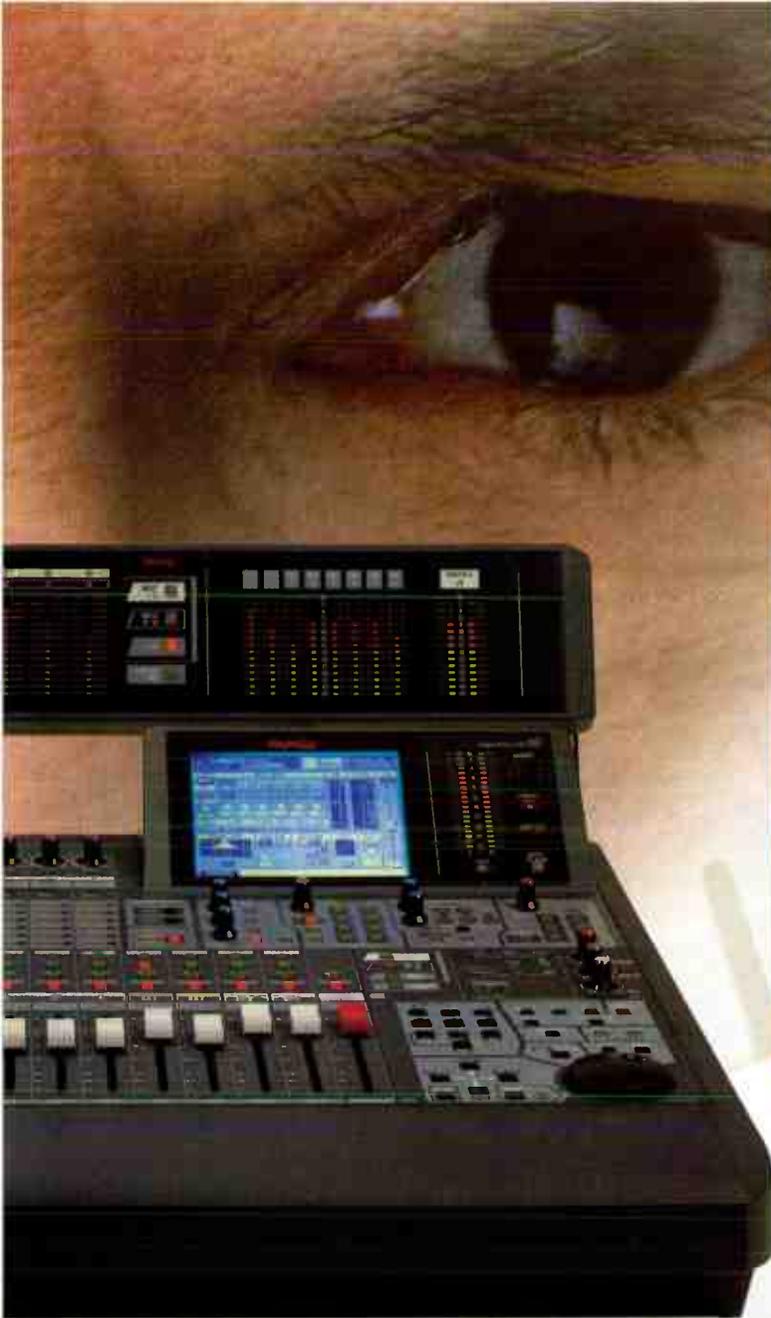
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(Below - the DX1000 digital console.)

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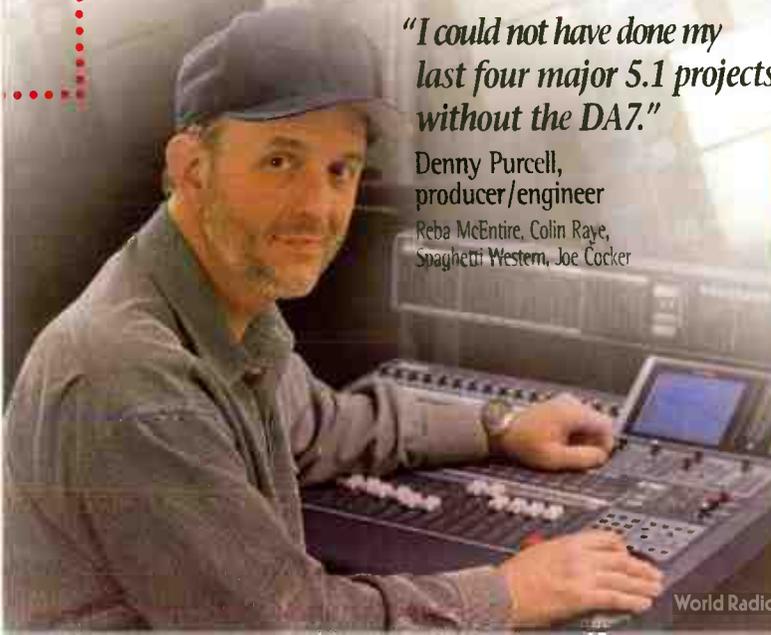


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## HEAD CASE

**Q** I have a problem with my Sony DTC-D7. Some time ago, my DAT began to behave oddly. It wouldn't playback old recordings at all or record new ones without loud noise on playback. I opened it up and found that one of the two arms that loads the tape had fallen off. I managed to put it back, and it seems to be firmly attached.

The DAT is now recording fine on blank tape, but it won't completely erase previous recordings. Also, if a new recording is made over an old one, both of them are still there. When I push Play, sometimes I can hear the old one with that noise, but if at that moment I press Stop and then Play again, the new recording can be heard without any obvious troubles.

Is this problem due to this arm I "fixed" causing a kind of "azimuth" misalignment, or maybe is it something even worse (like a bad head)?

LUX  
via Internet

**A** Congratulations on being so mechanically inclined. I think these miniature DAT machines are technical wonders, but Sony did not design enough mechanical reliability or serviceability into them. That said, what you need is an oscilloscope and a test tape. (The test points are labeled on the main circuit board as RF and SWP.) With them, you can precisely align the guide you restored to its proper place.

The trick is to lock the guide with the set screw located at the base after achieving the correct guide alignment. This is one of the most difficult tasks without fully disassembling the mechanism, and, even then, it's a bear. You need to have very fine tools — a set that would make a jeweler jealous!

Keep it up, and you'll be able to make a living at this!

Eddie Ciletti  
EQ Magazine  
www.tangible-technology.com

## 'BASE MANAGEMENT

**Q** I would like to learn all I can about equalization and its use. I have Steinberg's Cubase, and I'm still not satisfied with the sounds that I am getting from it. Can you direct me to some

articles that would help me? What do you think about Cubase? Can it sound like the big-league studios or did I go in the wrong direction?

Greg Cabrera  
via Internet

**A** Cubase is a very cool application with lots of power, but it will sound only as good as the waveforms and A/D converters you use for your workstation. If you're using the samples that are included on a generic consumer-grade "Blaster-type" card that came bundled with your computer, then all the EQ in the world won't fix your mix. You need some professional outboard sound modules. Also, consider adding the Yamaha DSP Factory, which basically gives you the power of an 02R mixer on a computer card. Then you'll have the basic sounds and processing to work with.

If you're attempting to capture audio via the on-board A/D converters included with your PC or Mac, you're in big trouble. They're almost impossible to work with. Get an outboard converter from someone like Event Electronics or Aardvark (the Midiman Flying Cow is pretty decent and inexpensive). I just don't consider the line and mic-level preamps on an OEM sound card worthy of any production using more than 8 bits.

Finally, good production techniques using decent mic preamps and microphones, good compressors, and a high-quality reverb are all required. Just because you've got a digital workstation doesn't mean you can ignore all the basic steps to good production. Plus, remember that all audio mixing takes place in the gray matter between the ears. If you can't do a decent mix on an analog console with 8 or 16 tape tracks, then all the computer power in the world won't "fix your mix." The machinery is just the tool of your craft, nothing more or less. Granted, they can be pretty fancy and expensive tools, but you are the craftsman. When you know how all the various tools work and can make them do your will, then you're a true audio engineer.

Mike Sokol  
JMS Productions  
Hagerstown, MD

[Steinberg also replies: How you get your sound into the computer is where the music begins. This means that, if you are serious about sound, you need the best converters possible. Steinberg rec-

ommends professional cards like DSP Factory, MindPrint En-Voice preamps, Lexicon Studio, etc. Cubase VST then does the best possible processing of 24 bit /96 kHz with internal resolution of 32-bit floating point for highest dynamics.

The beauty of this technology is that anybody can start with a cheap sound card and then grow with the quality of new converters, but still using the same tools, all while becoming familiar with the basic process of recording. —Thomas Wendt, Steinberg]

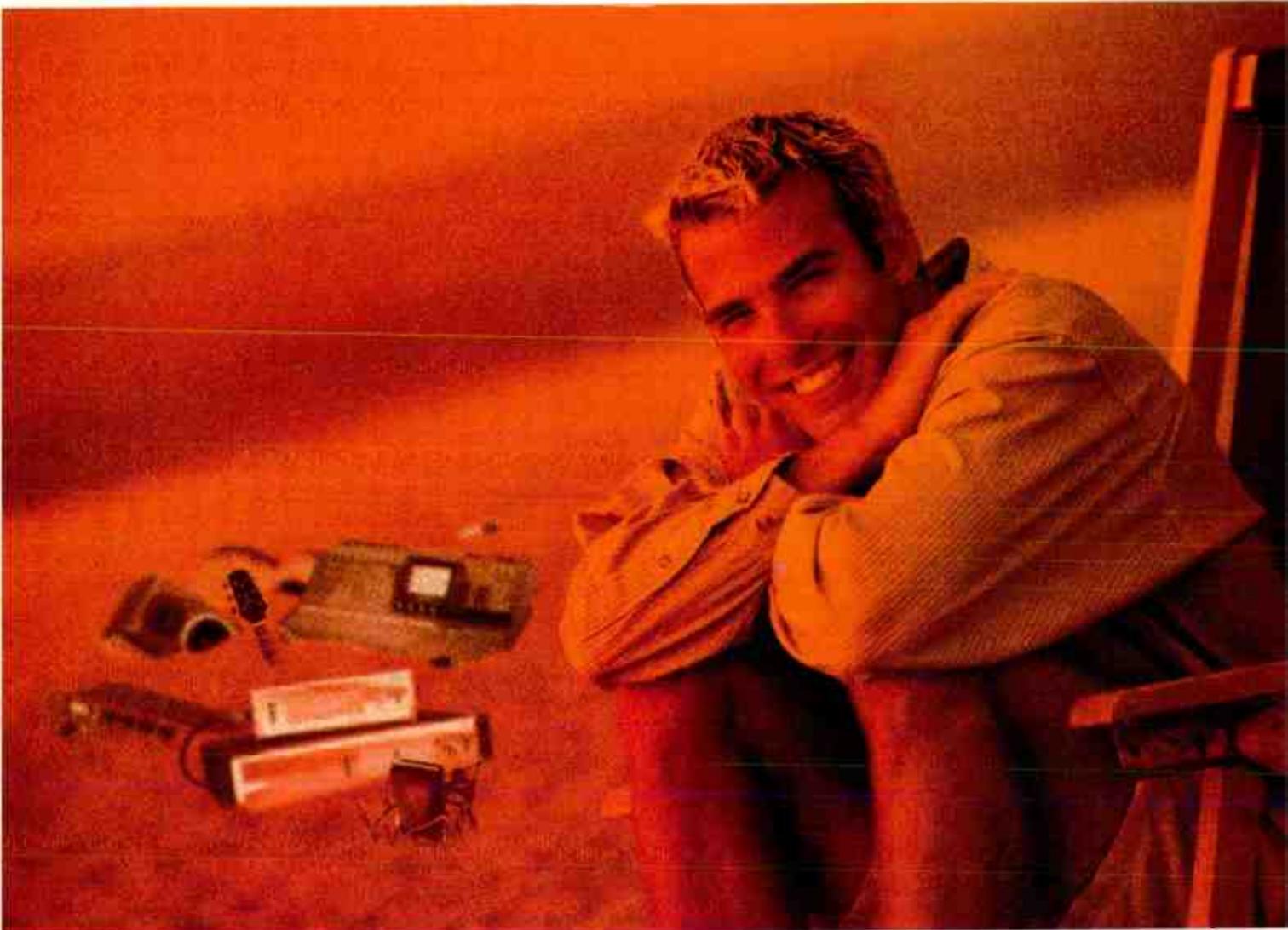
## DRIVEN ONLY ON SUNDAYS

**Q** I am about to buy a small multi-track recorder and have narrowed my choices down to a used TASCAM 238 8-track for \$250 or a brand new TASCAM 424 mkII (4-track) for \$359. Both are analog units, of course, and I am tempted to buy the 8-track, though it may be 10 years old. Would this be a foolish buy? How well do such older 8-tracks hold up?

Wilson  
via Internet

**A** Fitting 8 tracks on 1/8-inch-wide tape is an engineering marvel, but it's not necessarily the most robust production media. I've done a few remixes in my studio from projects that were tracked on a 238, and while the sound was OK, there were a lot of dropout problems due to tape mishandling. So if that becomes your format of choice, you need to keep things really clean. I don't know if I would trust a 10-year-old deck, especially since you don't know what it's been through, and, if the heads fail, you're toast. On the other hand, I don't know if I would buy a new analog 4-track deck either.

I did a review of the 424 mkII last year for EQ's sister publication, *Gig* magazine (212-378-0400), and while it was fine as a 4-track production tool, I think there are other creative options for musicians with a little more money. Akai, Yamaha, Fostex, TASCAM, Roland, and other manufacturers now make reasonably priced multitrack (4, 8, and 16) digital recorders using hard disk or MiniDisc as their recording mediums. Such mediums give you the ability to cut-and-paste edit, as well as to bounce tracks digitally without generation loss. Or, if you have access to a Pentium-level computer with a decent sound card



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and a few gigabytes of free hard-disk space, you could add something like [Syntrillium's] Cool Edit Pro and a basic mic preamp. Then you could go to a dozen tracks or better, plus have lots of editing and creative options.

Still, it's hard to beat the simplicity of a 4-track Portastudio™ and an acoustic guitar for playing with song ideas. So don't feel bad about the TASCAM 424mkII deck if that's how you'll use it.

Mike Sokol  
JMS Productions  
Hagerstown, MD

## WHAT'S THE BUZZ

**Q** I seem to have run afoul of an ADAT XT problem that is turning out to be most dastardly. I'm dealing with an intermittent problem, since the symptoms seem to fluctuate between barely detectable to completely intolerable, an audible artifact on all eight tracks. I initially noticed the anomaly when procuring tom sounds on a real drum kit. The attack is OK, but, during the decay, a buzzing sound is heard. Creepy!

At first, only toms would yield the buzz — not snare nor kick. The double creepy alert was that tracks 1-3-5-7 have a different "buzz-decay" character than do tracks 2-4-6-8. Facts follow:

1. The problem seems to be on the A-to-D side of the chain, because tom tracks recorded on another deck play back fine in the problem deck.

2. I believe I have eliminated all chances of anything outboard as the culprit. (During the process of scientific control, different mics, cables, mic preamps, and even drums have been used. The method has been exhaustive, except for moving the deck out of the studio, which I am reluctant to do because the third deck is fine and, yes, they are all plugged into the same power conditioner. I even eliminated the conditioner and tried at least three 115v circuits.)

3. If you handhold the mic being used and pull it away so the ADAT doesn't have to deal with the decay of the drum, the anomaly is not heard.

4. The deck has been in to Alesis for service twice and I have sent a tape and descriptive letter. They indicated that they changed out the A-to-D converter and (Lord only knows why) they changed the ELCO connector. They said they

could detect nothing wrong before or after the new parts were installed.

5. I found out they were using a drum machine rather than an acoustic drum, so I tried a drum machine while the deck was symptomatic, and no anomaly was heard. An immediate switch back to an acoustic drum, and boom — there was the buzz again.

6. Piano can now be added to the list of sonic signatures that cause a buzz.

7. If the deck is used to record, the anomaly is printed to tape and can be heard on (how does the ad campaign go?) 500,000 ADATS worldwide.

8. When the deck came back from service the second time, the problem could only be detected on track 7 and almost imperceptible at that. The buzz is now back on all eight tracks.

9. The buzz can be heard while the deck is in Stop mode and tracks are in Record Ready.

10. Deck two seems to be symptomatic, albeit darn near imperceptible.

Whew! I sure hope you have an idea or two, or should I say....Help me Obi-wan Ciletti, you're my only hope!

Rob Cimmarusti  
via Internet

**A** The problem you refer to is the dreaded "D" problem, one that has plagued digitized audio "products" from their inception...

All digital audio products are mass produced, increasing their potential to be inconsistent. (See Eddie's March '99 column, "The Price of Maintenance.") You certainly did all the homework, including sending a tape. Since you've pretty much ruled out room, mic, and preamp-related causes, my guess would be clock jitter. This comes from the main system board. It might explain why the problem was inconsistent when the machine was returned to you. You might try running the machine with the cover off to see if "cool runnin'" seems to offer a temporary cure.

That Alesis could not replicate the problem is not a total surprise. They don't have a recording studio in-house, nor is it likely that each test bench is outfitted with a control-room quality audio system and acoustic isolation from other test benches. Tracking the cause of the problem back to the system board might be equally squirrely, and, if I'm wrong, then what else could it be? The only other test

would be to put the XT in "analog" mode, so that the signal is not being digitized (when you are monitoring in Stop mode).

Eddie Ciletti  
Manhattan Sound Technicians  
Now of St. Paul, Minnesota

## SNAKE HANDLING

**Q** I just received my order for a 1/4-inch-TRS-to-male-XLR snake to lay off the 8-track audio we have recorded, and discovered the company we ordered from made an error and shipped me a female-XLR-to-1/4-inch snake instead. When I called to complain, they said they were on back order and it'd be a week to 10 days before I see it. Not good.

You wouldn't just happen to have a male (pin end) XLR-to-1/4-inch 8-line snake laying around for rent, would you? I've got to get this music off right away (though now I guess it'll be next week) and I can't wait 5-10 days.

Mark Ford  
Review and Herald Publishing  
via Internet

**A** Are you really sure you don't want the XLR female-to-1/4-inch snake? The outputs on your Otari tape deck should be XLR males. This is how almost all audio gear is wired, with very few exceptions (the Bizarro universe of old Bogen PA amps being the only example of reverse XLRs that I can think of...).

Here's an easy way to remember your IN-ies from your OUT-ies: Look at the pins of the XLR male connector on a microphone. In the audio universe, the pins always point in the direction of signal flow — always. This holds true for tape returns, microphones, power amplifiers, equalizers, press mults...even AES/EBU connections. You get the idea. You wouldn't believe the number of times I've asked an assistant to lay a feed to the press box and they lay (and gaff down) 200 feet of cable with the ends reversed. So, let's all say it together in unison: "The XLR pins always point in the direction of signal flow."

Mike Sokol  
Contributing Editor  
EQ magazine

# The First Integrated Professional 5.1 Monitoring System With THX® Approval

## No Off the Shelf Parts. No Off the Shelf Thinking.

The All-New JBL LSR Monitors are, quite literally, just that. Highlighted by a long list of performance-tailored components and customer-inspired features, they're like no other systems on the market today. The entire line, including the LSR32 3-way, 28P 2-way and 12P Subwoofer, is a technical triumph; resulting in new standards and performance levels for a rapidly emerging multi-channel recording industry.

## Performance-Tailored Components

Revolutionary transducer designs, optimized network topologies and innovative materials are some of the reasons why the LSR line is being hailed as 'the world's most advanced monitor'. JBL's all-new *Differential Drive*® woofer permanently dispels the notion that better linearity, higher power handling and greater dynamic accuracy are somehow an unobtainable, evil triangle. *Dynamic braking* produces truly accurate bass at higher SPLs with maximum reliability. Composite materials, including *Carbon Fiber* in the woofer as well as *Titanium* and *Kevlar*® in the high and mid frequency components, insures performance that is always optimally maintained.

## Not Just A Better Spec... A Better Monitoring System

While all companies boast about their specifications, JBL went one step further. To guarantee that every component of the LSR family worked together for optimal performance, LSR development employed JBL's unique 'system-engineered' design philosophy. Simply put: the entire line was researched and refined as one, with an overall performance goal in sight. What this means to you is a monitor and subwoofer that work together as a system; delivering stunningly uniform and accurate performance in both stereo and multi-channel applications.



### LSR 32

12" 3-way mid-field monitor with rotatable Mid/High Elements.



### LSR 28P

8" 2-way close field monitor with bi-amplification and active filtering.



### LSR 12P

12" Active Subwoofer with Bass Management System.

Carbon Fiber Composite Cone

Dual Top Plate

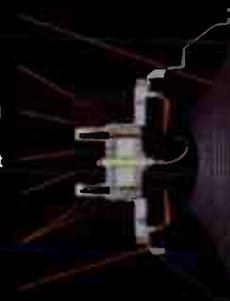
Dynamic Brake Coil

Neodymium Magnet

Aluminum Diecast Heatsink

Dual Drive Coils

Diecast Frame



H A Harman International Company

To find out more about the revolutionary LSR Monitors, visit JBL Professional at [www.jblpro.com](http://www.jblpro.com)

## MICHAEL DeLORENZO



Double threat **Michael DeLorenzo's** acting credits won him a role on "NY Undercover"... his musical gifts landed a recording deal. "The sound of this console is as good as any big analog console I've worked on," he says, adding "My producer **Peter Michael** and I were so surprised by the quality of the onboard dynamics and reverbs that we plan to mix the whole album without outboard gear."

## WHY GO DIGITAL?

Virtually everybody in this ad has worked on a Big Automated Analog Console. Motorized faders... instant recall of channel, aux, EQ and effects settings... the ability to polish every facet of a mix... It doesn't take long to get used to the fantastic creative benefits of automation. Now, at a tiny fraction of the cost of those Mega-Consoles, a whole new breed of affordable digital consoles promises the same automation convenience. Our Digital 8•Bus not only delivers better-than-big-console automation, but it's intuitively easy to use, and it has a warm natural sound—while maintaining the pristine sonics of 24-bit digital. **CALL OR E-MAIL FOR A FREE VIDEO AND THE NAME OF YOUR NEAREST DEALER... AND FIND OUT WHY YOU SHOULD GO DIGITAL WITH MACKIE.**

## LEE ROY PARNELL



**Lee Roy Parnell's** upcoming Arista album may start a new trend in artist-producer-label communication. At every stage of each song's progress, mixes get modemed between Parnell's studio, producer **Ed Cherney** in Los Angeles, and Arista-Nashville president **Tim Dubois'** Nashville office on Music Row. (This won't make the airline industry too happy.)

## POKE



**Poke** (above) and co-creator **Tone's** credits include "Allure." Will Smith's "Big Willie Style" album, and NAS' "It Was Written." Their opinion of our new digital mixer? "Making records on the D8B is for real. Tight mixes and we love not having to give up the bread it used to cost to get great sound."

## MAD JEF



**Mad Jef's** platinum credits include engineering and programming for the likes of Michael Jackson, Janet, Jam & Lewis, and Grammy winners Sounds of Blackness. Jef didn't expect much from the D8B's processing. His opinion after several mixes? "The onboard effects are so good I'm getting rid of a bunch of outboard gear."

## NAUGHTY BY NATURE



**Naughty By Nature** cut and mixed the platinum album "Next" on their analog 8•Bus, so buying a D8B to mix their new release "19 Naughty IX" was a no-brainer. NBN's KG says the band avoided other digital mixers because they "mess with your sound."

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# SUPERB SOUND

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CITY LIMIT

"Sounds as good as an expensive analog console." We hear it over and over. From seasoned recording veterans. From new, emerging talent. Though musically diverse, the folks in this ad all have one thing in common: highly-tuned BS filters. If the Digital 8•Bus didn't deliver, they wouldn't be using it. Call or e-mail for a free video and the name of your nearest Mackie Digital Systems dealer. Get an in-depth D8B demo and prove it to yourself: Mackie's Digital 8•Bus simply sounds superb.

WALTER AFANASIEFF



JIMMY JOHNSON



You'd think with more than 100 million album sales to his credit, we could have treated pop producer **Walter Afanasieff** better. But even his dazzling production credits and deposit at a local retailer couldn't land him a D8B until recently. Was the 9-month wait worth it? As Walter's engineer **David Gleason** says (in his inimitable British accent): "Walter and I both really love this desk."

Few know the evolution of recording better than Muscle Shoals legend **Jimmy Johnson**. He engineered hits for Otis Redding on a big-knob mono console, did the Stones' "Brown Sugar" on the first 8-track, produced Lynyrd Skynyrd on 24-track, and is now one of the first to own a Mackie D8B. Johnson says, "The sound I'm getting out of this console is phenomenal. Why did I have to wait so long to get it?"

ARROWHEAD STUDIOS



Virgin/Nashville President/CEO **Scott Hendricks** has produced over forty #1 records. His newest commercial recording facility is built around a pair of Mackie D8Bs. With a 48-track Sony, 24-track RADAR, oodles of outboard gear, and Pro Tools 24 on hand, Arrowhead Studios' double-D8B 144-channel Mackie rig gets a serious digital workout.

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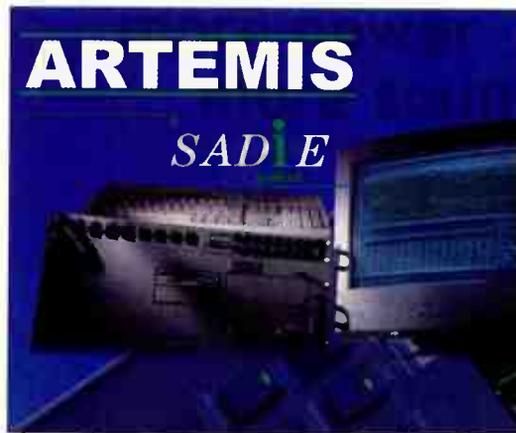
World Radio History

CIRCLE 17 ON FREE INFO CARD

# EQ PRODUCT VIEWS

## ARTEMIS LAUNCHED

**S**ADiE Digital Editing systems launched its new digital audio workstation, ARTEMIS, a system capable of 192 kHz editing and mixing, full surround sound panning, and configurable to provide up to 24 inputs and outputs. Specifically designed for applications that require large amounts of digital signal processing, ARTEMIS systems are supplied as fully configured, rack mounting turnkey systems in a range of input/output configurations, from 8 to 24 inputs and outputs. The entry-level ARTEMIS system is equipped with 8 inputs and 8 outputs, and can replay 24 tracks of edited 16-bit audio. Twenty-bit analog conversion is built into the system and external converters are provided for by AES/EBU digital I/O on every channel. For additional information, contact SADiE, Inc. at 615-327-1140. Circle EQ free lit. #112.



## A DAC LIKE NO OTHER

**A**nalog Devices announces a 24-bit stereo audio DAC, a stand-alone solution that enables OEMs to meet the new 192-kHz audio sample rate standard for DVD players. Named the AD1853, this new IC combines proprietary data-conversion technology with a multibit sigma-delta converter core to deliver improved audio performance at every sample rate from 32 kHz to 192 kHz. The AD1853 is fully compatible with all known DVD formats and sample rates, and is backwards compatible by supporting the 50/15  $\mu$ s digital re-emphasis intended for compact discs, as well as 32 kHz and 49 kHz Fs. For more information, contact Analog Devices at 781-329-4700 or visit their Web site at [www.analog.com](http://www.analog.com). Circle EQ free lit. #113.



## DEIFIED DISTORTION

**T**he Bixonic Expandora is a Japanese-made distortion pedal distributed in North America by Godlyke, Inc. It is housed in a unique cylindrical, brushed aluminum chassis with engraved graphics and it features gain, tone, and level control, an Effect Bypass switch, and an effect LED indicator. It works on a 9-volt battery or via an AC adapter. Other features of the Expandora are two internal DIP switches that are used to alter the unit's gain structure, as well as in conjunction with the Expandora's other controls, to yield a variety of distorted tones. Dynamically sensitive, the Expandora allows users to vary the amount of distortion by backing off on their instrument's volume control. The list price for the Expandora is \$229 and it comes with a one-year full parts and labor warranty. For additional information about the Expandora and other Bixonic products, contact Godlyke, Inc. at 973-835-2100 or e-mail them at [godlykehq@aol.com](mailto:godlykehq@aol.com). Circle EQ free lit. #114.

## HAF YOU HEARD?

**H**afler's P1000 Trans•ana compact single-rack-height amplifier is designed for broadcast studio monitoring and recording, headphone system amplification, surround sound applications, and paging systems. The circuitry of the system is based on TRANScconductance Active Nodal Amplifier topology, which operates the output stage with its full voltage gain, allowing the input stage to operate from a low-voltage regulated supply. The signal is then shifted up in level to the high-voltage section by the driver stage, which forms an active node at ultrasonic frequencies. For further information on the P1000 Trans•ana, call Hafler at 888-HAFLER1 or fax them at 602-894-1528. Circle EQ free lit. #115.



## GET THE POWER

**P**ower Technology has announced the availability of the 6.0 version of the DSP FX Virtual Pack PC DAW-compatible software effects plug-in package. Version 6.0 of the DSP FX Virtual Pack includes the latest three Direct X plug-ins, the StudioVerb, the Optimizer, and the Aural Activator from Power Technology. The StudioVerb is a Direct X software plug-in that provides a dense and warm reverberation sound, the Aural Activator is a spectral enhancer that adds high-frequency harmonics to the output signal, and the DSP-FX Optimizer is a mastering tool that combines a look-ahead peak limiter with dithering algorithms. Even with the addition of these three latest plug-ins, the DSP-FX Virtual Pack retains its retail price of \$299. A full demo of the Virtual Pack, including a free Multi-Tap Delay plug-in, is available at [www.dspfx.com](http://www.dspfx.com). For more information, contact Power Technology at 415-467-7886. Circle EQ free lit. #116.



## MAKE CONNECTIONS

**N**eutrik has introduced a new generation of the BNC connector. The new BNC series comes in three versions to cover all applications. The Neutrik BNC connector series offers a nonlocking "budget" friction-fit connector, and a push-pull connector for high-density applications. All three feature a comfortable cable clamp principle in which the cable is simply inserted into the plug and a machined nut is turned to complete the assembly and crimp machined contacts are inserted.

This design virtually generates an absolute constant wave propagation resistance of 75 or 50 ohms, which is guaranteed throughout the connector into the mating chassis connectors up into the lower GHz area. For more information, call Neutrik at 732-901-9488. Circle EQ free lit. #118.



## NEW AND IMPROVED NEATO

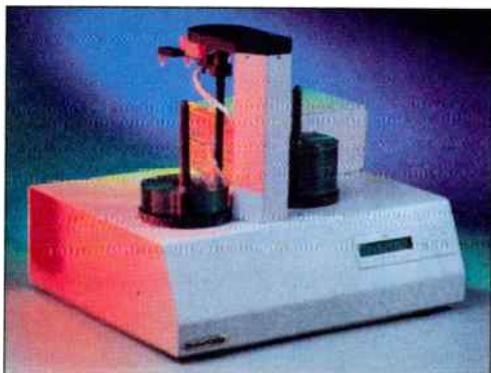
**N**EATO LLC has announced the release of the NEATO 2000 CD labeler kit, which includes a compact, one-piece NEATO 2000 CD label applicator. Also included in the kit is MediaFACE label design software, 66 color images suitable for backgrounds, templates for alignment of designs on labels, and sheets of jewel case inserts and CD labels suitable for color ink jet printing. Users who register their software also get a free sample pack of labeling and packaging materials. Price is \$29.95. For more information, contact NEATO LLC at 203-466-5170 and visit their Web site at [www.neato.com](http://www.neato.com). Circle EQ free lit. #117.



# EQ PRODUCT VIEWS

## MAGIC WERKS

**E**magic's Audiowerk2 is for the MacOS and Windows 95/98 platforms and is a cost-effective digital audio card complete with bundled Emagic software. The Audiowerk2 is based on the Audiowerk8 technology that offers analog inputs and outputs along with stereo digital I/O (S/PDIF). The analog and digital inputs can be used alternatively, and the analog and digital outputs can be used both simultaneously or individually. Price is \$299. Contact Emagic at 916-477-1051. Circle EQ free lit. #119.

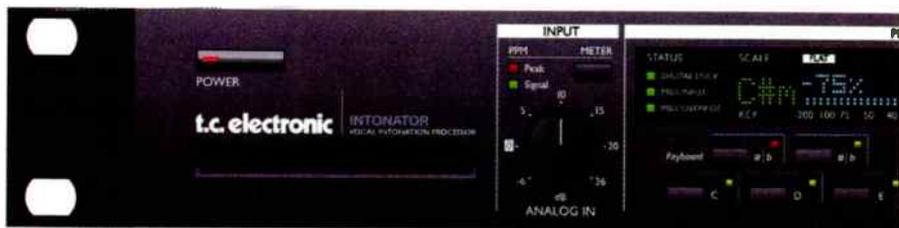


## DIY RECORD PLANT

**M**ediaFORM's CD-3702 system delivers simple operation and unattended duplication of 100 CD-Rs. The CD-3702 provides unattended duplication of data or audio CDs and will detect defective blank media and place these in a separate reject bin. The CD-3702 is easy to follow, whether the user copies immediately from the keypad or uses more advanced features. The two-drive standalone system supports 8X drive, features one-button operation and Pro Audio Compare mode, and copies all current formats. Additionally, the CD-3702's job streaming feature simplifies the task of duplicating sets of CDs. For more information, contact MediaFORM at 610-458-9200 and visit their Web site at [www.mediaform.com](http://www.mediaform.com). Circle EQ free lit. #121.

## DEEP BASS

**A**guilar Amplification has introduced the DB 659, a bass preamplifier designed in the tradition of the DB 680. The tube bass preamplifier features all-tube gain stages, the Aguilar "Deep" switch, which allows users to fatten up bass and add lows to five and six-string basses, and a transformer (Jensen) balanced output. Other features of the DB 659 are the EFX loop with two push-pull pots, one for series or parallel operation and one for line or instrument level return, and treble, mid, and bass shelving filters. Aguilar's DB 659 retails for \$995 and comes with a 10-year limited warranty. For more information, contact Aguilar Amplification at 800-304-1875 and visit their Web site at [www.aguilaramp.com](http://www.aguilaramp.com). Circle EQ free lit. #122.



## PLUG EXAM

**T**he Tone Plug from GTC Industries is an 11-function audio test generator, no larger than a standard microphone connector. The audio test instrument is capable of generating 11 distinct test functions for the rapid troubleshooting, analysis, and calibration of audio systems and components. Offering five user-selectable sine wave test tones at frequencies of 100 Hz, 250 Hz, 400 Hz, 1 kHz, and 10 kHz, the Tone Plug is phantom powered, requiring no batteries or external power supply. An additional five special-function test signals include a 40/2400 Hz signal for testing the VLF components of a system such as subwoofers, crossovers, and amplifiers; a short-duration, multi-frequency pulse for adjusting time delays, reverbs, and echo units; and an amplitude sweep function for adjusting compressors, limiters, and tape levels. The Tone Plug has a suggested retail price of \$49.95. For more information, contact GTC Industries, Inc. at 630-369-9815 and visit their Web site at [www.gtcindustries.com](http://www.gtcindustries.com). Circle EQ free lit. #120.



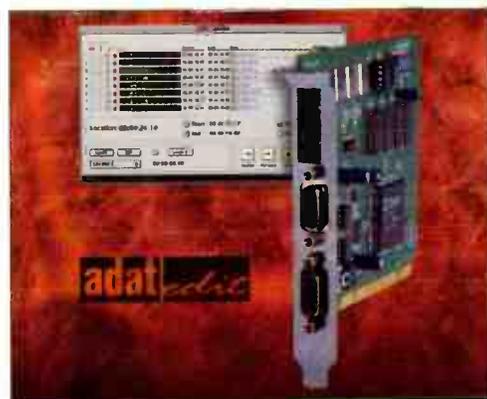


## DIVINE INTONATION

**T**C Electronic's new Intonator is a vocal intonation processor that features Pitch Correction, De-Essing, and a special Adaptive Lo-Cut Filter. The Intonator preserves vocals, allowing vibrato, initial intonation, and limited correction individually at 96 kHz internal processing and 24-bit resolution. The Intonator's design is based on TC's DARC-chip technology and has a unique window in which users can process one note at a time, a Pitch Window, and Analog Dual I/Os (ADIOS). The De-esser and Adaptive Low-Cut (ALC) filtering techniques allow the user to manipulate and refine the signal without compromising any of the original tonal characteristics. Price is \$1499. For more information, contact TC Electronic at 805-373-1828 and visit their Web site at [www.tcelectronic.com](http://www.tcelectronic.com). Circle EQ free lit. #123.

## NONLINEAR ADAT EDITING

**A**lesis's new solution for affordable nonlinear audio editing for the ADAT customer, the ADAT/EDIT, is now shipping, allowing users to add hard-disk editing and signal processing capabilities to existing ADAT systems. The ADAT/EDIT package includes the ADAT/PCR interface card, ADAT/EDIT audio editing software, ADAT/CONNECT audio transfer software, and all required cables for connecting ADAT to a PC. Developed specifically for users to combine the benefits of tape with the nonlinear world of hard-disk editing, the ADAT/EDIT is compatible with any model of ADAT from the original ADAT classic to the current generation of ADAT Type II machines. ADAT/EDIT is also compatible with popular audio editing software using standard WAV or ASIO drivers and the program imports and exports AIFF, SDII, and WAV files, as well as 24-bit audio from ADATs with single-sample accuracy. For more information, contact Alesis at 310-255-3495 or visit their Web site at [www.alesis.com](http://www.alesis.com). Circle EQ free lit. #124.



# Affordable CD-R Recording Solutions by

**NEW!**

### DSR 1000 Series

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# EQ PRODUCT VIEWS

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While standard boards are available without the rack unit (starting at \$175 for a 24-x 14-inch board), most boards are custom-built to your specific needs and specifications. For more information, contact Pedal-Racks at 800-616-9444, fax them at 516-254-3567, or visit them on the Web at [www.pedalboards.com](http://www.pedalboards.com). Circle EQ free lit. #125.

## CEDAR UPGRADE

**J**ust 16 months after its initial release, the CEDAR DCX declicker has received its first major upgrade. The DCX with Version 2 software saves time because it takes out clicks that previously needed a second pass, or even manual removal. All DCX declickers from serial number DCX-1-01294 include Version 2 software as standard. Owners of earlier units can return them to CEDAR Audio USA or their local dealer for a free upgrade. For further information, call CEDAR Audio at 207-828-0024 or fax them at 207-773-2422. Circle EQ free lit. #126.



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Engineers who have already gotten hold of the MASSIVE PASSIVE have told us: "Why does it make everything sound so much better?", "It's organic and orgasmic.", "It's a f%#king powerhouse.", "It's unlike any other EQ.", "This is IT. The sound I've always dreamt of but couldn't ever get until now."

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Craig 'HUTCH' Hutchison designed these monsters...

The MASSIVE PASSIVE is a two channel, four band equalizer, with additional high pass and low pass filters. "Passive" refers to the tone shaping part of this clever new EQ design not using any active circuitry. Only metal film resistors, film capacitors and hand-wound inductors sculpt the sound, kinda like a Pultec EQ on hyper-steroids. Super-beefy, hugely-high-headroom Manley all-tube make-up gain amplifiers deliver your tunes into the next realm. You'll need to experience this.

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CIRCLE 18 ON FREE INFO CARD



# ART Tube Channel

ART's versatile processor can add some warmth to your tracks

BY ROGER MAYCOCK

For those of you in search of a tube preamp that "does a whole lot more," you hear this: Applied Research and Technology (ART) recently introduced the Tube Channel, a professional tube pre-amplifier, compressor, and equalizer that is neatly packaged in a 1U, rack-mount design. In essence, the Tube Channel is exactly what the name implies — an additional channel strip, providing considerable flexibility for the recording engineer. In addition to conventional recording applications, the Tube Channel can be used as a DI box for instruments or integrated into live sound environments at FOH (front of house). The unit also fits nicely into voice-over, broadcast, and edit suites, and makes an ideal tool for anyone who uses a sampler extensively or records directly into a computer.

ART's new Tube Channel is a versatile tube recording channel that features individual circuits to provide a tube mic preamp, an optical compressor, and a 4-band, tube-based parametric EQ. Designed to be used with any digital or analog recording equipment, the Tube Channel accommodates both mic and line level signals. The Tube Channel is an ideal recording accessory for bypassing a mixer and patching directly into a digital recorder, and can also be a valuable tool for adding that warm, tube sound to a digital console.

Comprised of two hand-selected 12AX7A tubes designed to yield a transparent sound quality, the preamp features over 60 dB of gain, +48 V phantom power for use with high-quality condenser microphones, and a 20 dB pad — ensuring that virtually any input signal can be optimized prior to feeding the recorder or console. For visually monitoring the amount of tube drive being deployed at any given time, the unit incorporates a unique tube character LED array.

The Tube Channel's optical compressor design is derived from the company's highly acclaimed Pro VLA. The optical compressor features settings for compression and limiting, selectable release times, an adjustable threshold setting, and output level controls. The compression ratio is 2.3:1 for the compressor and 6:1 for the limiter. Gain reduction is displayed via a four-segment LED array. The unit's 4-band parametric EQ section provides selectable high and low shelving filters with two mid-bands, which sweep from 20 Hz to 20 kHz. The mid-bands overlap from 200 Hz to 2 kHz.

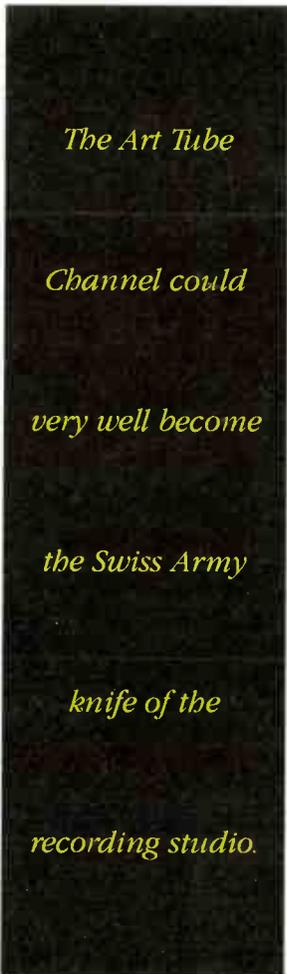
Of particular note, 1/4-inch insert points are available between each of the Tube Channel's three processing sections. These inserts provide direct outputs from the preamp and the

compressor for signal routing flexibility. These inserts also enable each processing section to be isolated for independent usage or to change the order of the processing sections. As an example, you can easily place the EQ before the compressor.

The Tube Channel sports a black faceplate with detented rotary controls, VU output level metering, and its own internal power supply. On the rear panel, both 1/4-inch unbalanced and XLR balanced input and output connectors are present.

The Art Tube Channel could very well become the Swiss Army knife of the recording studio — providing not just a tube preamp, but also the studio essentials for shaping a variety of signals to improve the quality of your recorded tracks. After all, who can't benefit from an additional compressor/limiter or EQ from time to time? It's difficult to imagine a recording professional not being interested in this type of studio tool. Check out the Tube

Channel from ART.



Price is \$499. For more information, contact Applied Research and Technology, Tel: 716-436-2720. Fax: 716-436-3942. Web: [www.artroch.com](http://www.artroch.com). Circle EQ free lit. #101.



# THE RIGHT BRUSH FOR EVERY ARTIST

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AKG provides the best of both worlds, offering a full pallet of colors and textures, enabling an artist to fully express themselves with a single stroke of the right brush.

## C 414 B/ULS

For over 25 years, this microphone has been the defacto standard for large diaphragm condensers. Switchable polar patterns, pads and low frequency attenuation make the C 414 B/ULS ideal for virtually any application.

## SOLID TUBE

Designed to combine the benefits of solid-state and tube technologies, the Solid Tube delivers an exceptionally warm tube sound while maintaining the reliability of solid-state gear.

## C 414 B/TLII

Specifically designed for vocals, the C 414 B/TLII features a transformerless output and the legendary C12VR capsule that enable vocals to soar over the rhythm section without disturbing the microphone's pristine sound.



