

# EQ

PROFESSIONAL  
PROJECT  
RECORDING  
& SOUND

# PC Recording Quarterly

DECEMBER • 1998

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**IN REVIEW**

- Digidesign Pro Tools | 24 MIX
- Microboards
- Jam Session
- Lexicon
- Guitar Amp
- Xwire System
- Brauner Mic

*Greg Ladanyi*  
records  
*Jody Davidson*

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# The Birth Of A Legend

## The Diaphragm

All GT Electronics AM Series mics use a super-thin 3-micron, gold-evaporated mylar diaphragm for the ultimate in sensitivity and transparent response. Over 1" in diameter, the extra-large diaphragm is precisely tensioned by hand to ensure perfect accuracy.

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The GT AM61 and AM62 maintain an all-tube signal path for preamplification. The tube, a military-spec GT5840M, is the most advanced audio vacuum tube ever made. It offers incredibly low self noise, a long life and nearly non-existent microphonics. The result...classic, warm, rich tone that you demand from a legendary tube mic.



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# Advanced Digital Mixer

Panasonic is taking digital further today with the DA7 digital mixer, an entirely new standard in quality, flexibility, affordability, ease-of use and value. 24-bit converters, 32 inputs, 8 buses, 32-bit processing, moving faders, instantaneous recall of all settings, surround sound mixing...nothing this fully featured has been this easy to use or affordable... and it's available NOW! Incredible sound quality, Internal 32-bit processing and 24-bit A/D and D/A converters give this mixer sound worthy of consoles costing several times its price.

**Easy-to-use.** The DA7 is one powerful mixer. If you know how to run a traditional mixer, you already know how to run a DA7, since it has a smart, user-friendly design. To access any of the 32 channels, just press its select button and all parameters for the channel-EQ settings, bus and aux assignments, and dynamics and delay settings come up on the large backlit LCD screen. To access individual parameters, just touch the appropriate knob in the console's master section. This automatically calls up the sub-menu on the LCD screen and zooms in on the appropriate function. No more digging through menus or getting lost in functions; just adjust EQ, Pan/Assign, Dynamics/Delay, or Aux... and you're there.

**The power to control.** The EQ section offers 4 true overlapping parametric bands active on every channel (with the top and bottom bands switchable to low or high peak/shelving, or low pass, or high pass filters). Each Aux return also provides two bands of fully parametric EQ. The dynamics section offers variable attack/release times and levels for threshold and ratio on each channel, and delay is adjustable up to a maximum of 300ms. 50 Memories each are provided for EQ, Dynamics and individual channel settings. In addition to full dynamic moving fader automation of 32,000 events, there are 50 "snapshot" or "scene" memories. Plus, a Macintosh and

windows software package (that greatly expands the capabilities of the DA7), will soon be available.

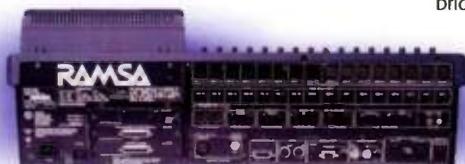
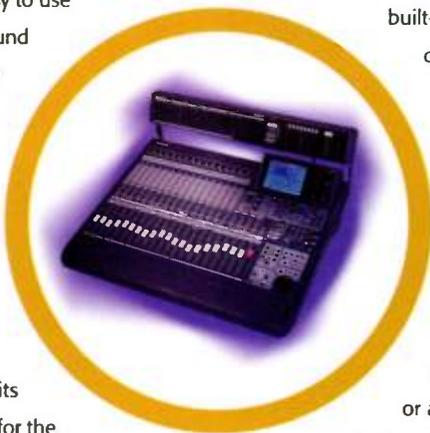
**Surround sound at your command.** You'll be mixing surround soon.

The DA7 is equipped to mix 5.1 channel today. The DA7 has 3 built-in panning modes, and all modes provide full dynamic control of panning, and can be copied, stored, and transferred to any other channel. An optional MIDI joystick gives you yet a fourth method of surround control.

**MIDI and more.** The DA7 features 4 up/down/left/right cursor keys that can be switched to output MIDI Machine Control commands to MDMs, sequencers, or workstations. Data entry is done through the large parameter dial or an alphanumeric keypad. There's also an undo/redo button, a solo-mode set, and a built-in Talkback mic.

**Take on the world.** The rear panel sports 16 analog mic/line inputs (8 XLR with individual software-switched phantom power, and 8 with TRS); 16 channel inserts (pre-A/D); and 6 auxiliary send/return jacks (1,2 use S/PDIF; the rest use +4dB 1/4inch connectors). Along with the 2 digital and 4 analog Aux returns, the DA7 has 38 total inputs. Digital I/O, provided via XLR connectors switchable between AES/EBU and S/PDIF, offer the master out signals and they can be assigned to inputs 15 and 16.

The DA7 rear panel also offers MIDI In and Out, word clock I/Os, both a 9-pin RS-422/485 serial port and PC port for Mac or Windows with software support for both, a 1/4 inch footswitch jack for controlling Talkback on/off or automatic punch in/out, and a D-15 subconnector for the optional meter bridge. So, take your digital mixing further today by going to the nearest Panasonic dealer and auditioning the DA7 for yourself!



For more information call:  
1-800-777-1146 or visit our website at  
[www.panasonic.com/proaudio](http://www.panasonic.com/proaudio)

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# DA7 Digital Mixer

1-Step Functionality

24 Bit A/D and D/A

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Surround Sound

Full Automation

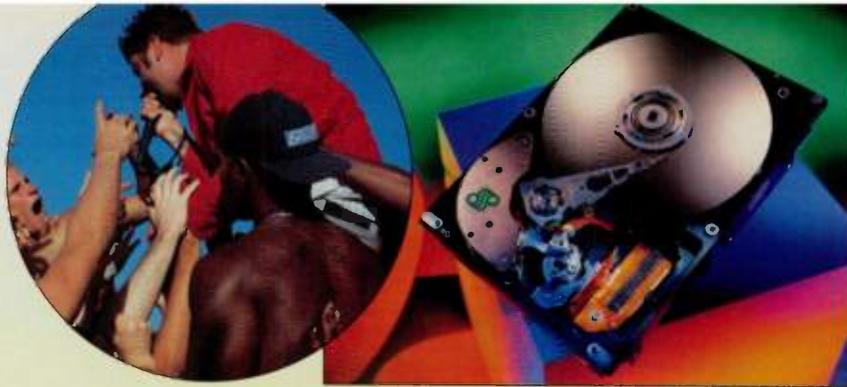
Easy to use

Taking Digital Further

**Panasonic**  
Broadcast & Digital Systems Company

# EQ

PROFESSIONAL PROJECT  
RECORDING & SOUND  
VOLUME 9, ISSUE 12  
DECEMBER 1998



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**Greg Ladanyi and Jody Davidson**  
*in her project studio.*

*Photo by Edward Colver.*

EQ (ISSN 1050-7868) is published monthly plus Buyer's Guide in December by Miller Freeman PSN Inc., 460 Park Ave. south, 9th fl., New York, NY 10016-7315. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. \$29.95 for 1 yr. (13 issues); CANADA add \$10.00 per year; other countries add \$15.00 per yr. for surface; All add \$30.00 per yr. for Airmail. All subscriptions outside the U.S. must be pre-paid in U.S. funds by International Money Order, checks draw from a bank located in the USA Visa, Master Card or American Express. Back-issues \$5. Printed in the U.S.A.

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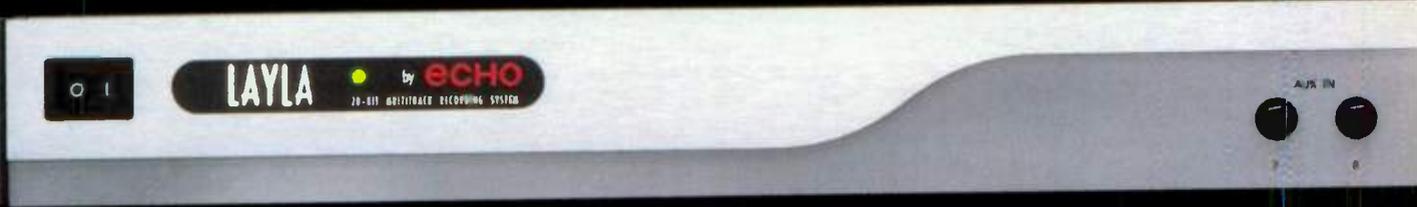


**Y**ou need excellent sound, fast, easy operation, and sophisticated editing capabilities. Layla is the professional's choice—combining full random-access recording and playback options with superb audio, then icing the cake with advanced synchronization capabilities and MIDI.

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CIRCLE 81 ON FREE INFO CARD



Vol. 9, No. 12 December 1998

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**Editorial Offices**

6 Manhasset Ave., Port Washington, NY 11050  
Tel: (516) 944-5940, Fax: (516) 767-1745  
E-mail: eqmagazine@aol.com

**PUBLISHED BY MILLER FREEMAN PSN, INC.**

**RIVA DANZIG** Creative Director  
**FRED VEGA** Production Manager  
**CRISTINA GALLO** Marketing Manager  
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**Subscriptions:** EQ Magazine  
P.O. Box 0532, Baldwin, NY 11510  
tel: (212) 378-0449 **email:** circulation@psn.com  
**Article Reprints:** tel: (212) 378-0440 **email:** reprints@psn.com  
**Administrative/Sales Offices**  
460 Park Ave. South, 9th Floor, New York, NY 10016-7315  
Tel: (212) 378-0400, Fax: (212) 378-2160  
**Websites:** www.prosoundnews.com www.eqmag.com



EQ (ISSN 1050-7868) is published monthly plus Buyer's Guide in December by Miller Freeman PSN Inc., 460 Park Ave. S., 9th fl., New York, NY 10016-7315. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. \$29.95 for 1 yr.; CANADA add \$10 per yr.; for surface; other countries add \$15 per yr. for surface; All add \$30 per yr. for Airmail. All subscriptions outside the U.S. must be pre-paid in U.S. funds by International Money Order, checks draw from a bank located in the USA, Visa, MasterCard or American Express. Back issues \$5. All product information is subject to change; publisher assumes no responsibility for such changes. All listed model numbers and product names are manufacturers' registered trademarks.

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# Comparing Apples and Oranges

I've been doing lots of multiple reviews lately for EQ magazine on equipment with wildly varying price ranges. Recent examples have included headphone mixers, mic preamps, and digital converters. The biggest differences have been in the digital converter reviews, with prices going from \$400 to \$18,000 for hardware that performs basically the same tasks. While these reviews have not been "shoot-outs," I often work on several pieces of gear during a short period of time and direct comparisons are unavoidable. So it can be a little difficult for me to keep perspective at times and not assume that the product costing nearly 50 times as much has got to be 50 times better than its cheaper brethren is. Whenever I get all sweaty-palmed about some new audio gadget that costs as much as a car, I go back to my design engineering roots.

In a previous life I was a robotics designer for a major glassware manufacturer, so I have some experience on the subject. Design engineering is really a balancing act with cost, performance, life span, and physical attributes in a constant struggle. And this balance changes dramatically depending on the specific target market. Anyone can build a better mousetrap given enough time and money, but to successfully build one under budget and on time for a particular market is what separates the real engineers from the wannabes. I tend to separate designs into four specific market areas and judge the success of a product's design as to whether or not it meets the requirements of its particular market.