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CIRCLE 70 ON FREE INFO CARD

# Royer R-121 Ribbon-Velocity Studio Microphone

Yet another high-quality project studio microphone enters the marketplace

BY ROGER MAYCOCK

Over the course of the past 9–12 months, it seems as though new microphones have been popping up everywhere — some from well-known companies, others from smaller firms. Companies such as Shure, which are primarily known as microphone providers for live sound applications, have introduced high-end studio pieces, while smaller firms have become closely affiliated with larger manufacturers to increase their market penetration, as is the case with GT Electronics and Alesis. Clearly, the prolific amount of new and innovative recording equipment has spurred a resurgence in every segment of the market, and, for those in search of new microphones, these are indeed good times.

First introduced last fall at the AES (Audio Engineering Society) show, Royer Labs has a new offering known as the R-121 ribbon-velocity studio microphone. Royer Labs is a small firm based in L.A.'s San Fernando Valley that was founded by David Royer, who serves as the company's chief engineer, and Rick Perrotta of Matchless Guitar Amplifier fame. The R-121 is Royer's first production ribbon microphone (the second is the Royer/Speiden SF-12 stereo ribbon) and is gaining popularity with several top studio creatives — including Bruce Swedien, Ed Cherney, Sean Beavan, and Joe Satriani.

Designed to meet the demands of the studio environment, the R-121 exhibits a flat frequency response coupled with a well-balanced panoramic sound-field and an extremely low noise residual. The mic features a high SPL (Sound Pressure Level) with no internal active electronics to overload or produce dis-

tortion up to its rating of 135 dB. These characteristics make the R-121 well suited for handling the sharp attack transients of percussive sounds, as well as an ideal microphone for recording instruments such as brass, saxophone, or electric guitar.

The heart of the R-121 is its 99.99-percent pure, low-mass, 2.5-micron thick aluminum ribbon transducer assembly incorporates rare earth Neodymium magnets in a specially designed flux frame. This design forms a powerful magnetic field while reducing unwanted stray magnetic radiation. Heat or humidity does not affect the ribbon element, and there is equal sensitivity from either the front or back.

Royer Labs claims the ribbon element's "smooth frequency response and phase linearity, coupled with sensitivity levels surpassing those of 'classic' ribbons, make the R-121 an ideal

choice for digital recording." The microphone exhibits a consistent frequency response regardless of distance and an absence of high-frequency phase distortion.

The R-121 is designed to deliver a transparent, acoustical performance with a very high degree of realism. The microphone's figure-8 pattern yields a very natural ambience when used for room-miking applications, and orchestral and choral recordings. The R-121 works very well for miking acoustic pianos, acoustic guitars, harp, or similar instruments, and is also a competent performer for a variety of overhead miking applications.

The microphone's finish is a burnished satin nickel. A matte black chrome finish is optional. Royer provides a protective wooden case and a mic clip as part of the package and makes a windscreens and shock mount available as optional accessories. Royer Labs provides a lifetime warranty to the original owner and, in the event of difficulties, will either repair or replace the mic as necessary.

For those of you interested in specifications, the R-121 weighs in at 8.6 ounces with dimensions of 6.13 inches in length and 1 inch in width. The unit's output impedance is 300 ohms at 1K (nominal), while its rated load impedance is greater than 1000 ohms. If you prefer, the R-121 can be optionally configured for an output rating of 200 ohms. The microphone has a frequency response ranging from 30 Hz to 15 kHz.

Whether you're looking for a new microphone to handle commercial broadcast or voice-over work, close miking situations, or any of the applications mentioned earlier, Royer Labs' new R-121 ribbon-velocity studio microphone merits close examination. You can never have too many microphones in your studio arsenal, and the R-121 is well worth checking out.

Price is \$995. For more information, contact Royer Labs, Tel: 818-760-8472. Fax: 818-760-8864. Web: [www.royerlabs.com](http://www.royerlabs.com). Circle EQ free lit. #102.



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*Lee Roy Parnell*

Check out Lee Roy Parnell's latest release, "Every Night's a Saturday Night," as well as his earlier recordings available on Arista/Nashville CDs and tapes.  
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World Radio History



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CIRCLE 25 ON FREE INFO CARD

# Know the Score

TV and film composer Michael Whalen uses his digital gear to handle his many projects

**STUDIO NAME:** The Attic

**LOCATION:** Boston, MA

**KEY CREW:** Michael Whalen, owner; Paul Rowan, studio manager

**CREDITS:** Whalen has scored nearly 200 dramatic and documentary television projects and several independent feature films, as well as created new themes for HBO, ESPN, CBS, PBS, and most recently, Major League Soccer. His current CD on the EverSound label, *The Softest Touch*, is a solo piano album that features the theme from *Good Morning America*. His next album, entitled *The Shadows of October*, is a collection of chamber classical works scheduled for release on June 15th, 1999 on Arabesque Recordings.

**CONSOLES:** Yamaha 02R [3] and 01V

**DIGITAL WORKSTATIONS:** Synclavier 9600 [System PCI 1.6.2] (768 MB RAM/96 voice); Fairlight Series III System (16 MB RAM/16 voice); Digidesign Pro Tools 4 with 888 interface and Yamaha CD-R printer; Symbolic Sound KYMA and CAPARA 320 system  
**SAMPLERS:** Akai S-6000 [2] and Akai S-3000 [2]

**SYNTHESIZERS:** Korg Trinity Pro, Trinity Rack, Wavestation, O1/W, and M1R; Roland JD-990 [3], JP-8080, MKS-70; Doepfer Modular, Waldorf Wave (32 voice), Waldorf Q, Waldorf Micro, Wave II XT, and Waldorf 4 Pole Filter; Nord Lead II and Modular Rack; Yamaha VL-1, TG77, EX-5R [2], GS-1, DX-1, TX-816, Formant FSR-1, QX-1, and KX-5; Kurzweil K-2500; MiniMoog; Studio Electronics MIDI Moog; Rhodes Chroma, Prophet-5 (rev. 3.3), Sequential Poly Sequencer, and Remote Prophet; ARP Quadra, Omni-2, and Pro Soloist/DGX  
**DIGITAL TAPE MACHINES:** Sony

PCM-7010 timecode R-DAT and PCM-2800 timecode R-DAT; TASCAM DA-88 [2] and DA-30 mkII R-DAT

**CASSETTE MACHINES:** Sony [2]; TASCAM 122 mkII

**OUTBOARD:** Lexicon 300, PCM-90, PCM-80, and PCM-42; Neve Dual Mic Pre

**AMPLIFIERS:** Bryston 3B; Hafler Pro 1200

**MONITORS:** Genelec 1030A and 1031; Auratones

**MICROPHONES:** Neumann TLM-103; Shure SM57

**VIDEO:** Sony BVU-800 w/BVR-8203/4-inch recorder player, VO-7600 w/RM-580 remote 3/4-inch recorder/player, UVW-1800 Beta SP recorder/player, and UVW-1600 Beta SP player; Panasonic S-VHS recorder/player

**VIDEO EDITING SYSTEM:** Avid Express w/Apple G3 Mac and After Effects graphics package

**MISCELLANEOUS:** Brainstorm Timecode Refresher; Sony 25-inch monitor, LCD 16:9 video projector, 20-inch monitor, 25-inch television, and 13-inch television

**PIANO:** Yamaha G Series 5-foot, 7-inch piano; Lester spinet piano (Granny Whalen's)

**GUITARS:** Fender Stratocaster w/Roland GK-2 synth pick-ups and Seymour Duncan humbuckers, Strat (stock), Roland Gui-

tar w/hex pick-up Synclavier interface  
**PERCUSSION:** Yamaha Recording Custom Drums; Zildjian Cymbals; Paiste Gongs; LP Congas and toys

**EQUIPMENT NOTES:** Michael relies on his NED Synclavier as his main controller and sequencer. States Whalen: Nothing else sounds quite like it, and, with all the changes they've made to the software recently, it is as fast as anything out there. I've checked out all the alternatives, and they just can't compete for doing music and sound design to picture. For inspiration, I turn to my pair of Yamaha EX5's. My first major synthesizer was a huge Yamaha DX1, and I've just been in love with the Yamaha sound ever since. The architecture is great, and it's extremely fast to work on.  
**STUDIO NOTES:** Whalen continues: After putting together several rooms, I learned to keep things open, friendly, and livable. You don't want your clients tripping over equipment and cables, and you don't want to stick the technology in their face. You want them to feel like the human is always in control — not the machines. I kept that in mind when designing my current studio, and clients really seem to have responded well to it.

EQ





# wouldn't even fit on this page

# The biggest thing in samplers

- Up to 128 Voice polyphony
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The complete list of features is too massive to print here . . . so check out the big picture at your local Akai dealer.

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**CIRCLE 02 ON FREE INFO CARD**

# AKG DX 11

A dynamic reverb mic with built-in spring reverberator

**MICROPHONE NAME:** AKG DX 11

**FROM THE COLLECTION OF:** Jan Paluchowski, Springfield, MA (originally from Warsaw, Poland)

**PRICE (NEW):** \$68 U.S., circa January 1969

**TYPE OF MIC:** Dynamic reverb microphone

**POLAR PATTERN:** Cardioid

**FREQUENCY RESPONSE:** 50 Hz to 18,000 Hz

**MAXIMUM SPL FOR 3% DISTORTION:** 114 dB or 100 microbars

**IMPEDANCE:** 200 ohms or 15,000 ohms (tolerance of 20%)

**POWER REQUIREMENTS:** 9 volts DC

**SELF-NOISE:** less than 22 dB (Filter 1954 DIN 45 405)

**DIMENSIONS:** 10-1/8 long x 2-1/16 wide x 1-5/16 thick (inches)

**WEIGHT:** 13.9 ounces

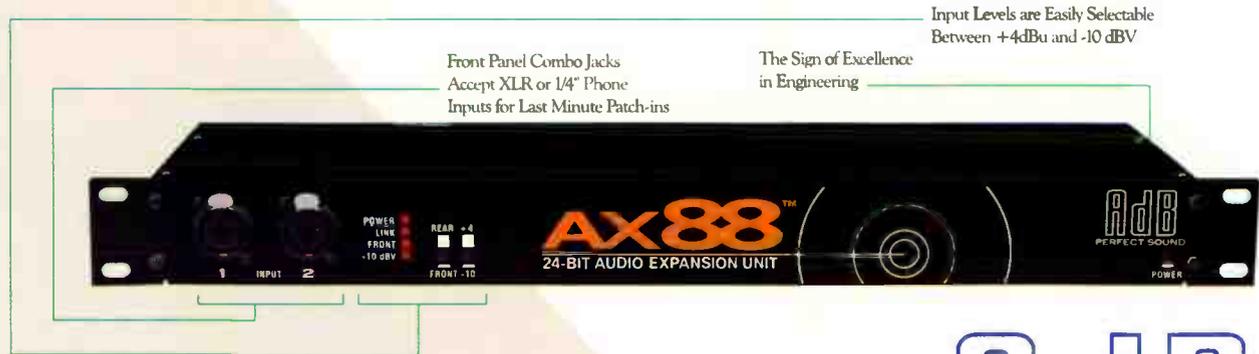
**MIC NOTES:** This AKG DX 11 dynamic reverb microphone holds the rare distinction of including a built-in spring reverberator. Reverb time could be continuously varied by the user from 0 to 2.5 seconds at 800 Hz (4 seconds maximum at 100 Hz). AKG provided a stand adapter (the SA 13) with the DX 11 because the mic was not designed to be handheld. In fact, movement of the microphone body caused mechanical vibration to the spring, resulting in an audible noise at the output. In spite of this limitation, the DX 11 could be seen in use by singers performing at clubs and cafes during the late 1960s and early 1970s. Output of the DX 11 could be converted from high-impedance unbalanced to low-impedance balanced by soldering an otherwise unused lead in the 5-conductor cable.

**USER TIPS:** Owner Jan Paluchowski states: I did not use the DX 11 in recording practice; the only testing I did was to plug it into my Nagra 4.2 and listen to it through headphones. The reverberation characteristic of this mic can be regulated, so I simply wanted to observe the sonic effect. Therefore, the only thing I can say is that I find it quite useful for reverb effects, added when recording a female voice on location, using a full-track, analog Nagra 4.2 loaded with QPSE (preamplifier for dynamic mics), running at 7.5 ips with Ampex tape. 



PHOTO BY EDWARD COLVER

# Unlock the Power of DSP Factory with AX88™!



Front Panel Combo Jacks  
Accept XLR or 1/4" Phone  
Inputs for Last Minute Patch-ins

The Sign of Excellence  
in Engineering

Input Levels are Easily Selectable  
Between +4dBu and -10 dBV

Inside the Yamaha® DSP Factory™ is the heart of a powerful recording and mixing workstation: 16 tracks of recording, 24 channels of mix-down into 16 busses, 26 totally parametric 4 band EQs, 26 dynamics units (compressor/expander/gate/compander/etc), 2 professional stereo multi-effects units (REV500s, essentially), and many more incredible features too numerous to list.

**AdB**  
PERFECT SOUND

The AX-Link Interface  
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Other AX-Link Devices as Far  
Away as 25' (7.62M) from Your  
Computer. Wow!

But up until now this power was locked away behind too few channels of home quality I/O. Not Anymore.

Enter AX88™. Eight channels of input, eight channels of output, pristine sound, 24-Bit, PRO +4 levels, fully balanced, Word Clock, and more. Designed by AdB, in cooperation with Yamaha, as the analog front-end to DSP Factory.

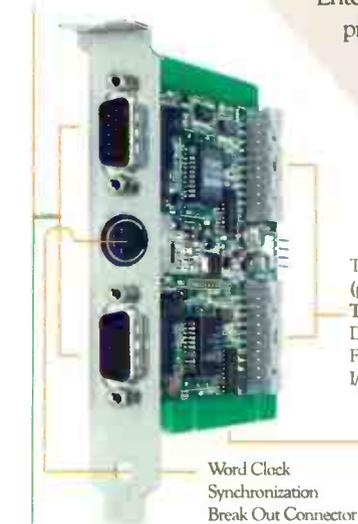


DSP Factory provides the same 32-Bit audio quality and digital processing power of the 02R mixing console used by thousands of professionals around the world to produce chart topping hits and film scores. AX88 gives you access to this power with the most transparent audio available.

The AX88, together with the DSP Factory and your choice of software interface, will turn your PC or Mac into a powerhouse professional, automated, random access recording and mixing environment, all for less than the cost of one ADAT®.

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# Panasonic DA7

## Getting in deep with some of the board's processing and automation functions

BY BOBBY FRASIER

### CREATIVE USE OF DYNAMICS PROCESSORS

**Brick Wall Limiting:** A limiter and a compressor are really the same device. When you set the compression ratio above 6:1, you enter the realm of limiting. Let's do a quick review of what happens in a compressor. A compressor will let your signal go above a selected threshold at a given ratio. In other words, if you set your threshold at -20 dB, and your ratio at 3:1, for every 3 dB of signal above -20 dB, 1 dB of gain will pass through the circuit. Your meter will then read -19 dB, since you've added 1 dB of gain above your threshold. With the same settings, if your singer hits a peak of 12 dB above your threshold, only 4 dB will be sent through. Your meter would now read -16 dB. By setting higher ratios, particularly the maximum ratio of ∞ (infinity): 1, you greatly limit the signal from going above your selected threshold. By setting your threshold at -1 dB, and your ratio at ∞: 1, you have now limited the signal to 1 dB above -1 dB, or a maximum of 0 dB, no matter how much signal you feed the limiter. This is good for setting maximum levels when recording digitally. No worries about "overs," and we all know how painful those can be... **Soft Knee Compression:** The compressor is one device that, in most instances, should be used and not heard! The DA7 has 42 onboard compressors. The default settings for the compressor are 10 ms Attack Time, 100 ms Release Time, -20 dB Threshold, and 1:1 Compression Ratio. This attack time can "clamp down" on a vocal, causing the vocal to pump. Increase the attack time to the 100-125 ms range. Start your compression earlier by bringing your threshold down slightly lower than you would normally use. If your compression starts at say, -30 dB, try going down to -33 dB or -36 dB. Then, by using a mild ratio of 2:1 or 3:1, you will more closely emulate a soft knee compression, producing a much smoother gain reduction. Try

increasing your release time to 600-800 ms as well. To smooth your signal even further, add similar settings on the Master L/R output, or the bus when recording. Using this multiple detector technique results in a smooth, natural, easy-to-mix compression.

### CREATIVE USE OF DELAY

**Drop a Track Back in the Pocket:** If you have a lead guitar player on top of the beat, a bass player behind the beat, or drum machine clinically on the beat, use delay to drop these performances back in the pocket. The DA7 has 32 separate onboard delays. By delaying the instrument that is on top of the beat, you can salvage a performance. If an instrument is behind the beat, use delay on all the other instruments to bring the performance under control. If a drum machine sounds too much like a drum machine, use a little delay on the snare to "pull the groove back." Please use this technique sparingly! Conversely, if you wish to push the beat ahead slightly, do so by delaying the kick drum back a few milliseconds. Experiment to get the feel you are looking for.

### AUTOMATION AUX OFF

Here's a cool tip for turning aux sends off, on a per channel basis, when using automation. You can use the Event Editor to perform this task in the following manner:

As you are

recording your mix, note exactly where you wish to turn the aux send off, via the Time-code field in the upper right hand Taskbar Area. Stop the automation, save your mix in the Automation Set Up Window, then turn the automation off. This will allow you to get to the Event Editor. Go to the Event Editor (it is the third window of the Automation Window Group) and select the channel or channels you wish to work on. Then select AUX SND in the Offline Edit Parameter area. You can select all or individual auxes. Now the aux send information you have recorded shows up in the EDL-style event edit list. Scroll down to the Time/Parameter/Data/CH area, and highlight the entire row of any event. Press

*continued on page 133*



SCREEN GEMS: (Top) Panasonic DA7 Dynamics screen. (Bottom) DA7 Event List screen.

# 32 Channels. Built-in MIDI. Solid sync. All together. Now.

Introducing

## Dakota, Montana, Sierra & Tango24

The superintegrated digital audio, MIDI, and sync solution, now with 24-bit analog performance!

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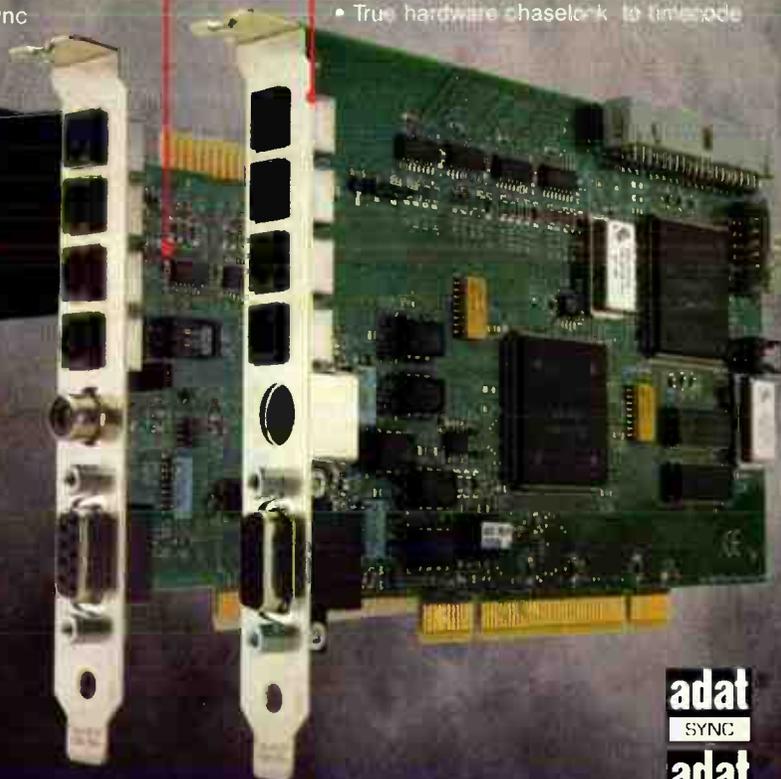
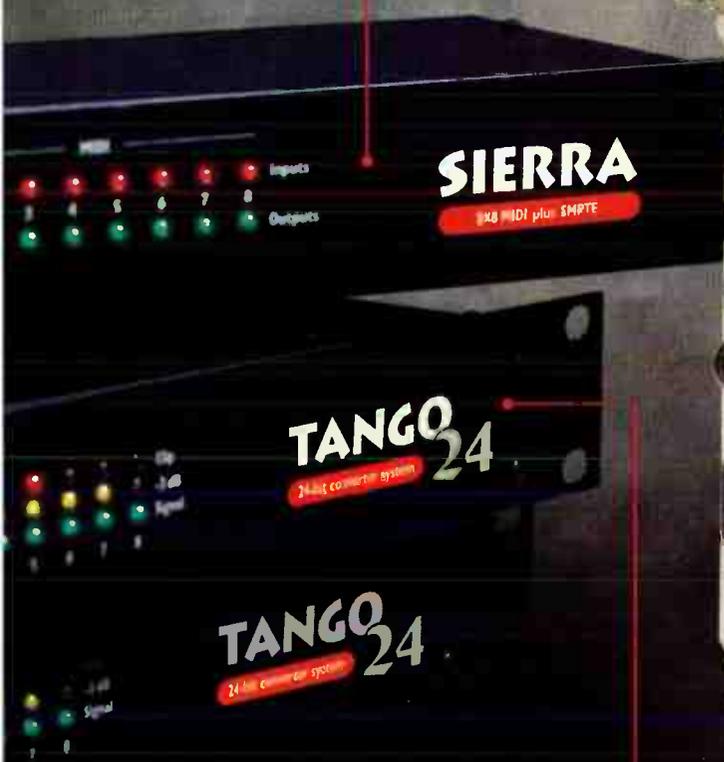
Dakota expansion box with 8x8 MIDI and SMPTE I/O

### MONTANA

Dakota expansion card with 16 more audio channels, ADAT 9-pin sync output, and video/word clock sync

### DAKOTA Superintegrated PCI soundcard

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- 2 channels S/PDIF audio (coax or optical)
- 2x2 low-latency MIDI I/O
- ADAT 9-pin sync input
- Ultra-efficient bus-mastering PCI interface with scatter-gather DMA
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### TANGO 24 Professional multichannel A/D & D/A converter system

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- 24-bit resolution with 128x oversampling converters
- Frequency response  $\pm 0.05\text{dB}$ , 20Hz-20kHz
- S/N ratio (EIAJ) 105dB
- Dynamic range 105dB A-weighted
- +4dBu or -10dBV signal levels (selectable per channel)
- True differential balanced signals on professional 1/4" TRS jacks
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- Connects to any soundcard with ADAT lightpipe I/O



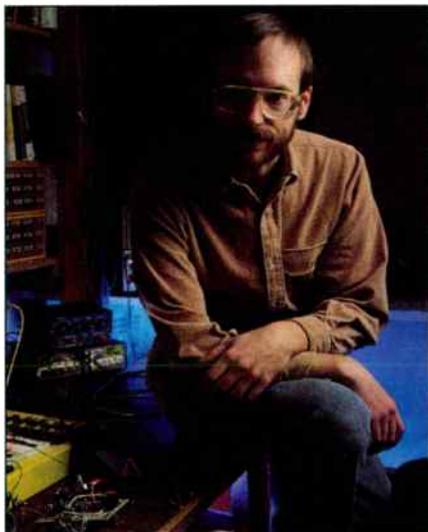
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# Frankfurt Music Fair Highlights



It's that time of year where we once again dust off our "Fine Messe" pun and present the best from Frankfurt

BY CRAIG ANDERTON

It's big, really big: 2044 companies, 96,000 visitors, and what appears to be zillions of products — it's the Frankfurt, Germany Musik Messe. Although the show occurred shortly after NAMM, there was still lots of new gear coming out of Europe; besides, Messe provides a chance to catch up on some of the items missed at NAMM. As to trends, the most obvious one is toward devices that provide live, real-time control, and techno is as big as ever.

Check out what Eurogearheads were lusting over. (Note: Owing to currency conversions, many prices are approximate and subject to change without notice.)

**Alesis** (tel. 310-255-3495; [www.alesis.com](http://www.alesis.com)): The price of the M20 8-track digital tape recorder, with 24-bit converters and numerous synchronization fea-

tures, has been dropped to \$4999.

**Allen & Heath** (tel. 801-568-7660; [www.allen-heath.com](http://www.allen-heath.com)): Intended primarily for live use, the Icon digital mixer series boasts 10 ins, 4 outs, 2 stereo FX processors, and 2 master 10-band graphic EQs; every input has a noise gate, compressor, and 4-band parametric EQ. There are 127 "snapshot" memories, 9 "set" memories that chain snapshots, and 19 "venue" memories that include settings for the amp outputs and graphic EQs. Two versions are available: the DP1000 includes dual 300-watt amps, while the DL1000 has balanced XLR outs. Approx. \$1700.

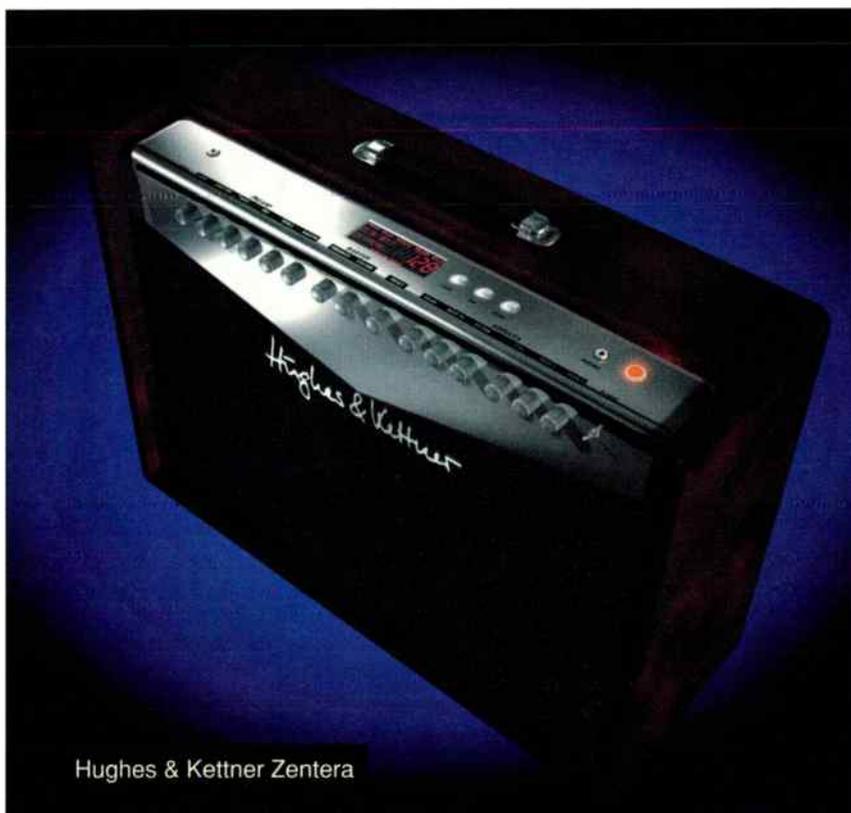
**Clavia** (tel. 727-519-9669; [www.clavia.se](http://www.clavia.se)): The wait is over: Starting this summer, Nord Modular software version 3.0 will be available for the Mac platform as well as Windows. System requirements are PPC hardware and system 7.5.3 or higher.

**Digigram** (tel. 703-875-9100; [www.digigram.com](http://www.digigram.com)): VX Pocket is a PCMCIA-compatible linear audio card with balanced, 24-bit, stereo analog in/out

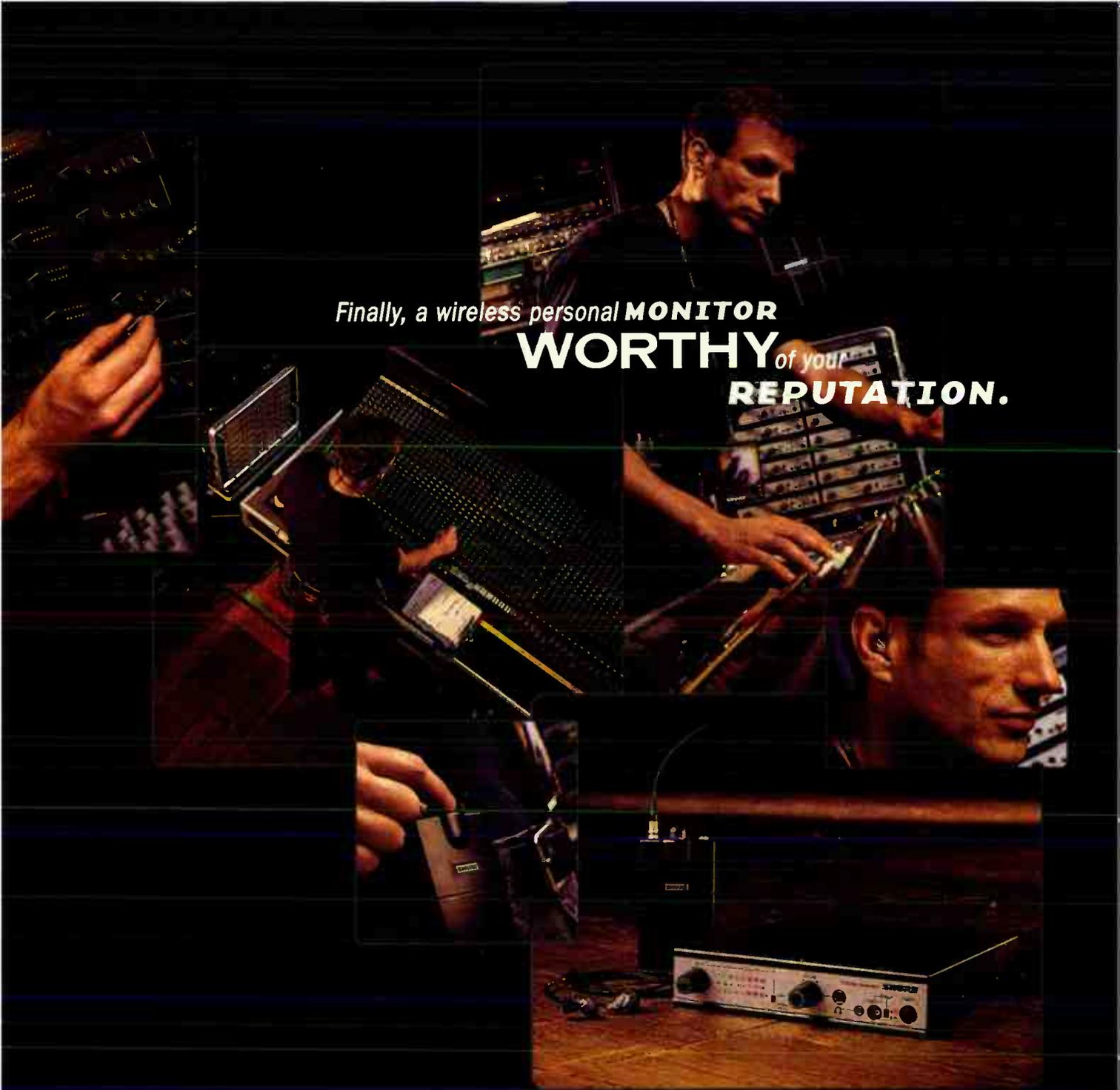
(with mic preamp) and stereo S/PDIF in/out. It works with Microsoft WAV or MacOS Sound Manager-compatible programs, and is designed to transform higher-end laptops into mobile audio workstations. Approx. \$750.

**Drawmer** (tel. 011-44-1924-378669; [www.drawmer.com](http://www.drawmer.com); distributed in the U.S. by Transamerica Audio Group, Inc., 805-241-4443): The DC2476 digital mastering processor is an all-digital, 24-bit processor with dynamic EQ, 24-bit processor with dynamic EQ, main 5-band EQ, 3-band crossover, 3-band expander, 3-band bootstrap compressor, 3-band limiter, and 3-band tube modeling; I/O includes stereo analog XLR, AES/EBU, and S/PDIF, word clock, and MIDI. Approx. \$2500.

**Emagic** (tel. 530-477-1051; [www.emagic.de](http://www.emagic.de)): EASI, the Enhanced Audio Streaming Interface, is a cross-platform, open standard designed to facilitate more efficient hard-disk recording. Emagic claims that EASI decreases the CPU load, provides multichannel support with sample-accurate synchronization, and simplifies software



Hughes & Kettner Zentara



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World Radio History

development by allowing tasks to be handed over to the EASI host. Also new: Logic 4.0, rewritten from the ground up, now supports 24/96 recording, sports a

new user interface, and comes with 31 high-end plug-ins. Fostex (tel. 562-921-1112; www.fostex.com): The VC-8 ADAT analog converter

provides eight, 20-bit analog ins and outs and TOSLINK (ADAT or S/PDIF) in/out... The VM200 digital mixing console is a 20 x 8 console with 9 motorized faders, 100 scene memories, 50 EQ preset libraries, 2 FX processors, and 3 fader + 3 mute groups. The 20 inputs include 8 analog ins (4 with balanced XLR/phantom power), ADAT optical in, and 4 analog effects returns. Outputs are 8 bus direct ADAT out, as well as stereo L/R, FX 1/2, and aux sends 1-4... The VR800 digital multitrack recorder offers 8-track simultaneous digital recording via ADAT optical interface, 16 additional tracks, 3.5-inch drive bay for hard drive/ZIP/MO drive, noncompressed recording, variable pitch, and 99 locate point memories.

Using two SHARC floating-point DSP chips, the amp is said to model not just a finished sound, but the interplay that occurs among the various stages in a tube guitar amp. Whatever — it sounded great. Approx. \$2500. **Kenton Electronics** (tel. 011-44-181-337-0333; www.kenton.co.uk): The Control Freak is an 8-channel, real-time MIDI controller (*à la* Peavey PC1600 or Keyfax Phat Boy) that can send any type of MIDI message. It has 8 sliders, 8 buttons, 128 user memories, and a two-line, backlit LCD (approx. \$599; the 16-channel version is \$899).

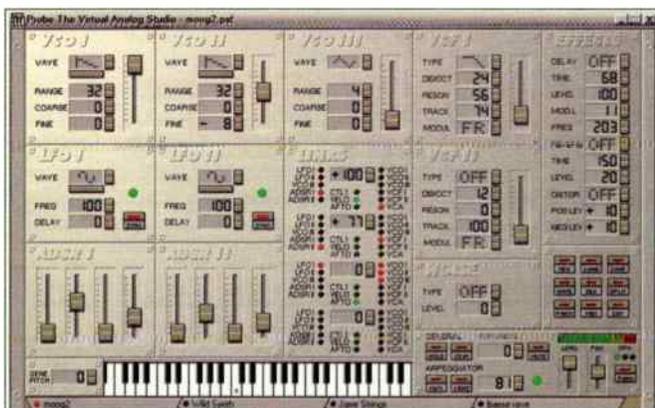
**Korg** (tel. 516-333-9100; www.korg.com): Optimized for DJ and other real-time control applications, the KAOSS pad is an effects processor that packs several effects, a 5-second sampler, and MIDI control into a tabletop package with a touch-sensitive, X-Y control surface. Sliding your finger across the surface, or tapping it, controls effects in real time; for MIDI, the horizontal and vertical axis can have separate controller numbers. It also features a mic input for real-time vocal control... The Triton workstation/sampler offers a 32 MB ROM set, 16 MB of sample memory (expandable to 64 MB), sample editing, tons of effects, dual polyphonic arpeggiators, 16-track sequencer with individual track looping, and "pattern play" where you can assign sequenced phrases to individual keyboard notes. Yeah, it's deep.

**Mil Productions** (tel. 011-33-474-025195; www.milprod.com): Modularing 2.0 provides a set of modular MIDI controllers for the MacOS, including sequencers, mono/poly triggers, arpeggiator, MIDI delay, virtual keyboard, mixing controller, GM programmer for QuickTime instruments or external MIDI devices, synchronizer, etc. It's also easy to take a snapshot of the system and swap setups with other Modularing users.

**Hughes & Kettner** (tel. 847-439-6771; www.hughes-and-kettner.com): In conjunction with Spectral Designs (designers of several VST plug-ins), H&K has introduced the Zentera digital amp with dual 100-watt amps and dual Celestion Vintage 30 speakers. Using two SHARC floating-point DSP chips, the amp is said to model not just a finished sound, but the interplay that occurs among the various stages in a tube guitar amp. Whatever — it sounded great. Approx. \$2500.



Mil Productions Modularing 2.0



Synoptic Probe Virtual Analog Studio



Waves Pro FX Suite of DSP Plug-Ins

**SPL** (tel. 847-439-6771; www.spl-electronics.com; distributed in the U.S. by beyerdynamic, 516-293-3200): Consisting of the Atmos 5.1 recording/mixing console and Brauner ASM5 mic array, this 3D surround recording system includes five Brauner VM1 mic capsules designed specifically for picking up acoustic sources in surround. The Atmos console includes matched mic preamps, motorized master gain controls, 5.1 surround panning matrix, and L/R and SL/SR stereo expander.

Synoptic (tel. 011-33-148-180572; [www.synoptic.net](http://www.synoptic.net)): The Probe virtual analog studio for Windows computers includes a 16-voice analog synth emulator, 100-note arpeggiator, 17-track sequencer, effects processor, and vocoder. It responds to MIDI or concurrently running sequencers such as Cubase, Cake-walk, Logic, etc. All sounds can be recorded in real time to hard disk.

TASCAM (tel. 323-726-0303; [www.tascam.com](http://www.tascam.com)): The TM-D4000 digital mixer has 32 mono input channels (16 assignable to motorized faders) with 6 aux sends, 4-band EQ, and dynamics; inputs 1-8 are analog, while expansion slots for various interfaces (TDIF, ADAT, AES/EBU, or analog) are available for inputs 9-32.

TC Electronic (tel. 805-373-1828; [www.tcelectronic.com](http://www.tcelectronic.com)): SPARK for the MacOS is a digital audio editor that integrates waveform editing, real-time FX (including time-stretching) with flexible routing, project file management, and playlist functions. It supports AIFF, Sound Designer, WAV, and Quick-Time file formats (up to 24/96), and handles VST plug-ins. It looks cool, too...The Intonator is a hardware vocal intonation processor/pitch corrector that also includes vocal-specific de-essing, adaptive low-pass filter, word clock input, MIDI automation, and audio-to-MIDI conversion that allows tracking the correction signal history. I/O consists of analog balanced, AES/EBU, S/PDIF, and TOSLINK/ADAT.

Tracoman (tel. 954-929-8999; [www.tracoman.com](http://www.tracoman.com)): The MAM SQ16 is a pattern-oriented MIDI sequencer designed for live performance — think TB-303. There are 16 steps per pattern, MIDI echo, 13 instrument tracks, and a DIN-24 sync connector for sync'ing up vintage analog gear (approx. \$599)...The VSR 3 vintage spring reverb is based on the Musitronics reverb springs used in early Hammond organs and ARP synthesizers. Packaged in a 1U rack panel, the VSR 3 also has a guitar input (approx. \$399)...The MAM DRM 1 has eight channels of analog drum sounds with individual controls for level, pitch, decay, bend, attack, FM frequency, distortion, and other parameters (approx. \$995).

Waves (tel. 423-689-5395; [www.waves.com](http://www.waves.com)): The Pro-FX suite of DSP plug-ins is now available for TDM digital audio systems. The bundle includes the UltraPitch, a 6-voice formant-corrected pitch shifter; SuperTap, a 6-

voice multi-tap delay for effortless rhythmic repeats and doubling; MetaFlanger for vintage tape-flanging and phase emulation; and MondoMod, a unique combination of AM, FM, and Rotation (panning) modulations. Price is \$700.

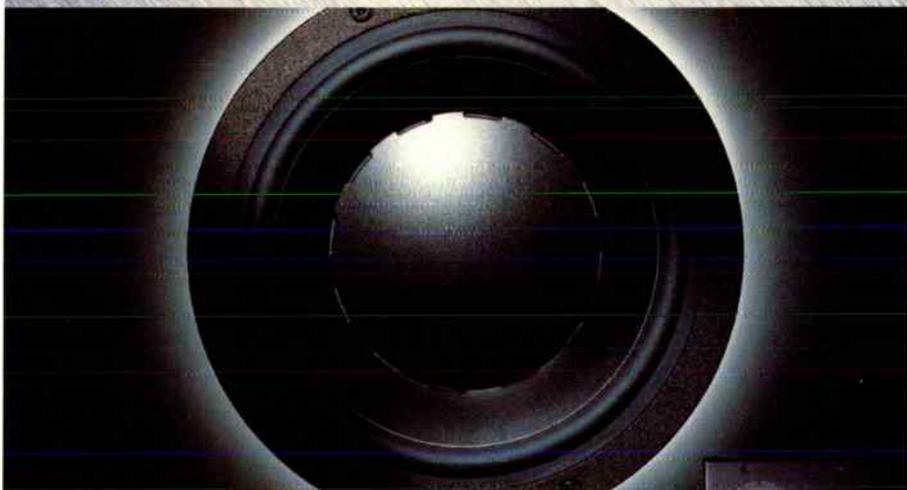
Xaudio (tel. 011-49-9562-921044; [www.xaudio.de](http://www.xaudio.de)): An MP3 "dual-turntable" DJ mixer? Yup, with mix, cue, and all the usual features, as well as Windows software for importing sounds. Yes, MP3 has now migrated from your

hard drive to the local dance club.

That's it for now. Next issue, it's back to applications, techniques, and generally making mischief with today's gear.

*Craig Anderton has just wrapped up a 50-city tour on digital mixing, and is hard at work on his next music project, which will be released in Sonic Foundry's ACID format. Check out one of his latest music production efforts at [www.kac-cohen.com](http://www.kac-cohen.com).*

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# The Art of the Setlist



PHOTO BY JONATHAN POSTAL

The setlist can make or break the gig — so plan it right

BY AL KOOPER

I know what you're thinking — you're thinking what on earth does a setlist have to do with anything. Well, if you're in a band, it can make or break you. I've seen bands with hit records play a show and have people walking out the entire duration of their show — bad setlist! OK, OK — so tell us, Al, what makes a good setlist? I thought you'd never ask...

In the beginning, you must immediately knock them on their ass. Not for a long time either. Just come out, make a *big* impression and keep the audience from thinking you're just like everybody else. Just do it in three or four minutes. Then do a change-up, but keep it up or medium tempo — save your ballad for fourth or fifth. Energy is the key. If you're a solo performer, it's nice to break down the audience/performer wall, and have a sense of humor about what you're doing — it puts the crowd on your side, which is a good place for them to be. In a standup ballroom situation, talking to the audience is

futile except to introduce the song with a title and a one-liner if you have one — let the music speak for you. The audience is standing and their legs don't wanna hear chatter, just rock.

So you've played four or five up-tempo tunes, and then it's ballad time. Give 'em your best one. Your momentum is *really* important up there. When we go out with The Rekooperators, we try and play one long show at a club. Two sets are death for us because we have to build, climax, take a break, and start all over again. Give me that long steady build and a killer climax, and I'll leave ya with a satisfied crowd every time. By the end of the second show, we're horsemeat — physically and intellectually. Your closer is everything in your show. You can falter along the way, make an error in judgement or two, but if they're still there and you close with a wallop, it wipes out the bad stuff before it. I'm sure Lynyrd Skynyrd had a few nights where the daily grind produced a so-so show, but after "Free Bird"? A satisfied audience every time. And save that extra bit of strength to expound on that last song.

Keep ballads to a minimum, maybe two or three in a 90-minute set. Never begin or end with one. Good songs, of course, are *everything*. Good arrangements don't hurt either. But put them in the right place or they'll get lost in a sea of mediocrity. The hardest setlist is one for a Blues band. You can degenerate into three-chord hell quite easily, and endless solos by each member of the band only works in jazz clubs or Phish shows. There are all kinds of blues songs: minor-key ones, Latin-beat ones, etc. If you just play a buncha shuf-

fles in a row, you'll end up in Buffalo. Nothing is more uninteresting than an uninspired set from a Blues band that is just going through the motions on their way to Los Angeles. Stevie Ray, Eric Clapton, and Steve Winwood have shown a great variety of style under the Blues banner — it can be done.