**Consumer:** Yes, this is the cheap stuff that everyone loves and buys in mass quantities, and generally is designed with planned obsolescence so you'll buy next year's model. The two main design criteria are a low price and physical style.

**Prosumer:** This can be a big step above consumer gear since actual performance is now part of the design equation. Sometimes resembling consumer gear, the performance can often reach professional levels with the main compromise usually being a lack of a "professional" interface (i.e., -10 dBV RCA or TRS connections instead of +4 dBu levels and balanced XLR connectors) and less headroom than usually found in pro gear. The buyer can benefit from the price savings due to mass-production and still get pro performance at an affordable price.

**Professional:** Pro gear has performance as the main design factor, but also includes structural integrity and stable performance in the equation. For mechanical devices, this means using ball bearings and thick structural materials so that you can turn the thing on and leave it running for years at a time or drag it around on the road without it going out of calibration. There's extra performance built-in (such as oversized power supplies and heat sinks) so that low maintenance or physical abuse won't cause failure.

**Industrial:** Few people ever encounter industrial gear outside of a manufacturing plant. This stuff is built with a cost-is-no-object, never-break-down attitude, since a single failure could take down a whole production line, costing the company tens of thousands of dollars an hour or more. For the audio trade, think of things like satellite uplinks and tape machines running commercials during the Super Bowl.

Some audio gear is built with this industrial-strength-engineering attitude. For instance, I've just auditioned the VM-1 microphone from Brauner and recently reviewed the D.W. Fern mic preamp — both examples of gear that not only sound great, but are also built with the absolute best available materials. The same holds true for some of the A-to-D converters that cost the price of a car. They use military-grade components that are extremely stable both to temperature swings and vibration, so you know that your investment will sound exactly the same, year after year, after year. Which is exactly how we want a true industrial piece of gear to behave — no surprises.

So, while I can get goosebumps over an industrial device, I can also appreciate the engineering expertise that goes into prosumer gear. After all, if everything cost a year's salary, then very few studios could afford to make music, and we would all be the losers. So treat yourself to a professional piece of gear for the critical parts of your sound chain, but don't be afraid to buy what you can afford now, rather than do without. After all, the most important thing is making music now and getting it out for everyone else to enjoy.

—Mike Sokol

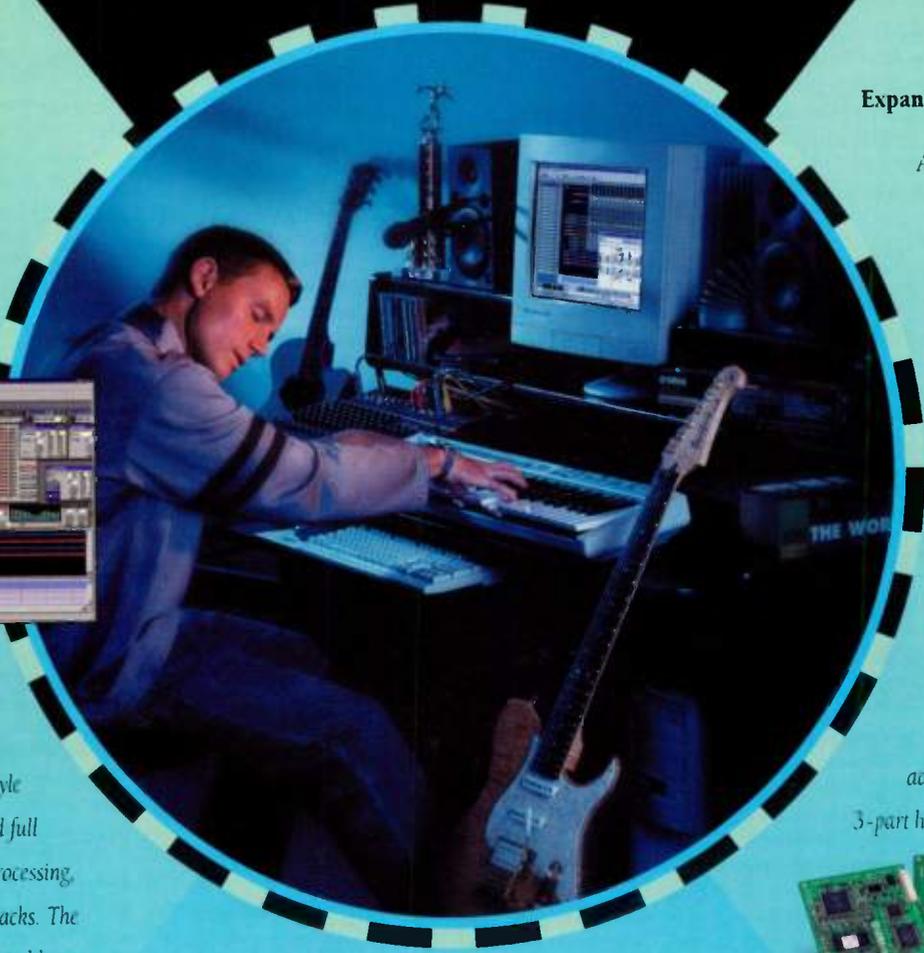
# You could spend years putting together a powerful, fully equipped MIDI/Audio project studio.

## Powerful, Integrated Music Software

XG Works, included with the SW1000XG, is a complete suite of music software applications



integrated into a single package, featuring sequencing, sound editing, notation, built-in style libraries of music data and full mix control over effects processing, digital audio and MIDI tracks. The SW1000XG is also supported by most major sequencing packages.