But if you're not having a good time onstage, chances are the audience isn't either. And make no mistake about it, it's not easy to pump up after being in a fart-filled van for 13 hours subsisting on Cheetos and room-temperature beer, and arriving an hour before you play. But you *have* to save something for the show. After all, that's why you suffer all the indignities — it's cause you *love* playing music. If you don't, and you're just paying the rent, the music sounds different. Trust me. So make sure everyone in your band loves the music and has their priorities in order or they'll ruin the fun for everyone else.

OK — I'm off my soapbox now — but, then again, I'm in a dream situation nowadays. I'm in a band where all the other guys play five days a week on national TV. You think they wanna take their weekend and go play music? Hell, yeah they do! And here's why: In our band, they get to play what they love to play — the TV show

pays the rent and the weekends are for us. We play what we want for the sheer joy of it with a mutual respect for each other — and a carefully written setlist that takes the audiences concerns into consideration. It took me 40 years — but that's the ideal way to play music live. Hope all this helps — see ya next month. **EQ**

*Make no mistake about it, it's not easy to pump up after being in a fart-filled van for 13 hours subsisting on Cheetos and room-temperature beer, and arriving an hour before you play. But you have to save something for the show.*

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World Radio History

# Nathaniel Kunkel



PHOTO BY ED FREEMAN

A conversation with the producer/engineer behind Lyle Lovett's Grammy-winning sound, as well as many others

**BY MR. BONZAI**

**Mr. Bonzai:** What is your favorite new recording gadget/ processor/tool?  
**Nathaniel Kunkel:** The new TC M3000

reverb. I sold my [Eventide] SP2016.  
**What kind of gear do you have at home?**

A Cuisinart Vari-Speed™ blender. Same model as yours, I believe. Makes a great piña colada.

**What personal rack gear do you carry around to sessions?**

Too much to mention. It's a sickness really. I need help.

**Do you have a favorite console?**

Either the SSL 9000 or the MAD (Musgrave Audio Design) Labs Neve VR. I love them both.

**If you could only use one microphone, which one would it be?**

A Neumann U 67.

**What's the latest good news with digital?**

I don't think there's anything new really. It's just all starting to work like it's

supposed to. 'Though I am looking forward to seeing the Euphonix R1 run at

96k and the new GML Digital EQ.

**Anything surprising in analog?**

I'm surprised to be using my 1/2-inch

analog ATR-104 2-track [restored by ATR Services] more than my 88.2 digital set up.

**What's your first musical memory?**

I remember being in the basement of our house when my father had a 4-track studio set up. He and Danny Kortchmar were working there. I also remember crawling underneath the console in the main room at L.A.'s Record One and sleeping.

**Did you feel that you had a musical calling as a kid?**

Musical, yes. I play drums as well, and have since I was about four. It wasn't until around 1985 that I got really into audio, though. In grade

school, I was very interested in technology and lighting, and when I would

**Suspect:** Nathaniel Kunkel

**Occupation:** Engineer/Producer

**Birthplace:** Los Angeles

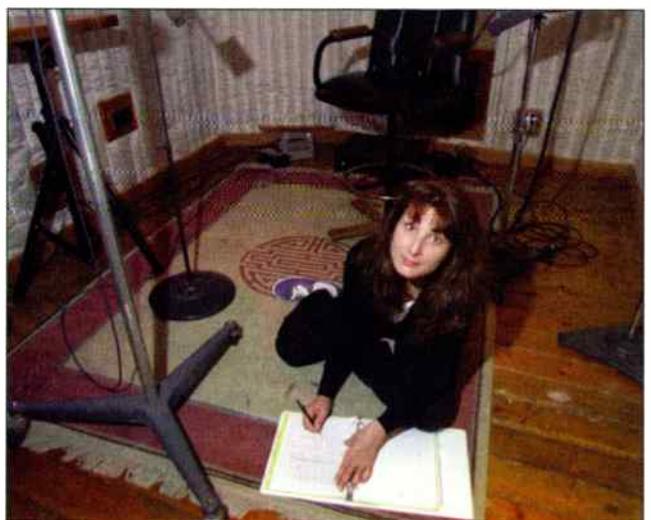
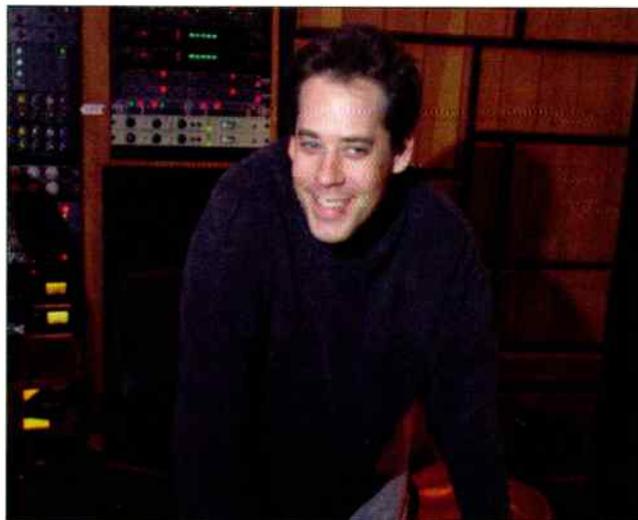
**Residence:** Los Angeles

**Vehicle:** 1957 Chevy 210 wagon

**Notes:** Kunkel began apprenticing with George Massenburg before entering high school. Years of hard work as an assistant led to gigs with James Taylor, Linda Ronstadt, Little Feat, and his first solo recording and mix: Lyle Lovett's *I Love Everybody* in 1994, followed by Lovett's Grammy-winning Country Album of the Year, *The Road To Ensenada*. Kunkel's mix of *Lyle Lovett and His Large Band — Live in Texas* will be out this summer.

Kunkel is currently recording tracks for the upcoming album from Crosby, Stills, Nash and Young. Kunkel has also recorded Kenny Loggins's last two albums.

We met at Conway Recording in L.A. while Kunkel was engineering/co-producing debut artist Amye Williams, with guitarist/co-producer Dean Parks, bassist Lee Sklar, and drummer/dad Russell Kunkel.



PHOTOS BY MR. BONZAI

SCENES FROM THE BONZAI BEAT: (left) Nathaniel Kunkel and (right) Amye Williams.

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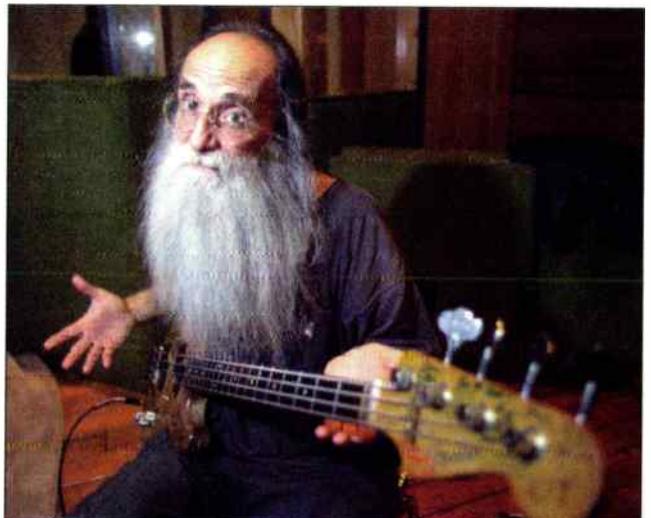
go on the road with my dad, I wouldn't leave Alan Owen [L.D. for Showco] alone. It wasn't until I met George Massenburg at the Complex that I really got into audio.

**How old were you at that time?**  
[I was] 14 or 15. My dad was working with Bill Payne and George, scoring

films, and I was hanging out at the studio for the summer. The very next year, just before I got out of school for the year, I spoke with Greg Ladanyi on the phone. At that time, Greg and George owned the Complex. Greg offered me a job — running basically, but I didn't have a driver's license. I was just there,

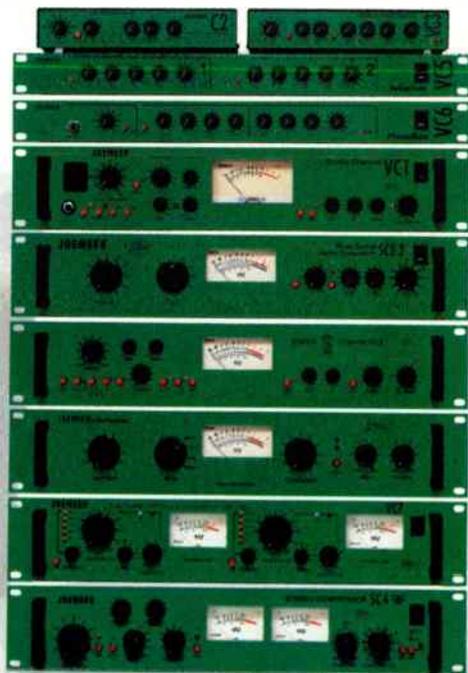
and would do things like clean the snakes when they came in off the road, clean the connectors, and solder patch-bays...poorly. There was a great technical staff there, and I learned how to wire and all that. Meanwhile, George taught me how to drive.

At that point, George was doing a lot



SCENES FROM THE BONZAI BEAT CONT'D: (left) dad and drummer Russell Kunkel and (right) Lee Sklar.

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of R&D for GML. At the end of the day, he would say, "Great, you go in there and mix because I have to watch the logic analyzer hooked up to the automation computer while it's working." He'd put a mix up and say, "Don't touch any of the EQ — go for it." I would mix and mix and mix.

**What is the most important thing you learned from George?**

As he used to say to me, "Use those things [ears] strapped to the sides of your head."

**What was your first solo gig?**

The first record I did solo was Lyle Lovett's *I Love Everybody*.

**What's your secret to getting that great guitar sound?**

Actually, my secret is not so much a secret. I just copped what George did on the first Lyle record we did. It was a

C-24 on Lyle's guitar. I run the C-24 up the neck, not up and down, so your left-right is the floor and ceiling. His vocal mic is a large part of that sound, too. He plays and sings at the same time, and all of his vocals are keepers. I use a U 67 on his vocal. Because there is so much leakage, I don't really try to isolate the vocal and guitar. I just try to get a good blend going. I use the C-24 in M-S and fudge that around, making the guitar and the vocal sit right in an image.

**Russ: So how do you punch in vocal parts?**

You punch the guitar and the vocal, which is really difficult because Lyle moves, and a large part of it is just being in the same space. Move closer, lift the head of the guitar a little, or to the side, lift your head up.

**How do you record a piano?**

With a C-24 M-S. I open up the piano lid and move my head around inside the piano until I find a good spot. I note where the center of my eyes are and put the center of the middle capsule there.

**How do you mic your dad's drum kit?**

That changes a lot really. But, in general, most of my drum sound is Doug Sax's Sheffield microphones on the overheads. They are fantastic. I use a Shure BETA 52 on the kick, AKG 414's on the toms, and a Sennheiser MD-431 on the snare. I rarely use a hihat mic, but if I think I'll need one, I use a U 87 or something big like that. Room mics are either Neumann M 50's if I can get 'em or B&K 4003's.

**Could you point out one engineer who has really inspired you?**

The man who designed the Golden



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Gate Bridge, Joseph Baermann Strauss — I find the Golden Gate inspirational. What do you listen to while you're driving?

KPCC public radio.

If you could go back in time before the birth of recording, what would you like to hear?

The "1812 Overture" during the first performance with live rounds.

Who are some great engineers working today?

Doug Sax and Gavin Lurssen.

Is there anyone in the world you would love to record?

That's a toss up. Either Jules Shear or the Tuvan throat singers.

Do you know any interesting business tricks?

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Who is the most amazing artist you've worked with?

I just did a session for the handicapped children from Widney High School, who had a songwriting class. We recorded, overdubbed, and mixed in three days at Jackson Browne's place. They were the most amazing people. They loved singing so much; just being able to make music made them as happy as they could be. I learned a lot.

What makes a great producer?

Knowing that you can't do everything. Know what you do well, what you don't, and who does. Keeping in mind that it is your job to get the emotion and soul of the music to the listener.

Any advice for getting a good start as an engineer?

Only do it if you love it. There're easier ways to make a living. But if you are going to go for it, my only consistent advice would be to pay attention all the time.

What was the most valuable thing your dad gave you?

A drum set. Professionalism. Diligence. Committing yourself and following through until the end. It means completing what you said you would do. In terms of records — when it's done, all that will be remembered is how the record sounds. That ethic is the one that has done me the most good in my job, because people know that it doesn't matter what the budget is — I'm always gonna give them everything I can.

What would you like Santa to bring you this year?

John X's wardrobe.

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# Bigger is Better

Recording engineer Jon Gass reveals his R&B mixing secrets and how he gets such big sounds

BY BOBBY OWSINSKI

*Babyface, Tony Rich, Mariah Carey, Usher, the Waiting To Exhale soundtrack...mixer Jon Gass's credit list reads like a Who's Who of R&B greats. And with good reason. Gass's unsurpassed style and technique has elevated him to an esteemed position among engineers — working with the best of the best on some of today's most creative and demanding music. In this excerpt from my upcoming book Mixdown, Jon explains his totally unique approach to mixing.*

**EQ:** Do you have a philosophy about what you're trying to accomplish when you mix?

**Jon Gass:** Not really, I just go for it. I'm kind of a musical mixer. I think I try to find the more natural tones of instruments and maybe boost that direction and make everything sound natural as long as it still fits together. I always think of it as a layer cake or something, so I just kind of layer the thing.

**Can you hear the final product in your head before you start? That is, do you know what you're going for?**

Yeah, I can. I know some people push up just the drums and

work on them for awhile, but I start with everything on and I work on it like that. The reason is, in my opinion, all the instruments are going to be there sooner or later, so you might as well just get used to it. And I think that's also what helps me see what I need to do within the first passage. That's when I start picturing. So it doesn't take me long.

**How do you go about building your mix if you have everything up?**

I really start searching out the frequencies that are clashing or rubbing against each other, then I work back towards the drums. But I really try to keep the whole picture in there most of the time, as opposed to isolating things too much.

**So what's your approach to EQ? Do you just go through and look for things that are clashing?**

Essentially, yes. If there are two or three instruments that are clashing, that's

probably where I get more into the solo — if I need to hear the whole natural sound of the instrument. I'll try to go more that way with each instrument unless there's a couple that are really clashing, and then I'll EQ more aggressively. Otherwise, I'm not scared to EQ quite a bit.

**How long does it take you to do a mix? A day and a half is perfect. Two days is long.**

**What's your approach to compression?**

I'm pretty light on compression. Individual tracks, pretty light. Just really to add attack on acoustic guitars, electric guitars...stuff like that. Mostly on things I want to poke out of the mix. If the stuff's EQ'd and layered right, you don't really need to do a ton of compression on the stereo bus. If the thing's laying right, at least with R&B, it just kind of sits there.



**GASS MAN:** Engineer Jon Gass has worked with some of the biggest acts in R&B, including such artists as Babyface, Mariah Carey, and Usher.

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When you're talking about layering, do you mean in terms of frequency or level?

Frequency. My ears have always been sensitive to frequency clashing, even back when I played in bands. I didn't know why, but frequencies onstage would drive me insane. Too much bottom maybe on the rhythm guitar amp clashing with the bass amp or something.

Do you add your effects right from the beginning, or do you wait until you

have everything balanced out and then add them?

As I go. I hardly ever use long hall or long reverb effects programs. I use a lot of gear, but it's usually for tight spaces. Sometimes it doesn't sound like I'm using anything in the mix, but I might use 20 different reverb-type boxes, maybe not set for reverb, though, just to create more spaces. You may not hear it in the mix, [but] you can feel it.

How do you go about getting your sound? What determines what you're going to use?

I don't have a formula. Whatever feels right. I usually have maybe 24 or 30 'verbs and delays set up almost all the time. Not necessarily set to the same thing, but up. I think I have probably more outboard gear than anybody in the world does. I like to use a lot of different 'verbs. Instead of having 20 Yamaha reverbs, I'd rather have one or two Yama-has and one or two Lexicons, because they each seem to have their own sound. The more different ones you use, the easier it is to separate the actual sounds.

Before you start a mix then, do you have same effects set up all the time?

Yeah. For instance, on the last song I did, there was a MiniMoog-type sound, and I had this kind of a short, tight room 'verb on it that set it back in the mix really nice. On the next song, I didn't get a chance to change the setting, but I just happened to flip it onto the snare and it sounded great. So I didn't change it. It's the same effect from the last song, but it's on a completely different instrument.

Do you use mostly delays or reverbs or a combination?

I use a combination. I do like the reverb programs with predelay in them so that you can kind of customize them to the song and the tempo.

So everything's timed to tempo...? Depending on the song, yes. Mainly the 1/8th's, 1/4's, or 1/16th's. But, depending on the tune, I'll add in triplets or whatever feels right.

*If the stuff's*

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The other thing I like to do with delays is to diffuse them. I'll put a delay through a bunch of stuff just to make it sound worse. We joke about this guy that mixed a long time ago, and he'd have his delay clearer and brighter and louder than the actual lead vocal. I think that's what kind of got me experimenting with ways to really tone it down. Sometimes I put a delay through an [Yamaha] SPX90 and won't even use the program. I just use it to clip the top and bottom end off and diffuse it off the lead vocal a little bit.

**When you say you use short spaces, are you trying to move stuff back [in the mix] or just put it in its own space?**

Put it in its own space. Sometimes it can be just a chorus, even a Harmonizer® with a really short delay time. What it comes down to is that I like short, dry sounds.

**How short?**

Like 25 ms or less. I use a lot of 10, 12, 15 ms on things. For *Waiting To Exhale*, for instance, a lot of that was really different for me because of the big string arrangements. That wasn't something that I'm used to doing, but I sure loved it.

**How did you approach the big strings?**

**The traditional way, that is, by putting a big hall [effects program] on them...?**  
No, I approached it kind of differently. I didn't think that the stereo pairs were wide enough, so the first thing I did was spread them out about 10 milliseconds or so. Then I took the room tracks and kicked them back maybe 80 or 100 milliseconds, just to really make the room bigger. I was trying to create a bigger room on the room they already had before I started adding 'verb. And, finally, I just added a little bit of reverb on the delayed room tracks. Once I created that, I thought it worked great. It's still kind of dryish, but it's gigantic. So it's really more of just the delays than reverbs.

**With all the effects you're using, it sounds like there's a separate effect for each instrument.**

Absolutely. I very rarely use the same effect on more than one thing.

**How about monitoring? Do you carry your own monitors with you?**

No, I don't, but I really only work in about four different rooms. The rooms I work in regularly have stock NS10's with extremely high power on them, and the mains are always TAD [George]

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Plus, I mix really quiet on the big ones most of the time. That seems strange, but it's something that hit me about 15 years ago when I went to my first mastering session and they were listening quietly on the big ones and it sounded so good. And I was like, "Wow! I could've made that sound better if I could've heard it this way."

Do you have any listening tricks, like walking down the hall or listening in the car?

I like to listen outside the room, but one of my favorite tricks is to turn on the vacuum cleaner and lay it up against the wall in the front of the room. [That] sounds a little strange, but I just kind of want to see if the mix is still cutting through at all. A blender would work, making margaritas or something... [Laughs.]

When you're doing a mix, how many versions of the same mix do you do?

I'll do the main version, a lead vocal up, just the backgrounds up, and then the lead and backgrounds up. I hardly ever do a vocal down version. Then I'll just go through and pick some instruments that somebody might have questioned and put those up. It usually comes out to be 10 or 12 versions of each song, believe it or not.

Covers your bases, though.

If I don't do that, somebody always says, "It's too bad you didn't do one with this." But if I do that, it never happens. Even though they always pick the main version, I think people just feel better knowing that the alternate versions are printed.

You have an interesting approach, and it certainly does work. You try to make things bigger instead of washing them out...

I think part of that is probably from my early recording days. I didn't really have any reverbs, so I had to use more of the ambience that was available. That started adding such a new twist as opposed to everything just miked so close and direct all the time. It adds such a great depth to everything.

That must be the secret then.

I'm sure that helps. But, to me, this business is about 95 percent luck, because if people don't call you and you don't have the right stuff to work on, with the right gear, then it doesn't really matter. There are so many great, great engineers that don't have a lot of work. It's really luck.

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# Performing Engineer as Musician

DJ Homicide plays his tables as an instrument to help Sugar Ray stay on top

BY MICHAEL SANCHEZ

*With the help of performing engineer Craig "DJ Homicide" Bullock, Sugar Ray has managed to take its blend of Southern-California punk-rock/hip-hop to the outer limits of pop stardom. Bullock explains the ins and outs of performing and songwriting in a full band, as well as some of the techniques he uses.*

**EQ:** How did you end up in a rock band?

Homicide: It was just luck, I guess. I had a buddy who works for Immortal Records. I used to do internships with them; they got me on all the hip-hop radio stations. He was like, "You should try to hook up with this band. They need a DJ." I went and tried out, and that was it. These guys took me off the radio and put me on the road. Before that, I worked on 92.3 The Beat in L.A. I had my own show with Snoop Dogg's DJ — DJ Jam.

**What is your role in Sugar Ray's songwriting process?**

Some songs are written around stuff that I find. For example, for "RPM" on the last album, I had this race car sound. [Guitarist] Rodney Sheppard and I were like, "Let's make this race-car sound the riff of a song." So, he emulated the car sound on his guitar, and we

were going back and forth when the rest of the guys chimed in. So when we write like that, the DJ becomes a huge part of the process. In songs like "Fly" and "Every Morning," where I go in and lay down drum tracks and sounds, the guys come in and play over them. On those songs, if I don't run my beat, there's no song. The band made me really important in the writing process. We try to come up with anything we can at any point and time. Nobody's responsible for the bulk of the writing. It's a matter of whoever comes up with the freshest stuff.

**So, you're just one of the musicians?**

Yeah, turntables are like the newest instrument right now. You can actually tune records to guitars or any kind of sound.

Anything that you put on a record, your turntable becomes that. I can become a drummer or guitarist or anything. We use it for everything. We do skits in the middle of our shows where we'll let a kid from the crowd rap over [a song from rapper] Eminem. I use sound effects when the kids mess up; I like to do comedic references or quotes from movies. I just put these things on wax and spin them during shows. It's brought a whole new color and dimension to the music.

**Where do you get your sounds and samples from?**

I get a lot of sounds from movies, put them down on DAT, and I take them to get pressed on wax. Also, a lot of stuff that we use is from our own vocals. Many songs

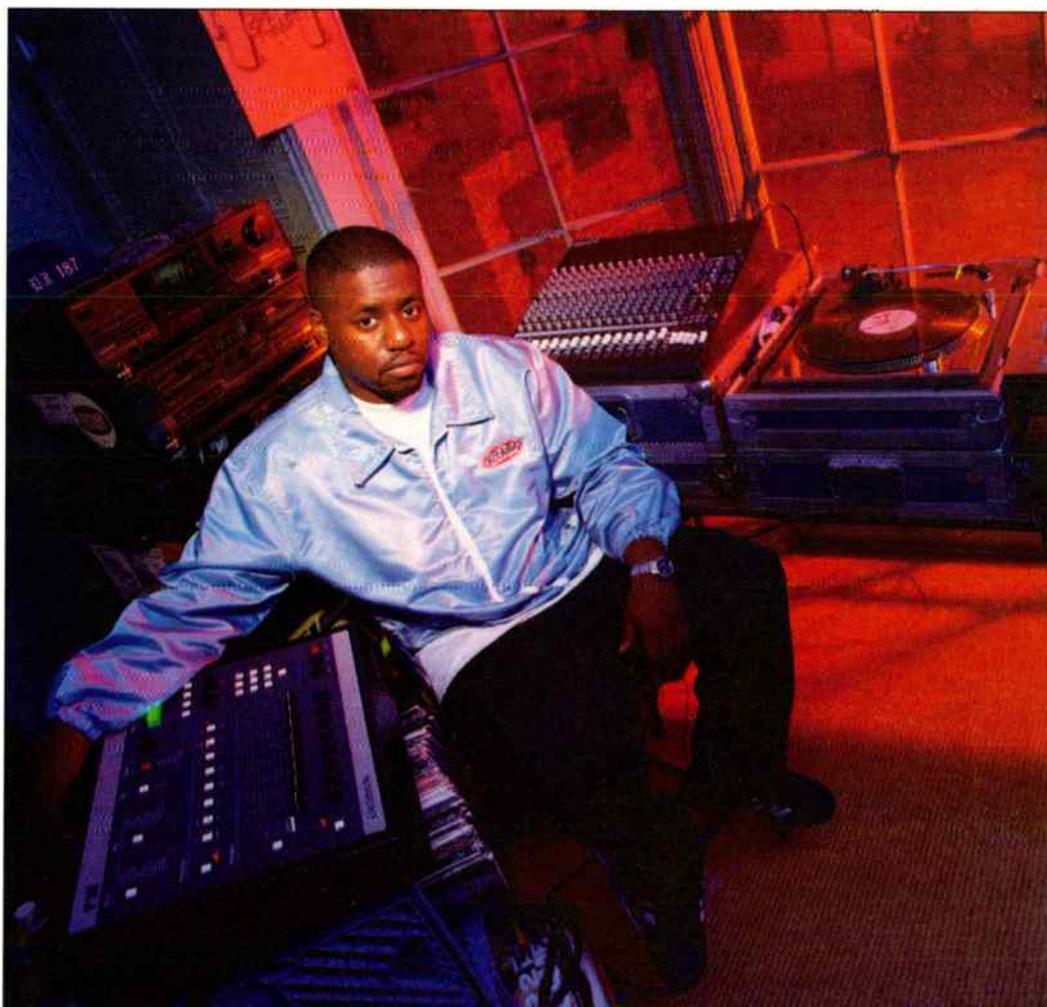


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PRETTY "FLY": Craig Bullock (a.k.a. DJ Homicide) provides the building blocks for many of Sugar Ray's hit songs.

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on the first album contained hooks and samples from vocals the band already sang. We take it off the board and put it on a record. There's just no limit.

What equipment do you use on stage?

I use my Akai MPC2000, and I use a Denon MiniDisc that has five presets I put songs in. I can play five different things at the touch of a button; I trigger them like samples. The MiniDisc is huge for me because it saves me a lot of time. The most important things are my turntables (Technics 1210's, MK3's, and 1200's) and my mixers (Pro Limited 05 and 07). I have an entire little studio I bring on the road with me. I have a TASCAM CD burner, a 2180, a 16-track Roland board, Alesis effects, and an Alesis ADAT. I'm definitely the toy guy in the band; I'm always messing around with different equipment.

Do you use any outboard effects or guitar pedals?

Although it's hard to get a clear signal through all the pedals — especially with the turntables — I still use all sorts of effects. With my equipment, you've got a DJ aspect, you've got a MIDI aspect, and then you have a guitar aspect. I use around seven different pedals. It's really fun. It takes DJ'ing somewhere else.

I've got some delays including one called a Gonculator; I got it from one of the guys in Incubus. It's like a robotic-type flange with distortion. I run guitar sounds or a tone through it and just make weird noises. For example, I created sort of a flying saucer sound for a song called "Personal Space Invader" on the new album [14:59, Lava/Atlantic]. The sound comes from this record I have that consists of sounds from old '80s Atari video games. I put the sound through a delay pedal and scratched fast backwards and forwards to help it sustain.

Another song, called "Glory," starts with a guitar riff, but it's not the guitarist, it's me. That guitar riff comes from the end riff of an old Sugar Ray song. I sampled it, put it on a record, then ran it through my Gonculator pedal and a wah-wah. There's a lot of stuff like that on the album that goes unnoticed because people are simply

listening for straight scratching.

I heard that you have well over 20,000 records in your collection.

Yeah, I'm a vinyl fiend. Usually I bring between 100 and 200 records on the road with me. Anything from hip-hop to drum breaks to jazz records; stuff I can sample and make beats with. The guys can come in and play over this stuff. That's one of the ways the songs get written.

How do you organize specific samples and grooves on stage?

With a Zip drive, organization is easy. I just preprogram the songs — every change

and every alteration. So when I hit play, it's going to play exactly how I programmed it.

So how do you go about sync'ing or matching beats? Actually, the band has to sync with me a lot of the time. Once I program a beat, it's gonna play the same every time. They just have to play live over it. If the band doesn't get my sounds right in their monitors, they're going to be off. On the songs that are beat-driven — like "Fly," "Every Morning," and "She Falls Apart" — the band plays around me.

Have you run into any problems where the band couldn't stay in time with you?

Hell yeah, my whole system went down during [the tour we did with] Everlast. All of my Zip drives broke; all of my discs got messed up. But that's the downside of technology.

What separates you from other DJ's?

Throughout our music, there's a lot of stuff where I'm trying to be ambient. Usually I'm trying to fill in spaces, trying to

create a mood with textures and colors. Being in a band makes me more of a complete artist. First, I was just a good DJ, but now I'm more of a musician. The best part about all this is I get to do what I really love, DJ, at a high level. What have you got in the works for the future?

I'm always trying to learn new stuff. I want to put out some real hip-hop bands that have the energy of rock bands. I'm starting to work on a few visions right now. I'm working with a few bands. I'd love to do a solo album — get together with some groups and mix it up. **EQ**

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CIRCLE 26 ON FREE INFO CARD

## WHAT IT IS

The StudioMix package (\$899 list) consists of Cakewalk Professional 8.0 (a MIDI+digital audio recorder; see review by Wade McGregor in the March '99 issue), hardware console, and cables. The console replaces the tedious process of navigating and mixing with a mouse, thanks to hands-on, hardware controls.

These include: nine motorized faders (eight channel modules + master); 18 assignable rotary encoders (two per module); nine assignable buttons (one per module; typically used for writing automation, solo, or mute); five assignable "function keys" that can duplicate any standard menu function (open file, print notation, cut, groove quantize, etc.); and a set of MMC-compatible transport controls — yes, you can control your ADAT, DA-88, etc., from the same control surface.

A jog/shuttle wheel allows for transport control beyond the

usual play, stop, go to end, and go to beginning. "Quantizing" the jog wheel moves it by specific amounts (measure, beat, frame, etc.) — all the way down to individual clock pulses when set to "fine" control.

The final element is an audio section, designed to interface with analog sound cards and a mixdown deck, that is ideal for those on a budget. Connections include XLR balanced mic in, stereo line in, monitor out (with headphone out), stereo to sound card, stereo from sound card, master out, and tape input (a tape monitor switch toggles between the latter two connections). There are also controls for mic gain, line gain, master out, and monitor out.

System requirements are a Windows 95/98/NT computer with minimum 120 MHz Pentium. With slower machines,

*continued on page 133*

# Anschlußvielfältig



Ricky Recordo started off with a four track, just like you, he then saved up and bought an ADAT. He was swingin' when a DAT machine showed up.

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the 16 measures. Now, suppose you want to duck the level to 25 percent for the duration of measure 8. You enable automation prior to measure 8, duck the fader to the desired level, and then disable automation at the beginning of measure 9. However, the fader will not return to halfway, because the last controller value it saw was the one at the beginning of measure 8, not the one at the very beginning of the 16 measures. For these types of "micro-edits," consider using the vector-based audio track automation, and for MIDI tracks, edit controller values. Or just remember to return the fader to the desired position after making any changes.

- Two CAL programs, *Wipe Automation* and *Wipe Selected Automation*, are extremely useful (CAL is Cakewalk's programming language for creating your own commands). Go to Tools > Run CAL Program, and choose the appropriate program to remove the desired automation data.

- When panning with the rotary encoders, assign them to the top-most row. When a fader is all the way up, turning a knob on the lower rotaries could accidentally cause your finger to brush against the fader and move it.

- Although Cakewalk Professional can play back a maximum of eight digital audio tracks, you can record far more. This is excellent for assembling composite solos, where you lay down multiple solos, then mix down the best parts of each solo into one final, composite part. Snapshots are particularly helpful for this: go to where you want part of a track to play, turn down faders for all the other channels, and click on the mixer's snapshot (camera) icon. Repeat this process for all tracks until the solo is perfected, then bounce the completed version over to an open track.

The StudioMix is very cool, because it brings spontaneity and multiple-fader mixing into a computer-based environment. Hopefully, these tips will help you get more out of an already clever system. **EQ**

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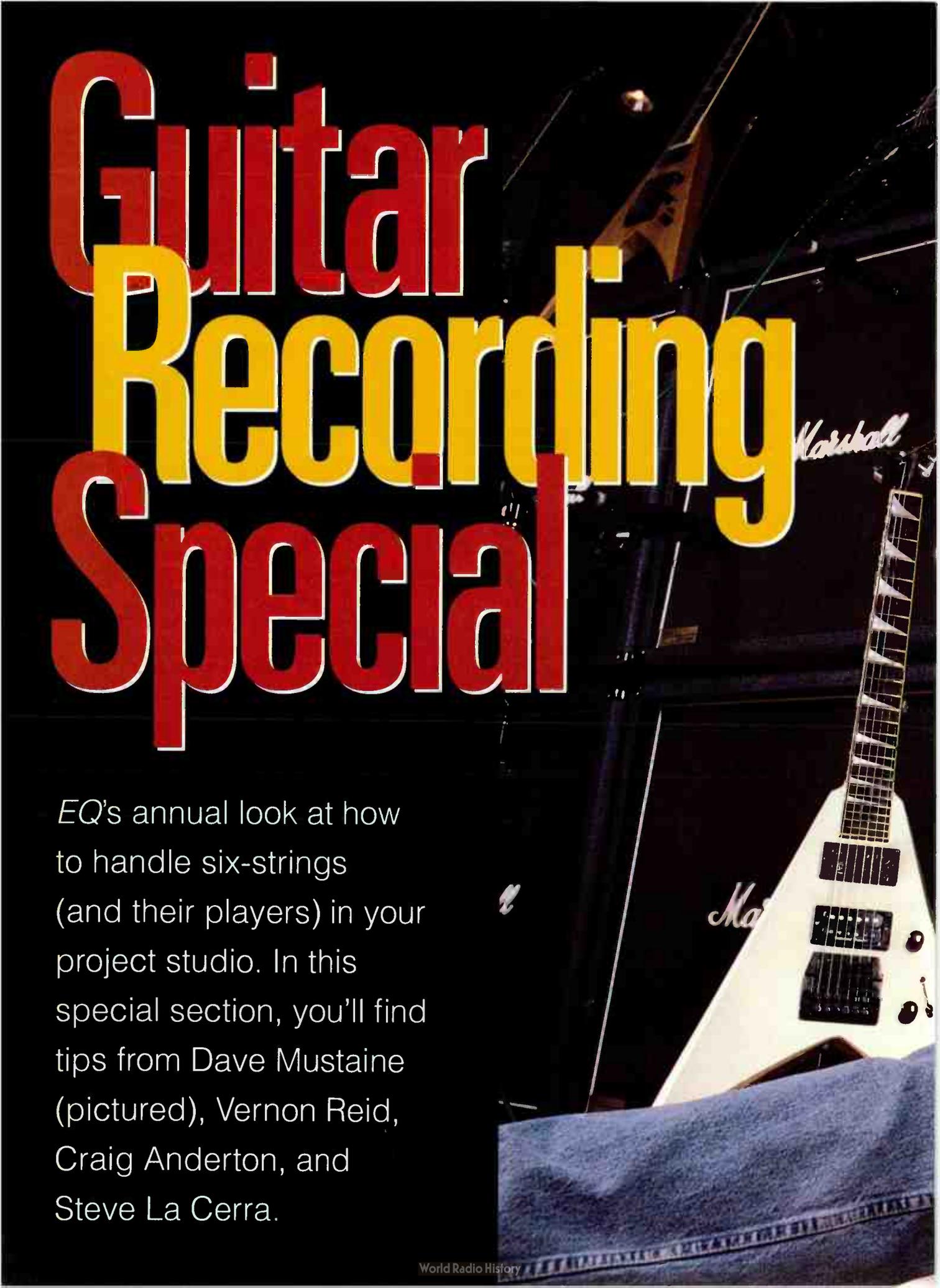


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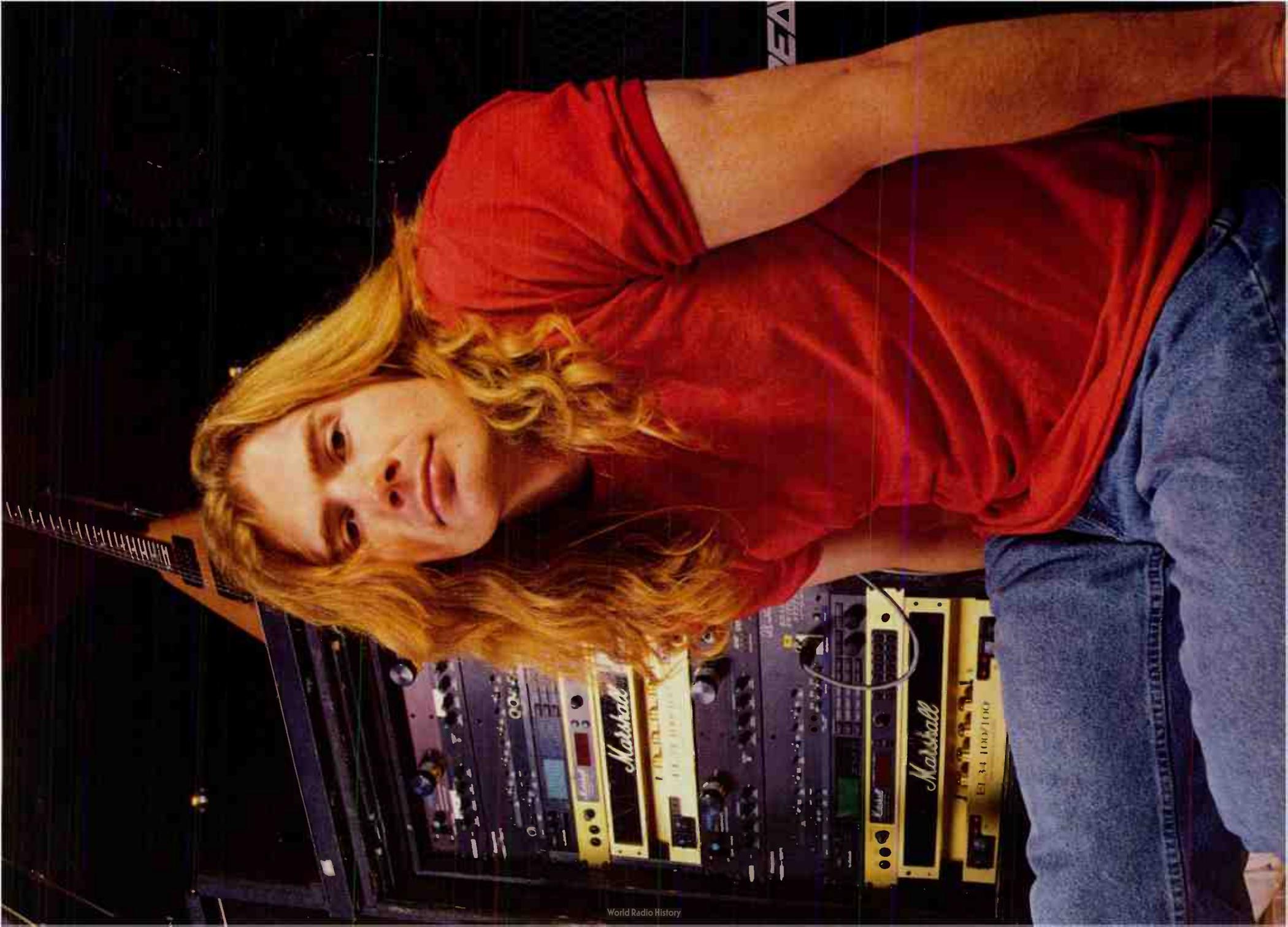
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CIRCLE 16 ON FREE INFO CARD



# Guitar Recording Special

*EQ's* annual look at how to handle six-strings (and their players) in your project studio. In this special section, you'll find tips from Dave Mustaine (pictured), Vernon Reid, Craig Anderton, and Steve La Cerra.



## Megadeth heads to Music Row for the band's latest release in Nashville, TN?

What do you get when you combine two parts guitar gods, equal parts guitar techs, one carefully picked engineer, an amassment of creativity, and a mountain of cool gear? You get the perfect mixture for a successful rock record and the sound that is found on Megadeth's latest CD, *Cryptic Writings*. The main ingredients of this finely tweaked recipe for success are guitar guru and producer Dann Huff, his longtime engineer, Jeff Balding, and Megadeth's ultra-fly guitar man, Dave Mustaine. This powerful team has been holed up at Emerald Sound Studios in Nashville for almost five months, creating the follow-up to *Cryptic Writings*, which is to be released this summer.

This project marks the second collaboration between producer Huff and Megadeth, a pairing that raised a few eyebrows in the beginning. According to Mustaine, "My manager, Bud Prager, had an idea for a potential producer, someone who hadn't really done much Rock recently, but was very credible. Dann and I hit it off really well, and now it's reassuring as well as motivating for us to know that we have his backing and input on this project." Huff agrees that, although he spends the majority of his year producing Country music's "A-list," he and Balding have a unique opportunity to bring

another perspective to the recording process for the band. But he admits that recording with Mustaine and crew is "not really a set process. It's more like flying by the seat of our pants!"

Balding concurs that it's difficult to find a method to their madness, but offers a bit more insight into capturing the ultimate mega-guitar sound. "Once they've kind of given me what they're

expecting, I try to find what I can do differently to bring it one notch above that. For example, let's not just put Dave's Marshall amp through a great mic preamp to tape, but what can we do to pump it up and go to the next level."

Taking guitar tone to the next level has included using one of Balding and Huff's favorite toys to bring a new dimension to the signature guitar



PHOTOS TAKEN AT EMERALD SOUND STUDIOS...THE TRACKING ROOM BY BETH GWINN

MEGA-TRIO: The team behind Megadeth's last release, *Cryptic Writings*, as well as the one currently in production. (L-R) Dave Mustaine, Dann Huff, and Jeff Balding.

ALESIS recording



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## ALESIS

CIRCLE 79 ON FREE INFO CARD

World Radio History

sound: Digidesign's Pro Tools. "On the last project," Balding continues, "we used a lot of different amps and a lot of different layers. For this record, we want to go further, maybe not as much layering. I began turning towards Pro Tools and looking at plug-ins. There's a wide variety of stuff out there that's really great. One of the things that I've used a lot on this project is a plug-in called Amp Farm that simulates different guitar amps. It will simulate a Marshall, it'll do a Fender. On a new song called 'Breadline,' we used Dave's Jackson guitar and Marshall (DI) track through a 'balls-to-the-wall' Amp Farm setting and blended it in with the amp sound off tape," he explains.

Pro Tools is not the only change that can be found during the second set of sessions shared by this talented trio. Mustaine admits that his rack — which now consists of a Rocktron Piranha preamp, Marshall amps, TC Electronic effects unit, and Rocktron Intellifex, has gone through somewhat of a metamorphosis since the first time he walked into Emerald's "The Tracking Room" in 1996 to work on *Cryptic Writings*. "The first time in, I was proud of my rack because I had semi-decent gear compared to what I have now. I had Marshall EL34 100/100 dual-monoblock power amps (which I still use) and a 1960 4x12 cabinet. I think Marshall amps are the greatest rock amps in the world. But, when we came in this time, I started using a Piranha (preamp) from Rocktron. Dann really liked that, and, in fact, some of the scratch tracks we put on this record are tucked into the song in some places. I

know that I want the guitars to sound powerful, but I don't want them to be overbearing."

Fortunately, honing that "non-overbearing" sound that Mustaine desires is Huff and Balding's specialty, and, apparently, a consensus on the

sound youthful.' You see these kids wearing baggy clothes, body art, and piercings who listen to this crunchy, guttural-sounding guitar. We wanted that sound to be there along with the articulation. You want to play really well, you want to play fine-crafted instruments



TESTING, 1,2, 3: Experimenting was a big part of Mustaine's sound on the new project.

sound was reached early on after much trial and error with effects and amps. Mustaine agrees that the experimental process has been essential during the production of this record. "We tried a lot of different things. There was a point where we finally just said, 'OK, this is what we want. We want the guitars to

that sound good. But when it comes down to EQ'ing at the end of the process, you want to also make it favorable to people who like listening over and over again. You don't want a grating sound so when you hear it it's like, 'Not these guys again.'"