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Add to the SW1000XG's powerful synthesizer with three amazing plug-in boards\*: PLG100-VL lets you solo with the unparalleled realism of Yamaha's exclusive virtual acoustic synthesis; PLG100-DX gives you that vintage FM vibe; and PLG100-VH adds dynamic 1-, 2- and 3-part harmonies to your vocals!



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## MANUAL LABOR

I must admit that I read Mike Sokol's comments about "Good Manuals" [Sept. '98] while cringing! You see, I recently took an interest in a particular unreleased product from a relative newcomer to the pro audio scene. I figured that if I showed enough interest, maybe I could get one a little ahead of the game for beta testing. After numerous phone calls and at least one discussion with someone at the company, I thought I was a shoe-in. Then they called me on a different product and asked if I would like to write the user manual. I declined, referred them to a tech writer friend, and explained that I was simply too busy in my studio! I got another call from the company shortly thereafter and they complained, "We didn't want a tech writer, we have those. We wanted a user, someone who has to deal with these manuals and can explain things in user's terms." Reluctantly, I agreed to take the job, for which they offered to pay me well. A couple all-nighters into the project, things changed quite a bit. The company started to reject whole pages of the text. "It's too wordy," they complained. I countered, "I thought you wanted something from the user's perspective?" They seemed to believe that all users would have a great degree of

knowledge already, but I disagreed firmly. In the end, the users got a heavily edited version of what I thought they would need to know to make the start-up process painless. I got an offer for 65 percent of what they originally agreed to pay me! They complained that I hadn't a clue of what a manual should be and they had to hire someone else to write some of it. Looking at the finished product (manual), there was very little written by anyone other than myself, and what was there was copied directly from help screens in Windows or other products. Go figure!

Stephen Gualdoni  
Eden Recording  
via Internet

## HANGING WITH MR. KOOPER

I thoroughly enjoyed the November issue's cover story featuring excerpts and exploits of Al Kooper. The article prompted me to scour my vinyl archives for my well-remembered high school-era copy of Kooper's LP *You Never Know Who Your Friends Are*. I was surprised to find myself remembering most of the lyrics and melodies nearly 20 years since my last playing of that disc, amazed at how Kooper's production style has left its signature

on the music of so many other artists during the past two decades.

Following my listening, I opened Whitburn's *Top Pop* guide and found nothing listed for Mr. Kooper. Turning then to *The Rolling Stone Album Guide*, I had to laugh when the very first sentence following Kooper's discography began with the words: "Adding superb organ to Dylan's 'Like a Rolling Stone...!' " I guess it's just a matter of perspective. No matter: Al Kooper is a giant, and I'll join many others in relishing his new book.

Bobb Rayner  
Philadelphia, PA

## WRITE TO US

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6 Manhasset Ave.  
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# Blue Ribbons '98 Ballot

Please choose only one product from the list below or write your own favorite on the "Other" line. See last issue for full product descriptions.

- AKG C3000 MICROPHONE
- ALLEN & HEATH ICON DP1000 DIGITAL MIXER
- BEYER MCD SERIES OF DIGITAL MICROPHONES
- CM AUTOMATION MOTOR MIX
- CRANE SONG FLAMINGO
- CRANE SONG TRAKKER ANALOG COMPRESSOR
- DYNAUDIO ACOUSTICS BM15A
- EMU-ENSONIQ MANTIS: MODULAR DIGITAL MIXING SYSTEM
- EUPHONIX R-1 HARD-DISK RECORDING SYSTEM
- GREAT RIVER ELECTRONICS MP-2/MP-2X MICROPHONE PREAMPS
- MANLEY MASSIVE PASSIVE STEREO TUBE EQ
- MOTOROLA DSP56364 AND DSP56362 AUDIO DSP
- MTA (MALCOM TOFT ASSOCIATES) INTERMIX MODULAR MIXING SYSTEM
- SABINE GRQ 3102 GRAPHI-Q
- SHURE KSM32 CONDENSER MICROPHONE
- SOUNDSCAPE MIXTREME
- STEINBERG QUADRA FUZZ
- STUDIO TECHNOLOGIES, INC. STUDIO COMM MODEL 68 AND MODEL 69
- SYNCHRO ARTS VOCALIGN SOFTWARE

- TASCAM DA45-HR DAT RECORDER
- TC ELECTRONIC M3000 STUDIO EFFECTS PROCESSOR
- XWIRE DIGITAL WIRELESS SYSTEMS X905
- YAMAHA FSR1 SYNTHESIZER
- YAMAHA GA32 MIXING CONSOLE
- YAMAHA D24 DIGITAL MULTITRACK RECORDER
- HONORABLE MENTION: TC FINALIZER EXPRESS
- OTHER: \_\_\_\_\_

NAME: \_\_\_\_\_

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Phone number will be used only for verification purposes and must be provided for ballot to be counted.

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# ULTIMATE SOUND MACHINES

## Gold Channel



### DIGITALLY ENHANCED MIC PRE-AMP

The TC Electronic Gold Channel is a Digitally Enhanced Microphone pre-amplifier and a DSP signal refinement toolbox. Plug in your microphone, connect the Gold Channel's outputs to any analogue or digital recorder, and safely capture your signal in the best possible recording quality.

## M2000



### STUDIO EFFECTS PROCESSOR

The Engineering Group at TC Electronic was given carte blanche to create the optimal studio effects processor. Being musicians and studio engineers themselves, they have a feel for what is needed in modern high-grade processors. The library of effects includes: Reverb, Pitch Shift, Delay, Chorus, Ambience, Equalization, De-essing, Phasing, Compression, Gates, Expansion, Limiting, and Stereo Enhancement.

## M3000



### STUDIO REVERB PROCESSOR

Setting the new industry standard with the VSS3 technology the M3000 is the best sounding, most versatile and easiest to use professional reverb today and well into the future. Combining the ultimate control of directivity in the early reflections with a transparent and harmonically magnificent tale, the art of reverberation is brought to a new and higher level.

## FIREWORX



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### STUDIO MASTERING PROCESSOR

The Finalizer Express is the fast and efficient way to turn your mix into a professional master! Based upon the TC Electronic 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.

## Finalizer PLUS



### STUDIO MASTERING PROCESSOR

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## GROUP ACTIVITY

**Q** I wish to purchase a microphone to be used in a conference setting. That is, the microphone will be placed in the middle of a table that seats 12 persons around it. The microphone will be connected to an amplifier and cassette deck so that the discussion can be recorded. What type of microphone do you suggest for this?

Jacqueline  
via Internet

**A** There are a number of ways to record a round-table conference, but perhaps the most cost-effective way is by using a PZM boundary effect microphone. A Pressure Zone Microphone resembles a flat plate with an electret element mounted on top in a cantilevered housing with a slit to let in the sound pressure. Since it's so close to the boundary of the table top and the air, PZMs take advantage of this "boundary effect" to boost the direct signal (which comes from a single direction) over the omnidirectional reverberant field, which results from room echo. The result is more intelligibility and less room tone than using a conventional table mounted pressure-gradient mic.

Crown was the first to license the technology, but you can now get a PZM mic from several manufacturers, including, Audio-Technica (A-T 851A), beyerdynamic (MPC-67), and Shure (MX393). Most of these newer mics cost around \$200 to \$250. Some need phantom power, while others will run on an internal battery, so check to see if your mic preamp can provide 48-volt phantom. Call Markertek at 800-522-2025 for a good source.

If you're interested in a high-priced teleconference solution, you can use one of these mics in conjunction with a front-to-

rear gate, and run it into an intelligent mixer. This option opens up the mic only for the person speaking. This option, however, costs a few thousand bucks to get started, and probably is not needed for your situation.

Let us know how you make out on your recording.

Mike Sokol  
Contributing Editor  
EQmagazine

*the mastering by making the song louder. I don't want to waste money getting the song remixed just to find that all it needed was some mastering. On the other hand, I don't want to lose any money on mastering a song that needed to be remixed. If you have a clue as to what I'm trying to ask you, or if you have an answer to my problem, please let me know what I can do about it.*

Darnell  
via Internet

## MASTER PLANNER

**Q** I am looking to get some material mastered and I was wondering if you could help me out. I have a song, which was mixed pretty well (all instruments being clean and clear, etc.), but, for some reason, although it's not recorded low, you have to turn up the track to really get a good feel for the vibe of the song. That is, you kind of have to play it on a bigger system to really "feel" the song. I can't pinpoint if it is something that the mix is lacking, like "energy," or if it was something that could be fixed in

**A** "Energy" and "feel" are subjective terms, and if a song is lacking in either, it's generally because there are problems with a song's arrangement (conflicting parts or lacking in dynamics), playing style (not aggressive enough), or musicianship. A well-written and arranged song should give you the right "feel" no matter what its playback level. You should just feel it more on a visceral (gut) level when you crank it up. That said, let's assume your problem is strictly technical, not musical, and go from there.

What your song probably needs is some multiband compression, which is normally added during the mastering process. This will bring up the overall average levels in four or more frequency bands and make the song sound louder even when played back at lower sound pressure levels (SPLs).

All radio stations use multiband compression to make their station sound louder than the competitors without over-modulating the transmitter. Most of the listening public (you included) have been trained to perceive this as the "norm" even though the process is artificial.

The other possibility is to add some saturation, again, which can be added during the mastering process. Saturation was easily accomplished in the old analog days by simply over-modulating the

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tape (recording above 0 VU), and had the effect of compressing the dynamics as well as adding harmonics (distortion) to the signal. In this modern "digital world," most mixes don't have this elusive quality of soft-compression and harmonic thickening, which was a byproduct of a hot mix on good tape stock. There are a number of modern processors, both tube- and computer-algorithm-based, that can emulate this effect without having to endure the side effects of analog tape.

Mike Sokol & H.G. La Torre  
EQ Magazine

### PC DROPOUT

**Q** I have *Samplitude Studio 4.0*, *Samplitude Master*, and *PointC-DAudio* installed on a *Pentium II 300 MMX* PC running *Windows 98*. My sound card is a *Sound Blaster Live* and my *VGA* card is an *8 MB Intel i740*.

I experience audio dropouts during playback. [I believe] The WAV file is fine, since the dropouts occur at different points when played back again. I need the project to play continuously since I have to master them on DAT. What I'm currently doing is burning the whole project to CD before transferring it to DAT. My friend has the same *Samplitude* setup, but on a lesser system, and his seems to be working just fine.

What's the problem and how can I fix it?

Perfecto de Castro  
via Internet

**A** Your dropout problem in *Samplitude Studio* during playback can be easily fixed by increasing the buffers from within the System dialog. All *Samplitude* and *Red Roaster* programs allow for control over the specific buffers as well as over the number of buffers used in order to compensate for natural computer tendencies such as the software waiting for a hard disk to supply audio data. As mentioned in the manual, in general, the larger the buffer, the more reliable the playback. However, using too big a buffer will cause unwanted delays, so your buffers need to be set based on your individual system and your audio needs. In *Samplitude Studio*, press the "Y" key and you'll be able to adjust all the program's buffers in the System dialog.