To accomplish this, Balding has

called on myriad effects to push the limit, including the D-Fi and Opcode Vocoder plug-ins for Pro Tools. He believes that these plug-ins allow them to go completely left of center with a variety of distortions and ring modulations. "If you have the wrong touch with a certain sound, it's not going to work. The sound will do a certain thing when you have an effect on it, and if you don't play to that effect, it's not going to happen. A couple of sounds on this record are really whacked out — like the song 'Insomnia.' The main guitars on this song are Dave's rack — his Piranha. It was two scratch passes. It's easy, we don't have to worry about anything. We just plug in, put a SM57 on it, go to tape, and we're done."

But everyone knows that you can only do so much with effects and amps. There must be an incredible source to draw from, and many might say that Mustaine's fretboard talent is unparalleled. His sound is as unique as the guitar he most often turns to for creating it, the Dave Mustaine Signature Model Jackson V. "What I play almost 100 percent of the rhythm on is the silver V. The serial number is DM010, and I've had it for years. It's been on just about every single record I've ever cut. This is going to sound perverted, but, to me, music is very sexual and the way the V sits on my lap is a turn on. The neck is kind of flat and fits my hand properly. It has certain overtones to it that I like."

His guitar tech, Ernie Hudson, notes that they travel with a large selection of acoustic guitars as well, including guitars by Guild, Fender, Bourgeois, and Mustaine's favorite acoustic choice — a 12-string Alvarez. "I played a 12-string on this record, and, for me, playing an electric 12-string is OK if you're using it for banging out chords. But when you have to pick it really clean like Dann does, well it's hard enough playing six strings as good as Dann, let alone 12! One of the beauties of having good gear is that when you get out on the road, you can pretty much emulate the sound. We really take a lot of pride in trying to match stuff up as much as we can, so it's important to us when we're in the studio to pay attention to

what Jeff and Dann are doing because they put all this mojo on the songs."

Some of that "mojo" Mustaine is referring to is the result of Balding's miking techniques, which were carefully developed while recording Megadeth. Although some of the most guarded secrets of any engineer are those of miking, Balding gave *EQ* a glimpse at his choices of mics and preamps on *Cryptic Writings*, as well as the current production. "For guitar, there's one preamp that, to me, is just the meat-and-potatoes preamp for guitar, especially in the power guitar stuff: vintage Neve, like a 1073," reveals Balding. He's the owner of a rack that includes Neve preamps, EQs, and compressors, GML EQ and limiters, LA-2A's, a Fairchild, and even some old Moog filter EQs. "For this record, I've got a little Neve 10-channel line mixer and I bring four or five mics into that through the 1073's. I try to put one of everything (mics) on the amp. Shure SM57's are great. I always have one of those on it. I've got a Neumann '67 that I'll use further back from the amp, a Sennheiser '421, and an Audio-Technica AT4050 that I'll put up there. I may use one that sounds great or blend two or three together, depending on the song. You just kind of experiment to find stuff that works.

"I don't put them on separate tracks. I sometimes use a lot of compression, and, for this record, the [Empirical Labs] Distressor has been a big compressor. I've been liking the Focusrite D3, sometimes Fairchild, sometimes Neve. It depends on the song. The general flow is a Neve preamp to tape with maybe a comp and not a lot of EQ. With power guitar sounds, if you over-EQ, you really get some wacky phasing stuff going on," he explains.

Balding exposed his recording secrets for one of the new tracks: "On 'Crush 'Em,' there's a Strat solo fill part in the verses. We wanted a sound to set it apart from everything else — something real skanky with a lot of energy in the top. We miked the cabinet with an SM57 for one track. For the other track we miked a stone iso booth at one end of the studio where we normally cut drums. But for this guitar part I had an

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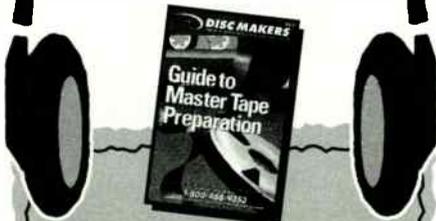
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AT4060 in the room and recorded it to a separate track. I could pan them left and right, and we had a gorgeous sound that was delayed naturally because it was far enough from the Marshall cabinet."

Balding is very conscious to try to satisfy both Huff and Mustaine's delicate requirements in the studio. "I'm not a big fan of the mic in the middle of the speaker as a rule, he contends. "It's bright and brittle. I feel like the speaker cone is there for a purpose. Dann is a big fan of warmer guitar sounds, the core of the guitar sound. To satisfy that, I'll mic at the edge of the speaker cone, pretty close to the speaker, too. Maybe I'll put SM57's in that position, maybe I'll use one of the other mics back a foot or two, or maybe I'll put one 15 feet back. It depends on how loud the amp is." For most of the record, Balding didn't mic the rear of the cabinet: "The only open-back cabinet we had was a Matchless for a new song called 'Wonderlust.' Something basic you have to do is flip the phase of the rear mic. Sometimes I use SM57's or the '421's. On some of the big sounds we'll use a floor mic, which can be anything from a '441 Sennheiser to a PZM."

Generally, you can bet that any session involving Mustaine is going to be pretty loud. He jokes that, in the beginning of this recording relationship, both Balding and Huff were often found in the studio clad with earplugs and gun muffs. "I would come in after them, and it's like needle point — the music was so low it surprised me! The sound they get out of a volume that low, I would never imagine possible. When I track, it needs to make the hair on my legs move." Mustaine jokes.

But not all of the Megadeth sessions are filled with loud guitars. Occasional-

ly, Mustaine will drag out his 12-string Alvarez acoustic guitar like he did for the song "Almost Honest" on *Cryptic Writings*. For this task, Balding most often turns to the Audio-Technica AT4051 (which he also uses overhead on drums). "I think that on 'Almost Honest' I did use a couple of Neumann mics. They're great on acoustic. I used stereo miking

on that track through API mic pres with a couple of 550 API EQs and a Fairchild compressor," he recalls.

"Recording the first track from *Cryptic Writings*, 'Trust,' was a bit more intricate of a process. As Balding explains, "We did six tracks at a time for a basic Dave power path. The last track was a stereo track with a real rough-sounding stereo chorus. Other passes were mono with different amps and guitars each time we did a pass — like the Peavey 5150, Marshall, or Peavey Classic 50. One pass would be a Boogie Dual Rectifier with one of the Jackson guitars, one would be maybe a Les Paul or an SG through a Marshall Plexi miked with an AKG C414 and SM57. I'd use a different mic on some passes or maybe move the mic around to get a different vibe. Two were a cleaner-sounding distortion and the other two would be real heavy, grinding power chords with a lot of bottom. I used Neve's, and didn't do a lot of compression to tape last album; I pretty much went through just a Pultec EQP1A3," he remembers.

Although all three men respect the gear used on this project, they all concede that the creative element of the process is more important overall. "With all the tools that you have at your disposal these days, it's imagination that still rules," Huff concludes. "If we were in a different studio, the record would essentially be the same, but different things affect you in different ways,

*continued on page 133*

"Once they've kind  
of given me what  
they're expecting, I  
try to find what I  
can do differently  
to bring it one  
notch above that."  
—Jeff Balding

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CIRCLE 75 ON FREE INFO CARD

## Reid Between the Lines

Vernon Reid discusses how he works in his project studio

*Many of you may know Vernon Reid from his monster tone and aggressive guitar sounds from his previous band, Living Colour. Before and after this very successful group, lies a musician who does not limit himself, integrating sounds of fusion, jazz, hip-hop, and other worldly elements into his records. Recently, I began to work with Vernon in his comfortable project studio in New York, so filled with gear, new and old, I almost didn't know where to begin...*

**EQ: What got you into project recording?**  
Vernon Reid: My first recorder years ago

was one of those TASCAM Portastudios — that's how I started out. I was like, "Wow, you can actually do this at home!" They are funky little things. That led me to an 8-track version of the Portastudio. I think the Latin Playboys and Mitchell Froom do a lot of work on cassette multitrack machines.

I can't neglect to mention sampling, which came into play back on Living Colour's first record, using Akai S-900's and S-1000's. I started to record direct to DAT, submixing all the elements. I got a Mac Quadra 650, and I was in the debate between dedicated sequencers and dedicated hard-disk recorders vs. software; then I bought an Akai DR-4D. That was my first hard-disk recorder, which got me back into multitracking.

That eventually led me to the Roland VS-880. The people at Roland have been pretty great and supportive, plus, their 1680 recorder is amazing. The only

problem is the learning curve thing, where you have to try to be creative while bumping up each from each higher level of gear. I've always found it important to work where I am, as opposed to waiting for the next "Big Thing." Finally, I got a Mac 604e. From there I got into Cubase, then moved up to a G3.

**What's the Vernon Reid guitar sound?**  
I have this setup that's always varied through the years. I've been using some digital technology, but using tube power amps for warmth. I work with old VHT power amps, wired with Monster

Cable. I use the Roland VG-8 guitar system, as well as Dual Rectifier Mesa Boogie amps. Talking to people about the VG-8, some people are strongly opinionated about it, but I'm into programming it. I've always been into programming my own sounds, and I've gotten some sounds that I really like out of it. The idea of using computer modules on guitar is really just the next step. The best mark of a technology working is it becoming unselfconscious, invisible. But, still, I have my own personal barriers and limits concerning technol-



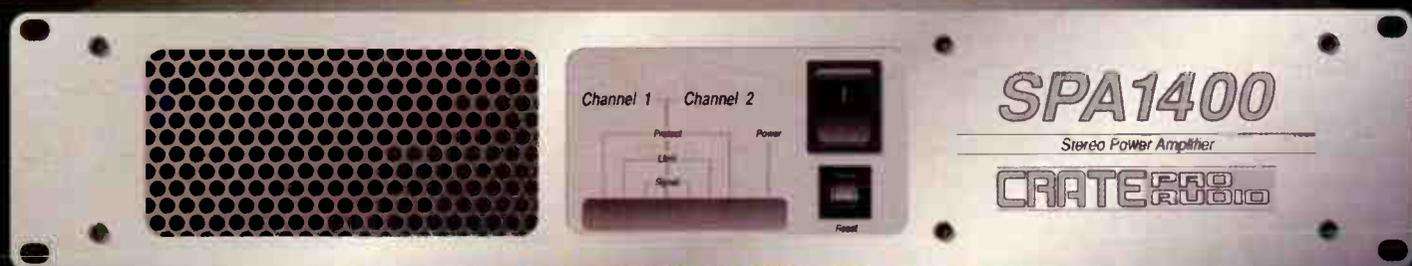
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**LIFE AFTER LIVING COLOUR:** Vernon Reid may like digital technology, but he still passes his guitar through tube power amps for added warmth.

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ogy. A Martin is a Martin is a Martin, hands down. While all this technology is here to utilize, you really have to just use your good sense of feel.

**What guitars are you using?**

I'm using custom Hamer electric guitars with Tom Anderson or EMG pickups. For acoustic guitars, I have an amazing Taylor koa single cutaway and an Ovation Custom Legend, which is also outfitted with a hex pickup. I have a really cool Parker-Fly that's incredibly lightweight. For vintage funk, I have a '58 Gibson 345, Gibson L5s, and a Howard Roberts Fusion. I also use Z-guitars by Harvey Starr, which are these radical MIDI controllers I use for my sequencing. Instead of strings, they use six rows of keys configured for guitar. I actually worked with Harvey in the development of it. There are actual frets on the instrument, so, even when I play chords, I feel frets, which takes me back to the feeling of playing guitar. It's a tactile thing. I think that's the reason knobs and buttons are making a big comeback as opposed to membrane switches. It's something about feeling that resistance.

**What about your new record?**

I'm doing my second solo album for Sony. I'm in the process right now of writing and recording bits and pieces. I'm doing a lot of work here at home, working with different vocalists. Also, I have been working with drummers using the Roland V-Drums, using drum models and samplers to have a live feel in the middle of a bunch of tracks and loops. I'm working with some wonderful people, and I have instrumental material as well as songs. Part of what I will do is take some of the material and go into an analog room, using some of the bits and pieces I have as guideposts, and just do something completely live. I may do some of the mixes at home and some outside.

**What gear do you really love in your studio?**

I have a Groove Tube model 1A mic and mic pre that's very warm and present, especially for male vocals, and an Audio-Technica 4033, which is a good all-around vocal mic. I just got ART's Pro MPA and VLA that sound excellent alongside my TLA tube EQs. I have a couple of wacky old devices; a 16-second delay by Electro Harmonix, an Italian Binson Echo-Rec., and

a macabre antideluvian Korg guitar synth.

Akai still has the clearest sampler layout, followed by Ensoniq's ASR-X. No one has beaten the ergonometry of Lake Butler Sound's MIDI Mitigator as a MIDI control pedal. For looping guitar phrases, I dig the Lexicon JamMan or the Boomerang. For more complex layering, I like the Oberheim Echoplex. My Eventide H3000's still a favorite. The Craziest single footpedal has to be my DigiTech Space Station. On the software side, I love Cubase 4.0/24's plug-in architecture combined with Bias Peak V. 2.02 and SFX Machine. I love to use Recycle, taking a sample, chopping it up, and playing it at another tempo while maintaining pitch. It becomes another expression altogether. I really like a company called Bit-headz, which has a software sampler called Unity DS-1, and a software-based analog synth called the Retro AS-1. I've also been working with Rebirth by Propellerheads (who also does Recycle). They really opened the architecture to users who come up with radical variations on the basic 303/808/909 scheme called Mods that you can download from the Internet. And an E-bow. I really love that.

**Tell me a bit about early Vernon Reid...**

I started playing guitar when I was about 16. I grew up in Brooklyn, and was largely self-taught, with some lessons. I was raised with AM radio, and was quite influenced by the sound of Motown records such as Marvin Gaye and the Stax sound. I was also really into Led Zeppelin, the Beatles, and James Brown. All that music where the guitar is a big part of the rhythm. Parliament Funkadelic was the first concert I ever went to, when they were wearing diapers. It was like a giant voodoo ceremony at Madison Square Garden. That was wild. Carlos Santana left a lasting impression on me. I had heard him before Hendrix, and, of course, Hendrix blew my mind. I knew that's what I wanted to do.

**What was your first professional experience?**

After a short stint with R&B producer Kashif, I hooked up with Ronald Shannon Jackson, who was playing with both Cecil Taylor and Ornette Coleman. It was another kind of music — a har-

molodic free jazz/blues thing, which I had also been listening to even before I met him. It was the late '70s, early '80s period, during the New York loft jazz thing. That was a reaction to the whole conservative jazz club mentality, and people would take over these spaces in old factory buildings in Manhattan. Before the loft thing became a huge real estate business in the '80s, there were clubs in these lofts, and we were doing a new kind of jazz in these alternative spaces. That's when it really started for me. We recorded "Eye On You," the first of several records as Ronald Shannon Jackson and The Decoding Society, and I went to Europe for the first time. There I met Branford Marsalis. It was his first trip as well, and it was a really magical period. I really learned about being on the road, saw and heard some amazing things, and went through some intense experiences.

**Where did Living Colour cut their records, and with whom?**

We recorded the basics for *Vivid* at Skyline studios, the overdubs at Sound On Sound, and did the mixes at Right Track, all in New York. We were the first band to record at Sound On Sound at the time. We actually mixed all the Living Colour records at Right Track. I can't say enough about Ed Stasium and Paul Hamingson. Ed is a master engineer, and when I met him he was working with Mick Jagger, and Paul was assisting. When we did those first two songs, we did them with Ron St. Germaine, who's phenomenal — a sonic guru. He had recorded those Ronald Shannon Jackson records I played on, as well as the duet record I had done with Bill Frisell. He was the engineer for the songs Mick produced. Mick was a really good producer; he was really involved. Ed was mixing Mick Jagger's *Primitive Cool* album at the time, but finished the rest of *Vivid* with the band. Ed and Paul worked with us on *Time's Up*, which was recorded at A&M Studios in L.A. Ron St. Germaine produced and recorded *Stain*, which was the third Living Colour album that followed the departure of Muzz and the arrival of Doug Wimbish. Doug plays unbelievable stuff on *Stain*. We did that one at Longview farm in Massachusetts; they treated us the best. Really sweet, kind, attentive people. 

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# Hitting the Trail(side)

Capturing the Trailside Rangers' sound using unusual guitar techniques

*Trailside Rangers incorporate a paradox of musical styles more difficult to describe than Rocky Road ice cream. Their influences span the musical spectrum from Johnny Cash to Hüsker Dü to REM to Neil Young. It makes for a very interesting band with thoughtful lyrics and a lot of energy. After hearing their first two releases (The Great Divide and Peacemaker), I was delighted to field a call from Trailside guitarist Rowan Bishop to engineer and produce their newest release, Promise and Prayer, for Jericho Hill Records. Since Trailside Rangers are an atypical band, the recording process went down a slightly unusual road, especially when it came to the guitars.*

First and foremost to the Trailside Rangers sound is getting a good feel. Quite frankly, I wasn't going to be concerned with stuff like click tracks or spending five days getting a drum sound. It had to be done quickly (the project had a modest budget), it had to sound great, and it had to have the TR vibe. It didn't take much for us all to realize that the band would need to record as much as possible while playing live.

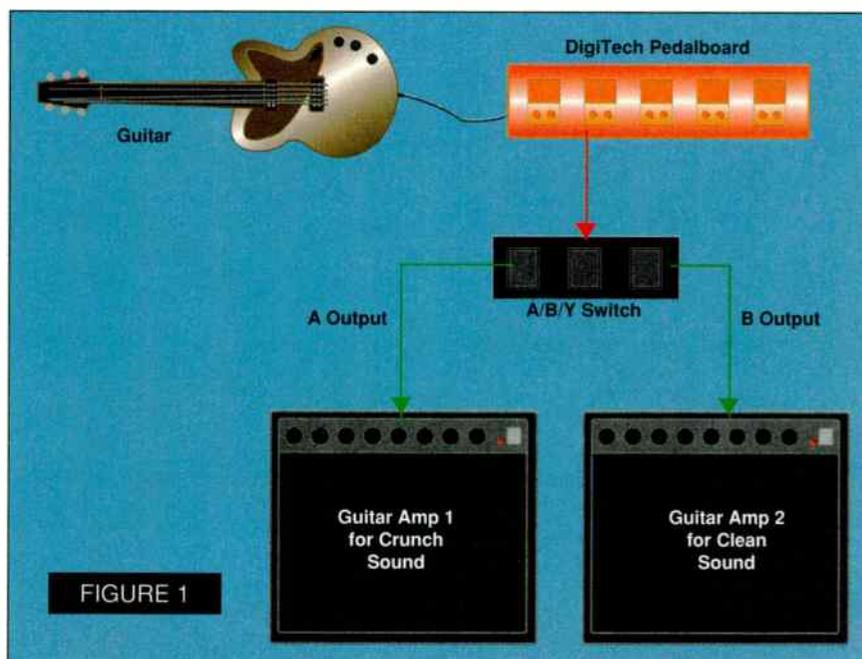
We planned to track at End Result Recording in Brooklyn, NY for two reasons: they had a D&R Orion console that sounded excellent, and they had the space to accommodate the band comfortably — without worry that we'd be stepping all over each other. Then we'd proceed to The Wood Shop for overdubs and mixing. Knowing that the band wanted to track live, I initially thought I could take advantage of the live room and iso booths at End Result. I intended to set up drummer Jason Byrne in the live room, use the iso booths for the guitar and bass amps, and maybe bassist Dale Nixon could play in the control room. I had it all figured out.

Yeah right! To preserve the live feel, the band wanted to all be in the same room with their instruments and amps, so my iso booth idea took a leap out of the 12th floor window. In fact, the band's initial idea was to record as if they were doing a rehearsal or a live show — no headphones, and stage wedges all around for monitoring. Now I had to start thinking about how to keep leakage to a minimum, and how to make sure that any unavoidable leakage wouldn't cause massive phase cancellation. One factor working in my favor was that Dale agreed to play bass in the control room — so the one instrument I expected would leak into every mic in the room (bass) could easily be isolated. Complicating technical matters slight-

ly was the fact that both Rowan and TR lead vocalist/guitarist Joe Wilford had two amps running simultaneously; each was set for a different tone, with A/B pedals for switching between crunch and clean sounds.

## RACKING UP THE TRACKS

We started by setting up Jason's drums in one corner of the live room. Ever the jazz hipster, Jason uses Remo Fibreskyn heads on his kit. These are a sort of imitation calfskin head that have a very dynamic response and are very live. Jason keeps both heads on the kick, as well as the other drums, and was adamant about *not* removing the front kick head, *not* putting a hole in it for a mic, and *not* using any stuff-



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ing inside the drum — so my options were limited in terms of the kick sound. I placed an Electro-Voice RE20 on the kick, Audio-Technica AT4031 on snare, Neumann KM 84 on hat, Sennheiser '421 for rack and floor toms, a beyerdynamic MCE 82 stereo mic overhead, and another AT4031 for a secondary snare drum. Baffles were placed around Jason to keep guitar amp leakage under control. I placed the mics as close to his drums as I possibly could, and tried to point them away from other sound sources. On the first few run-throughs, the beyer MCE 82 stereo mic was about 7 feet in the air, but the guitar amps leaked in way too loud.

As a result, I pulled the MCE 82 down to about 4 feet in height and pointed it slightly towards Jason's seat.

Processing on the drums tracks was very minimal: a bit of low-end rolloff on the kick channel and *very* light gating on the rack and floor toms. In an effort to keep the hihat out of the snare drum mic, I used a variation of a trick that I believe Bruce Swedien developed: I made a small square acoustic baffle from a piece of Sonex, put a 1-inch hole in the center, and placed it at the back end of the snare mic. Since the back of this mic pointed towards the hihat, the baffle reduced the amount of hihat leaking into the snare mic.

I've noticed in the past that some mic stands can pick up resonance from the hihat and transmit vibration to the mic via the stand, so I wrapped the snare stand boom arm in pipe insulation — the kind you can get at any hardware store. Call me a crackpot (I won't deny it), but I think this makes a difference.

#### AN AFFAIR TO REMEMBER

Handling the guitar setups was a relatively complicated affair because both gui-

tarists had arranged their parts with different guitar tones in mind. The whole idea was for Rowan and Joe to be able to play live with the band, yet still get "tweaked" sounds for both clean and crunch guitar parts. We decided that they'd have separate setups for each type of sound. Rowan's rig consisted of two Marshall 4x12 cabinets. One of these was powered by a Marshall JCM800, set up for a crunch guitar sound. On this particular cabinet I placed a Lawson L47MP (set for a narrow cardioid pattern) about 4 inches away from one of the speakers. I pointed it directly at the speaker, but

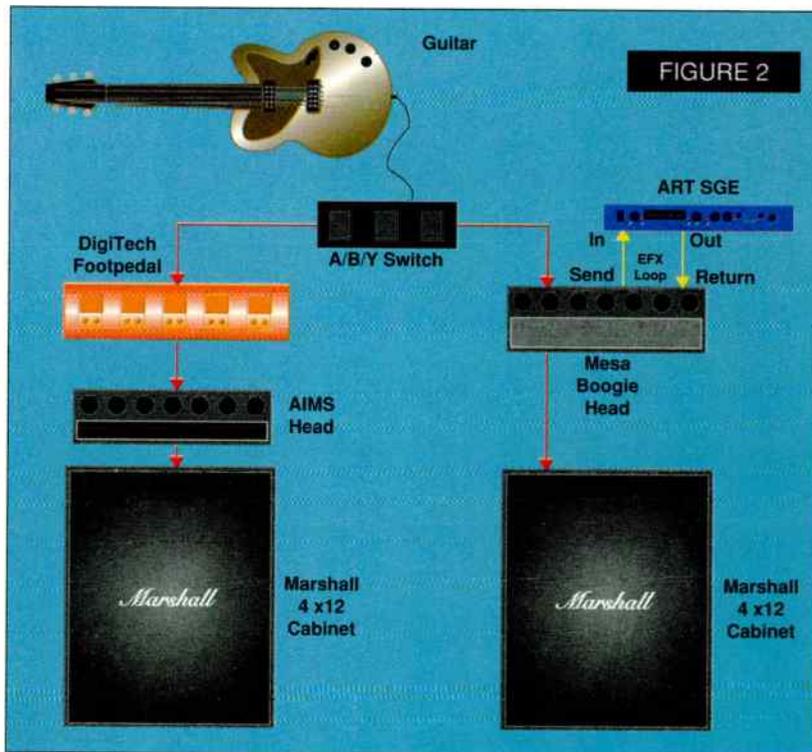
JCM900 with a Marshall 4 x 12 for a crunch sound. But we ran into a couple of snags. If you look at fig. 1, you can see that the output of Joe's guitar was plugged into a DigiTech pedal board for effects. From the output of the pedal board, the signal goes to an A/B/Y switch so Joe can select either or both of the amps. Since Joe needed effects regardless of which amp was being used, the DigiTech pedal had to be patched *before* the A/B/Y switch.

Unfortunately, every time he switched the effects in or out we'd get a pop from the amp. Plus, there's a slight processor lag in program changes that could be heard. After a bit of head scratching,

we revamped Joe's rig with a new signal flow and different amplifiers (see fig. 2). The guitar was now plugged directly into the A/B/Y switch. One output from the A/B/Y switch was plugged into the DigiTech pedal board, then to the AIMS head, which was driving a new Marshall 4 x 12 cabinet. This cabinet was miked with a Lawson L47 close-up and towards the center of the cone. On the way to tape, this signal went through a dbx 160X with a 2:1 compression ratio.

The other output of the A/B/Y went to the input of another Mesa Boogie head set

for a crunch sound, and driving a rather old Marshall 4 x 12. A Shure SM57 was placed on this cabinet and went to tape without any processing. The good news of this configuration was that we no longer had to worry about the pedal board popping; the bad news was that we now had no effects for the crunch sound — a problem for Joe since he plays off of his effect sounds in certain songs. Of course, this part has a happy ending: the Boogie head had an effects loop, so I pulled an ART SGE Mach II out of my "goodie" rack and wired



moved it off-center, about halfway between the dome and the surround. Rowan's second cabinet was powered with a Mesa Boogie DC-3 head to produce his clean guitar sound. An AKG C414 set to cardioid with a 10 dB pad was used to mic this cabinet. Neither of the mics received any kind of processing to tape.

Getting Joe's guitar sound proved to be quite the challenge. At first, we tried Joe's trusty AIMS head plugged into the speakers of a Fender Twin Reverb for a clean, open-backed sound, and a Marshall

it into the effects loop. I programmed a "reverb with digital delay" patch for Joe, popped a footswitch into the rear-panel bypass jack, and off he went.

#### GETTING A WEDGE IN IT

With the mics up and the sounds coming together, I turned my attention to getting monitor mixes happening. Jason wanted a headphone mix with bass, guitar, and vocal, but no drums. Monitoring for Joe proved to be another adventure because he wanted to monitor live-style. We dragged a JBL stage wedge (one 15 and a horn) from one of End Results' rehearsal rooms and set it on the floor in the studio. Interestingly, powering this wedge was easy because of the headphone wiring set-up at End Result (done a few years earlier by yours truly). Headphone cue outs from the D&R console are routed to the amp room where they go into QSC

MX1500 power amps. The QSC's provide plenty of clean power for multiple sets of 'phones on a big tracking session. Speaker outputs of the QSC amps terminate at XLR panels in the live room and the iso booths. From there, a standard mic cable is typically used to patch in a remote headphone box such as a Furman HR-2. I had already prepared a cable with an XLR on one end and a 1/4-inch plug on the other to connect the wedge. Pins 1 and 2 of the XLR connector were wired to the sleeve and tip (respectively) of the 1/4-inch connector. All we had to do was run the cable between the XLR panel and the wedge.

With the wedge placed in a comfortable spot for Joe, I hung an Audio-Technica AT4033 from a heavy-duty boom stand above the monitor, perpendicular to the floor. The mic went to a channel of the D&R Orion with one side of an ART Pro VLA compressor inserted in the channel's loop. Of

course, once we fired the whole thing up, there was feedback between the wedge and the 4033. Backing down the amount of compression helped reduce the feedback, but there was still a lot of leakage from the wedge into the mic. Moving the monitor about three feet away from Joe helped, as did placing a moving blanket on the floor below the wedge. To further reduce problems, I changed the angle of the 4033, moving it to about 60 degrees from the floor. Now the null point of the 4033's cardioid pattern was facing the horn of the monitor, which tightened up both the feedback and leakage problems.

Finally, we were ready to cut tracks! Since we were going to eventually overdub and mix at the Wood Shop, we needed to keep everything within 16 tracks, which really wasn't a problem due to the nature of the band. Tracks were allocated for kick, snare 1 and snare 2, rack 1, rack 2, floor tom,

*continued on page 139*

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# Guitar & the Beat Generation

Some guitar-handling techniques for the performing engineer

That's "beat" as in drum machine, Hip-Hop, Techno, etc., not "beat" as in people from the '50s who wore berets, played bongos, and recited poetry. For years, dance music seemed ambivalent at best about guitars, but now guitar is creeping into the mix as well, and not just via samples.

Of course, there's no one way to play guitar in an electronic context. This article is about my particular approach, which is not necessarily intended to serve as a model, but which will hopefully inspire you to come up with your own style.

## A QUESTION OF PHILOSOPHY

From the dawn of Rock 'n' Roll to the death of Grunge, the guitar has often been the focus of popular music. With dance-oriented music, guitar is just one more element of the mix: being into rhythm guitar will probably serve you better than being a hot-shot, zillion-notes-per-millisecond kinda lead player. You also need a really precise sense of time (it's never too late to start practicing with a drum machine).

While jamming recently, I considered it a good sign when someone from the audience mentioned that the guitar didn't seem loud enough. I knew the guitar was actually plenty loud; but what I played was intended to layer with and reinforce the mix rather than stand out as a traditional "lead" instrument. Because of this, it blended in so completely that it was just part of the overall sound. However, had it not

been there, the difference would have been obvious.

## GEAR CONSTRAINTS

My priorities for processing guitar in this context include a tap tempo option for effects, a post-effect volume pedal for muting, a headphone jack, and long maximum delay times (2 seconds or more). Optional goodies are the ability to sample the processed signal, thereby letting you trigger recordings of your own playing, and some kind of gate input so other signals (drum, bass, etc.) can control the guitar's amplitude.

Tap tempo is essential, because Electronica is so rhythm-oriented. Effect changes have to fit in seamlessly with the

song. At the very least, you want tap tempo to affect delay; but it's even better if it can also specify a rate for LFOs (flanging, tremolo, etc.), *à la* Line 6 POD [see review on page 82].

A compressor is also important for two reasons: it can extend sustain when playing leads and it can bring up more subtle sounds, such as picking above the nut as an effect or rapping the guitar with your knuckle (it's a cool percussive sound). Compression also facilitates creating controlled feedback, even at relatively low levels.

The volume pedal allows you to mute the guitar while tuning, checking the key, changing patches, or anything else you don't want the audience to hear. Howev-



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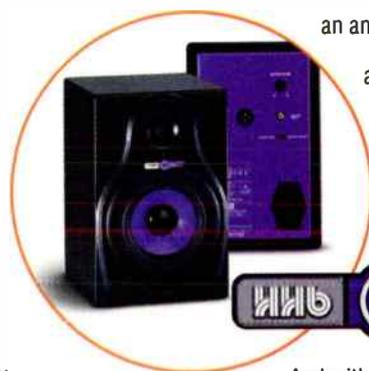
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er, you want to hear it, which is why the headphones are important for monitoring what's going on inside the box. Get ear-phones with cups that enclose your ear (not "open air" types that sit on your ears), as this cuts out some of the other sound and allows you to use lower headphone levels — you don't want to blast your ears.

### THE THREE BASIC FOOD GROUPS

For what I do, three styles seem to work best: extremely percussive effects, languid "leads," and sounds for sounds' sake (think "Third Stone from the Sun," from the first Jimi Hendrix Experience album). The model for the first two approaches are vocals: the percussive effects mirror the rap model, where words are used rhythmically; the leads are more like the divas who sing sustained phrases, often repeatedly. The sounds are there for texture.

Percussive effects come naturally to guitar (after all, it's a percussive instrument); these effects generally fall under one of several categories:

**Muted strings.** This is simply a "hands" technique — mute the strings while you strum. This is good for creating staccato, 1/8th-note parts.

**Noise gate with high threshold.** Setting a high threshold leaves only the guitar signal's peaks, thus making strummed guitar more percussive and clipped.

**"Drumcoding" guitar.** I've discussed this previously, but the basic idea is to use a vocoder to modulate guitar, with drums serving as the "mic" input. This superimposes the drum's rhythmic qualities on the guitar. I never mix in any dry guitar in this application.

**Working the volume pedal.** This is great for adding rhythmic "washes" to the sound. For example, with a power chord, slam the pedal down on the beat, then pull back slowly over the course of one or two measures. I also use it for tremolo-type effects — push down on the beat and back on the "and" (as in "one-and-two-and-three-and...").

**Slides.** Guitar slides fit in well with dance music, especially because very few players seem to use this technique with synths. I usually work with tonic-fifth (or fourth)-octave combinations. For example, a figure that might "loop" every measure is to slide down an octave over two beats start-

ing with "one," hit the octave-lower note briefly on "three," then rest on "four." To add variety, from time to time, on some measures, I might slide down from the fifth instead of the octave on "one," or slide up instead of down. The basic idea is to use the slide as an element that is both percussive (like a tom with a real long ring) and melodic, because you're fitting in with the key.

Leads are another story. I play very few leads in the traditional sense, but rather, long, atmospheric types of effects that are more pad-like — there are very few notes, lots of echo, and plenty of sustain (again, the volume pedal is great, as you can fade these long notes in and out). The basic lead styles I use are:

**Bent sustained notes with lots of whammy bar action.** In this case, I basically take a single note and work with it in as many ways possible — bend, vibrato, whammy bar dives, etc. In other words, the articulations of that note become the lead, rather than playing lots of notes.

**Echoed notes with E-bow.** The E-bow, a small, handheld device that drives a string into continuous sustain, is my "secret weapon." I usually throw on a ton of echo, so holding the string creates a sort of pad against which I can then layer more sounds. The latest E-bow includes a three-position switch — off, standard sustain, and octave-higher sustain. It's really cool, and people always remark on it.

**Feedback.** If there's a monitor speaker nearby, touching the end of the guitar neck to the cabinet can often produce extremely smooth controllable feedback effects. This is sort of like a polyphonic E-bow, although sometimes it can be awkward touching the guitar to the speaker. To prevent uncontrolled oscillation, it's usually a good idea to roll off the highs on the guitar's tone control.

As to pure sound, that's an "anything goes" situation. There are often times that the overall mix transforms into something more ambient before returning to a strong beat. Scraping strings with the edge of a pick, tapping the body and letting the strings resonate, using massive amounts of distortion and just hitting open strings to create an al-

most white-noise effect, sliding something smooth and hard down the strings (if you don't have a slide handy — and you should — you can probably find an empty beer bottle somewhere that will do the job), and so on. In other words, let your creativity be your guide; remember that a guitar can generate sounds as well as notes.

### STRINGING ALONG

This type of playing can be pretty hard on strings. I use sets with a 0.010-inch for the high E, and unwound G. Extra-light gauges have a harder time putting up with whammy bar abuse, and don't sustain as long. Also, graphite saddles and nuts (or other "slippery" materials) really help promote longer string life.

### BYE FOR NOW

If you're really adventurous, in the studio you can use a hard-disk recorder to slice, dice, fold, bend, staple, and mutilate your part into something even more bizarre and/or interesting. It can also be fun to take the best guitar "bits," blast them into a sampler, and play your guitar from a keyboard. Set the pitch bend wheel for a wide range, and go to town!

Before signing off, I'd again like to emphasize that this is my own personal approach, which may or may not have anything to do with what other guitarists in Techno/Hip-Hop/Dance bands do. But I do know two things: I have lots of fun playing in this style, and, fortunately, many people like listening to it. Give "Techno guitar" a shot, and see what variations you can add to this particular theme. **EQ**

A compressor is also important for two reasons: it can extend sustain when playing leads and it can bring up more subtle sounds.

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FOUNDRY

# Line 6 POD Is this really the "ultimate direct recording device for guitar"?

## Guitar Effects Unit

The POD draws on Line 6's expertise in guitar amp modeling to create a small, relatively inexpensive box that's billed as the ultimate direct recording device for guitar. That's quite a claim, so let's investigate.

POD's appearance is striking: a U-shaped, rounded, candy-apple red box, made from aluminum. The center contains readouts and buttons, while controls ring the outer perimeter. However, what you see is definitely not all you get — this is a deep and clever box, with many hidden functions.

### CONTROLS

The POD stores 36 user programs (called "channels," as in "36-channel amp") in RAM. They're accessible with program changes, and can reset to the factory defaults. You program sounds with the various knobs, but many programming options, and even entire effects, are hidden within POD and are accessible only via MIDI (more on this later).

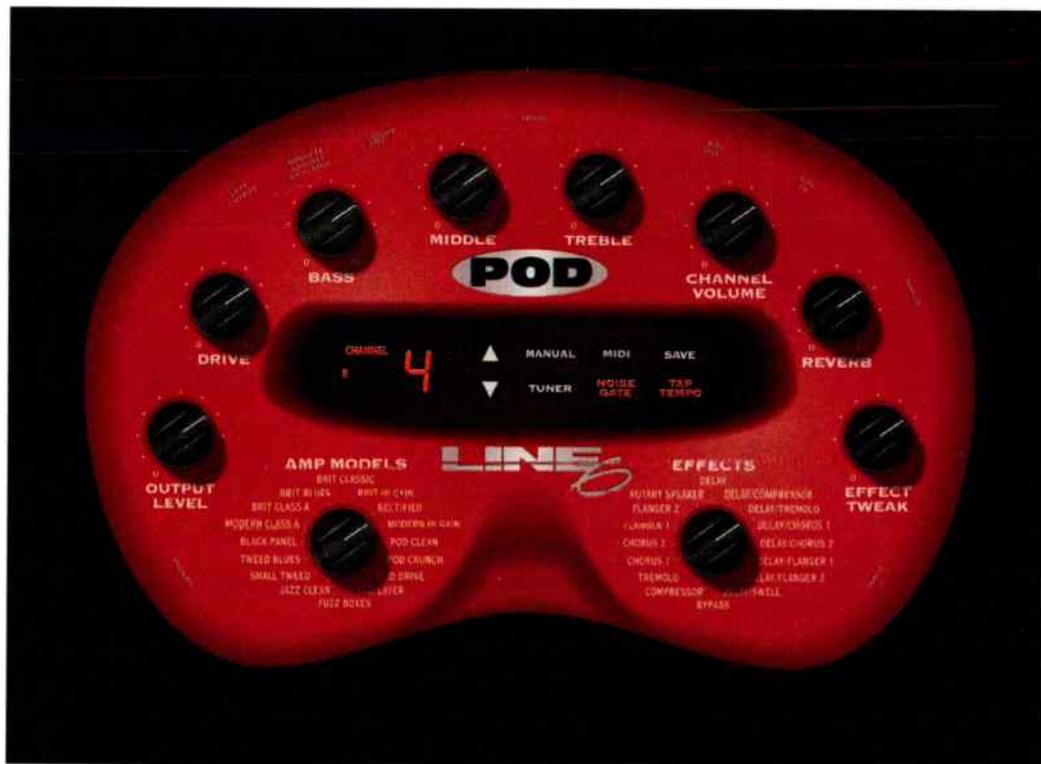
Jacks include input, right and left outs, headphones, and AC adapter jack (the wall wart has a separate AC cord so it doesn't hog barrier strip space). An "Air" switch simulates the effect of an amp being miked, and is recommended for going direct.

The heart of the unit, a 16-position rotary switch, selects various amp models from clean to

"stack o' Marshalls" sounds. They're all usable; although I suspect most guitarists will gravitate to a half dozen or so favorites, each musician will probably choose a different half dozen. I won't attempt to describe the sounds, as that gets into wine-tasting land ("a pert, yet unassuming distortion, with a hint of tartness and slight sheen"). Nor will I split hairs over whether some things sound *just like* an AC-30 or whatever, because the bottom line is there are some great sounds that feel extremely tube-like.

Other controls include Output Level (not saved as part of a patch; use this to set levels to whatever the POD is feeding),

Drive (distortion amount), Bass, Middle, and Treble tone controls, Channel Volume (basically for matching levels among presets), Reverb Amount, Effects Tweak, and Effects Selector. The 16 effects include compressor, tremolo, two choruses, and two flangers; six multieffects that combine one of the previous effects with delay; delay only; delay+swell (an attack fade-in effect); and bypass. An Effect Tweak knob changes one selected parameter for each effect, such as delay mix, compression ratio, etc. "Tap tempo" editing works for delay time (up to 3 seconds), as well as flanger, chorus, and tremolo rate. With the



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CIRCLE 53 ON FREE INFO CARD World Radio History

delay + other effect options, tap tempo always controls delay.

There are some cool subtleties. For example, if the amp being modeled uses spring reverb, then the reverb does a spring algorithm. If the amp didn't include a reverb, you get a room algorithm. Also, the tone controls mimic those of the amp being modeled. In situations where there's not an exact correlation (e.g., the amp had no midrange control), POD assigns any unused controls to additional tone shaping.

Also, there are "hidden" tweaks: hold down the Tap Tempo button, and by twisting the appropriate knobs, you can add a volume boost, distortion boost, or extra presence.

## MIDI-LAND

Okay, now forget everything I said about programming, because with MIDI, you can go *way* beyond the front panel. For example, you can change the spring reverb to room and program its tone, density, diffusion, and decay. You can also access an additional 12 amp models (!), alter delay regeneration, flip the flanging phase...you get the idea. There's even a predistortion wah-wah pedal that you can access only through MIDI or the Line 6 Floorboard, and as the owner of an original Vox wah-wah, I can attest that the effect is uncannily accurate. Best of all, saving a patch retains any changes made with MIDI, even if the parameters can't be accessed via front-panel controls. Not all multieffects do this; many use MIDI to offset an existing value, and saving ignores the offset.

So how do you access this power? There are four options: Emagic's Mac/Windows-compatible SoundDiver POD editor

(included on CD-ROM), a fader box (e.g., Peavey PC1600), a computer sequencer adjunct (such as a Cubase Mixermap or Cakewalk StudioWare panel), or the Line 6 Floorboard. The Floorboard provides limited MIDI control, but makes it really easy (and fast) to work the POD live. Although the custom version of SoundDiver is a little squirrely, an update will supposedly be available on the Line 6 Web site.

## SO WHAT'S THE CATCH?

There are really only two significant POD limitations: changing programs or effects produces pops, and, with lots of delay feedback, the pops keep echoing away. However, Line 6 is aware of this problem and is about to release a new EPROM that crossfades smoothly between patches. Mitigating factor: separate delay sections mean that echo tails from one program continue when you select another program, which is very considerate. Also, as you'd expect, some parameters glitch big-time under MIDI control. Delay changes, or changing amp models with very different effects, cause the most artifacts; changing level-related parameters is less problematic (in fact, the volume control sounds downright smooth). Even then, fast parameter changes can cause zippering.

Also, with lengthy delay times and lots of regeneration, some amp models seem to add a subtle crackling that occurs after about the first 6-8 repeats. This occurs because building up enough echoes can increase the amplitude to the point of distortion. However, any distortion is avoidable by lowering the Channel Volume setting.

On a basic level, POD is easy to understand — even the most technophobic guitarist should be able to get going with a minimum of head scratching. On a deeper level, you definitely need to understand MIDI. While the manual describes POD's MIDI operation quite well, it doesn't explain MIDI basics, which may be a drawback for guitarists who aren't up on the subject.