There are two ways to approach adjusting the buffers. First, try increasing

the number of buffers by clicking on the + button next to Buffer Number in the System dialog. You can also increase the buffer sizes for each type of buffer. If you are playing back your WAV file in a HDP (hard-disk project), increase the HD Buffer (click once on the + button) and try playback again. If you are playing your file from a VIP (virtual (nondestructive) project), increase the VIP buffer and listen again to the playback. Finding a good balance in your buffer setup will provide dropout-free playback. The right side of the status bar, located on the bottom of the program screen, shows you how many buffers are being used and whether any errors occurred during buffer access.

I also would mention that you are using older versions of our products, which, since your original purchase, have been dramatically upgraded. *Samplitude Studio 5.1* now supports 24-bit/48-kHz audio, built-in CD burning, DirectX support, Yamaha DSP Factory support, and much more. We also carry high-resolution digital and analog sound cards that audibly improve your sound quality, passing that of your fine *Sound Blaster* card. Please feel free to contact SEK'D or check out our Web site at [www.sekd.com](http://www.sekd.com) for product information, demos, and upgrade information.

If you have any other problems or questions, please e-mail us at [support@sekd.com](mailto:support@sekd.com) or call our Tech Support Line at 707-578-1825.

Thanks for being a "Samplitude" (sorry, couldn't resist)!

Jon Medek  
Product Manager  
SEK'D America  
(that's "Ess-eee-kay-dee")

### SEEKING OBERHEIM

**Q** I still have original *Oberheim* gear and need replacement parts. Is *Oberheim* still in business? If so, how can I contact them?

Fred Herzog  
Racine, WI

**A** *Oberheim* is alive and well, and living in Nashville, TN. The *Oberheim* line is now part of the *Gibson Corporation*. Contact them at: *Oberheim*, A Division of *GMI*, 1050 Acorn Drive, Nashville, TN 37210. Tel: 615-871-4500. Web: [www.gibson.com](http://www.gibson.com).