## WHAT ABOUT LIVE?

Although promoted as more of a studio device, I played through POD live with the group Reissdorf Force in Cologne, Germany. POD was perfect for traveling techno guitar: it's small, using a 220V wall wart obviates the need for a power converter, and Tap

Tempo makes it easy to create synchronized effects. Placing a post-POD volume pedal allowed pulling back the volume to "key-match" and check tuning while listening on headphones. (The onboard tuner is extremely handy, but might be even cooler if it muted the output while tuning — perhaps by holding the button for more than two seconds.)

## THE VERDICT

Especially for the bucks, POD delivers a lot in a small package. It lacks some of the flexibility found in processors that cost considerably more, but what's amazing is the degree of flexibility it *does* incorporate. As always, though, the bottom line is sound — and, quite simply, POD has got it right. For my live setup, there's no turning back: POD has taken over the guitar processor slot and shows no signs of giving it up.

POD is easy to understand — even the most technophobic guitarist should be able to get going with a minimum of head scratching.

**MANUFACTURER:** Line 6, 555 St. Charles Drive, Suite 100, Thousand Oaks, CA 91360. Tel: 805-379-8900. Web: [www.line6.com](http://www.line6.com)

**APPLICATION:** Provide vintage guitar amp sounds, plus effects, when recording direct or playing live.

**SUMMARY:** The reasonable price and cool packaging are the first things you notice, but the depth of programming and versatility also make this package special.

**STRENGTHS:** Sound modeling provides a broad, accurate tonal palette; very deep device when edited with MIDI; several real-time controls; compact and looks cool; floorboard compatibility for real-time foot control; decent selection of effects; on-board tuner.

**WEAKNESSES:** Switching programs/effects or changing parameters often creates clicks (*note:* crossfading between programs is scheduled for an upcoming ROM upgrade); accessing many functions requires MIDI savvy, or a computer to run an editing program.

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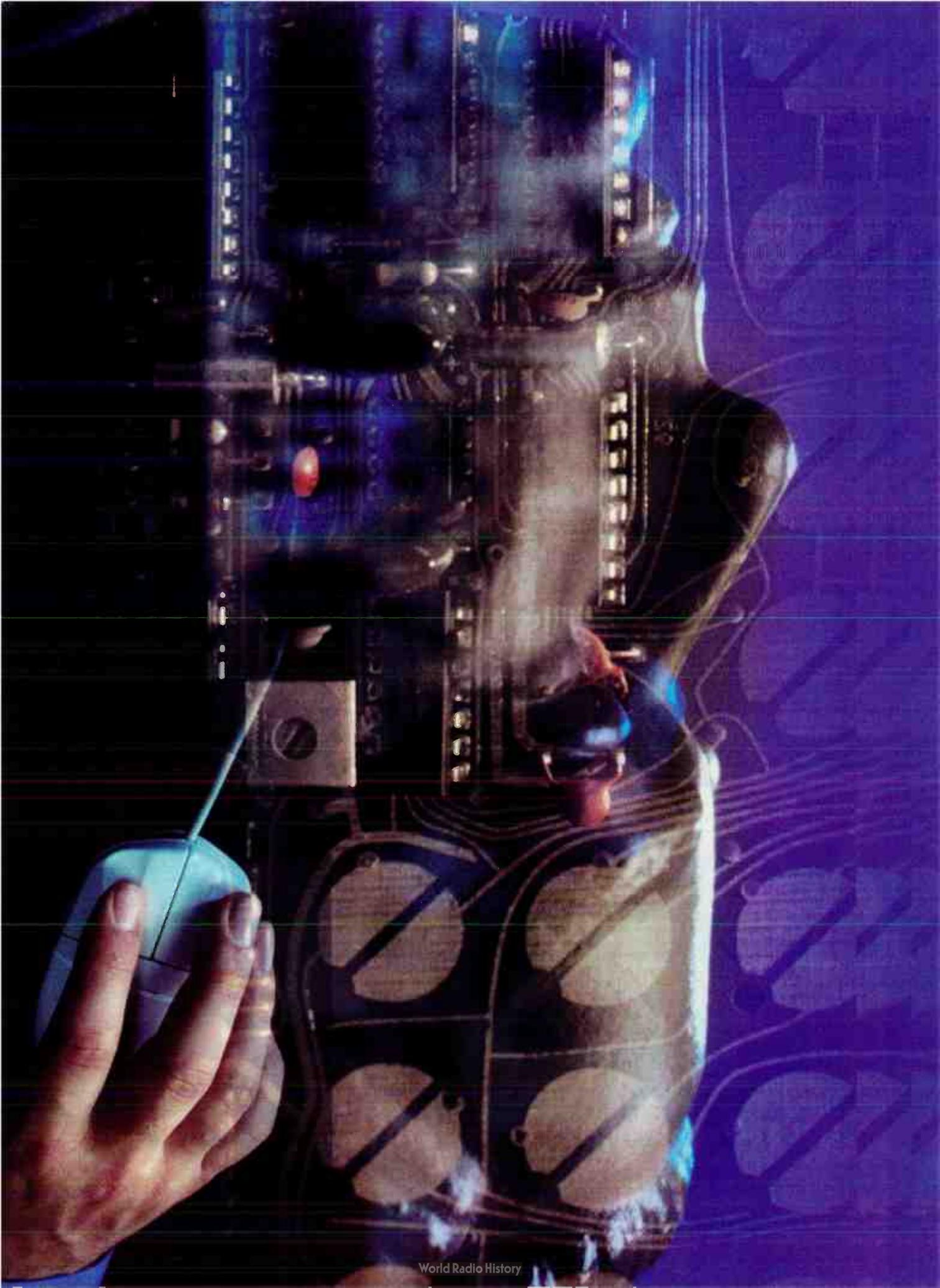
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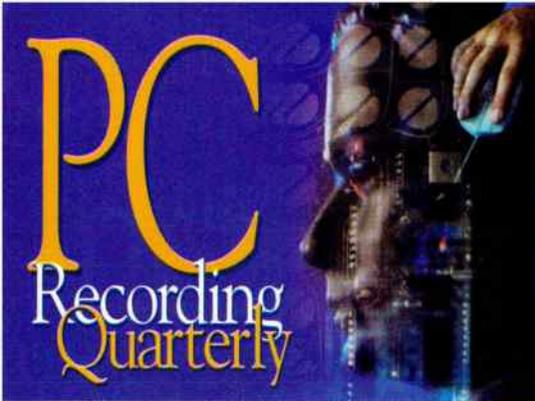
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# Recording Quarterly





Gain the competitive edge  
by offering your clients  
Internet-ready MP3 files  
of their songs

By Jon Luini and  
Allen Whitman

# Evolve or Die: Become a Web-Ready Studio!

Psst! Want to make your studio more attractive than the one across the street? Consider offering your client a CD-R or Zip disk of their audio — encoded! Suddenly their music is Web-ready and can be uploaded onto the server of their choice. After all, it's 1999, and chances are very good that you already have a computer with a Zip drive and/or a CD burner. When your client walks out of your studio with their finished standard Red Book CD master, they can also be carrying Web-ready audio in two formats: downloadable (near-CD quality) and streaming. Here's the scoop that puts you ahead of the curve in the next wave of digital distribution.

## HARDWARE REQUIREMENTS:

For PC users, a reasonably fast CPU (233 MHz or faster preferable, 100 MHz absolute minimum) is advised. For Mac users, a PowerPC is recommended. Regardless of the OS, 128 MB of RAM is preferred, though you can get by with a minimum of 64 MB. Lots of disk space is mandatory. You don't want to run out of steam in mid-stream. The FezGuys suggest trying to keep at least 1 GB of disk space free at all times. This may require a minimum of 2 GB of disk space on your computer (measured *after* all of the applications and OS are loaded). Also necessary are the above-mentioned CD burner and/or Zip drive.

## SOFTWARE REQUIREMENTS

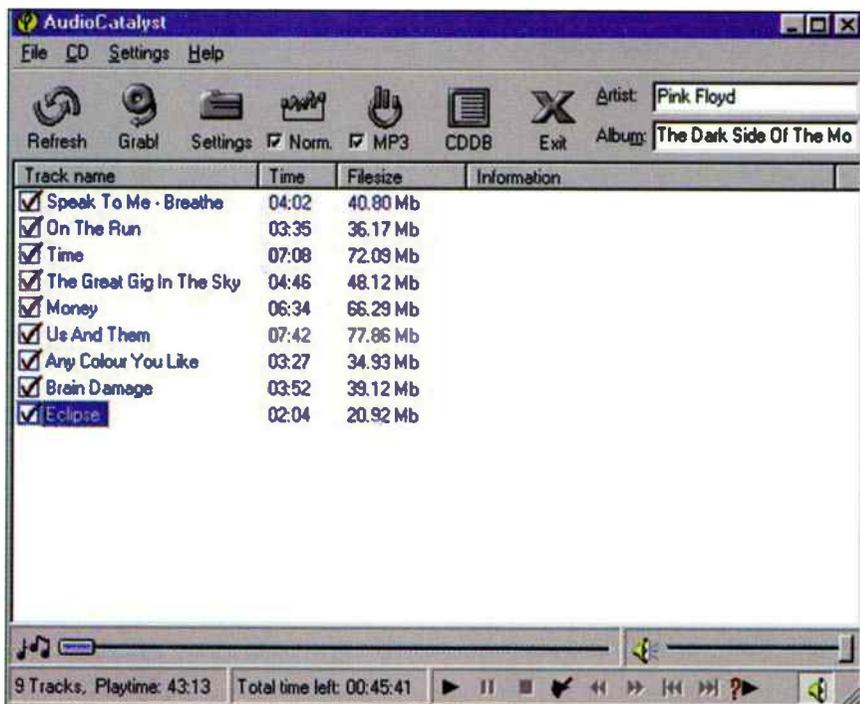
You need a fast, stable MP3 encoder and the RealProducer from RealNetworks. For the MP3 encoder, we recommend Xing's \$35 AudioCatalyst MP3 encoder (go to: [www.xingtech.com/mp3/audiocatalyst/](http://www.xingtech.com/mp3/audiocatalyst/))

(Mac/PC). The basic RealProducer can be downloaded for free from RealNetworks' Web site (go to: [www.real.com/products/tools/producer/](http://www.real.com/products/tools/producer/)). The FezGuys currently use the older RealEncoder 5, which is nice and stable. It's also free from RealNetworks' Web site, though you have to dig around for it. For some reason known only to them, RealNetworks made it hard to list a simple URL to download it. The RealProducer supports batch encoding, but the process can be simplified considerably by acquiring any of the third-party tools listed on their Web site (prices vary).

## THE PROCESS

After the final mix and mastering, burn a regular Red Book audio CD for your customer, as usual. Now leave that newly burned CD in your computer and, with AudioCatalyst open, rip all of the tracks to 128 kbps MP3 files. The FezGuys recommend spending a few minutes entering the ID4 data (artist, album title, and individual song names) prior to encoding to MP3 files.

Since you're also going to make RealAudio streaming files of the music, now is the time to create the WAV files (if you are using Windows) or AIF files (for Mac users)



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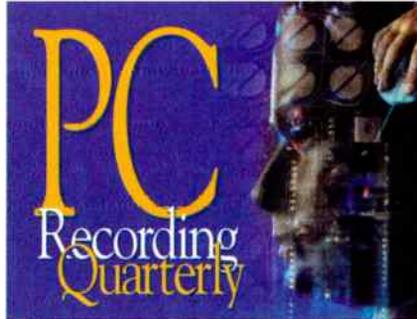
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from the master CD-R. Windows AudioCatalyst users can easily retain the uncompressed WAV audio files that will be used for encoding RealAudio. Macintosh AudioCatalyst 1.0 users will need to rip from the CD master to AIF files first, and then create their MP3 files from the AIF files. These uncompressed AIF audio files are what you will use to build RealAudio files. Performing this task now will take a little longer, but saves time by having the files ready to input into the RealProducer (or RealEncoder) later. It also makes more sense in our logical brains to grab the raw audio first and then encode to each format. It scales better because you can add other formats, or create 30-second samples from AIF/WAV files on your desktop without reading the data from CD again each time — your computer's hard disk is faster than your CD-ROM.

Back to MP3 creation: After filling in the ID4 data, from within AudioCatalyst (or whichever MP3 encoder you choose), select all of the tracks and click: "Go!" Or: "Start." Or: "Get On With it, Already!" AudioCatalyst users can expect each MP3 track to take approximately one minute of encoding time per minute of audio (other MP3 encoders may vary considerably). Each MP3 file will take approximately 1 MB of disk space for each minute of audio. A cup of coffee, a load of laundry (what self-respecting project recording studio can possibly get by without an industrial grade, front-loading washer and gas dryer?) and some amusing conversation, and *voila*, the MP3-encoded files are now ready to copy onto another CD-R or Zip disk.

Tips and techniques about the use and usefulness of the XingAudioCatalyst encoder are covered in great detail in the FezGuys columns #29 (Mar. '99) and #30 (Apr. '99), available anytime on the Web at [www.fezguys.com](http://www.fezguys.com) and [www.eqmag.com](http://www.eqmag.com).

Now it's time to create streaming RealAudio versions of the songs. Use your RealProducer (or RealEncoder) with the WAV (or AIF for Macintosh users) files as source material. The FezGuys recommend that streaming files be provided in three handy bit rates: 28k (mono), 56k (also mono), and 128k or ISDN (stereo). This gives a listener the opportunity to experience sound quality in proportion to the speed they're connected to the Internet. The use and abuse of RealAudio encoding products is covered in loving detail in FezGuys columns #4 (Feb. '97) and #25 (Nov.

'98), also available anytime at [www.fezguys.com](http://www.fezguys.com).

Your customer may also want 30-second song previews. Allow her to choose the segment she feels best represents what the song is about. Make a separate file of that segment, pulled from the previously saved WAV (or AIF) files, using your sound editor application (CoolEdit for Windows, SoundEdit16 for Macintosh, etc.). Don't forget to include fade-ins and fade-outs! It's the gloss that makes a Web page shine. Then, from within your RealAudio encoder, open the file of that segment and encode. Use the same three bit-rate settings you created for the complete songs earlier. Remember the 11th commandment: "Be Consistent."

When encoding for low-streaming bit rates (28k and 56k), it's possible to get passable audio quality using your mastered CD as the source material. But if you're the type who likes to go the extra mile (and create listenable RealAudio files), then some kind of sonic optimization is called for. There are several choices. Waves ([www.waves.com](http://www.waves.com)) is one of a variety of high-quality software plug-ins. A basic compressor, equalizer, and reverb plug-in pack runs about \$100. The Cutting Edge Omnia.net ([www.nogrunge.com](http://www.nogrunge.com)), reviewed in the March issue, is the Maserati of streaming audio optimization hardware. But at \$3800, it may be just a bit over the top for the project studio. A quick fix for improving sonic legibility is the built-in "normalize" feature in AudioCatalyst. (Note: The Macintosh version does not support this yet.) When using software plug-ins, open your WAV/AIF files and optimize them before creating RealAudio files. If you use outboard processing hardware such as the Omnia or even a basic compressor, you will need to digitize *all* of your audio as the first step, running it through the device before building your WAV/AIF files. For example, play the CD from a stock CD player, route it through your mixing consoles through your hardware processor, and then send an input into your computer (and sound editor of choice).

By this point, you've got a hard drive full of MP3 and RealAudio files. Make sure to organize them in hierarchical folders in a sensible way. Now double-check their playability — there are few things worse than a CD-R full of corrupted sound files! Once you're satisfied, burn to CD-R or Zip disks. Your client

*continued on page 138*

CIRCLE 59 ON FREE INFO CARD

# More Secrets of the DAW Masters

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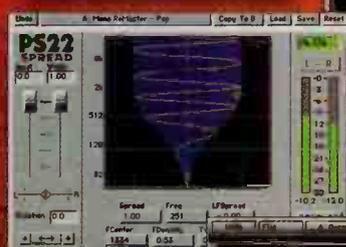
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CIRCLE 52 ON FREE INFO CARD



Two monitors are better than one when working with complicated DAW projects

By Eddie Ciletti

# Computer Desktop Clutter Solutions

Digital audio and sequencing programs not only like RAM and fast processors — they also need lots of desktop space to display all the open windows typical of these programs. For example, with a MIDI + digital audio sequencer, you'll typically have a track view, a window with some digital audio, master tempo window, level meters, and maybe even some notation. It's enough to make you wish for a 35-inch monitor.

A really large monitor might be beyond your budget, but you still have two options for a bigger desktop: increase the screen resolution or run dual monitors.

The typical desktop is 640 pixels wide by 480 pixels high; fig. 1a shows how 640 x 480 pixels fills a standard 15-inch (14-inch viewable) monitor. Increasing the monitor's resolution will make everything smaller, thus clearing more desktop space. To tweak resolution in Windows machines, click the Display icon in the Windows Control Panel. For the Mac, go to the Monitors control panel.

Fig. 1b shows the results of selecting 1152 x 864 resolution (for a 21-inch monitor). Note, however, that increased resolution may not be possible with smaller monitors (less than 17 inches), or if your video card doesn't have enough memory.

Running dual monitors is fairly new to Windows, but has been a mainstay on the MacOS for years. Typically, you use the Mac's standard video out for one monitor and a graphics card for the other monitor. Call up the "Monitors" control panel, choose which monitor is #1 and which is #2, and you're set.

Windows 98 makes installing a second monitor relatively easy. As with any computer tweak, your configuration, as well as the results after any change, will vary. I "modified" a computer with a Pentium II processor and

STB monitor card (in the AGP slot). Loaded with 16 MB of video RAM (V-RAM), this card can deliver a resolution of 1600 x 1200 pixels and should connect to the better of the two displays.

After shutting down the system, I installed a no-frills 1 MB Trident card. The operating system re-directed the desktop to this display, now designated Monitor-1; the STB-driven monitor was Monitor-2. The designations can't be swapped, and they may not seem like the optimum choice at first, but be patient. Remember that the good monitor and AGP card should stick together.

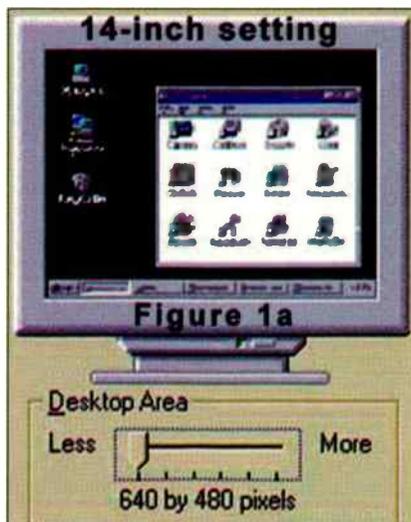
Be sure to check out the System folder in the Control Panel. Win98 will see the PCI card first, but may have difficulty correctly re-identifying the AGP card. You may even have to virtually "remove" the card from the system folder, and let Windows try to find it again. (Fig. 2 shows both cards being prop-

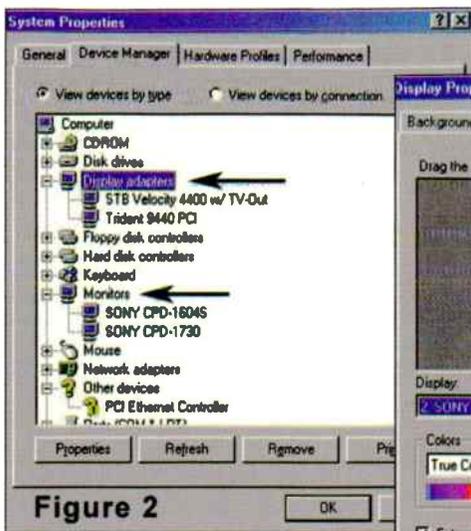
erly identified. Note the option to "Remove" any of the items on the list.)

Whenever reconfiguring, always reboot to make sure things stick, even if you aren't prompted to do so. I am always surprised when things work; you can only laugh when they don't.

If Windows does correctly identify the AGP card during the next reboot, you should see basic DOS-style text on the #2 display. Once the Win98 desktop is through with its gyrations and advertisements (you can remove offenders from the Start menu), open the Control Panel, click Display, then Settings. You should now see two monitor icons, labeled #1 and #2, indicating that each monitor can be optimized for resolution and bit depth (fig. 3).

While the hardware settings for each video card are transparent to the user, the operating system may choose a configuration that creates wild psychedelic effects.

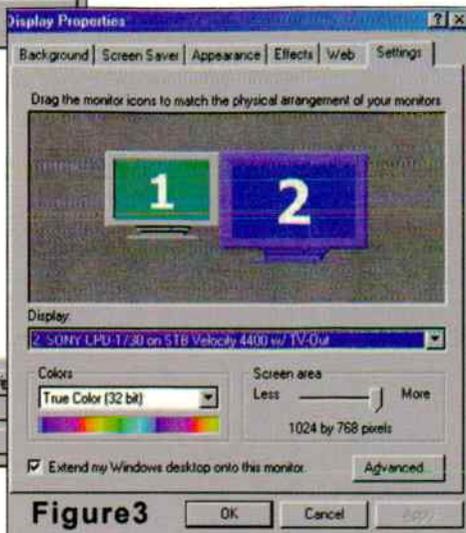




This can be due to an address or memory allocation conflict. Here's what happened to me.

Settings that worked for Monitor-1 after the computer first identified the PCI card may (need to) be altered when the Monitor-2 comes online. For example, I set #1 for 800 x 600 with 256 colors. Enabling #2 (in the Settings window) sent #1 into a no-color, high-contrast, B&W mode! (At least I could drag windows over to #2 to make changes.) Tweaking monitor #1 from 8-bit to 16-bit color mode resolved the conflict, and *voila* — two screens!

I assigned the lo-res card (and older monitor) to desktop duty as Monitor-1. Icons require no graphic wizardry. All the programs that require resolution can be dragged onto the hi-res desktop, Monitor-2. Adobe Premiere, for example, would not let me drag a "maximized" window onto #2 without first de-maximizing. (The Windows option between "maximize" and "minimize" is called "size.") Keep this idiosyncrasy in mind, because each program may require a slightly different approach.



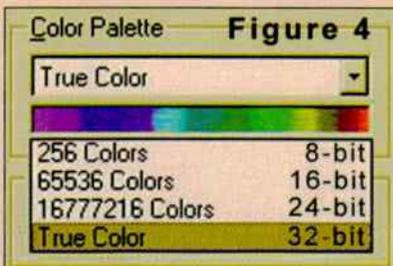
*Note:* Keep all your icons on Monitor-1. If Monitor-2 fails to boot, the icons will automatically migrate to #1 and stay there (even if the next reboot is glitch-free).

Unless the two monitors are identical (including age), it will be difficult to match the "color temperature." Some monitors allow global Color Temperature settings. The "computer default standard" is 9300 Kelvin (a cold blue-white), while the 6500 Kelvin "video" standard achieves its warmth by using less blue.

I did end up with an error message while booting: "either system.ini or registry can't find pcilink.vxd." I searched for this file, as well as the file seeking it, without success. I don't understand registry-speak, so rather than live with an error message, I reinstalled the operating system by booting from my Win98 startup floppy (you have made one, haven't you?) and installing a new, clean operating system from the Win98 CD-ROM. This is the easiest way to clean up boot-error messages. **EQ**

## PIXELS AND RESOLUTION

Squeezing more on the desktop forces the monitor to work harder to produce detail. "Dot pitch" is the spacing between the colored-phosphor deposits on the screen, typically specified from 0.22 mm to 0.30 mm, smaller being better. But resolution goes beyond that. The monitor circuitry must also run at higher frequencies and scan rates. Look for a monitor that can do at least one level beyond your target. Most can do 1280 x 1024. A typical setting is 1024 x 768.



A card's bit depth determines the color's dynamic range, from the brightest to the darkest. The basic minimum is 8 to 10 bits per primary color: red, green, and blue. "Photographic" accuracy is stated as either 24 bits, or millions of colors, or as "True Color." With Windows, click on the Display icon to set bit resolution. The number of options depends on the amount of V-RAM, or the memory located on the video card (fig. 4). At least 8 MB is recommended; a couple of MB will work for the basic desktop.

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How to keep  
the PC's noise  
out of your  
recordings

By David Miles Huber

## Ways to Reduce Hard Drive Noise

A few issues back, a reader wrote in asking that we address the issue of excessive hard drive and multi-spin CD-ROM noise. It's definitely a subject that's been on my mind as of late, and I couldn't agree more that it's a really big problem for music production facilities of all types and sizes.

It always seemed ironic that we have been forced to place our computers smack-dab in the middle of the soundfield. This problem has eased some with the onslaught of tower cases, because we've finally been able to get our workhorses off the desk and onto the floor. This has helped keep disk and fan noise pollution to a minimum. (I always recommend that folks get a really big tower with lots-o-bays, so that they won't run out of slots and will have room to maneuver when doing upgrades or repairs.) Even still, the problem of noise continues to make its presence heard. That said, the following are a few solutions that can help reduce or eliminate "PC pollution."

### SILENT SYSTEMS

One of the most effective ways that I've found to greatly reduce noise for the IBM-compatible PC is the Hushkit (\$114-149.90, depending upon your PC type) from the folks at Silent Systems ([www.silent-systems.com](http://www.silent-systems.com); 1-888-HUSHKIT). Hushkit is a noise-dampening hardware kit comprised of a special case that mounts into an available 5-1/4-inch drive bay to completely enclose a 3-1/2-inch drive in a foamed, plastic case. Also included is

a specially designed CPU fan and AT or ATX-style power supply that directly replaces your PC's current parts. By using a special fan and airflow design, this 230-watt, line-conditioned supply can greatly reduce component and hard drive noise.

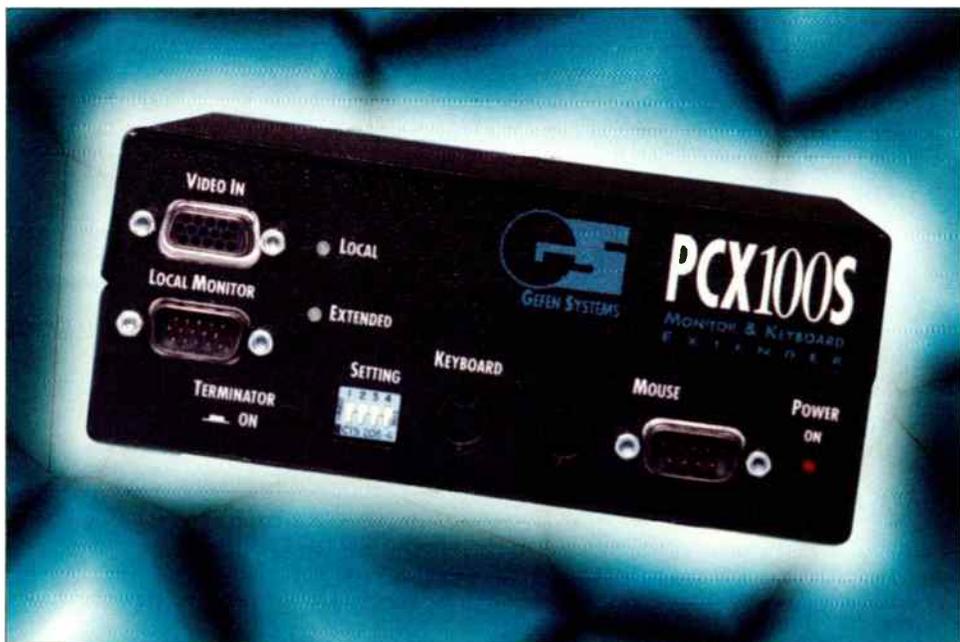
I've had a Hushkit in my PC for several years, and it's reduced my PC's noise to the point that you can hardly tell the computer's on. [See the *Hushkit review on page 98.*] I was an instant convert from the moment I installed it. The only catch is that you have to make sure that you have enough open 5-1/4-inch bays to handle both your hard- and CD-ROM drives (i.e., a big tower). Although Hushkits aren't available for Macs, those of you who have systems containing 5-1/4-inch dri-

ve bays can still install a SilentDrive hard drive case into your 'puter for \$29.95).

### MORE SILENCE

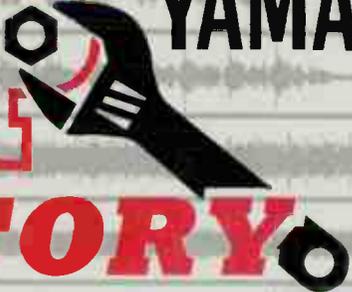
Another way to eliminate your computer noise problems is to remove the PC from your production room altogether. This is the approach taken by the Ex•ten•dit line of devices from Gefen Systems ([www.Gefen.com](http://www.Gefen.com); 1-800-545-6900).

Ex•ten•dit acts like a super-extension cord, letting you place your monitor, keyboard, and PS/2 or RS232 mouse away from the CPU. From a setup standpoint, this system's theoretically a no-brainer! Just plug the peripherals into the sender unit and use similar cords to plug the receiver unit into the PC. The two boxes are



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Group Copy  
Group Paste  
Group Delete  
Group Fade  
Group Crossfade  
Group Trim  
Group Split  
Group Gain Change  
Group Normalize  
Group Move in Time  
Play from Beginning  
Play Selection  
Play from Cursor  
Play to In Point  
Play to Out Point  
Loop  
Jump to Special Point  
Jump to In Point  
Jump to Out Point  
Jump to Marker  
Zoom In by 2  
Zoom Out by 2  
Zoom to Sample Level  
Zoom to Full Recording  
Rescale waveform  
Scale in Real Time  
Scale in Bits per Minute  
Scrub Automation  
Automated on Stop

## QUIET!

When it comes to keeping the noise down, I like the remote PC concept the best. If you go that route, it's a great idea to keep the computers in your coldest room. Some day, you'll be able to do this with all your gear. When you finally become comfortable with the idea of using a controller work surface (and an affordable, well-designed one becomes available), you can fill the control room only with the essentials, keep it cooler, and make it a better acoustic space. In the meantime, keeping your gear "chilled" will improve reliability and extend life.

Heat reduces the life of your gear. I've made a point to add extra fans to my PC, doing the same kinda mod on them as I do — and I've shown in

these pages — with the DA-88. By reversing the power supply fan direction and installing a filter, cleaner air is drawn into the machine. This helps the power supply the most, but it also keeps dust and other non-musical funk from collecting in your floppy, Zip, and CD drives. I then find another place to put a fan (on the front) to improve the airflow from rear to front.

Remember that quieter fans most likely reduce airflow, so anything you can do to reduce heat helps. Be sure there's a fan on your processor (and that it's still spinning), *plus* take note of other heat sources inside your computer — especially DSP chips on the audio and video cards. If necessary, add fans nearby. —Eddie Ciletti

then connected over a distance of up to 100 feet for the PC PCX100 version, and up to 250 feet for the TSE100S/R Mac-based unit, by a rather expensive connecting cable (for example, a 25-foot cable for the Mac unit costs an additional \$109). Both

the PC and Mac versions cost \$495 without the connecting cables.

For those of you who like to do things your own way, there are several ways to skin a cat. For example, you might be surprised how far you can get monitor,

mouse, and keyboard cables away from the CPU. This would let you place it away from your workspace or in a nearby closet. Alternatively, you could reduce noise by designing a corner gobo or sonic iso-box that could house your computer.

To build the latter, all that's needed is for you (or your favorite woodworker) to design a sturdy wooden box that's been lined with a medium-density foam. You could leave the rear open, or enclose it and design in several low-noise fans that are quiet enough to keep the noise down yet large enough to prevent heat buildup. (I'd recommend using "at least" one fan to blow air directly into the case and one to vent air out at the top of the case.)

For the front, you might want to design a Plexiglas door that can be easily opened and possibly even locked. When closed, it's important that the door let you see all the drive and system activity lights. Pay special care to the proper ventilation of your computer. You don't need to have problems crop up due to excessive heat buildup. **EQ**

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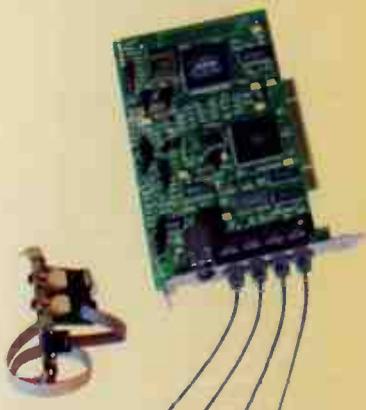
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# AUDI/O



SONORUS



Computers should be seen and not heard (at least when they're not supposed to make noise). Here's a way to quiet down those noisy PCs.

By David Miles Huber

## Silent Systems HushKit and SilentDrive

Noise! Noise! Noise! It's everywhere. In the streets, in the car, and even in our studios. It seems like we spend all those bucks getting the best sound possible, only to gunk it all up by placing this big computer box that's full of noisy fans and whirring hard drives right between our speakers. Well, folks, someone's finally come up with a cost-effective solution for substantially quieting the PC down to levels that have to be experienced to be believed.

Yup. It's true. The folks at Silent Systems, Inc. have tackled the problem of PC noise pollution by coming up with simple hardware solutions: SilentDrive and HushKit.

### SILENTDRIVE

SilentDrive reduces up to 98 percent of a 3 1/2-inch hard drive's noise by sealing the drive in a suspended plastic container that fits into a standard 5 1/4-inch half-height drive bay. The container's innards are lined with sound-dampening foam, while upper and lower metal plates safely conduct heat away from the drive to the computer's outside drive bay casing. Pretty simple!

### HUSHKIT

The HushKit lets you totally re-vamp your PC's noise specs by packaging a single SilentDrive (those of you with dual-drive systems should buy an extra SilentDrive), along with a specially designed CPU fan and power supply.

The Eldorado CPU fan (so named because the fan blades look like the fins on the Caddy) reduces noise by using a quieter motor and lighter fan blades (which cut down on air drag, thereby reducing

noise.) It's meant as a simple snap-on replacement to PCs with standard Pentium CPU fans. The SilentPower power supply acts as a direct replacement for your PC's current supply. By using a special fan and airflow design, this 230-watt, line-conditioned supply can reduce component noise by up to 90 percent!

It should be pointed out that PCs make use of two different types of power supplies: AT and ATX. The easiest way to tell if you have an AT is to look at the back of the PC. If you can see fan blades directly behind the air exit hole, then you have an AT. If no fan blades are visible, you probably have an ATX supply (which is a different unit type and costs a few extra bucks).

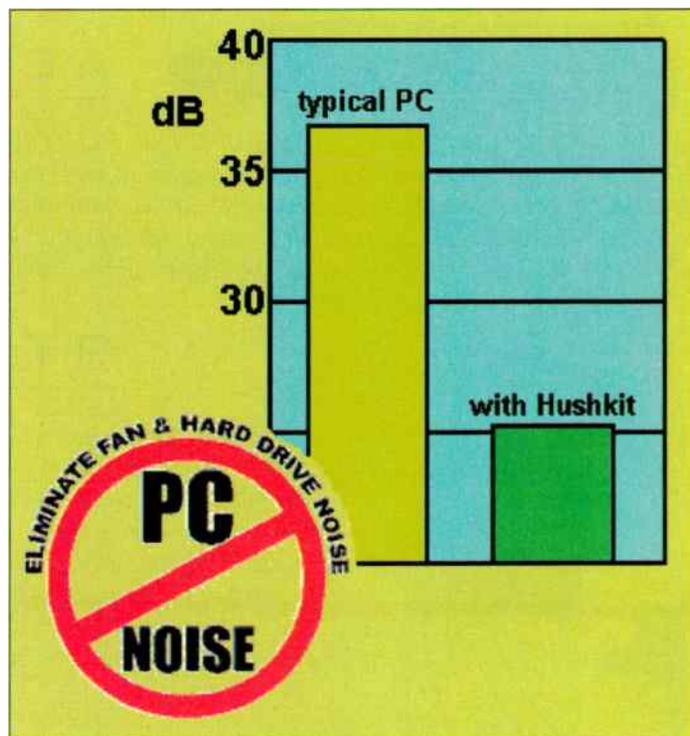
### MAC WOES

Unfortunately, SilentPower isn't available for the Mac at this time. This is due to the wide range of power supply formats that exist among Macintosh

computers. However, on the brighter side, some Macs are fitted with 5 1/4-inch drive bays, which would at least allow you to reduce drive noise by installing one or more SilentDrives into the system.

### THE ROAD TEST

Installing the AT version of HushKit into my PC took only about 45 minutes, without exchanging a single swear word (my basic benchmark these days). I have to tell you that my PC's original chassis started



NOISES CARRY: By using Hushkit, you can cut down the noise your computer makes.

out its life as a 12 MHz/286. I just kept upgrading it to its present muscle-man state. This has a few advantages and minor disadvantage over present-day PC systems. First, I really like the fact that my older chassis includes two, 5-1/4-inch hard drive bays. This means that I could easily install both of my drives into two Silent Drive containers without having to sacrifice any of my front-accessible bays (which are all filled). Newer mini-towers only have internal bay space for two 3-1/2-inch drives and, as such, most folks will have to free up one or two empty 5-1/2-inch bays for the SilentDrive containers. For all you serious hardware junkies that don't have any real estate to spare, I'd suggest that you transfer your PC's innards into a full-height tower case. There's not much that I can say about the Eldorado CPU fan, except that the old fan snapped off and the Eldorado snapped into its place without any hitch at all.

**MANUFACTURER:** Silent Systems, Inc., 20 Commerce Way, Woburn, MA 01801. Tel: 781-932-8444, sales: 888-HUSHKIT 487-4548). Web: www.silentsystems.com.

**APPLICATION:** A hardware retrofit that significantly reduces the noise output of any IBM-compatible PC, allowing you to hear your music, not the computer.

**STRENGTHS:** Simple, easy-to-install hardware kit that is foolproof in nature.

**WEAKNESSES:** No Mac version is available.

**MINIMUM SYSTEM REQUIREMENTS:** SilentDrive: One available 5 1/4-inch bay per drive; HushKit: AT or ATX IBM PC-compatible computer (that includes just about all of them.)

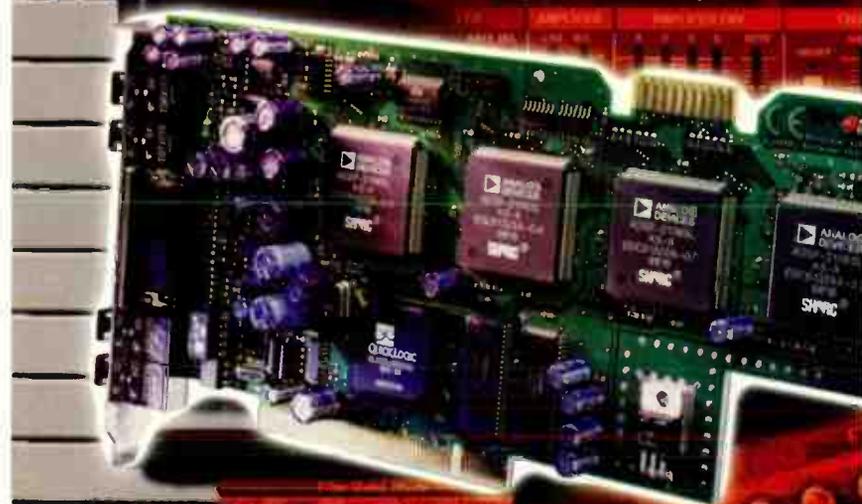
**PRICE:** SilentDrive, \$49; HushKit, \$149. EQ FREE LIT. #: 104

Due to the age of my case, I had to remove my old power supply and then bolt the SilentPower supply down to the PC's chassis in a non-standard fashion. Such a situation is rare, since most newer computers have standard power supply fittings that'll easily accommodate the SilentPower supply. However, even with this small hitch, installing the new power supply took only about 10 minutes.

Then came the moment of truth. I turned on the computer and was struck by an awesome silence! I estimated the noise to be about a quarter as loud as it had originally been just moments earlier. At last, I won't have to turn up the monitors to drown out the PC noise. Q: Would I recommend your installing or having your PC dealer install a HushKit? A: In an absolute heartbeat (which I can now hear...). **EQ**

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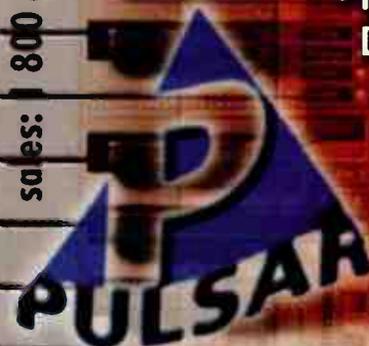
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So who is Generation EQ? Well, you are — our readers. And we are aware that, to meet your diversified recording and sound needs, Generation EQ is demanding more from their favorite magazine (that would be us). As a result, we are preparing a major roll-out of several new sections to provide the most timely and authoritative buying information to you.

We'll always be delivering the same tips, techniques, and expert columnists that Generation EQ has relied on every month for ten years. But now there's even more:

### EQ News

The type of late-breaking, cutting edge industry and technology information that will make our readers the most savvy professionals in the business. We're not talking the typical trade reports. We're talking about news that will impact your businesses and creative lives. What's up with MP3? Any cutting edge reports on data storage? Any news about DVD-Audio and surround?

### Drive!

As recording continues its embrace of computerized hard disk storage, how can you integrate these new technologies with your studio systems. *Drive!* will offer computer systems integration advice so that you can make your existing project studios even more productive and creative with PC-based cards, plug-ins, DSP, storage, and networking.

### Groove

Yes, we know that you're performing with your studios, too. Generation EQ is breaking out of the studio and out onto stage, finding work in today's dance scene. This new section will encourage you to adapt your mastery of studio technology into live performing in clubs and stages, as well as recording this new kind of music.

### EQ Multimedia

Games, video, the Internet, and DVD are all demanding more from today's project audio-for-video professional. Project post is itself taking over the commercial postproduction scene, the way that project recording did the same to commercial recording over the past ten years. And with a greater number of visual projects to work on, you require audio-for-video information from EQ every single month.

and bit-rate setting support at all. To get around these problems, special software routines had to be programmed into the interface. As a result of the quirks of USB, you must press the "Set" button in the Configuration Software window before changing to a new rate or bit setting. If you don't, nothing will happen, and you'll be as confused as I was when I first tried to change between rates.

For starters, it's almost an understatement to say that USB lives up to its promises of easy installation. There were no IRQs, DMAs, or I/O addresses to set, and no cases to open. It was basically a welcome no-brainer. Each time you plug the DATport into the PC, it automatically configures itself (even with the power turned on). In addition, it gets its power from the USB (so you don't have to worry about any batteries or pesky wall warts).

The best part by far is the sound. Since your DAT or S/PDIF-equipped device provides the conversion, the sound is absolutely top-notch. For a while now, I've predicted that USB was going to revolutionize pro sound on both the laptop and desktop PC (no matter which platform). The DATport will definitely help lead the way towards making this a reality. *Viva la USB revolution!* 

**MANUFACTURER:** Opcode Systems, Inc., 365 East Middlefield Road, Mountain View, CA 94043. Tel: 650-429-2400. Web: [www.opcode.com](http://www.opcode.com).

**APPLICATION:** Provides a simple, straightforward 32 kHz, 44.1 kHz, and 48 kHz S/PDIF digital audio interface to any IBM PC that's equipped with a USB port. (Support for any Mac with USB should be available by the time you read this.)

**SUMMARY:** DATport creates a high-quality, 2-channel digital link between any external digital S/PDIF audio device and any USB-compatible computer that's running under Windows 98.

**STRENGTHS:** Easy to install and just as easy to use. Finally, laptop and other USB-equipped PCs can be used to edit pro-quality audio!

**WEAKNESSES:** Besides a slightly quirky configuration interface, there really aren't any.

**MANUAL:** Simple, well-written manual that got me up and running in no time. It could include a bit more info on the "Instant Playback" option and the need to press "Set" when changing between rates.

**SYSTEM REQUIREMENTS:** Pentium 133 or faster, with Win 98 installed USB port or USB hub Windows 98 CD (for driver installation).

**PRICE:** \$249.95  
**EQ FREE LIT. #:** 105

# Inspiration...



*motor mix*

Creative control at your fingertips! Motor Mix™ by CM Automation is the world's first dedicated worksurface for mixing digital audio. It is capable of operating any DAW software on any computer platform. Slightly larger than a sheet of notebook paper, Motor Mix has controls that are laid out like a traditional mixing console channel strip. Operating this worksurface is quick, intuitive and easy. You are in complete control of your digital audio mixing software. When inspiration hits, let the music be first . . . not the mouse.

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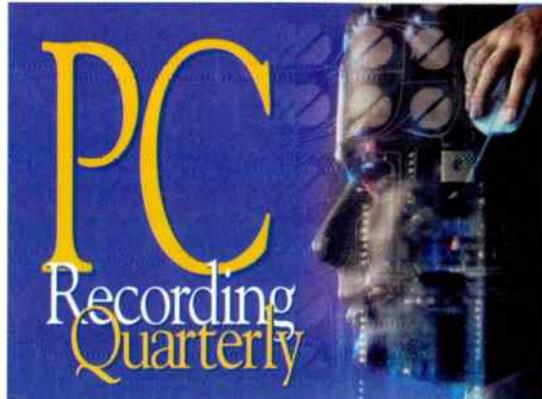
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CIRCLE 07 ON FREE INFO CARD



Here's a good read while waiting for those large files to process

By Craig Anderton

## EQ Book Review

### *Top 30 Music Shareware Windows*

Published by Wizoo

134 pages, softcover; with Win 3.1/95 compatible mixed-mode CD

Author René Algesheimer surfed the 'Net and returned with a collection of 30 cool shareware programs. This 134-page book not only describes them, but also includes them on an accompanying mixed-mode CD-ROM (there are also some audio examples on the CD).

Program categories consist of software synthesizers and groove tools, audio editors and converters, trackers (these generate MOD files), sequencers, audio players, audio CD-to-WAV "rippers," and some miscellaneous programs.

There's also a chapter on shareware, the Internet, and downloading (the CD even includes WinZip if you decide to do some surfing and don't have a suitable ZIP file converter).

Each program description has a similar format: name, specs (author, date, size, system requirements, registration procedures, etc.), and a short description (often with a few useful tips). Also included is a summary that reads like a magazine mini-review — a paragraph or two, and a rating of documentation, interface, functionali-

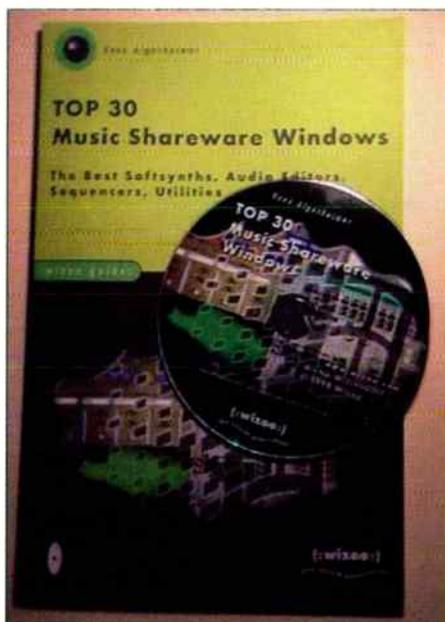
ty, stability, vibe, value, and bottom line. This helps you decide whether the program is worth taking the time to learn (and whether it justifies the hard-drive space).

The book is put together really well, but what about the programs? The author claims that hundreds of programs were evaluated; I believe it, as I've spent quite

a bit of time checking out shareware programs and definitely agree with the choices. Overall, the selection and quality are excellent.

Of course, it's not surprising that this software doesn't always measure up to commercial versions; what is surprising is how great some of these programs are. They're nothing if not cost-effective; with typical registration costs under \$50 (sometimes way

under), these programs are quite a deal. Simply stated, *Top 30 Shareware Windows* is the fastest, easiest, and best way to find out about them.



Available from Wizoo, c/o Music Trade Center, 495 Lorimer St., Brooklyn, NY 11211. Tel. (718) 963-2777; fax (718) 302-4890, or from [www.wizoo.com](http://www.wizoo.com).

PRICE: \$27.90

EQ FREE LIT. #: 106

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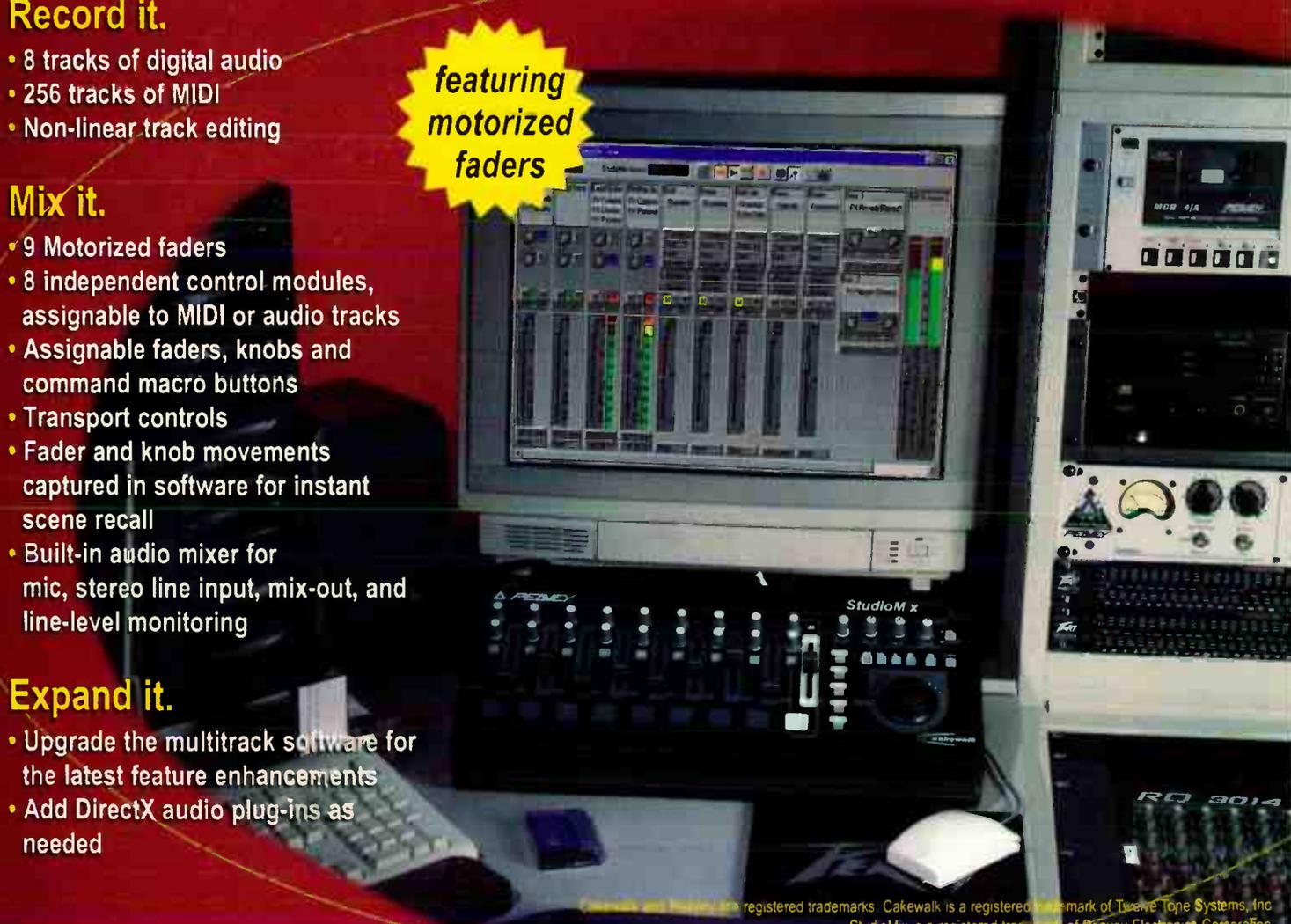
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Engineer Ronnie

Kimbell had an

idea to help him

facilitate the

soundcheck

process for Bad

Religion. Little

did he know it

would lead to a

live CD called

Tested...

# Bad Religion

PHOTO BY STEVEN J. MESSINA

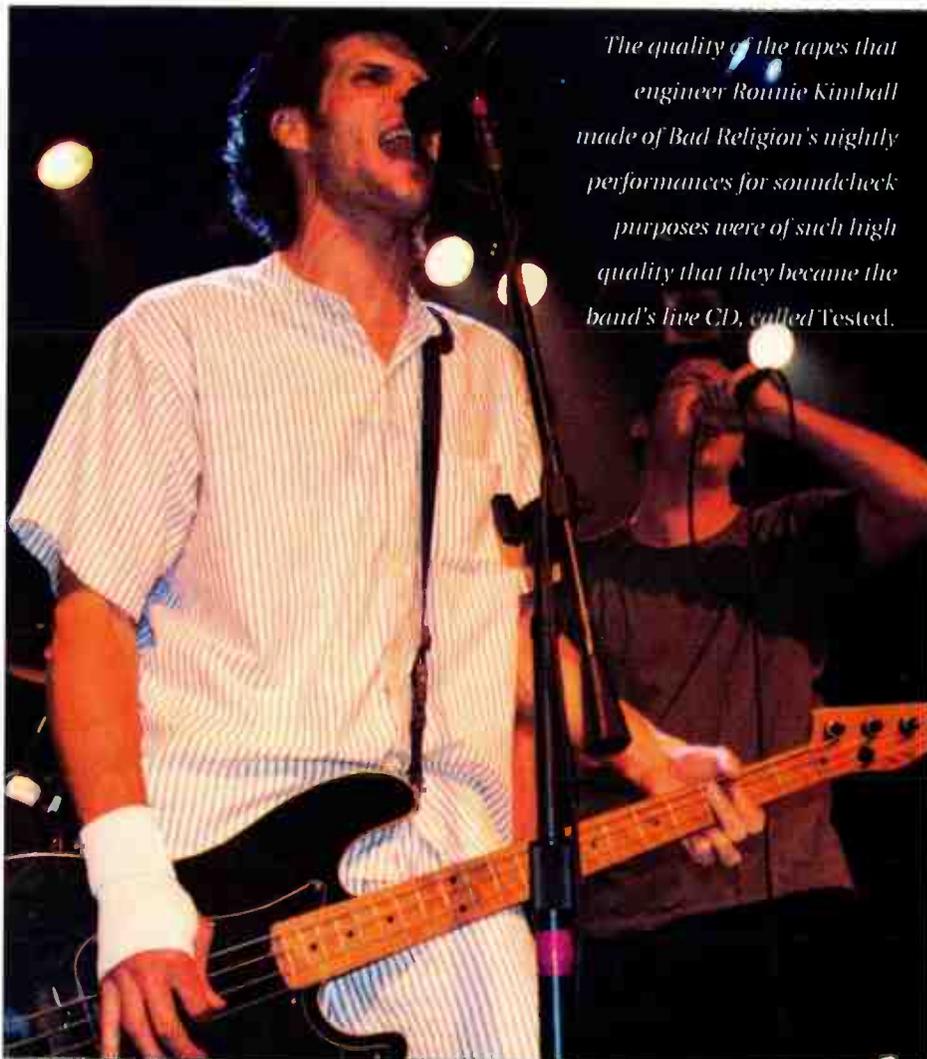
# TOURED AND TESTED

HOW TO SOUNDCHECK  
WITHOUT THE BAND  
(AND MAYBE EVEN GET  
A LIVE CD OUT OF  
THE DEAL)

By Steve  
La Cerra

On a recent Bad Religion tour, Ronnie Kimball experienced a problem that many engineers deal with at one point or another: the soundcheck crunch. This is what happens when a band either doesn't want to, or, for some practical reason, cannot attend the day's soundcheck. Maybe they have to do an in-store at the same time, maybe they're delayed while flying in to meet the crew, or maybe they just don't care to do it. In any case, the result is the same: the crew and sound engineer have their normal responsibility of setting up the gear and making sure it works, but then (after setting up the backline), also have to emulate the playing style of the band as closely as possible.

Kimball explains the roots of his idea: "In early 1995, during the start of the *Gray Race* tour, we were on a really tight schedule, doing a lot of festivals where there was no time for a soundcheck. On parts of the tour we were carrying production, but there were other times we couldn't carry production because of where the shows were. So tuning the PA was a bit of a problem. I came across a deal on some ADATs, and I thought, 'Why not put the sounds of the band's instruments on tape?' The next day I could tune the PA using the sounds I had on tape. I'd have all of the signals from the stage, channel for channel. I put together a flight case with three ADATs and a



*The quality of the tapes that engineer Ronnie Kimball made of Bad Religion's nightly performances for soundcheck purposes were of such high quality that they became the band's live CD, called Tested.*

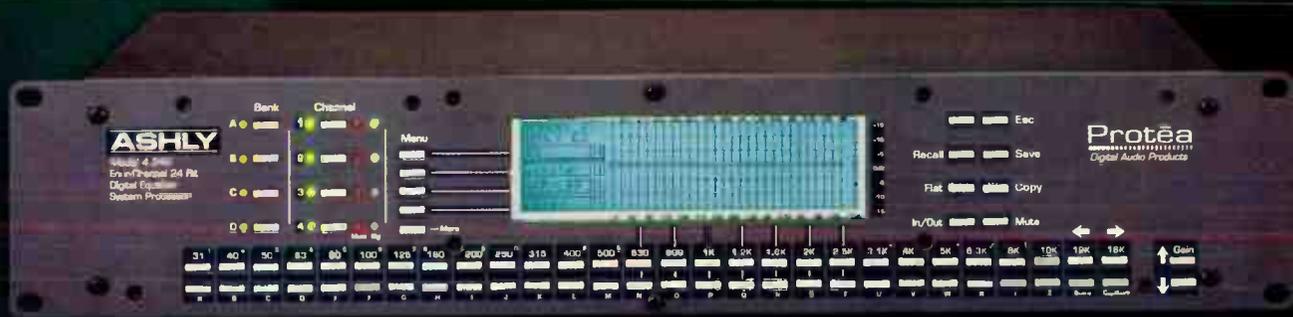
second small shock-mounted rack with a 16-channel mixer, an Eventide H3000SE, and a patchbay. Everywhere I went, these ADATs went along with me — including the hotel room."

#### THE ZERO TOLERANCE LAW

Since the tour brought Bad Religion to places as remote as Estonia, one of Ronnie's concerns was supply voltage. Fortunately, all of his gear was "voltage-tolerant, so I didn't have to worry about transformers or any of that nonsense. I just needed the physical cable to mate with the AC receptacles wherever we were working. In the back of my rack, I had a Cannon P-4 connector for the AC input. I made a bunch of AC cables with different connec-

tors (for different countries) on one side, and P-4's on the other. The Cannon end plugged into the back of my rack and the other end plugged into the AC receptacle. It was small, it was sturdy, it changed the connector voltage, and I didn't have to deal with transformers." Ronnie feels that this arrangement was paramount to reliability of the rig. "I cannot stress enough how much better it is using voltage-tolerant equipment rather than using transformers. Transformers are always wired wrong, they're always a pain in the ass, always breaking down, they're noisy, blah, blah, blah! The long arm of the [Ohm's] law states something like: more voltage, less current, and vice versa...blah, blah. This can work for or against you."

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### THE FATHER OF INVENTION

While Kimball's concept was relatively straightforward, actually making the connections on any given day could be considerably more challenging. Unfortunately, Ronnie couldn't just have made a single wiring harness to use every day for connecting the ADATs — since the band wasn't always carrying production, the front-of-house console varied to the ends of the spectrum. The main problem was that some live consoles have direct outputs on every input channel and some don't. Some consoles have TRS inserts where the tip is the send, while others use the tip for return. Still other designs have the send and the returns on separate jacks. That's not to mention the concern of whether these inserts are pre- or postfader/EQ — and getting the signals to tape without any processing was paramount because with equipment changing everyday, Ronnie needed an accurate representation of the signals at the

noticed that there really wasn't enough signal going to tape most of the time. At that point I was using the +4 I/O on the

ADAT with ELCO-to-TRS cables. It was quick and easy to hook up, but most inserts are at -10. That's when I realized that I really should be using the -10 inputs to the ADATs.

"Eventually, I made a patchbay that would allow me to connect any console to the ADATs, either with or without dynamics. One end of the bay was wired to the console with connectors for each channel. The signal would come out of the insert

separate jacks for the insert send and return (such as a Yamaha PM3000), Ronnie simply used the 1/4-to-1/4 lines of the snake to connect the desk to the bay. For consoles that had the inserts on a single 1/4-inch TRS connector, he carried breakout adapters with 1/4-inch TRS male at one end, and two 1/4-inch TS female connectors at the other. The tip of the male TRS was hot for one of the females connectors (!), and the ring of the TRS was hot for the other (see fig. 2). Sleeve (ground) of the TRS went to sleeve on both female TS jacks. If the console

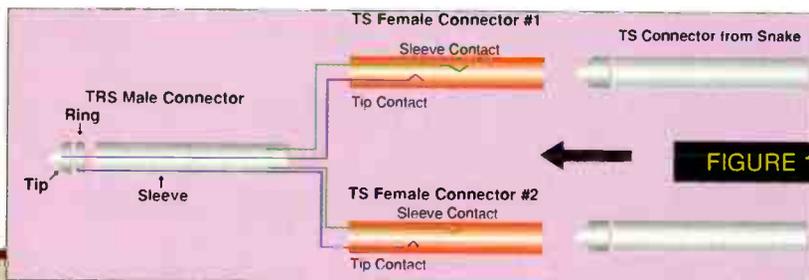
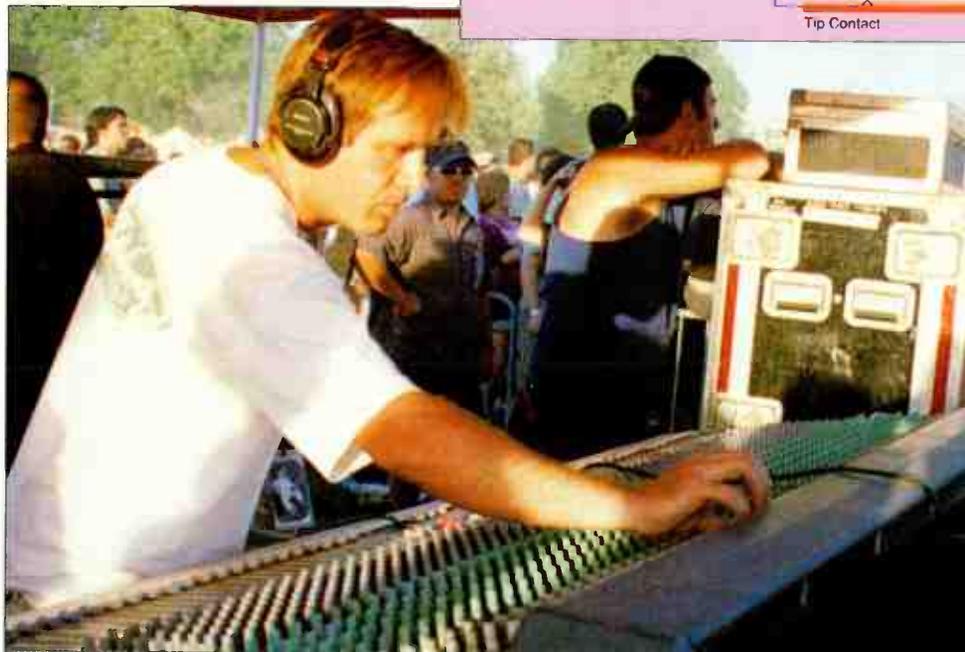


FIGURE 1



CABLE GUY: Ronnie Kimball used homemade cables to enhance the board recordings.

mics. Needless to say, it took a bit of experimentation.

"It was a strange progression," reveals Ronnie. "At first, I had some 1/4-inch cables I would connect to the direct outputs of the console. The problem is that the direct output on most desks is postfader and postdynamics. So any time you'd make a move in the house, the direct out would also change, and the signal would go to tape that way. So using the direct output turned out to be a bad idea.

"Then I started taking signal from the insert points. Many consoles have the insert wired pre-EQ, right off the pre-amp. That worked well for a while, until I

send, go to the patchbay (top row), normal through the bottom row to ADAT input. Then, in another section of the bay, the ADAT output came to the top row and was normalled through the patchbay to the insert return. So the ADAT became part of the insert chain. This made patching much easier, and I had the ability to put the tape machine either before or after the patch (see fig. 1)."

As far as making the physical connections between his patchbay and whatever console turned up at the gig, Kimball came up with two snakes to cover just about all of his needs. His main snake was a simple TS 1/4-inch-to-1/4-inch. If a console had

was (for example) a Mackie 8•Bus, the TRS part of the adapter was plugged into the channel insert. Then the female jacks at the other end of the adapter would accept the separate 1/4-inch male ends from the snake, with tip=send and ring=return. Since the 1/4-inch snake was not permanently wired to a TRS, the system could accommodate a console (such as a Soundcraft) where tip=return and send=ring simply by reversing the 1/4-inch female jacks. Ronnie also had a snake built for certain consoles that used XLR connectors on the console end for the inserts (believe it or not there are a couple out there).

Wherever possible, recordings were made without EQ, but this was dependent upon the console's insert or direct out being pre-EQ. If it was post-EQ, then EQ had to be printed. Kimball tried to extract the signal pre-EQ, "so I could roll those tapes the next day and know that, barring the limitations of digital, you're basically getting the signal that was at the mic. The first recordings were also postdynamic, but eventually I went to a stage where there were absolutely no dynamics going to tape. In the latter stages of the tour, I limited only the bass guitar to keep it more constant. I didn't need to limit the lead vocal be-

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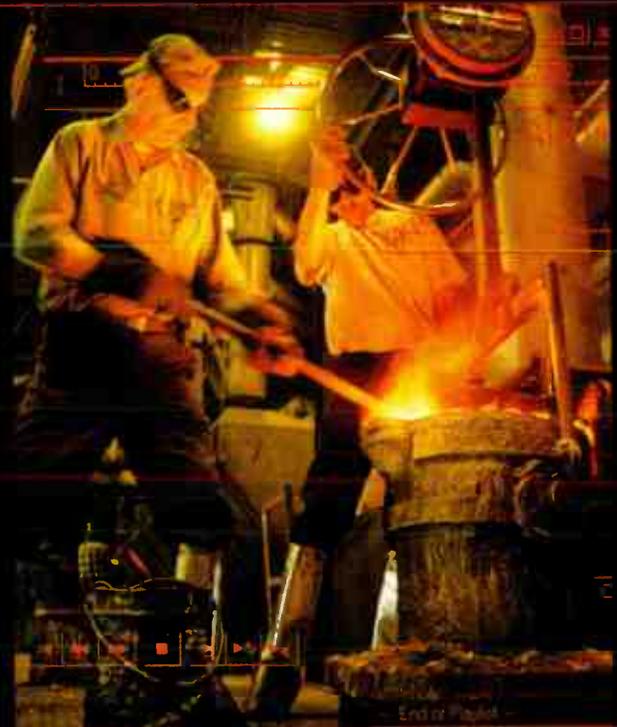
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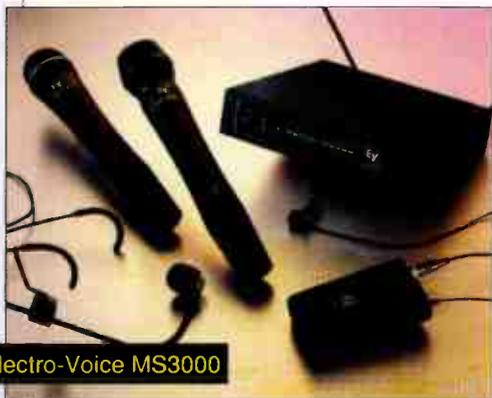
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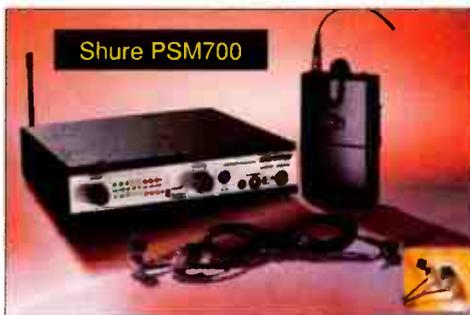
offers specially tuned quarter-wave antennas with TNC-type connectors. The all-metal enclosure features a five-segment LED audio level meter, a five-segment LED output level meter, two LEDs to indicate the action of the diversity circuitry, and a rear-panel squelch adjustment control. For more details, call Electro-Voice, Inc. at 616-695-6831 or fax them at 616-695-1304. Circle EQ free lit. #127.

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Shure PSM700

of monaural mixes rather than just a single stereo mix. When this function is active, the balance control on the PSM receiver can be used to adjust the relative volumes of these two mixes to facilitate individual performance needs. The system includes the Shure P7T Transmitter, P7R Body-pack Receiver, and E5 Earphones. The suggested price begins at \$1800. A full range of optional accessories is also of-

fered. For more information, call Shure Brothers, Inc. at 847-866-2200 or fax them at 847-866-2279. Circle EQ free lit. #129.



Yamaha M3000

## BOOGIE BOARD

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# BIAMP MSP22 MULTI-FUNCTION SYSTEM PROCESSOR

By **WADE MCGREGOR**

Loudspeakers require signal conditioning to achieve their optimal performance. This conditioning traditionally has come via a rack of equipment that included limiters, equalizers, and crossovers. Over the past ten years, this rack has been reduced to a single box with a DSP chip performing all the functions. Unfortunately, the cost of these DSP-based system processors was, until now, beyond the reach of many clubs and local and regional sound reinforcement users.

The Biamp MSP22 includes the comprehensive processing at a price that makes analog alternatives look expensive. While the design of the MSP22 is focused on installed sound applications, this is a processor that could easily fit into the rack of a sound reinforcement rental company, gigging band, or small church. The two-input and two-output audio path will not suit every sound system application, but the

flexible range of processing can meet the needs of many common loudspeaker systems. Inside the unit are 48 kHz/24-bit A/D and D/A converters. Between these ports is a complete chain of loudspeaker signal processing: compressor/limiters; noise gates; parametric and 1/3-octave equalization; crossover filters; signal delays; and level adjustments. The digital nature of this unit also provides for preset configurations that can be recalled with a simple switch contact. An updated version, the MSP22e (shipping Q3 '99), will allow the user to rearrange the processing modules to suit their application.

The unit offers no controls on the front or rear panel. All adjustments for the MSP22 are handled from a Windows 9X-based computer connected to the unit's serial port. While this may at first seem daunting to those familiar only with analog processors, there are many advantages to this "blank panel" format. The setup software provides parameter adjustments that can easily be stored (in the unit's non-volatile memory) or copied to other units. All

the adjustments can be saved in a relatively small computer file. Should a unit need to be serviced, the disk file is downloaded into the replacement unit, making their setup identical (try that with a rack of analog processors). You will, however, always need a computer to set up or monitor the signals within the unit. Once the computer is removed, unauthorized persons are prevented from making adjustments that could damage or disable the sound system. Anyone who has precisely set up an analog equalizer and then had another "expert" make inappropriate (smile curve) adjustments can appreciate this security.

The setup software (v2.3 at time of writing) of-

fers a graphic

interface that allows clear and precise adjustment of each stage of processing. The initial screen for the MSP22 (see fig. 1) includes input and output gain sliders, level metering throughout each processing stage, preset recall buttons, logic input indicators, and buttons to access the Gain Matrices, Gain Manager, EQ, Crossover, and Delay functions. Clicking on the process buttons opens up the controls (only one process at a time, though) to adjust each of these functions.

The Gain Matrix allows the levels in each channel to be adjusted and to mix the signal between channels, such as a two-way crossover where one input channel is fed to both output channels. The Gain Ma-

## ROAD TEST

**MANUFACTURER:** Biamp Systems, 10074 S.W. Arctic Drive, Beaverton, OR 97005. Tel: 503-641-7287. Web: [www.biamp.com](http://www.biamp.com)

**APPLICATIONS:** A 2-channel sound reinforcement system processor for fixed and portable applications.

**SUMMARY:** A fully featured, two-input/two-output, DSP-based loudspeaker processor that offers great flexibility to those who need to tweak their sound reinforcement system.

**STRENGTHS:** Easy configuration; lots of choice in EQ and crossover filtering; quiet 24-bit converters; affordable.

**WEAKNESSES:** Must be configured with a Windows-based computer (not included); available only through Biamp dealers (not music stores); no pre-built presets for specific loudspeakers.

**PRICE:** \$922, including software; \$614 for the MSP11 single-channel version. **EQ FREE LIT. #: 107**

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## GIG MAGAZINE'S ROAD TEST

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Gig Magazine, November 1998

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trix can also be a convenient place to reduce a stereo mix to mono. This module also includes polarity switches to flip the electrical polarity of the inputs and/or outputs.

The Gain Manager includes a Leveller (automatic gain adjustment), compressor, limiter, and soft gate. The Leveller is tricky to setup, as it interacts with the compressor and limiter, and is best used in fixed installations where the threshold of feedback will not vary dramatically. The compressor automatically sets the ratio depending on the timing and amount the signal exceeds the threshold set with an on-screen slider. A hard limiter is provided for system protection from excessive peaks. The Soft Gate is a downward ex-

pander that can be adjusted to reduce noise through the system, such as the noise from band gear between sets. An advanced mode (call Biamp technical support for details) provides additional parameters, such as attack and release times. All of the gain management can be bypassed with a single switch.

The EQ provides 28 bands of parametric or 1/3-octave graphic equalization. Unlike many processors, both EQ formats can be in use simultaneously. The parametric EQ (see fig. 2) offers filters that can be adjusted graphically (with your computer mouse) or using the drop-down dialog boxes. The filters are in stepped increments, but with sufficient resolution for all reasonable equalization settings, such as bandwidths between four octaves and

1/48th octave and level in 0.25 dB steps. In addition, there are high- and low-pass filters with 6-dB-to-24-dB-per-octave slopes. You can copy/paste equalization settings between the two channels from a menu accessed with the right-mouse button.

The Crossover module offers both Linkwitz-Riley and Butterworth filters between 6 dB/octave and 24 dB/octave. Similar to the equalization, these filters can be adjusted graphically. In addition, the two filters can be symmetrical (linked) or completely different, for those with more sophisticated requirements. The unit only provides for two-way crossover functions, with Output One always the high-frequency output (the MSP22e will allow much greater flexibility, including up to four-way crossovers with two units linked together). In

full-range applications, the crossover functions are simply bypassed. Once the crossover filters are engaged, the software will warn the user repeatedly that bypassing the filters could cause loudspeaker damage. This is mildly annoying during setup, but a good idea if the system is passing audio.

Signal delay is the final stage of processing before the output of each channel. Delays can be adjusted in increments of inches, feet, centimeters, meters, or milliseconds. The inherent latency of the unit (1.333 ms) is the lowest value allowed, and steps up in as little as 21 microsecond increments to a maximum of 1.359979 seconds.

Audio connections are through detachable screw terminal blocks that are inexpensive to terminate and can be disconnected quickly when removing the unit from a rack. The computer connection is via a null-modem female 9-pin sub-D connector (cable supplied) compatible with notebook computer serial ports. The control and setup of the unit is via the BiampWin software that runs under Win9X and is available on the Biamp Web site (in addition to shipping with the unit). A 25-pin sub-D connector offers logic inputs that can recall preset functions within the unit.

The 16 presets can provide very flexible operation. For example, a rental company may have 16 different loudspeaker configurations in their inventory. A simple switch panel (hidden inside the rack or simply connected during setup and removed before shipping) recalls the setup for each system configuration. This can allow one processor to be used in any system without requiring tedious calibration for each rental. In the club environment, presets can allow the system to be optimized for each different type of act the venue hosts. Setting up presets is as simple as making the adjustments, pressing the Store button, and selecting a Preset number.

The MSP22 may only have two channels, but it provides nearly every feature you really need to process two-way loudspeaker systems, full-range systems, or ancillary loudspeakers. The updated MSP22e will be available in late spring (same price) with enhanced capabilities, including digital linking between two units. Don't let the installation-style package fool you, the MSP22 can be a solid performer on the road, too.

*Wade McGregor is a principal consultant for Mc2 System Design Group, an acoustical consulting firm based in North Vancouver, BC. Visit their home page at [www.mcsquared.com](http://www.mcsquared.com).*

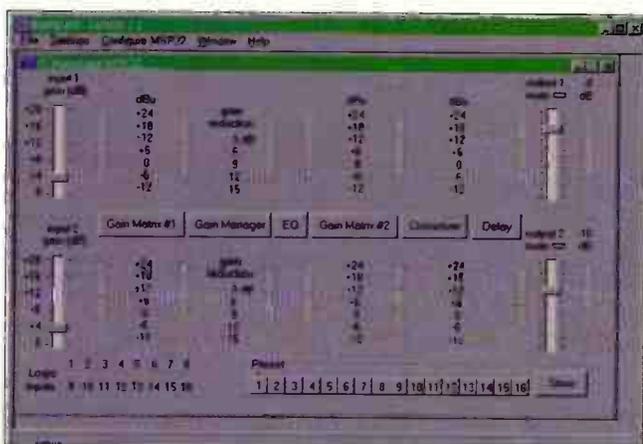


FIGURE 1: The main screen of the MSP22 control software indicates the signal flow through the unit. Outputs can be muted and the remote control port (Logic Inputs) can be monitored for activity.

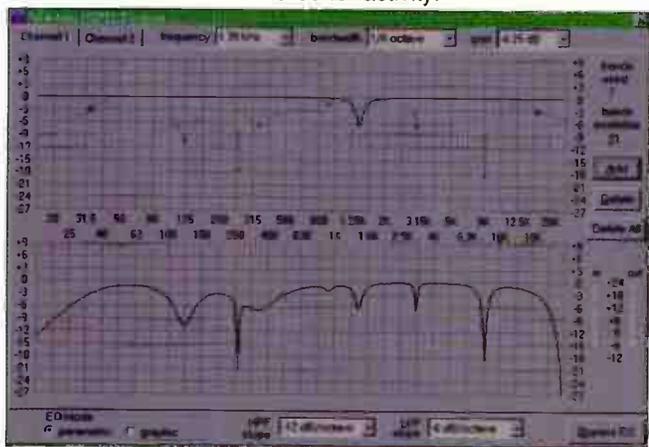


FIGURE 2: The equalization screen of the Biamp MSP22 control software provides a choice of drop-down menus or graphic adjustment for up to 28 bands (per channel) of equalization filters. On the upper graph, blue dots indicate level/frequency adjustment control points, while green circles indicate bandwidth adjustment points. The lower graph displays the combined response of the active filters. An alternate screen (graphic EQ mode) offers a classic 1/3-octave graphic EQ display for voicing a system.

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the new legend

# GALAXY CORE PA5X140 POWERED MONITOR



By **MIKE SOKOL**

Galaxy Audio has made a powered monitor that really works. This thing is just so darn cute, and what's not to love about being able to pick up your whole vocal monitor package in one hand? But I wasn't a quick and easy convert to the idea. I've tried to use powered "spot" monitors in the past, but they never had enough juice to get the job done. You can't expect a 30- or 40-watt amplifier to cut through the roar of the stage instruments. But the CORE PA5X140 has got the juice. With a legit 140-watt amplifier (75 watts to the internal speaker) on-board and a built-in limiter, this thing can get significantly loud.

Built like a brick (13.5 lbs.), the PA5X has a full heat sink on the front panel for cooling and a small, but comprehensive, control panel. Two input channels are included — one an XLR with 24-volt phantom power and the other a 1/4-inch TRS jack. Both inputs will accept mic or line-level signals without complaining. A 3-band equalizer is also included, with frequencies at 300 Hz, 2 kHz, and 16 kHz.

While these are standard frequency centers for music, I wish they had set the centers to maybe 100 Hz, 1 kHz, and 4 kHz, which are more in the problem areas I typically have to cut to correct feedback due to microphone proximity or presence boost. (But, for bigger applications, you would use an external 1/3-octave EQ anyway.)

The back panel includes an RCA jack with line-level output and a 1/4-inch speaker jack for

an external cabinet. Unlike previous models, plugging in an external speaker does not mute the internal speaker. This allows you to plug in one or two passive hot spot monitors from a single powered PA5X140 unit. All in all, this is a very nicely designed package.

A quick caveat here: Corrective monitor equalization should be mostly cuts as opposed to boosts. If you find that you're adding more than a few decibels of boost to any frequency band, you're probably asking for trouble. It's possible to cause any speaker driver to fail if

## ROAD TEST

**MANUFACTURER:** Galaxy Audio, 601 East Pawnee Ave, Wichita, KS 67211. Tel: 800-369-7768.

**APPLICATION:** Vocal monitoring for live sound and small sound reinforcement applications.

**SUMMARY:** Powered monitor with a single 5-inch driver, integrated 140-watt amplifier, 2-channel mixer, and 3-band EQ.

**STRENGTHS:** Lots of power in a small package; phantom powered XLR and 1/4-inch TRS inputs allow each musician to adjust the me/them mix; built-in limiter with clip light lets you go to the edge without falling off; stand mount permits raising the monitor, or it works pretty well as a tiny floor monitor.

**WEAKNESSES:** Frequency points of the 3-band EQ could be better placed for vocal applications, but were fine for standard music monitoring; could use a loop-through XLR output, which would pass your mic signal unaffected back to the main mixing console without an external splitter cable.

**PRICE:** \$399

**EQ FREE LIT. #:** 108

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you ask it to do the impossible. So don't try to make this (or any other) 5-inch driver put out mondo bass.

You can't rewrite the laws of physics, but you can break the machinery — and you'll probably end up with a wrecked speaker.

I got to try out the PA5X in a variety of studio and live applications, with lots of surprised artists and engineers. First, in my studio, I had to do some electric guitar tracking without an instrument amplifier. The artist brought his effects pedals along, which sounded fine, but he couldn't

get used to headphones. So I set up a PA5X for him with a DI box looping through the line-level 1/4-inch output

from his pedals to the input on the PA5X140. I let the DI box send a mic-level XLR signal to my console while I returned a feed from my monitor group on the console to the XLR input on the PAX5. This allowed him to mix together as much music cue and direct guitar as he wanted. It was a very simple solution that worked perfectly.

Next up I was asked to speak on live sound reinforcement theory at a harp convention in Baltimore. Not har-

monica-type harps, mind you, but real Concert and Celtic harps with strings. I took along a Barcus Berry piano pickup, a Crown CM-700 mic, and a Shure Beta 57 mic. Oh, and I brought a PA5X as well. Since a harp is built a lot like a piano, the Barcus piano pickup works great for sound reinforcement applications. After demonstrating mic and pickup techniques on a much larger sound system, I plugged in the PA5X alone and pointed it towards the room. Playing to a room of some 50 listeners, many of them couldn't believe that all the sound was coming from the little speaker on a stand. I had to let them listen at the bigger system to be sure it was turned off and there was no smoke and mirrors involved. The phantom power on the XLR input was handy, since it could power a condenser mic without batteries and I could put up a second mic for them to talk into. For sound augmentation in a small room, like a book store or coffeehouse, the PA5X alone would work as FOH speakers. But, of course, it can't make any bass from its small 5-inch driver. I did try plugging the speaker output into an 8-ohm, 15-inch sub, and the little PA5X drove the "stack" to really loud, surprisingly good-sounding levels.

Finally, I loaned a pair of the PA5X's to a musician friend who typically uses floor wedges. He liked the idea of tweaking his own vocal levels in the monitor, so he sent a monitor mix from his console to the 1/4-inch TRS input and made a "Y" XLR cable for the mic channel, which allowed him to pass through the mic signal to the console. This configuration allowed him to add in as much of his vocal mic as he liked through the XLR input and fold-back some of the regular monitor feed in the other channel. He was able to place the PA5X right on the corner of the stage console and get a nice cross feed of the mix. And he was able to leave his monitor amplifier and floor wedges home since he felt he had more than ample volume from the PA5X. Result? One happy camper (whatever that means).

Now, I'm not going to get rid of my dedicated amplifier rig for most applications, since it's a little hard to convince professional artists to give up their big wedges. And the PA5X140 simply can't sonically compete with a large pro monitor system. But for the rest of the weekend warrior applications and special situations, it will do the job with quite serious authority. You need to check it out.



Gloria Estefan, Dolly Parton, Neil Young, Lou Reed, Laurie Anderson, Bob Dylan, Madonna, Eric Clapton, George Harrison, Paul McCartney, Paul Simon, Joe Henderson, James Carter, Ernie Watts, Bill Hollman, Saturday Night Live, The Muppets and many others have done great work with the M-1. The M-1 is clearly superior, *satisfaction guaranteed*. Here's why:

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**Options:** VU-1 meter (shown); PK-1 meter; Jensen JT-11-BM output transformer;



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# Alesis M1 Active Monitors

Switching power supplies set these monitors apart from their peers

BY BOBBY OWSINSKI

Time marches on, and, although speaker technology has remained basically unchanged for the last 75 or so years, some of the accompanying science on the periphery of loudspeakers continues to evolve. Case in point, the new Alesis M1 Active monitors that bring loudspeakers into the age of digital by employing switching power supplies in the internal amplifiers.

The Alesis M1 Active speaker is a powered two-way monitor utilizing a 6.5-inch woofer featuring a proprietary carbon fiber cone that is 25 percent lighter than the more commonly used polypropylene (for better damping and transient response), and a 1-inch Japanese silk dome tweeter that's Ferrofluid cooled. Both drivers use a dual-magnet structure, with the tweeter also employing an additional carbon steel cup to maximize magnetic shielding. A 75-watt amplifier feeds the LF driver, while a separate 25-watt amp —

crossed over at a rather low 1500 Hz thanks to an unusually steep 48-dB-per-octave electronic crossover — amplifies the tweeter.

The internal amplifiers are somewhat different from those normally used in powered monitors in that they use switching power supplies. Although common in digital equipment, a switching power supply is used in only a few pieces of current analog gear despite some impressive attributes, including virtually no 60 Hz hum, since the supply works at a frequency of 130 kHz. Also, there are no large transformers required, so there's a reduction in weight, an increase in dynamic range, and less clipping under heavy load conditions.

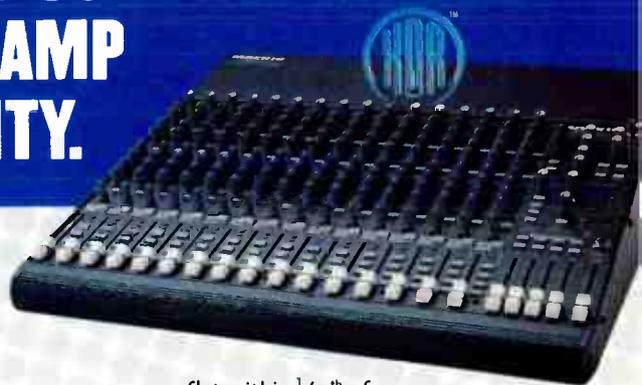
The M1 Active cabinets are mirror imaged with dual front-mounted ports

and offset tweeters, and are made up of .625-inch medium density fiberboard for the four sides and rear, with the front baffle using 1-inch MDF. To complete the finish, a vinyl composite material is laminated to all sides of the cabinet except the front baffle, which is painted. The cabinet measures at 15 by 8.5 by 9.75 inches and weighs only 19.5 lbs. — incredibly light for a powered monitor. Alesis states that the M1 has a frequency response of 50 Hz to 20 kHz,  $\pm 2$  dB with a maximum peak SPL of 118 dB at 1 meter.

The rear panel has only a center detented input level control and a dual 1/4-inch/XLR input connector. There are no EQ adjustments, although Alesis recommends that either or both of the front ports be plugged in order to adjust



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inputs • 6 mono  
mic/line inputs •  
extra ALT 3-4 stereo bus



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mic line inputs  
• 4 sub groups  
• rotatable I/O pod



## MS1202-VLZ PRO

4 XDR™ mic preamps  
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inputs • 4 mono  
mic/line inputs •  
extra ALT 3-4 stereo bus



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the low-end response to the room acoustics.

The manual for the M1 is rather extensive, with sections on installation, placement, and surround sound, along with the expected general description of the monitors. I found the section on surround somewhat curious in that much of it referred to Dolby Pro Logic and home theater, which are situations that M1 owners are unlikely to encounter since these monitors are more targeted to the studio than the living room.