H.G. La Torre  
Executive Director  
EQ magazine

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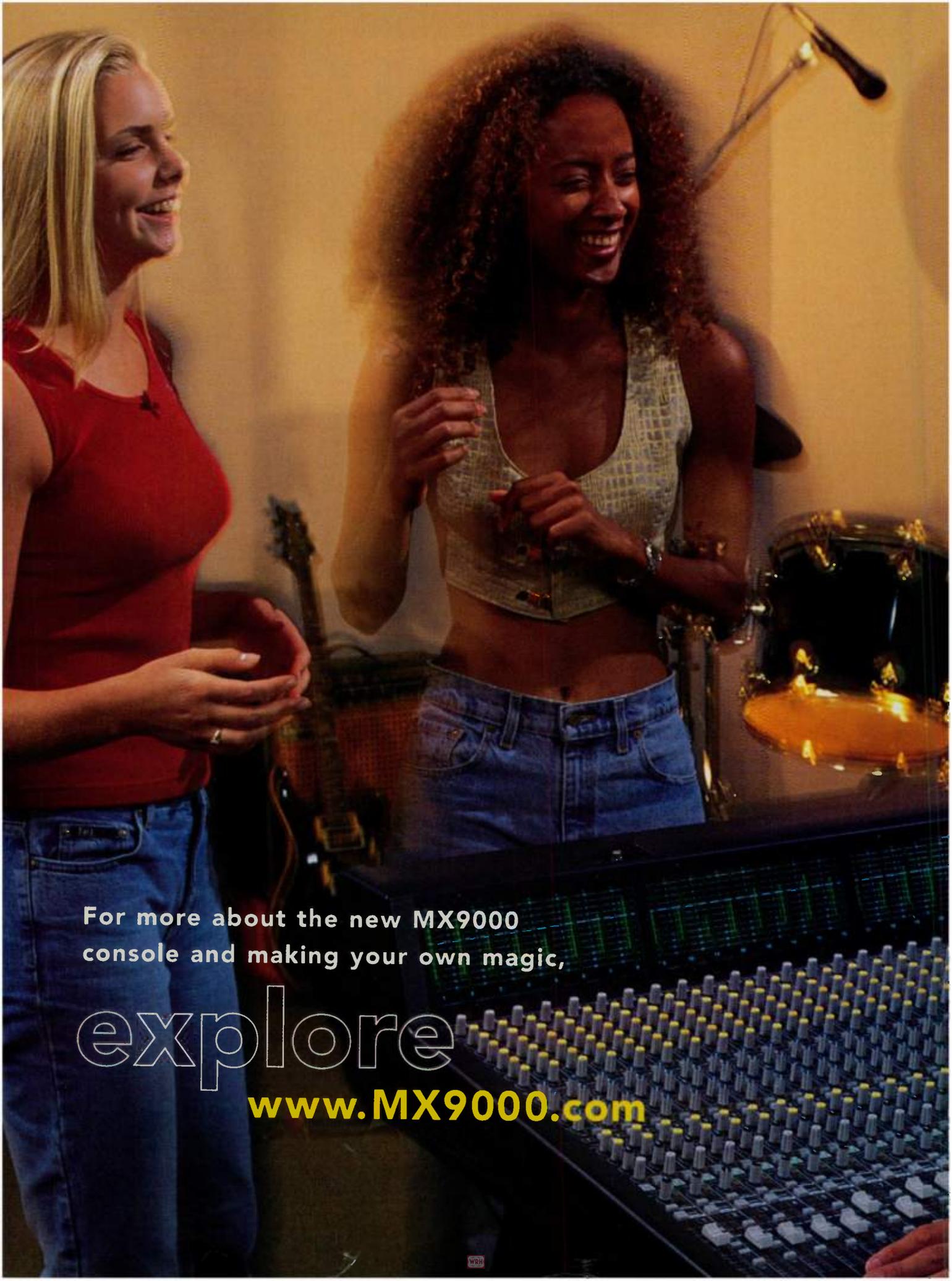
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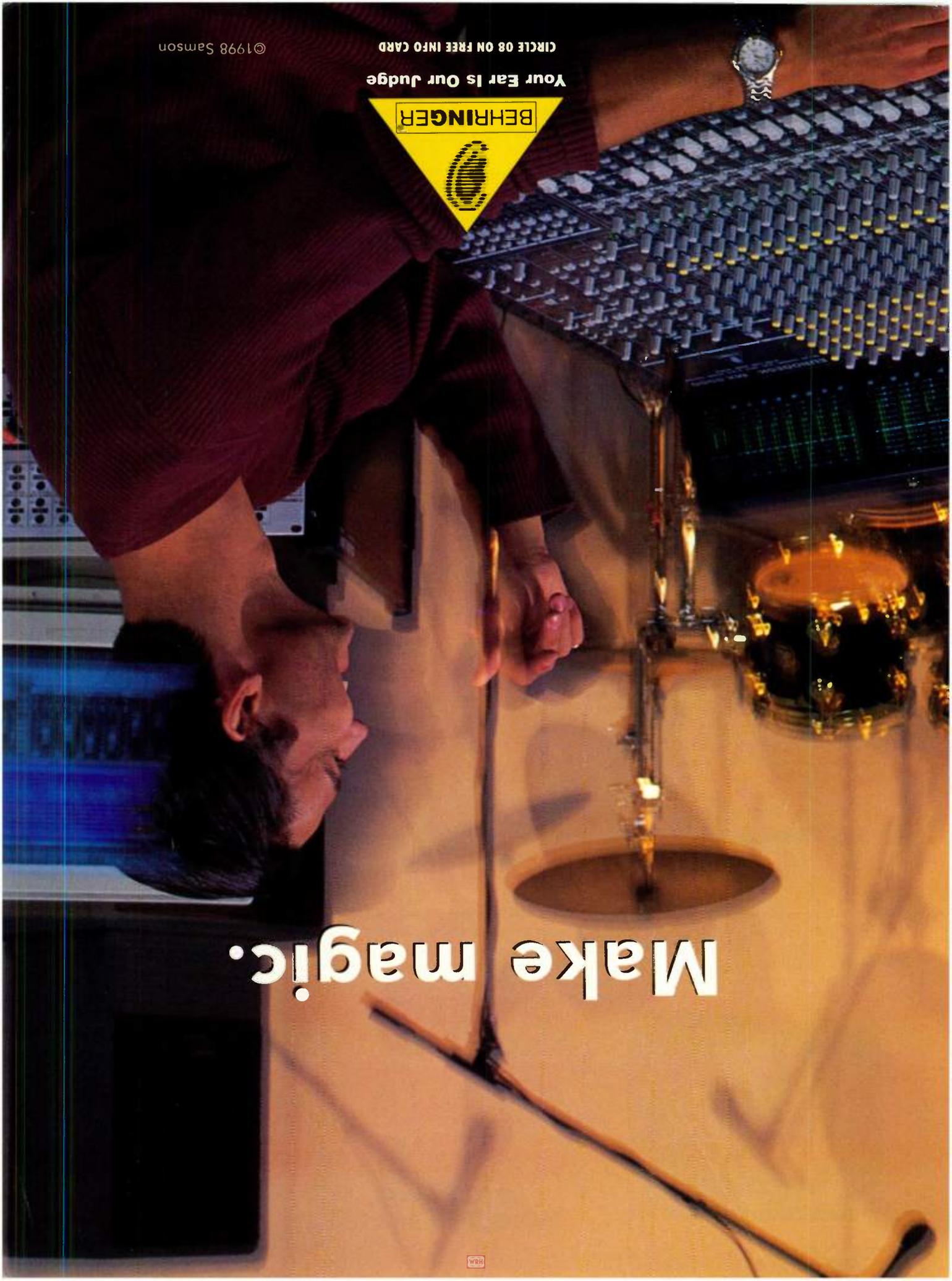
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A photograph of two women in a recording studio. The woman on the left has blonde hair and is wearing a red tank top and blue jeans. The woman on the right has voluminous curly hair and is wearing a patterned crop top and blue jeans. They are both smiling and looking at each other. In the background, there is a microphone on a stand, a guitar, and a drum set. In the foreground, a large mixing console with many faders and knobs is visible.

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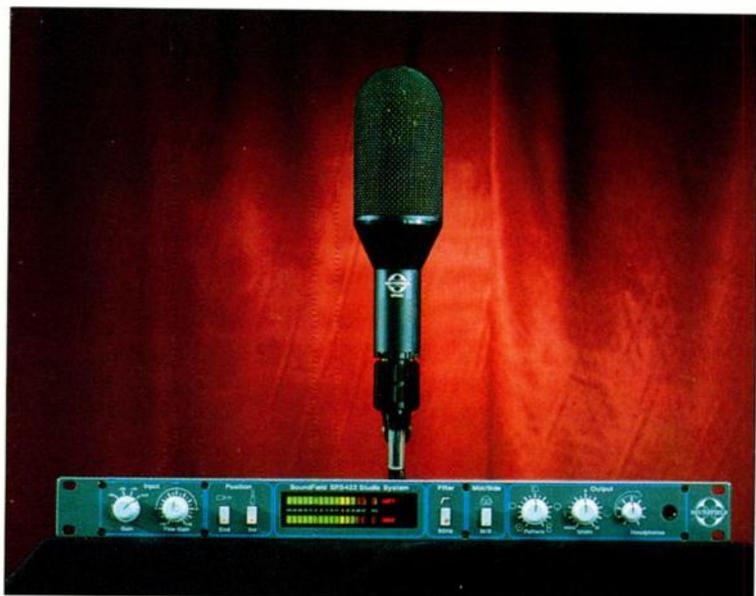
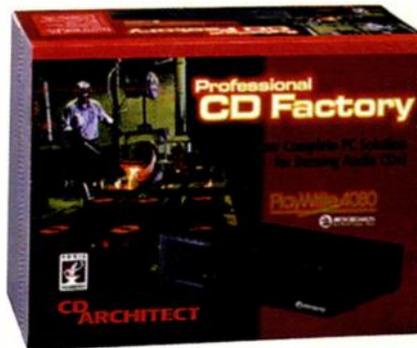
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# EQ PRODUCT VIEWS