In the manual, Alesis also recommends that the tweeters be placed to the inside, not outside, of the listening triangle because any comb filtering is reduced due to the built-in time alignment of the drivers. This is certainly counter to both what other manufacturers and conventional wisdom suggests, but I did, in fact, find that the M1 Actives gave a better stereo image in this position.

I used the M1 Actives to mix a tune intended as a theme song for the upcoming movie *Perfect Little Man*. The song had a lot of different textures — from acoustic guitars and pianos to

synths and samples to Blues guitar to Hammond B3 — all of which had to be sculpted and molded into a cohesive stereo mix.

My first impression of the M1 was that any instrument with lots of natural high end (cymbals, percussion), when played back through the speaker, seemed well-defined, if not a bit on the bright side. Instruments with a lot of natural low end such as bass guitar and kick reproduced well off the bat — a little too well in fact. My feelings were confirmed as my mix ended up a bit dull sounding on the top and a bit light on the bottom.

A quick look at the frequency response chart in the manual showed that there's about a 2-dB bump in the response from about 80 to 110 Hz and again at about 12 kHz, which once more confirmed what I was hearing. After learning the particular characteristics of the M1's, I was able to go back and complete the mix without any additional problems. I don't consider the frequency bumps to be a big deal, since, all things being equal, it's a lot better to

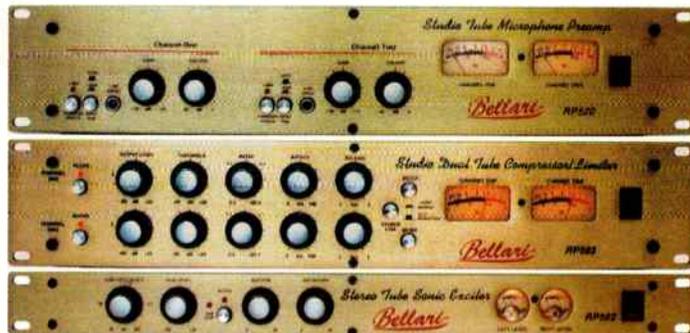
have mixes come out slightly lacking at certain frequencies than the opposite. After all, it's easier to dial frequencies back in during mastering than to try to take excessive amounts out.

At a retail of only \$649 per pair, the M1 Actives give you a tremendous bang for the buck. Only a very few years ago, it would have been unheard of to find a pair of powered monitors at this price, let alone ones that were fully biamped. They might not make you want to throw away your \$2000 monitors, but you'd be hard pressed to find this level of technology anywhere else in this price range. You can tell there's been a lot of thought and effort put into the design of these monitors, and Alesis should be applauded for trying to push the envelope of a rather staid technology.

**MANUFACTURER:** Alesis Corporation, 1633 26th Street, Santa Monica, CA 90404. Tel. 800-5-ALESIS/310-255-3400. E-mail: alecorp@alesis1.usa.com. Web: www.alesis.com. PRICE: \$649 per pair. EQ FREE LIT. #: 109

# Bellari

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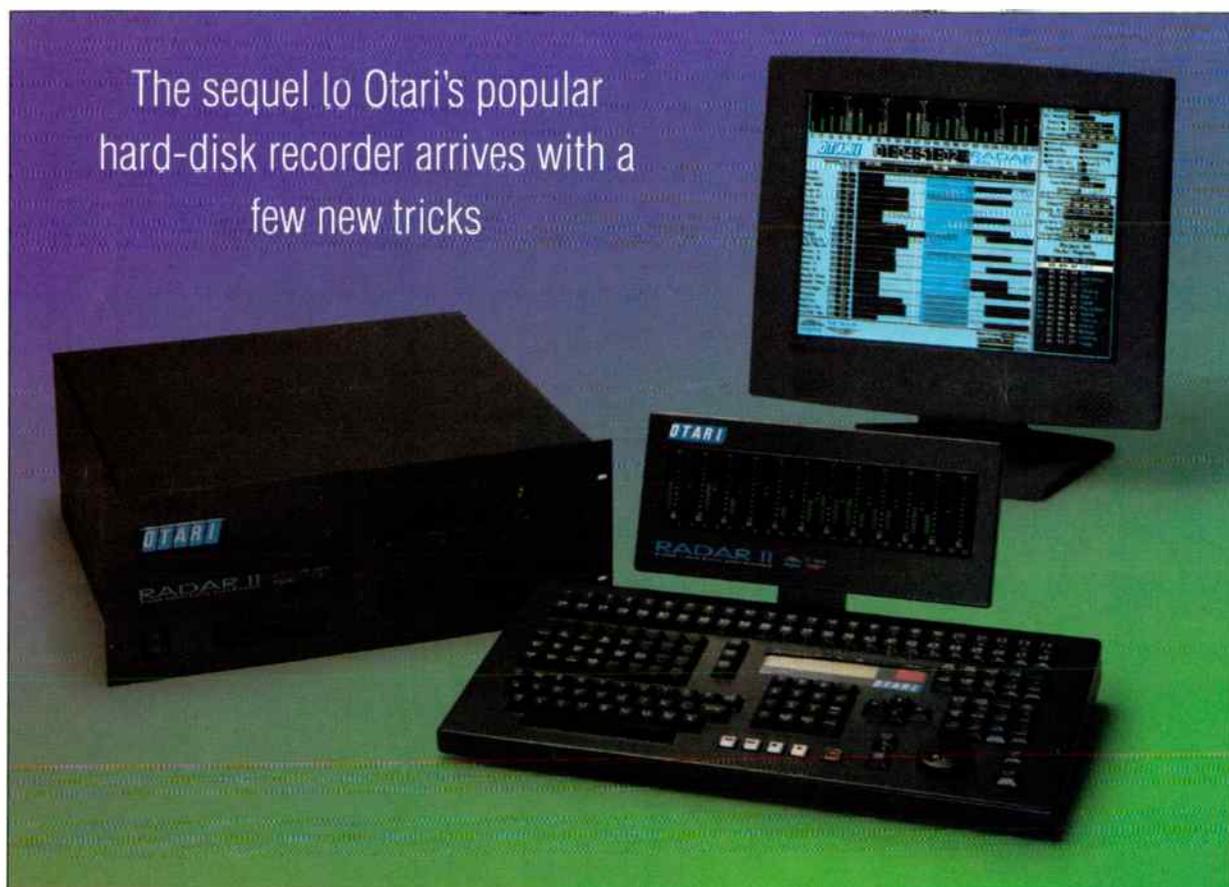
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# Otari RADAR II

## *Digital Audio Recorder*



**BY MIKE SOKOL**

An update to its highly successful predecessor RADAR, RADAR II acts like a high-performance 24-track tape deck without the tape, and has the added bonus of random access. Housed in a 3U chassis, the front panel is devoid of any controls or indicators except for a power switch and hard-drive lock. Every control is placed on the remote, which resembles a slightly enlarged computer keyboard with an additional 24-channel meter bridge. A 9-pin cable hooks it all together, so you can easily put the main box back in a rack in the machine closet, and keep the remote out at your console. A single remote will run a pair of RADAR II's, which is a

pretty cool (and cost-effective) way of getting a 48-track digital recorder you can easily take on live recording gigs. (More on that later.)

Hard drive size is no longer a limitation to disk-based recorders, since the RADAR II comes with a removable 9-GB drive built-in. If you need more recording time, just pop in another drive and go. Or, if you're really concerned, you can hook up an external RAID hard drive array with as many hot-swappable (and redundant) drives as you like. RAID arrays are very cool in that your data is redundantly spread across multiple drives, so you can pull a drive while it's working and destroy it without losing any of your recorded audio. It's a standard technology for big

network servers. So you don't have to fear drive failure on important recording. (In fact, this year's Grammy awards were recorded on a pair of RADAR II's with 27 GB of hard disk space.) An optional Exabyte 8-mm tape drive can selectively back up your sessions, or perform an image backup of the whole hard drive.

### **DOWN IN BACK**

On the back are connections for Linear Time Code (LTC), as well as AES/EBU, SP/DIF, and MIDI ports. A Sync Reference I/O is included for interfacing with the world of video and film work. There's a 15-pin connection for an SVGA monitor, which allows you to name the individual tracks as well as get a visual display

of all recording and looping functions. Also included are ten levels of undo and more single-function keys than the previous model. RADAR does include some basic track editing and looping functions, but don't expect it to replace your workstation any time soon. There's no waveform view, and you can't install software plug-ins for compressors or guitar amplifier emulators.

RADAR isn't just a Windows- or Mac-based computer with a big drive. It was designed from the ground up to get the tracks recorded and survive, no matter what. In fact, Otari rep John Spencer showed me how to enable the auto-save function for the EDL, then killed the power to the system in the middle of an edit. It automatically recovered the file in a few seconds after power-up, and I was back in business. (Otari still recommends a good quality UPS power supply, though.) With that demonstration in mind, EQ and I agreed to use the RADAR II on the road for a series of 5.1 multichannel mixing seminars dubbed "The EQ Surround Sound Road Tour."

I used the three TDIF connections to hook RADAR II up to a Panasonic DA7 console, and literally trucked this thing around the country. I started in Baltimore, drove to Middle Tennessee State University near Nashville, then continued on to Full Sail Recording near Orlando, FL. Then I put it on a truck and shipped it to The Conservatory of Recording Arts & Sciences in Tempe, AZ, ending the West Coast swing with a drive to Citrus College out-

side L.A. We then put it all back on a truck where it finally arrived back in Funkstown, MD. There wasn't a single failure of any kind even after that trip. When I turned it on, it just worked! That's the kind of reliability I need for field recording.

The random access was a big help in my seminars since I was able to load in a bunch of session and premixed tracks that I could recall with a few keystrokes. There wasn't any rewinding or tape searching involved, I just punched in the number of the song I wanted, and it was there in a few milliseconds. Try that with a tape drive. (One of the instructors at The Conservatory told me he's seen studios put in RADAR recorders and justified the cost from the savings in rewind time alone.)

Still, I think the RADAR II really shines for remote recording. Having 24 tracks of ultra-dependable and great sounding (24-bit by 48-kHz) audio at your fingertips is a wonderful thing. And you can ship it in a small road case. I have a few really important on-site recording sessions coming up later this summer, and guess what I'm specifying for the gigs? You guessed it: a RADAR II.

*Mike Sokol is either a technical writer who's an audio engineer, or an audio engineer who writes about his work, depending on what day you ask him. Visit his Web site at [www.soundav.com](http://www.soundav.com) for more details.*

## EQ LAB REPORT

**MANUFACTURER:** Otari Manufacturing Corporation, 8236 Remmet Ave, Canoga Park, CA 91304. Tel: 818-598-1200. E-mail: [sales@otari.com](mailto:sales@otari.com)

**APPLICATION:** A 24-channel hard-disk-based digital audio recorder for studio and live recording applications.

**SUMMARY:** A tapeless 24-track tape deck with 24-bit/48 kHz recording. Anything you can do with a 24-track tape deck you can do with a RADAR II (or link a pair together for 48 tracks). Plus you never have to wait for rewind.

**STRENGTHS:** Robust UNIX-type operating system (no more WinTel blue screen of death); three TDIF ports and 24 A/D converters are included, all using DB-25 connectors; comprehensive remote with meter bridge hooks up with a DB-9 cable; did I say you don't have to rewind?

**WEAKNESSES:** The fan and drive noise won't allow you to track in the same room with it (this is a problem common to hard drive recorders in general, and you can get a muffler for these things); no waveforms on screen, but the scrub works well.

**PRICE:** \$25,000

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CIRCLE 15 ON FREE INFO CARD

# HHB CDR-850 *CD Recorder*



Is this stand-alone CD recorder what you need to keep your clients happy?

**BY ROGER MAYCOCK**

Compact disc recorders are all the rage these days — with good reason. They enable you to deliver your creative efforts in a medium that is widely available. While DAT is still the preferred mixdown tool and is likely to remain that way for some time, its failure as a widespread consumer medium meant that you couldn't count on a DAT machine being readily accessible to the managers, agents, and others you intended to shop your recordings to. This situation forced many creative people to dupe their material to the trusty old (and I do mean old) compact cassette. So before your artistic efforts even made it out the front door, your precious material was compromised.

CD-R and CD-RW have changed all that. Nowadays, the biggest challenge

when purchasing a CD recorder is determining whether a dedicated unit such as the HHB CDR-850 reviewed here or one for your computer represents the best choice.

The purple-faced CDR-850 is a 2U rackmountable device weighing in at a substantial 15.4 lbs. The unit is supplied with an owner's manual, a wireless remote, power cord, a pair of stereo RCA terminated audio cables for analog

I/O, a supplemental sheet on the proper handling of CDs, a very useful guide to digital audio recording media, and one HHB (you were expecting otherwise?) CDR74 CD-R disc.

The CDR-850's rear panel provides everything necessary for integrating the recorder into a professional environment. For analog I/O, you'll find XLR balanced and RCA unbalanced connectors. Digital connections include an XLR AES/EBU input and both optical and coaxial S/PDIF inputs and outputs. There is also an 8-pin DIN connector for parallel remote control. The manual provides the pinouts for the jack, enabling a studio tech to easily access the unit. The port's implementation, however, lacks support for Play tally, Pause tally, Rec-Pause tally, Rec-Play tally, and Stop tally. A 15-Pin D-sub connector would have been a

better choice, as the additional pins could make tally information accessible. The 8-pin DIN connector takes priority over the wireless remote. If desired, the recorder's infrared capability can be disabled.

The unit's front panel has a clean, straightforward layout. The most noteworthy item here is the Input Selector, which offers the following choices: AES/EBU, optical or coaxial (S/PDIF) digital input, XLR +4 dBu, XLR -8 dBu, or line



## LAB REPORT

**MANUFACTURER:** HHB Communications USA LLC., 1410 Centinela Avenue, Los Angeles, CA 90025. Tel: 310-319-1111.

**APPLICATION:** Production of audio CDs for the professional studio environment.

**SUMMARY:** A well-made, good sounding CD recorder with straightforward, intuitive operation.

**STRENGTHS:** Easy to operate; flexible I/O architecture for both digital and analog connections; handy Skip ID function for use with recordable media; automatic sample rate conversion to 44.1 kHz CD standard; comprehensive feature set.

**WEAKNESSES:** The 8-pin DIN connector for parallel remote control is inadequate for providing any tally information; unit ships with a small consumer-style infrared remote as opposed to the more professional wired variety.

**PRICE:** \$1249

**EQ FREE LIT. #:** 111

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## PLACING START IDS

With many of today's digital recorders, the placement of Start IDs and, hence, track numbers can be a challenge to set accurately if you are re-recording a collection of programs. With analog sources, you may need to adjust the destination recorder's Auto Detect (level detection) parameter. While the default settings are usually fine for many types of material, programs with widely varying signal levels can cause the recorder to misplace and, as a result, "misnumber" the tracks.

For this reason, CD recorders provide the option of manual or automatic numbering. Unlike a DAT recorder, however, a CD recorder can't just renumber the disc after the fact. With CD-R, you

throw the disc away and start again. With CD-RW, you clear the entire disc and start over.

Digital source recording is typically less susceptible to the "misnumbering" condition as Start IDs are read automatically as part of the subcode information being received at the digital input. Copying a DAT isn't always foolproof, however, and can yield the same results as described earlier. This is because the Auto ID function on many DAT recorders actually places the Start ID slightly after the beginning of each track. By manually renumbering the tape so that the Start IDs occur prior to the first frame of audio, this situation can easily be avoided.

level analog input. Interestingly, if the desired input selection is already set to that position, it must first be changed to another setting and then returned in order to activate the Input Monitor facility.

Throughout my work with the CDR-850, all the controls felt solid and the disc tray opened and closed with a smooth motion — thus inspiring professional confidence.

At power on, the unit's display cycles through a series of "CD?, CD-R?, and CD-RW?" messages as it seeks to determine what form of media is in the drive. After recognizing that the drive is empty, it settles into a conventional display. Upon inserting a disc, the unit once again cycles through the aforementioned messages before recognizing the media, at which point it reads the disc's Table of Contents or identifies it as a new disc and then enters standby.

Playing a CD on the machine is like using any standard CD player. The unit provides all of the expected consumer playback features, several of which must be accessed via the remote. I could execute digital synchro recording with my DAT machine, search for specific tracks, have one track (or all tracks on the disc) repeat, program upwards of 24 tracks in any order, modify or clear the program and fade into or out of a track.

In a broadcast environment, the CDR-850's Auto Pause mode enables the operator to play a single track, at which point the unit stops. There's also a thoughtful touch whereby the digital outputs can be disabled. This feature is useful for preventing signal loops. The unit supports Selectable Copy ID,

facilitating free copying, a single copy, or no copies of a disc. With a recordable disc, the CDR-850 also provides a Skip ID function that is essentially identical to that of a DAT recorder. When recording from a digital source other than 44.1 kHz, the CDR-850 provides automatic sample-rate conversion to the 44.1 kHz CD reference standard.

I recorded to the CDR-850 both digitally and via analog in order to get a good sampling of its capabilities. Some material was from a commercially available CD, while other tracks were produced in my own studio.

Analog source recording frequently requires attention not only to the placement of Start IDs, but also to the unit's Auto Detect level. The CDR-850 provides settings of -66 dB, -60 dB, -54 dB, -48 dB, -42 dB, and -36 dB. The default is -60 dB. The challenge can occur if a program has dramatically fluctuating levels — perhaps a pianissimo string passage at the opening or close of the selection. If the Auto Detect setting isn't sensitive to these levels, the Start ID can be misplaced, causing the track numbers to be incorrectly written. For this reason, the CDR-850 provides both Manual and Automatic numbering. (See the sidebar on Start IDs.)

I recorded via the unbalanced line inputs using my DAT as the source. After selecting line on the CDR-850's Input Selector and pressing the Record key to place the machine into Record-Pause and Input Monitor, I adjusted my signal level. When I was satisfied, I pressed Play and the unit immediately entered Record mode as in-

dicated by the red LED over the tray. I then pressed Play on the DAT machine. Upon completion of the program, I pressed Stop on the CDR-850. Playback (indicated by a green LED over the tray) was perfect. The unit's converters sound very good [1-bit A/D converter on input side; multi-level Delta-Sigma D/A on output side]. There is absolutely no reason for avoiding the analog inputs if a digital path isn't an option.

I automated the mix of two small projects in Steinberg's Cubase VST and mixed them digitally to the CDR-850 using my sound card's optical S/PDIF output. The entire process could not have been easier. After correctly identifying a new CD-R disc, I pressed the Record button, which again placed the unit into Input Monitor. Since my levels were carefully set in Cubase, I checked to see if the CDR-850 was accurately reflecting them — it was. At this point, I pressed Play, and immediately thereafter, commenced playback in Cubase. The results were excellent.

When I was ready to mix my second project, I placed the same disc into the unit and pressed the Record key. The CDR-850 was ready to create track #2, and after checking all my levels while in Input Monitor, I pressed Play on the CDR-850, followed by Play in Cubase. Again, my recording was perfect, and each of the two programs on the disc was correctly identified as tracks #1 and #2.

Finalization is a function whereby a CD-R disc is processed in order to make it compatible with standard CD players. With my disc in the tray, I pressed the Finalize key. The CDR-850 informed me the process would take just over 4 minutes, at which point I pressed the Pause key. The recorder displayed remaining time as it processed the disc, and, upon completion, my CD-R disc became a regular CD. It is important to note that while CD recorders like the CDR-850 work with CD-RW media, these discs are not compatible with conventional CD players.

HHB's CDR-850 is a well-made, good sounding recorder that has most of the features you're likely to need. Operation is quite intuitive, and, for the few functions that you can't quite grasp, the manual is perfectly adequate. The unit's tepid support for remote parallel control is its biggest shortcoming, and this is only an issue if you require tally information as part of a larger system environment. While I would certainly prefer a wired remote as opposed to the consumer-style infrared variety, the unit functions well — but it feels rather "dinky" in your hand. All in all, the HHB CDR-850 is a fine recorder that will serve the overwhelming majority of facilities very well. 

## DA7 TECH TIPS

continued from page 34

Enter. This will put the data in a buffer. Scroll up to the Sheet Edit area, select Copy, press Enter, then select Paste, and hit Enter. You have now put an identical event next to the event you selected to copy. You can now go into the individual parameters of the event, changing the Parameter field to whichever aux you would like to work on. In the CH field, select the Channel where the aux resides. In the Data field, input ∞ (infinity) using the Jog Dial. In the Time field, input the time you wish this event to occur. (Note: As you change the fields, you must press Enter to record the change.) You can now return to automation, play back your mix, and, when the aux that you set to infinity in the Event Editor hits that timecode location, it will instantaneously turn off. The soon-to-be-released MAX outboard Mixing Automation & eXpansion software will make quick work of this as well.

*Bobby Frasier is the sales and marketing development specialist for Panasonic Professional Audio. He currently resides in North Hollywood, CA, next to a Starbucks. But doesn't everybody?*

## MEGADETH

continued from page 68

so you have to react to that. That's what I like about doing records here in Nashville — it's a breath of fresh air. We have to keep reminding ourselves that we got into this because we wanted to break the rules. The second you start setting rules up for yourself and start saying 'it can't be done,' having preconceived ideas, then you're boxing yourself in and you start getting old!"

Balding agrees that even he has limitations in what he can do to the sound. "In talking about tone and guitar players, I think it's all about the touch that a guitar player has. With Dave, that's the whole sound of Megadeth. That touch and the sound that comes out of his fingers." Mustaine, who believes the ultimate Rock sound has yet to be captured, shares this final anecdotal thought, "I had a girlfriend when I was a kid that told me it didn't matter how big my pencil was, it was how I wrote my name. I think that has a lot to do with using the same gear as someone else. You can have the same exact pencil, but it's how you write with it."

*Additional technical information provided by Mark Hagen, assistant engineer for the Megadeth studio project. Also, Doug Brooks, who is the band assistant, can be reached at [DBrooks@laserconnect.net](mailto:DBrooks@laserconnect.net) with additional Megadeth technical questions.*

## STUDIOMIX

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there's some audible latency on digital audio tracks (but not with MIDI) — move a fader quickly and the change in audio may lag a bit. Fortunately, this occurs only while recording; during playback, the audio comes in and out as intended. More memory and a faster processor speed minimize latency.

The software allows recording up to a theoretical maximum of 256 tracks of MIDI and digital audio, and playback of eight simultaneous tracks of audio. Your mileage may vary, depending on your computer; if you start loading several DirectX plug-ins into Cakewalk, though, you'll definitely need a faster processor. Cakewalk also allows MIDI plug-ins, which process MIDI data. **EQ**

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World Radio History

133

# Stream a Little Stream of Me



PHOTO BY STEVE JENNINGS

## A report from Spring Internet World

BY JON LUINI AND ALLEN WHITMAN

"It's difficult to predict the future without history." —Charlie Gilreath

In the yawning chasm of the Los Angeles Convention Center, hordes of freshly minted e-business warriors descend upon each other, stoking a feeding frenzy of commerce, cash, and control. The usual suspects are represented: Intel, MCI, Microsoft, AT&T, and even the hoary old United States Postal Service (using Steve Miller's "Fly Like An Eagle" as their ad-line, proving how music suffuses life at every level). From the eight T1 lines to the 35 miles of Category 5 copper cable strung throughout the buildings, the truly stupendous level of resources and energy dwarfs the annual budget of all the public schools in South Central Los Angeles.

"Excellent sales pitch. Not what I asked for, but..." —Michael Tchong

Long lines of humanity snake in tortuous trails as Street Blimp trucks waste tanker loads of gasoline driving the streets around and around the gigantic halls, displaying orange and yellow placards that

tout products with names that can't be pronounced, let alone spelled. It's the business of the Internet and it's business as usual, but with an edge. Everybody, from gray-suited corporate stiffs to promo flacks fresh out of junior college, speaks in the language of "Internet Time." History teaches that as soon as the big corporations start picking up the vernacular of the street, meanings of words devolve into mere sounds. Your FezGuys are there, to separate vapor from verity. We used the sharpest, longest blade we could lay our hands on. And we went snicker-snack.

Statistics flew fast and furious, and Ronald Reagan made it all too clear just how stupid facts can be when stuck in a feedback loop. Try these: the business of music is worth \$38 billion. Over 75 percent of Internet-based music companies didn't exist a couple of years ago. Sixty-five percent of music buyers have access to the Internet. There are over 200 million e-mail addresses. And the brilliant observation that, at this stage of Web audio, we are playing

"Pong." All this mess to ask the question: "How the hell can we make money using (and we mean 'using') the INTERNET (acronym: Incredible Notion To Entertain Really New E-business Techniques)?"

"The great thing about music is it's really complimentary." —Mark Wachen

Spinner.com, an Internet radio station offering genre-specific music streams, stunned themselves by experiencing a 700 percent increase in traffic since July of last summer. They reported the recent news that "MP3" was the most popular word entered into search engines, displacing, if it can be believed, "SEX." Human nature must be headed towards extinction. The Spinner.com kids went so far as to hint at future interactivity. Ground breaking! People could potentially be their own DJ by programming personalized streaming audio content from a wide variety of musical styles.

"MP3.com sucks balls." —A 19-year-old geek quoted in *Rolling Stone* magazine

Of course, the current hero of Everyman was there. Michael Robertson, chair-

## WHAT'S NEW

HeadSpace, Inc., of San Mateo, CA, announces their groovy new Beatnik 2.0 release, an upgrade for the powerful, great-sounding Beatnik suite of audio tools. The new version supports MP3 compression. MIDI users rejoice! Now you can use MP3 compression for RMF MIDI-controlled samples. Boasting 64 voice polyphony (up from 32) and doubling the simultaneous audio instances from 8 to 16, a body no longer has to be a brain surgeon to have a bunch of sonic stuff all happening at once! Content developers can create "sonified" Web pages once and have them work seamlessly within MSIE or Netscape. Four new reverbs are available. The Pro version (at \$19) offers a fat, 6 MB sound bank and 44.1 kHz, 16-bit CD-quality audio. The package is now available for Mac or Windows. Hooray!

### Microsoft Windows Media Technologies 4.0:

Mentioned elsewhere in this column, this new technology brags FM-quality stereo streaming at 28.8k bit rates (!) and MP3-quality audio at half the stream size (64 kbps near-CD quality) using three new advanced proprietary codecs (music

audio, video, and voice audio). Also included are rights management, pay-per-view capability, and a host of other features.

Initial FezGuy at-a-glance analysis shows that, without delving too deeply into the inner workings of the technology, the audio does indeed sound far superior to their previous offering. Perhaps even better than the new Real G2 (Cook) codec, making it potentially the best-sounding low-bit-rate codec. Of course, you can trust us to get under the hood with a more detailed report very soon. Our FezPop always said: "If it's true, it ain't bragging."

Also, in the continuing trend towards Web conglomeration, RealNetworks has announced they are purchasing Xing Streamworks. This should be a good thing for consumers and content producers alike. The FezGuys trust that this will result in more tightly integrating MP3 technology into RealNetworks' enormous user base. The downside is that Digital Bitcasting, which have been providing MPEG plug-ins for RealNetworks technologies, may be left out of the loop. Digital Bitcasting is a small company that provides a great service, and we're hoping they'll find an appropriate arena for their obvious talents.

man/CEO of battered, but still valiant, MP3.com sat patiently, awaiting his turn to rant the good rant. He looked pre-occupied, staring out into the crowd as if challenging them to a duel. A true rock star without a guitar (he claims he has no experience in music, except for some clarinet in high school), Mr. Robertson fired his insistent tirade right down the throats of the attendees. "Ten thousand artists are currently represented on the site, with 125 new artists being added every day." "250,000 visitors to MP3.com every day." "MP3.com represents a change in the model of the record industry from ownership of music into a service-oriented business." "The Internet has made the consumer more powerful than the corporation." He went on to announce that artists can receive daily statistics on sales and downloads, unlike the major labels, which typically take 18 months to reveal stats. Also unlike the majors, artists can leave the partnership at any time and take everything with them. Mr. Robertson offered this caveat: "MP3.com is a meritocracy." That means: "A system in which the talented are chosen and moved ahead on the basis of their achievement." The FezGuys know that because we looked it up.

"The software hides all that yucky stuff." —Michael Robertson

But something is slightly off-color here. Michael Robertson has the power of righteousness in him. And though he is right about so many things relating to how record companies treat artists, there is a touch of the born-again Fundamentalist to his message. Mr. Robertson might just be the Internet audio equivalent of the young Annakin Skywalker, poised on the knife-edge of decision. Will he go to the Dark Side and become Darth Vader? Will we be hearing soon that MP3.com is now a wholly owned subsidiary of America Online, in a stock swap worth billions?

Probably not. But after his talk, he is mobbed by eager business card traders.

In other rooms, various new technologies were announced with much hoopla. Microsoft unveiled its new Windows Media Technology 4.0 suite in a blowout at the House of Blues on Sunset Blvd. There was much rejoicing, sort of. Elsewhere, IBM and RealNetworks announced an unsurprising partnership to develop a secure digital download system that they hope will be adopted by the major labels. A yawn was heard throughout the music community as listeners pondered yet another offering in the bewildering array of overly complex, totalitarian Internet audio software. Open standards? Major labels

don't need no steenkin' open standards. They're not interested in anyone's rights. They're interested in control. God bless 'em.

"You don't need any bait with a net." —Andy Abramson

In the licensing session "Navigating the Licensing Minefield," complex issues surrounding legally incorporating music online were covered in a succinct fashion. An actual lawyer strongly recommended that musicians keep control of their publishing and master recording rights. The FezGuys are grateful this formerly inside

information is making it into the mainstream conference agenda.

"The emerging dilemma is do you take a traditional label deal?" —Brad Biddle

If the FezGuys have learned anything over the past few years, the answer is probably no.

#### LETTERS TO FEZGUYS

*I am experimenting for the first time with downloading sound files from the Internet. I need to take a downloaded RealAudio file*  
continued on page 138

## ROYER MODERN RIBBONS

"Definitely the best mic I've ever used for recording electric guitar."  
— Sean Beavan (Marilyn Manson, Nine Inch Nails)

"I'm absolutely thrilled. The high frequency response of this microphone is extremely smooth and soooooo sweet!"  
— Bruce Swedien

"A very rich, clear tonal characteristic."  
— Ed Cherney

"With Royer's, I just record flat and get amazing tracks."  
— Matt Hyde  
(No Doubt, Mighty Mighty Bosstones, Soul Asylum, Porno For Pyros)

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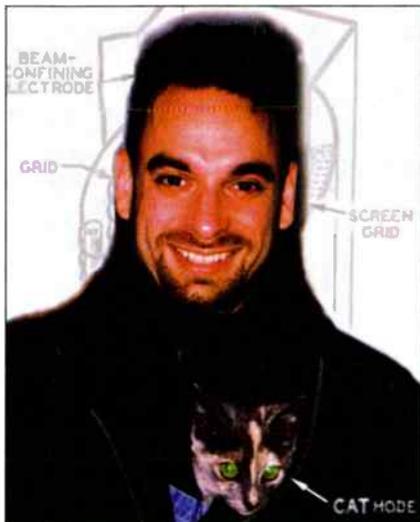
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# Pultec EQ 101

Going deep inside and fixing the classic equalizer

BY EDDIE CILETTI



Who doesn't love Pultec equalizers? Their reliability and versatility, even after 35+ years, is an inspiration to all. Would you believe I once saw them being sold as "surplus" on New York's Canal Street for \$95! Apparently one of the broadcast networks was decommission-

ing a room and just tossed 'em out.

When you think about an equalizer, the ability to boost and cut is presumed. But it wasn't always so. Where does the "boost" come from? Electronic sleight-of-hand requires that the signal first be attenuated; only then can boost be a possibility. Both Pultec and Lang equalizers are passive, meaning the frequency-manipulating circuitry requires no help from the active world (tubes and transistors), but there is a serious amount of signal loss — more than the total amount of boost — hence the need for "make-up" gain.

Many people e-mail me requesting Pultec schematics. The basic amplifier *sans* power supply is shown in fig. 1. It's funny to compare then and now. Then, "the Black box" was the equalizer circuitry — patented by Western Electric, licensed by Pulse Techniques, the latter company specializing in "amplifier technology." The secret ingredients are "potted" in wax to make it hard to reverse-engineer the magic.

### RAISING THE DEAD

Sometimes the frequency selectors will develop a "dead" position. If you are lucky, the cause of *signalis interruptus* is a dirty switch or a broken wire. To gain entry into the device, it will be necessary to melt the above-mentioned wax. It's a messy job.

Amplifier problems are more easily solved. While still connected, re-

move the tube shields and tap those valves with a finger to check for microphonics and interconnect problems. Tube sockets get crusty over time, so I've been using toothpicks moistened with anhydrous alcohol to clean them. (For safety turn the power off *and* unplug!)

### MIRROR IMAGE

With the big noises gone, I then connected two oscilloscope probes, one to each of the plates of the first stage (pins 1 and 6 of the 12AX7). Using a sine wave oscillator for the basic tests, you'll find the circuit easy to troubleshoot. The transformer-coupled design is naturally balanced — the signal at each plate should be a perfect mirror image. If not, look on the other side of the coupling capacitors (highlighted in reverse-video). If the signal is even worse, especially at low frequencies, change the capacitors. (One of the caps on my unit was completely dead. The other was half its printed value.)

New caps solved the frequency response error and improved the symmetry, but I did ultimately hand-select a few tubes for an even better match. I then switched to a square wave oscillator to check all of the frequency options, cut, and boost.

### SURFING THE SQUARE

In order to confirm the frequency response of the amplifier and the performance of the various equalizers it is necessary to have some test equipment.

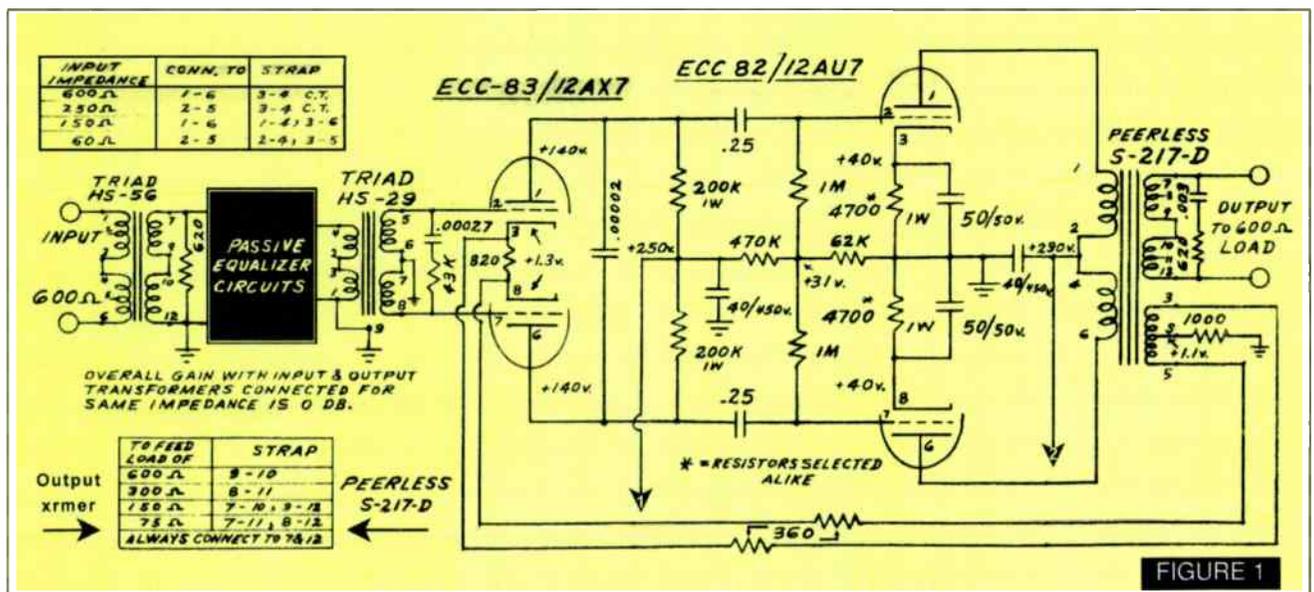
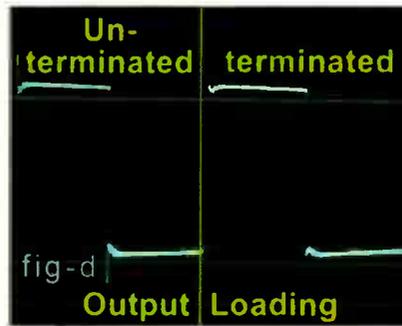
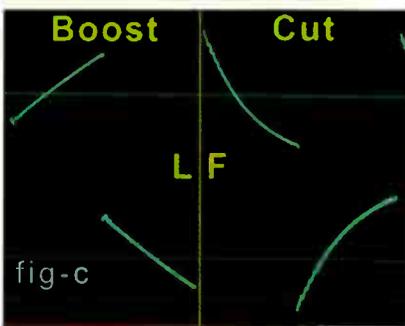
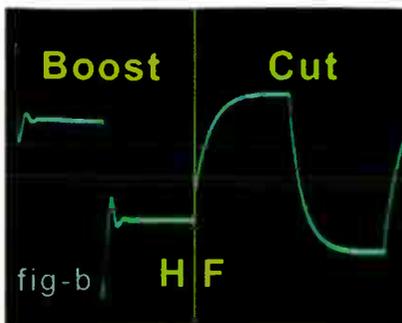


FIGURE 1



## MAKING THE MOST OF THE OSCILLOSCOPE PICTURES

Figure	Connect 'scope to	Left Pane Description	Right Pane Description
a	12AX7, pins 1 and 6	Asymmetrical amplitude at the Plates (output) of the first stage indicates loading problem by the next stage.	Improvement after changing interstage caps and the next stage of amplification, the 12AU7.
b	Output	High Frequency Boost spikes the "rise-time" of the square wave.	High Frequency Cut softens the sharp "rise-time" edges.
c	Output	Low Frequency Boost produces this signature "tilt" of the square wave.	Low Frequency Cut produces this characteristic "droop" of the square wave.
d	Output* (see note)	Pultec Unterminated: transformer ringing looks similar to HF Boost.	Pultec Terminated with 600-ohm resistor. Square wave looks nearly perfect.

\* Note: Equipment from the transformer-coupled era was designed for maximum power transfer, operating at 600 ohms impedance. All gear had the same input and output impedance, not "bridging" as is the norm today (Hi-Z input, low-Z output). If you are connecting a Pultec or similar device at the insert point of a modern console, a 600-ohm terminating resistor should be installed at the output.

There are many alternatives, starting with a sine wave oscillator and a voltmeter. A spectrum analyzer is handy for checking those EQ curves, and a sophisticated all-in-one test set makes nice printouts, but...

Applying a 1-kHz square wave is a quick and easy way to get a quick snapshot of the audio spectrum, viewed on an oscilloscope. Unlike a sine wave, which is a single pure tone, a square wave is a complex combination of fundamental and odd harmonics that extend ten times

that of the fundamental. With this one signal, you can immediately determine if termination is required, capacitors have failed, and, especially in this case, if all of the equalizer options are responding.

Figures -a through -d show the 'scope traces. Table 1 has the explanations. Each image is divided in half to conserve space yet reveal the differences. Happy viewing.

For more information on Vacuum Tube gear, visit: [www.tangible-technology.com](http://www.tangible-technology.com)

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IN  
JUNE

### COMPANY MAN.

Nile Rodgers discusses his latest role — that of record company executive. Learn how an independent record company — run by an active record producer — does business. And maybe if we're nice, Nile will offer some recording techniques as well.

### MIC AUDITIONS.

With all of the new microphone introductions of late, it's hard to keep track. EQ presents auditions of several new mics, including those from CAD, Royer, Korby, ADK, and Alesis.

To be a part of this exciting issue, contact: **Andy Myers, Associate Publisher (ext. 457); Christine Cali, Manager of Specialty Sales (ext.454); Albert Margolis, Midwest Sales (949-582-5951); Dan Brown, West Coast Sales (650-345-7199)**

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## MP3 FOR STUDIOS

*continued from page 90*

has Internet-ready audio, and all she needs is a page to place it.

Should you charge for this service? The FezGuys struggled with that one. Even batch-encoding audio files can be time consuming (potentially adding as much as one or more days to your work). The process and the payoff (or lack of it) may seem overly complex. Once up and running though, the process becomes merely a couple of clicks on your desktop and some downtime on your computer. Maybe the appropriate way to go is to offer the basic complete song MP3 and RealAudio files for free, and charge a small fee to provide the 30-second streaming song samples. Optimizations of RealAudio low-bit-rate-encoded streaming files could be another add-on. This freebie might make your studio stand out from your competitors. If you find that your studio starts doing a lot of this kind of work (and you can't spare the processing power or the time), it's possible to outsource your encoding to a company like encoding.com ([www.encoding.com](http://www.encoding.com)). It's as simple as FedEx'ing them a CD and appropriate instructions (including track information and how you'd like to receive the encoded files).

The FezGuys invite you to consider that this process will soon become commonplace among studios for hire. So get cracking. Good luck, and may the Fez be with you! 

## BAD RELIGION LIVE

*continued from page 113*

is another story. "That was a big thing," Ronnie admits. "Compression, and reamping the vocal through a tube pre if I thought it was a little thin. We used the Focusrite Red 3 on kick drum and the lead vocal, as well as a Red 2 on vocal. I used an Aphex compressor for the bass guitar exclusively. That was pretty much it. I tried to stay away from gates, but I used them where I had to. On the kick and snare, I had Drawmer DS201's — which I still think are the best ever made. The vocal mic was not turned off when Greg wasn't singing, so every once in a while you'll hear Greg walk over to the drum kit. But it's a live record, so we left it in. Greg will do that to get your attention if he thinks you're not paying attention at FOH — he'll put his mic under a crash cymbal!"

When asked if there were any strange or unexpected noises that made their way onto *Tested*, which was the

name given to the live CD, Ronnie relates a quick story about one of their shows. "We were playing in Estonia. Greg told the crowd that he was hungry for a hot dog, but didn't have any local currency. All of a sudden, the stage got pelted with about seven dollars worth of change — which is a lot of the local currency raining on the stage. We left it in..."

*Ronnie Kimball has plans to record another live record in San Diego, this time for The Cadillac Tramps. He may be reached online at: [lonkimbar@aol.com](mailto:lonkimbar@aol.com)*

## FEZGUYS

*continued from page 135*

and convert it into Sound Designer II or AIF format for importing into Pro Tools software. Digidesign tech support initially said that Pro Tools v4.3 can convert RealAudio files into SDII. When this proved untrue, Product Support told me to call WAVES, to see if Waveconvert software would convert RealAudio files. WAVES said no, and that they don't know of any software that does. Then someone on the Pro Tools users conference said Barbabatch software would do the conversion...but Barbabatch said no. So, my question is: Can RealAudio files be retained and converted? If not, how do I download an audio file in a format that can be converted to SDII? Thank you very much for your help. —*Deb Driscoll*

Good question! People are often asking for tools to convert a RealAudio file to a WAV or AIF file. Alas, RealNetworks doesn't currently provide one. There are some hacker-type programs floating around the Internet which are reported to do this, but the most straightforward (though admittedly unpleasant) solution we've come across is to take a line-out from your sound card into another audio input (be it traditional analog/digital device or another computer). Then it can be encoded. Remember that unless it's a high-bit-rate RealAudio file, the quality of the resulting AIF/WAV file is going to be rather poor. One other detail to note is that when you have a .ram file on your desktop, it's typically the "metafile," which contains *only* the pointer to the actual audio file, and not the audio file itself (which is named either .ra or .rm). Your other options are to limit your downloads to formats that are currently supported by Sound Designer II. If the sound file of your choice is not available in a format you can use, you might try e-mailing the site's creators with your request.

Good luck and happy converting! —  
The FezGuys 

# TRAILSIDE RANGERS

continued from page 77

hat, and L/R overhead. Dale played an Epi-  
phone Beatle Bass, which we patched into  
the console via SansAmp Bass DI. At the  
channel, an ART Pro VIa was patched into  
the insert, with a 4:1 ratio and threshold set  
to give us about 10 dB of compression.

Each guitar amp was given its own  
track, so we'd have clean and crunch tracks  
for both Rowan and Joe. Since there were a  
total of four amplifiers being recorded, our  
tapes ultimately had tracks for "Rowan gui-  
tar, crunch," "Rowan, guitar clean," "Joe gui-  
tar clean," and "Joe guitar, crunch." There  
was good news and bad news about record-  
ing the guitars in this manner: first and fore-  
most, we were able to get the tones we want-  
ed for both crunch and clean without any  
compromise for either. Also, I liked the idea  
that during mixdown, we'd have these  
sounds on separate tracks — so we wouldn't  
have to start messing around with differ-  
ent EQs for different sections of the songs  
(we'd be mixing without automation).

The drawback was that there would  
be a lot of leakage on the tracks that  
weren't being used. In other words, if  
Rowan was playing a clean sound during

the session, the crunch track was still in  
record, picking up the room sound, drums,  
and ambient guitars and vocals (I didn't  
know the songs well enough to punch the  
clean and crunch tracks in and out during  
the tracking session). An obvious quick fix  
would be gating the tracks, but I decided  
on a different approach: after a day or two  
of working on the project, I'd know the  
songs and guitar parts and I could spend  
some time erasing the spaces in those  
tracks when one guitar sound or the oth-  
er wasn't active (this worked out very well).

The day after tracking, we went into  
The Wood Shop to start overdubs. On that  
day, Joe and Rowan sang their lead vocal  
parts for all 10 songs, including "Unfurl My  
Soul" — an acoustic song entirely record-  
ed that second day. On "Unfurl..." Joe  
started with a 12-string acoustic that I  
miked with a Neumann KM 84 through a  
Demeter VTMP2a mic pre, then to a Val-  
ley Audio Commander, and then to DA-88.  
We placed the mic's capsule on the tail end  
of the guitar, about halfway between the  
end of the bridge and the top of the guitar,  
angled slightly downwards. When Joe  
completed the 12-string track, we both had  
that gleam in our eye and decided to dou-  
ble the part with a 6-string acoustic that  
was miked in a similar manner.

Probably the most adventurous sound

of the CD came in the song "Gun Hill Min-  
ing Disaster," where Rowan had to play a  
screaming feedback note for the duration  
of the first verse. His Gibson ES-335 was  
plugged into a RealTube pedal and then  
into the Boogie head. To say that we  
cranked up the gain a little would be like  
saying Clinton fools around a bit. Even with  
Rowan standing near the control room  
door (the studio door open), the amp would  
wail when he opened the guitar's volume  
pot. I recall that, while playing this part,  
Rowan had one hand on the guitar neck  
and one hand over each ear [*this guy must  
be pretty dexterous —Ed.*]. Lucky for both of  
us he quickly figured how to get the requi-  
site notes. We rolled tape and laid it down  
(BTW: the amp was miked with a '57).

Much to the credit of the Trailside  
Rangers, we tracked, overdubbed, and  
mixed ten complete songs in eight work  
days over a period of only two weeks. We  
did go a bit over budget, but the time was  
well spent — especially since the guitar  
tones on tape are true to the band.

*Trailside Rangers may be reached  
through Jericho Hill Records, P.O. Box  
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## ACROSS THE BOARD

*continued from page 162*

where they were before they left the digital tape. The interface boxes or digital console that gets the audio into the workstation delays the digital audio, the processing of signals through plug-ins delays the digital audio, and the interface box or digital console that passes the digital audio back out to the digital tape delays the digital audio. The easiest place to compensate for this delay is inside Pro Tools, or whatever workstation you are using. Here is how to do it.

1. Identify a percussive track to use for alignment purposes. A click, a snare, guitar chinks, or any other track that contains percussive attacks.

2. Make sure the workstation is chasing the tape machine in sync.

3. Record the track into the workstation though the chain of boxes you plan to use.

4. Without sliding the audio track, assign it to an empty track on the digital tape machine.

5. Record the track in sync from the workstation to the digital tape machine.

6. Delete the audio track in the workstation to avoid confusion during the next step.

7. Make sure the workstation is chasing the tape machine in sync.

8. Set up to transfer the original percussive track *and* the track you just transferred to tape. They *must* be transferred together.

9. Record both tracks into the workstation.

10. Zoom in to the sample level and measure the distance between the attacks of the two different tracks. This is the round-trip delay in samples.

In my setup, this turns out to be about 42 samples, which is about one millisecond. I make the compensations right after recording into Pro Tools. I record the audio, then slide the tracks over 42 samples earlier. I can then cut up tracks, copy them from place to place, and, when it comes time to copy the tracks back to digital tape, all of the compensation is already done.

The amount of delay will vary from setup to setup. ADAT to Pro Tools and back will be different from DA-88 to Logic Audio and back. If you are going through a digital console, the delay will be different than through an Apogee AD-8000. Most digital consoles have a delay of around three milliseconds.

Because timecode is the usual

synchronizing reference, the resolution of the lockup can be off by a few samples here and there. When I transfer additional tracks from the digital tape to Pro Tools, I always digitally bounce a second of the click track (or some other percussive reference) onto the track I am going to transfer. After the track is in Pro Tools, I slide the track earlier until the click piece lines up with the master click reference that is already in Pro Tools (from the initial transfer). Because of sync slippage, the amount of delay may wander from 42 to 48 samples.

The one time I didn't take time to put some click on the track to be transferred was during a horn session with six drooling horn players getting triple-scale weekend overtime (the equivalent of about one Porsche per three hours of session). I needed to transfer the three passes (18 tracks) into Pro Tools to make room on the Sony 48-track for three more passes (we then take the best parts of the six passes to make the master horn track). Everything had been going fine in transfer land, so I just transferred the 18 tracks, slid them earlier by 42 samples, and went back to recording.

We recorded two more passes and then recorded just the tag of the song one more time on the third set of tracks. "Great, I think we've got it in there somewhere." The remaining 18 tracks were transferred to Pro Tools, but this time the horn players were gone (they were out of the studio before I let go of the talkback button). I transferred some click to one of the 18 tracks, transferred the horns to Pro Tools, and slid the tracks over until the clicks lined up — exactly 42 samples.

While listening back to the horns, I found that the first 18 tracks were horribly out of sync by about 27 milliseconds. It turned out that there was some sync burp during the transfer, the horns were way off, and there was no reference click. The client asked, "Everything's going to be alright, isn't it?" I smiled and said, "Uh, sure!"

Luckily, I didn't record the whole song the second time on the third set of tracks, so there were some horns left from pass three. Pass three had been transferred into the computer on the first pass of 18 tracks. I now had a common piece of audio on both the first set of 18 tracks and the second set of 18 tracks. I used a horn stab in the second chorus to line up the first set of 18 tracks. Saved by the bell (of the trumpet).

I just got a new Mexican digital audio workstation that has so much internal delay that the audio signal won't come out until tomorrow. It's made by a company called Mañana Digital Audio. Cool. 

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- George Petersen, Mix Magazine



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## DIGITAL MIXERS

# MACKIE

## Digital 8 Bus Mixing Console



Everything you've been waiting for and more!!! The new digital 8 bus from Mackie features great sound quality, full recording and middown capabilities, motorized faders and an array of digital features geared to take you flying into the next century. See for yourself what the entire industry is raving about.

### FEATURES-

- 48 channels of automated compression, gating, EQ and delay
- Built in 3-way meter display keeps you on top of your mix.
- Built-in meter bridge,
- Ultramix II automation for complete control, hook up an S-VGA monitor and you'll feel like you spent a lot more money.
- All functions can be automated, not just levels and mutes. Store EQ, reverb, compression, gating and even Aux send information.
- Fast SCENE automation allows you to change parameter snapshots on every beat.
- Reads Standard MIDI tempo maps, displaying clock info on the built-in position counter.
- Truly the cutting edge of mixing technology.



\* monitor, mouse & keyboard sold separately

# Panasonic

## WR-DA7 Digital Mixing Console



Stop dreaming about your digital future, it's here! The Panasonic WR-DA7 digital mixer features 32-bit internal processing combined with 24-bit A/D and D/A converters as well as moving faders, instant recall, surround sound capabilities, and much more. Best of all, it's from Panasonic.

### FEATURES-

- 32 Inputs/6 AUX send/returns
- 24-bit converters
- Large backlit LCD screen displays EQ, bus and aux assignments, and dynamic/delay settings.
- 4-band parametric EQ
- Choice of Gate/Compressor/Limiter or Expander on each channel
- 5.1 channel surround sound in three modes on the bus outputs
- Output MMC
- Optional MIDI joystick



\* meter bridge optional

# TASCAM

## TMD1000 Digital Mixing Console

You want to see what all the digital mixing buzz is about? The NEW TMD100 from Tascam will have you smiling & automatin in no time. It features fully automated EQ, levels, muting, panning and more in an attractive digital board with an analog 'feel'. Your digital future never looked, or sounded, so clear.

### FEATURES-

- 4 XLR mic inputs, 8 1/4" balanced TRS inputs.
- 20-bit A/D D/A conversion, 64x oversampling on input, 128x on output.
- Store all settings, fully MIDI compatible.
- **Optional IF-TD1000** adds another 8 channels of TDIF and a 2-channel sample rate converter.
- **Optional FX-1000** FX board adds another 4 dynamic processors and another pair of stereo effects.



## DIGITAL RECORDING

# Lexicon

## Lexicon Studio Recording System

The Lexicon Studio System interfaces with your favorite digital audio software for a complete hard disk recording package. Supporting both PC and Mac, Lexicon Studio can be expanded up to 32 voices from a variety of I/O options. For recording, editing, mixing and DSP, Lexicon Studio is here.

### FEATURES-

- The Core-32 System PCI-Card is capable of supporting 32 audio streams simultaneously. It can also be used as a time code or clock master or slave.
- The PC-90 Digital Reverb daughterboard attaches to the Core-32 providing 2 discrete stereo reverbs.
- The LDI-12T delivers up to 12 channels of simultaneous I/O supporting analog (4 XLR and -10 RCA), s/pdif, and ADAT.
- Direct support of Steinberg Cubase VST and many other software programs.

### OPTIONS-

- The LDI-16S provides 8 channels of +4 XLR balanced analog I/O, and 8 channels digitally through TDIF.
- 3 option packages are:  
AES-8, 8 channels of AES/EBU digital I/O  
ADT-8, 8 channels of ADAT digital I/O and sync  
STC-1, Post option including read and write of LTC, read and generate of VITC, Window-burn House Sync and a General Purpose Interface for triggering external devices from the system).



## EFFECTS PROCESSING

# t.c. electronic

## Finalizer Express



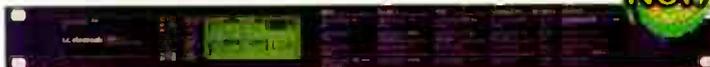
The Finalizer Express is a fast and efficient way to turn your mix into a Professional Master! Based upon TC's Multi-Award winning Finalizer Mastering Technology, it delivers the finishing touches of clarity, warmth and punch to your mixes, putting the world of professional mastering within your reach.

### FEATURES-

- 24-bit resolution A/D & D/A converters
- 16 & 20 bit dithering
- TC's unique Multiband Comp & Limiter Algorithms
- Boost and cut over three bands with the Spectral Balance Controls
- Soft Clipping and Look Ahead Delay.
- Finalize Matrix for 25 variations in style and rate

- Optimize overall level with the Automatic Make-Up Gain
- Extra compression in each band using Emphasis Keys
- Record fades from the built-in Digital Fader or the optional TC Master Fader via MIDI!
- Connections include AES/EBU, S/PDIF, Optical Toslink & MIDI I/O's.
- High Res LED Metering of I/O & multi-band gain reduction

## M3000 Professional Reverb



Incorporating TC Electronic's new VSS-3 technology, the M3000 is a great sounding, versatile reverb that is easy to use. Combining ultimate control of early reflections with a transparent reverb tail, the art of reverberation is brought to a new level. Whether it's a phone booth, cave or concert hall, the M3000 delivers high-quality ambience.

### FEATURES-

- VSS-3 VSS-3 Gate, C.O.R.E. & REV-3 reverbs as well as Delay, Pitch, EQ, Chorus, Flanger, Tremolo, Phaser, Expander/Gate, Compressor and De-Esser
- 300 high-grade factory presets including Halls, Rooms, Plates, Ambience, Gated Reverbs, and more

- Up to 300 user presets in internal RAM and 300 more using an optional PCMCIA card.
- Dual engine configuration featuring 24-bit A/D/D/A's.
- Connections include AES/EBU, Coaxial S/PDIF, Optical Tos-Link/ADAT & analog XLR I/O's, MIDI IN/OUT/THRU, Clock Sync and External Control.

# Lexicon

## MPX1 Multi-Effects Processor



The MPX-1 is truly an outstanding multi-effects device. Using Lexicon's Lexchip, it offers outstanding reverb or ambience as well as a separate processor for effects for awesome power in the studio or on the road.

### FEATURES-

- Intuitive user interface for easy editing, built-in help.
- Balanced Analog I/O (1/4" & XLR)
- 56 effect algorithms
- Digital Inputs & Outputs (S/PDIF @ 44.1KHz)
- 18 Bit A/D; 20 Bit D/A Conversion, 32-bit processing
- >90dB of Dynamic Range
- Intelligent Sorting by Name, Number, Application, etc.
- Parameter Morphing
- Dynamic MIDI patching & MIDI automation

## COMPRESSORS

# PreSonus

## ACP88 8 Channel Compressor

Stemming from their popular ACP8, the ACP88 comprises eight channels of compression, limiting and noise gating for a variety of studio applications. It features individual side chain for each channel and its attractive blue anodized finish lets you show your true sonic colors.

### FEATURES-

- 8 separate compressors/gates with individual controls.
- Servo balanced or unbalanced inputs & floating balanced or unbalanced outputs.
- Individual side chain jacks for spectral compression and a separate sidechain jack for gate processing.
- Each channel boasts full gain reduction metering, compression threshold indication & gate open/close.
- Front panel buttons include hard/soft knee compression, peak/auto compression, bypass, gate range and link.
- Link feature uses a unique summing bus for multiple combinations of master/slave link setups.

## dbx "Silver Series" Compressor Model 566

The new Silver Series introduces a 2 vacuum tube circuit design making the 566 no ordinary compressor. Loaded with features including custom designed analog VU meters that monitor tube level, gain reduction, or output levels. Full sidechain functionality, including sidechain monitor, Contour function allows low frequency material to pass through the threshold without triggering un-musical compression effects.

### FEATURES-

- Hand selected Premium 12AU7 vacuum tubes
- +4/-10 operation
- Drive control for a wide variety of great tube effects
- PeakPlus limiter on each channel
- Complete sidechain, OverEasy, and Auto function
- Optional TYPE IV Conversion System outputs
- Separate 1/4" sidechain insert send and return





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## HARD DISK RECORDERS



### VS1680 Digital Production Studio



The new VS-1680 Digital Studio Workstation is a complete 16 track, 24-bit recording, editing, mixing and effects processing system in a compact tabletop workstation. With its advanced features, amazing sound quality and intuitive new user interface, the VS-1680 can satisfy your wanderlust.

#### FEATURES-

- 16 tracks of hard disk recording, 256 virtual tracks.
- 24-bit MT Pro Recording Mode for massive headroom and dynamic range.
- Large 320 x 240 dot graphic LCD provides simultaneous level meters, playlist, EQ curves, EFX settings, waveforms and more.
- 20-bit A/D D/A converters
- 2 optional 24-bit stereo effects processors (VS8F-2) provide up to 8 channels of independent effects processing.



- New EZ routing function allows users to create and save various recording, mixing, track bouncing, and other comprehensive mixer templates for instant recall.
- 10 audio inputs: 2 balanced XLR-type inputs w/ phantom power, 6 balanced 1/4" inputs, and 1 stereo digital input (optical/coaxial)
- 12 audio outs: 8x RCA, 2x stereo digital & phones.
- Direct audio CD recording and data backup using optional VS-CDR-16 CD recorder.

## DIGITAL MULTI-TRACK RECORDERS



### DA-88 Modular Digital Multitrack

The standard digital multitrack for post-production and the DA-88 delivers the best of Tascam's Hi-8 digital format. Its Shuttle/Jog wheel and track delay function allow for precise cueing and synchronization and the modular design allows for easy servicing and performance enhancements with third-party options.

#### FEATURES-

- 1:48 minutes record time on a single 120 min tape
- Expandable up to 128 Tracks using 16 machines
- User-definable track delay & crossfade
- Shuttle & Jog capability
- Auto punch with rehearsal



- SMPTE, MIDI and Sony 9-Pin sync capability
- Options include RC-808/848 Remote Controllers, IF-88AE/IF-885D digital interfaces, MU-Series meter bridge, MMC-88 MIDI machine control interface, SY-88 Sync Card

### DA-38 Digital Multitrack for Musicians

Designed especially for musicians, the DA-38 is an 8 track digital recorder that nits performance at an affordable price. It features an extremely fast transport, Hi-8 compatibility, rugged construction, ergonomic design and sync compatibility with DA 88s.



### ADAT M20 20-bit Digital Audio Recorder

The M20 represents Alesis commitment to meeting the high-standards of world-class audio engineers, producers, studio owners and high-end video and film post production studios. A new professional digital multi-track, the M20 records 20-bit for outstanding sound quality. Combined with a host of production features like SMPTE/EBU, the M20 is a powerful tool.

#### FEATURES-

- SVHS Recording format - up to 67 minutes recording.
- 18-XLR connections (9 in and 9 out) as well as a 56-pin ELCO connection.



- 24-bit, 64x oversampling recording, 20-bit, 128x oversampling playback
- Digital I/O
- Includes LRC remote and a digital cable.

### ADAT XT20 Digital Audio Recorder

The New ADAT-XT20 provides a new standard in audio quality for affordable professional recorders while remaining completely compatible with over 100,000 ADATs in use worldwide. The XT20 uses the latest ultra-high fidelity 20-bit oversampling digital converters for sonic excellence, it could change the world.

#### FEATURES-

- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.



- Remote control
- Servo-balanced 56-pin ELCO connector.
- Built-in electronic patchbay
- Copy/paste digital edits between machines.

### ADAT LX20 Digital Audio Recorder

The most affordable ADAT ever made, the new LX20 features true 20-bit recording at a price you won't believe. Compatibility with all other ADATs and digital consoles, the LX20 provides the same sync options and digital inputs as the big brother XT20 at a lower price point.



## CD RECORDERS



### CR200 Professional CD Recorder

The Fostex name is not all the CD Recorder has to offer. The CR200 features S/PDIF I/Os, balanced XLR analog input, 5 record modes as well as a full function remote. A great choice for burning CDs in any studio or home recording environment.

#### FEATURES-

- Converts any input signal to CD 44.1kHz standard
- Uses both Professional and Consumer CD formats
- S/PDIF Inputs and Outputs for versatile interfacing.
- AES/EBU In, XLR Balanced Ins, Unbalanced Ins & Outs
- 5 Record Modes, Records To Red-Book Standards



- IDs Recorded Automatically
- Durable Platter Mechanism Resists vibrations
- Full-function Remote Included

## STUDIO DAT-RECORDERS



### DA-45HR Master DAT Recorder

The new DA-45HR master DAT recorder provides true 24-bit resolution plus standard 16-bit recording capability for backward compatibility-making this the most versatile and great sounding DAT recorder available. With support for both major digital I/O protocols plus the ability to integrate the machine into virtually any analog environment, the DA-45HR is the ideal production tool for the audio professional.

#### FEATURES-

- Word Clock
- 24-bit A/D and 20-bit D/A with dither
- XLR balanced and RCA unbalanced analog I/O
- AFS/EBU and S/PDIF digital I/O



- Word Sync In/Thru
- Alphanumeric data entry for naming programs
- Independent input level adjustment capability
- Output trim for XLR balanced analog output
- Optional RC-D45 Remote Controller

## Panasonic SV-3800

The SV-3800 & SV-4100 feature highly accurate and reliable transport mechanisms with search speeds of up to 400X normal. Both use 20-bit D/A converters to satisfy even the highest professional expectations. The SV-4100 adds features such as instant start, program & cue assignment, enhanced system diagnostics, multiple digital interfaces and more. Panasonic DATs are found in studios throughout the world and are widely recognized as the most reliable DAT machines available on the market today.

#### FEATURES-

- 64x Oversampling A/D converter for outstanding phase characteristics
- Search by start ID or program number
- Single program play, handy for post.



- Adjustable analog input attenuation, +4/-10dBu
- L/R independent record levels
- Front panel hour meter display
- 8-pin parallel remote terminal
- 250x normal speed search



### D-15 Pro Studio DAT Recorder

The new Fostex D-15 features built in 8Mbit of RAM for instant start and scrubbing as well as a host of new features aimed at audio post production and recording studio environments. Optional expansion boards can be added to include SMPTE and RS-422 compatibility, allowing the D-15 to grow as you do.

#### FEATURES-

- Hold the peak reading on the digital bargraphs with a choice of 5 different settings
- Set cue levels and cue times
- Supports all frame rates including 30df
- Newly designed, 4-motor transport is faster and more efficient (120 minute tape shuttles in about 60 sec.)
- Parallel interface • Front panel trim pots in addition to the level inputs



### D-15TC & D-15TCR

The D-15TC comes with the addition of optional chase and sync capability installed. It also includes timecode reading and output. The D-15TCR comes with the further addition of an optional RS-422 port installed, adding timecode and serial control (Sony protocol except vari-speed)

## SONY PCM-R500

Incorporating Sony's legendary high-reliability 40.0 Mechanism, the PCM-R500 sets a new standard for professional DAT recorders. The Jog/Shuttle wheel offers outstanding operational ease while extensive interface options and multiple menu modes meet a wide range of application needs.

#### FEATURES-

- Set-up menu for preference selection. Use this menu for setting ID6, level sync threshold, date & more. Also selects error indicator.
- Includes 8-pin parallel & wireless remote controls



- SBM recording for improved S/N (Sounds like 20bit)
- Independent L/R recording levels
- Equipped with auto head cleaning for improved sound quality.

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## TUBE MICROPHONES



### SOLIDTUBE TUBE MICROPHONE

The SOLIDTUBE combines the best of solid state and tube technology to provide a "warm" sounding microphone suitable for professional recording applications.

#### FEATURES-

- Large diaphragm condenser
- Integrated pop screen surrounds the capsule, reducing excessive pop noise
- ECC 83 (12AX7) vacuum tube which provides perfect transfer characteristics
- Includes elastic shock mount
- Low-cut switch, Ground lift switch



### audio-technica. AT4060

Combining premium 40 series engineering and vintage tube technology, the AT4060 delivers a versatile and competent studio microphone. Low-noise and high SPL capabilities make the AT4060 a premier vocal mic as well as strings, guitars and other demanding applications

#### FEATURES-

- 20 - 20,000 Hz freq response
- Dual gold-vaporized large diaphragm elements
- Includes the AT8560 power supply, AT8447 shock mount, rack mount adapters and case.



## MICROPHONES

### SHURE KSM-32

The new KSM32 side-address microphone features an extended frequency response for open, natural sound reproduction. Suitable for critical studio recording and live sound production, Shure steps up to the plate with another classic.

#### FEATURES-

- Class A, transformerless preamplifier circuitry for improved linearity across the full frequency range.
- Exceptionally low self-noise and increased dynamic range necessary for highly critical studio recording.
- 15 dB attenuation switch for handling high SPLs.
- Switchable low-frequency filter to reduce vibration noise or to counteract proximity effect.
- Great for vocals, acoustic instruments, ensembles and overhead miking of drums and percussion.
- SL model also features an elastic shock mount which greatly reduces external vibrations.



### BPM CR10

Hand-crafted in East Berlin, the BPM CR10 Studio Condenser Mic features a full frequency response for competition against the best of the best.

#### FEATURES-

- 1" Gold diaphragm
- Suitable for most guitar and vocal recording applications.
- Includes Custom Aluminum Road Case, XLR-cable, wind screen and elastic suspension.



## SAMPLING

# AKAI



### S5000 & S6000 Studio Samplers

Akai is proud to announce its next generation of samplers with the introduction of the S6000 and the S5000. Building upon Akai's legendary strengths, both machines feature up-to 128-voice polyphony and up-to 256 MB of RAM. They use the DOS disk format and .WAV files as the native sample format allowing standard PC .WAV files to be loaded directly for instant playback - even samples downloaded from the Internet into your PC may be used. And of course, both the S6000 and S5000 will read sounds from the S3000 library.

#### FEATURES-

- OS runs on easily upgradeable flash ROM.
- 2x MIDI In/Out/Thru ports for 32 MIDI channels
- Stereo digital I/O and up to 16 analog outputs.
- 2x SCSI ports standard
- Wordclock connection
- Optional ADAT interface provides 16 digital outs
- .WAV files as native sample format

#### S6000 ONLY FEATURES-

- Removable front panel display
- User Keys
- Audio inputs on both the front and rear panel allow you to wire the S6000 directly into a patchbay from the back and override this connection simply by plugging into the front.



### E-mu Systems, Inc.

### E6400 Professional Sampler

The e-6400 from EMU features an easy interface that makes sampling easy. Automated features like looping, normalizing and more allow you to flexibly create your own sound palettes or access any of the 400 sounds provided on 2 CDs for unlimited sound creation. It is upgradeable to 128MB of RAM (4MB standard) and features 64 voice polyphony, 8 balance analog outputs, SCSI, stereo phase-locked time compression, digital re-sampling and more. A dream machine.



## MIC PREAMPS

### Focusrite "Voicebox MKII"



The Voicebox MKII provides a signal path of exceptional clarity and smoothness for mic recording, combining an ultra-high quality mic amp, an all new Focusrite EQ section optimized for voice, and full Focusrite dynamics. The new MKII now includes a line input for recording and mixdown applications.

#### FEATURES-

- +48V Phantom power, phase reverse, and a 75Hz high-pass filter.
- Mute control and a true-VU response LED bargraph are also provided
- Includes a Mid-Parametric band with controls especially designed to enhance vocal characteristics.

- Single balanced Class A VCA delivers low distortion and a S/N ratio as low as -96dBu
- Dynamics section offers important voice processing functions such as compression and de-essing combined with a noise reducing expander.

### dbx 586 Vacuum Tube Mic Pre

The DBX 586 Vacuum Tube Dual Mic Preamp uses hand selected and matched premium 12AU7 vacuum tubes ensure ideal characteristics for a warm, distortion free signal path. Custom designed analog VU meters monitor tube level insert path or output levels well. Line/Instrument and mic inputs make the 586 versatile enough to use with virtually any input source.

#### FEATURES-

- Mic or line/instrument inputs on each channel.
- +4/-10 operation.
- Drive control for a wide variety of great tube effects

- 3-Band EQ with sweepable frequency
- Optional TYPE IV Conversion System outputs
- Separate 1/4" insert send/return on each channel



### JOE MEEK VC1 Studio Channel

The Joe Meek Studio Channel offers three pieces of studio gear in one. It features a transformer coupled mic pre, compression and a professional enhancer together in a sleek 2U rackmount design!

#### FEATURES-

- 48V phantom power, Fully balanced operation
- Mic/Line input switch
- High pass filter for use with large diaphragm mics

- Extra XLR input on front makes for easy patching
- Compression In/Out & VU/Compression meter
- Enhancer In/Out switch and enhance indicator
- Internal power supply 115/230V AC



## MONITORS



### M6000/S Studio Monitors

The KRK M6000/S are designed for close field monitoring. A smooth frequency response in a compact size make these units portable and efficient.

#### FEATURES-

- High power handling
- 62Hz - 20kHz, ±3dB
- Compact and portable
- Low distortion
- Smooth frequency response
- Custom Gray finish.



### Hafler TRM-8

### Powered Studio Monitors

Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Trans-nova power amp circuitry.

#### FEATURES-

- 45Hz - 21kHz, ±2dB
- 75W HF, 150W LF
- Electronically & Acoustically matched



### HR824

These new close-field monitors from Mackie have made a big stir. They sound great, they're affordable, they're internally bi-amped. "What's the catch?" Let us know if you find one.

#### FEATURES-

- 150W Bass amp, 100W Treble amp
- Full space, half space and quarter space placement compensation
- Frequency Response 39Hz to 22kHz, ±1.5dB



### TANNOY Reveal

The latest playback monitor from Tannoy, the Reveal has an extremely detailed, dynamic sound with a wide, flat frequency response.

#### FEATURES-

- 1" soft dome high frequency unit
- Long throw 6.5" bass driver
- Magnetic shielding for close use to video monitors
- Hard-wired, low-loss crossover
- Wide, flat frequency response
- Gold plated 5-way binding post connectors



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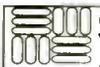
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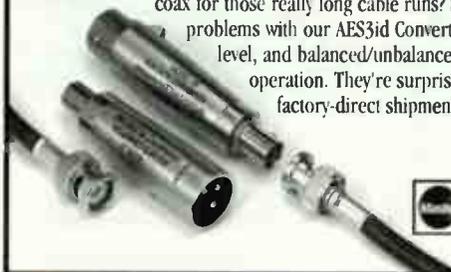


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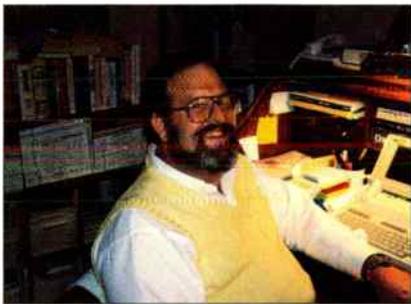
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# The Hobby Studio

How to handle your taxes when you don't make a profit — on purpose or otherwise



**BY MARTIN POLON**

Today, we will look at the tax issues surrounding the running of an unprofitable studio and its related cousin: the studio that is purposefully not run for profit. Incidentally, several readers of this column have questioned why these tax tips are run in early or late spring rather than at the beginning of the year so as to help with April 15 tax filing. The answer is a simple one. The precepts that are discussed here have relevancy for the entire taxable year and really apply to the future filing period rather than the last few months of the current one. Keeping a collection of these columns can be very helpful in guiding a studio to a survivable long-term tax strategy!

The term hobby studio is a tax concept that refers to a small recording studio that is run not as a business activity, but rather as the owner's hobby and is essentially unprofitable. The reason for the lack of profitability is not necessarily important, i.e., the deprecations of your mother-in-law, inept management style, poor choices of equipment, and/or the inability to attract musicians to record. It may be just plain lack of desire or even intent to be profitable. What is important to the U.S.

Internal Revenue Service (IRS) is basically two factors: Does the small business show a profit at any time in, say, a six-year period, and is it the owner's only income-producing activity. What the IRS does not want to happen is for the losses generated by an unprofitable small business venture, especially in a home studio (home office) setting, being used to defray profit from other business activities indefinitely.

The indications that an activity is a hobby include a lack of advertising in any publication suitable, including the Yellow Pages, community phone directories, and local/regional/community newspapers and music publications. The lack of any substantial amounts of billable studio time in the studio's books, or even the presence of the books (financial ledgers) themselves, also indicates the lack of any real commitment to producing income.

The size and other related activities covered in the tax return also impact the view taken by the IRS. If we are talking about a recording studio being the only business venture and source of income of its ownership unit, there are virtually no limits to the duration and amount of red ink that can be generated — other than bankruptcy!

The running of a small business out of a house, a garage, or other attached building that is considered part of the house is in effect a license to steal based on those parts of the tax code that are intended to nurture a fledgling business that starts in the home. The tax laws allow the deduction of all equipment purchases up to, say, \$25,000 per year. A substantial portion of the expense related to the home (including

mortgage/rent) can be stored up for future write-offs when the young business turns profitable. The purchase of a personal computer can be a deduction, as can telephone charges, Internet fees, etc. The intended model for this activity are three young people just out of high school who work at a McDonald's burger restaurant and pool their salaries to build a studio at one of their homes that shows a profit eventually.

The problem occurs with home studios as a hobby business that produce as much as \$50,000 in deductions without any profit against a non-music or even a music-related job that does not require a studio and reduces taxes from the so-called day job by half or more for a lengthy time frame. As long as a studio eventually becomes profitable against other sources of income or takes no deductions, there is no tax concern about abuse.

Perhaps the most simple way to visualize what is obviously a complicated concept is to think about a home swimming pool. No matter what the cost, the swimming pool will be an expense that you will not be able to write-off directly in almost any circumstances (except as required for health as certified by your physician and exceeding a given income percentage). The owner of a home studio can write-off similar or greater expense yearly without concern and additionally deduct whatever percentage of the house

expense the studio is entitled to based on its physical footprint.

Needless to say, this advice is designed to make you think about your tax options. You must consult a certified tax professional to discuss the particulars of your tax situation.

*The lack of any substantial amounts of billable studio time in the studio's books indicates the lack of any real commitment to producing income.*

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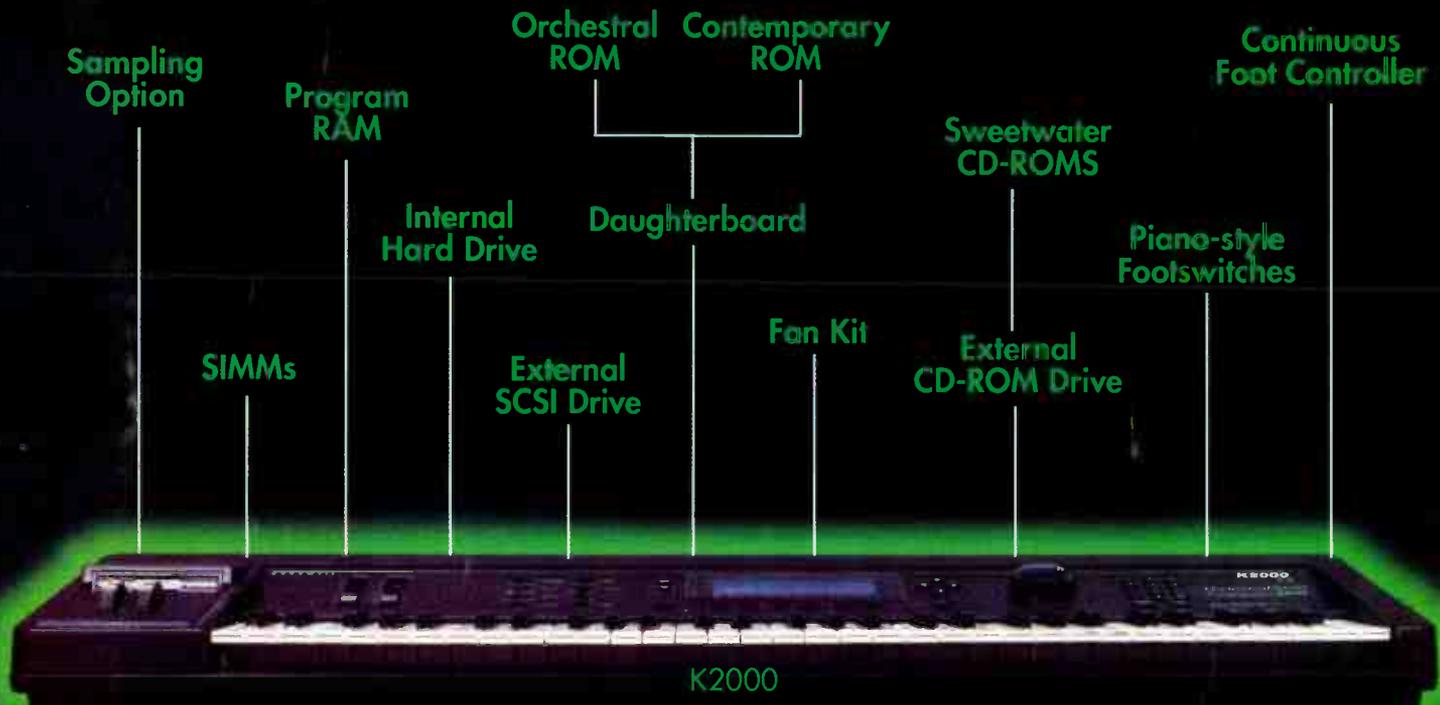
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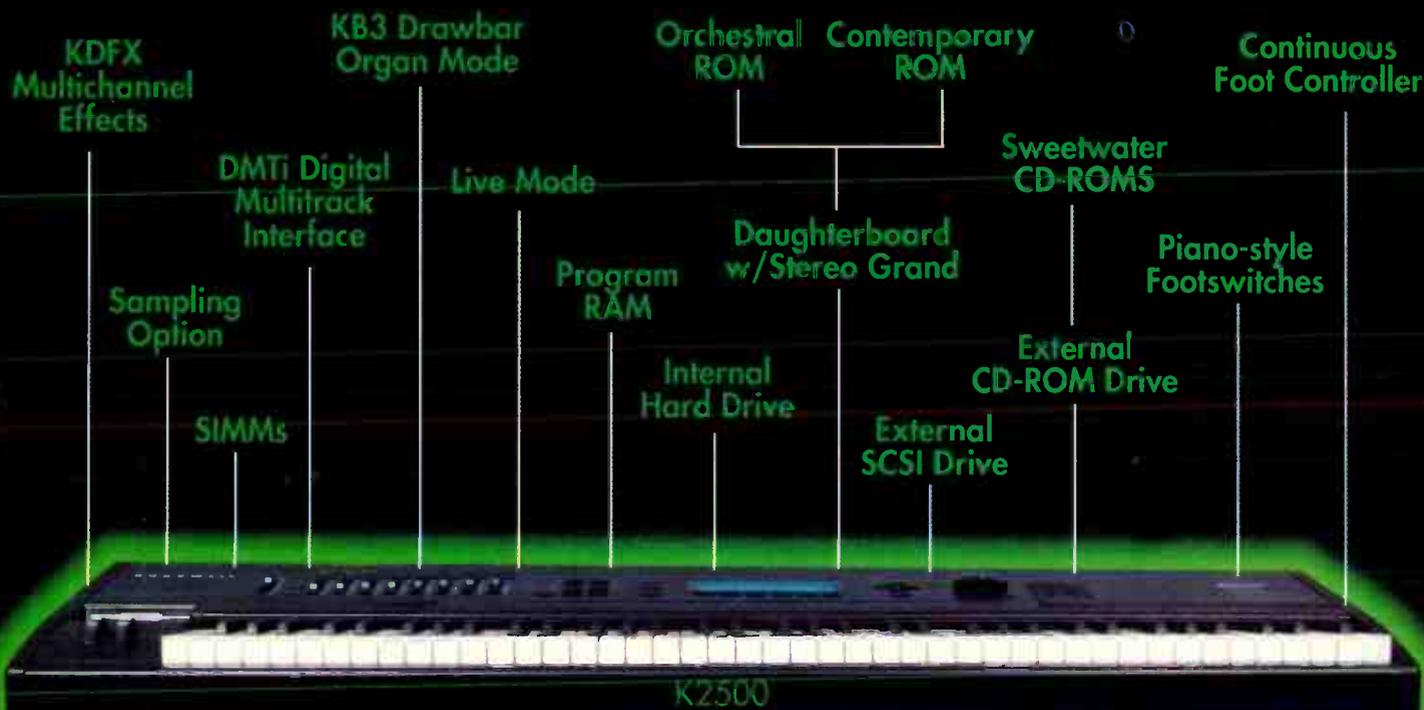
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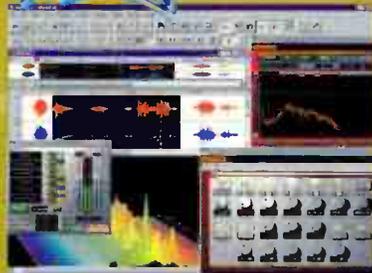
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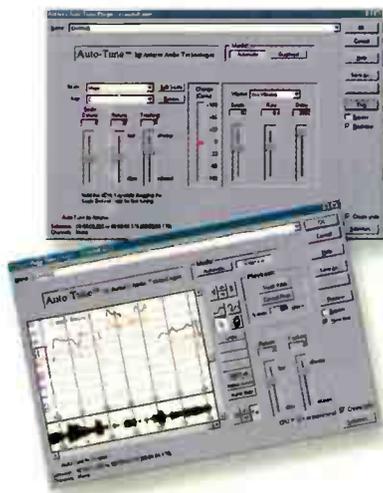
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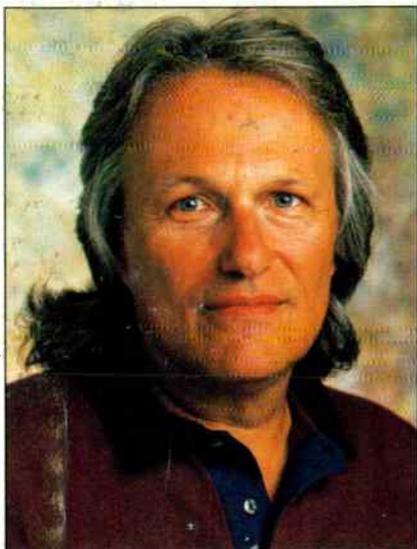
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# So Without *Further Delay...*



## Coping with tape delays when making digital transfers or copies

BY ROGER NICHOLS

When you hear the words "digital delay," you most often think about those little one rack high boxes that delay audio on purpose. You send the audio signal in one end, set the delay time to match the tempo, and one or more copies of the input audio comes out the other end. Well, all forms of digital audio incorporate delays, and if we don't pay attention, they will nip us in the butt.

### PESKY DELAYS IN DIGITAL MULTITRACKS

When you are working with one tape machine, the internal delays are compensated for so that you don't have to worry about the recordings being in sync with the playback. For this purpose, a stack of machines sync'd to get you more tracks is effectively one many-track machine. It doesn't matter whether the machines are ADATs or DA-88's or Sony 48-track machines, they all work basically the same way.

When you have to make a digital

tape copy, here is where the delay rears its ugly head. I will use ADAT as an example. If you make a copy from one machine to another, there is a delay. If the tape copy you made is never going to be referenced to the original tape, then it doesn't matter how much delay there is. All of the copied tapes will only be referenced to each other, and everything will be fine. If, however, you are making a backup copy of one tape and you are going to sync it up with one of the originals, you will be in big trouble. If you follow the directions in the owner's manual, there is a specific mode that the machines must be placed in, offsetting the source machine to compensate for the delay. A tape made correctly will be a clone and can be used in sync with the original tapes. Other digital multitracks have this same type of offset mode for making clone copies.

If you don't make the clone tapes properly, the instruments on the copy will sound slightly out of sync, and if there is a stereo instrument whose left and right channels are on different tapes, there will be significant phasing in the stereo image.

### MIXED DIGITAL MULTITRACKS

If you have a couple of ADATs and your friend has a couple of DA-88's, you can usually synchronize everything without a problem. There are a bunch of boxes that will take care of making sure everything is copasetic. The problem comes when you want to make a digital copy of some tracks from one format to the other, and then later decide that you want that guitar back on the original tape. There are boxes from many sources that will transfer your audio digitally back and forth between ADAT machines and DA-88 machines. What is not taken into account is the "round trip delay." This is the total amount of delay going from one format to another, and then back again digitally.

Remember, I said that, for record-

ing on one machine, all of the delays are taken care of internally so that what you record is in sync with what is playing back. This still holds true with mixed formats synchronized together, but only while you are going in and out of the machines via analog. If you want to make your copies via analog, then everything will line up. If you do that, however, you can never again read one of my columns! You know who you are! We only make digital copies here at Digi-Land.

You can compensate for the digital delay manually during these digital copies by advancing the tracks on the source machine. You can measure the

exact delay in your system by recording a click to all of the tracks of the source machine. Bounce them digitally to the destination machine. Bounce some of the tracks digitally back to the original source machine, leaving at least one original track for reference. Now, take one of the original tracks and one of the tracks that made the round trip bounce and put them into a hard-disk editor. It doesn't matter which one. Zoom in to the sample level and measure the difference between the two signals in samples. This is now the amount of advance that you will have to enter into the source machine before making the digital copy.

*If you make a copy from one machine to another, there is a delay.*

### DAW DELAY

Most of the time I record onto digital tape, either digital multitrack or Sony 48-track. I then transfer the instruments to Pro Tools for editing, flying choruses around, and noise clean-up. After all of the juggling, I transfer the tracks back to the digital tape. What is on the tape is the absolute master. The tracks can't accidentally slip around, and the wrong guitar solo can't accidentally play.

After this round trip to the workstation, I want the tracks to line up exactly

*continued on page 140*

"The magic of the HD 600s  
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