## THE PERSONAL CD FACTORY

**S**onic Foundry's Professional Remix Factory is a software/hardware package for creating, mixing, and burning music to CDs. Features of the Professional Remix Factory include ACID, Sonic Foundry's loop-based music creation software; CD Architect software, Sonic Foundry's professional CD mastering software; a Microboards PlayWrite 4080 CD burner; and the additional accessories necessary to burn professional audio CDs on a PC. The Professional Remix Factory renders PC users to quickly create and remix their own music and then burn the mix to a professional audio CD. For more information, contact Sonic Foundry: Tel: 608-256-3133. Fax: 608-256-7300. Web: [www.sonicfoundry.com](http://www.sonicfoundry.com). Circle free lit. #101.



## SOUNDFIELD OF DREAMS

**T**he SoundField SPS422 studio microphone system is comprised of a four-capsule microphone head, cable, and a SoundField 1U stereo processor. The SPS422 promises authentic reproduction of the three-dimensional sound field from a single microphone. The system operates by collecting audio information from the four capsules and feeds them to the processor. Once in the processor, the SoundField matrixing circuitry enables the engineer to adjust the stereo width and the pattern pickup. Delivering a complete 360-degree image in stereo that is both accurate in tonality and spatial relationships, the system makes it easy to obtain phase correct direct and ambient information, according to the manufacturer. For additional information, contact SoundField: Tel: 01924-201089. Fax: 01924-290460. E-mail: [sales@soundfield.co.uk](mailto:sales@soundfield.co.uk). Web: [www.proaudio.co.uk/sndfield.htm](http://www.proaudio.co.uk/sndfield.htm). Circle free lit. #102.

## MAKE THE CONNECTION

**E**soteric Sound's SuperConnector Recorder/Equalizer Interconnect Device permits connection of up to five audio recorders. The SuperConnector enables connection of various equalizers to a main audio system or between recorders for dubbing onto any or all of the recorders. The device features three extra inputs to add to an amp/preamp: the Tuner/Aux1, the CD/Aux2, and the TV/LD. Other features of the SuperConnector include a MONO mode switch to facilitate recording mono sources or to accommodate mono equalizers or single channels of a source. Black anodized, brushed-aluminum finished, and rack mountable, the device establishes a smooth, straight-line path that is easy to set up and use. For more information, contact Esoteric Sound: Tel/Fax: 630-960-9137. E-mail: [Esoteric@aol.com](mailto:Esoteric@aol.com). Circle free lit. #103.



## SHIFT HAPPENS

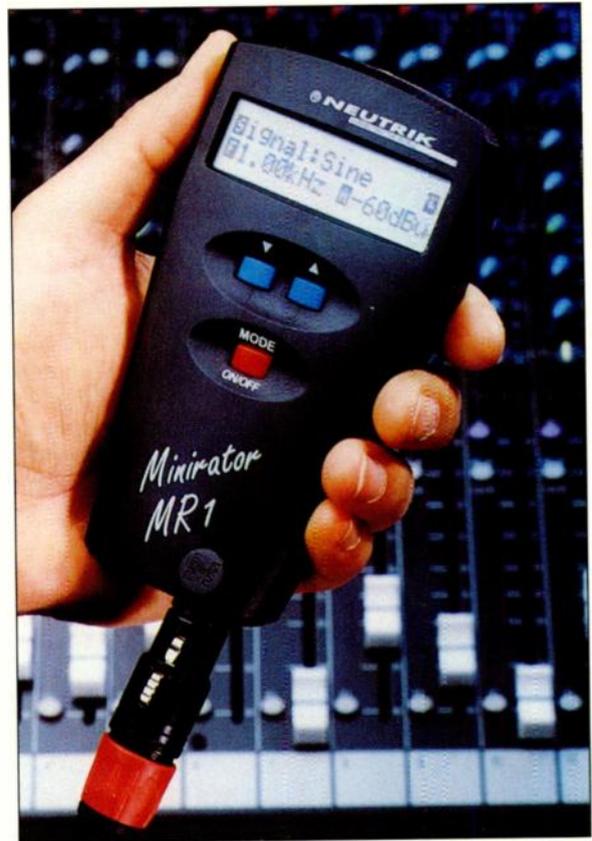
The UltraShifter software for the Ultra-Harmonizer 4000 series is new from Eventide as the next step in pitch-shift technology. Features of the UltraShifter include real-time adaptive resynthesis, modification and maintenance of pitch and spectral content over a four octave range, and the ability to manipulate the size, voice color, and singer's gender. It is available for the entire Eventide 4000 series range, including the studio DSP4000, the broadcast/production DSP4000B, the GTR4000, and the DSP4500, a model that combines the features of all other 4000 series units. For more information, contact Eventide, Inc.: Tel: 201-641-1200. Fax: 201-641-1640. Circle free lit. #104.

## NOISE NEGATOR

Arboretum's Ionizer is a high-performance noise reduction and mastering tool that has AudioSuite compatibility. The Ionizer's AudioSuite compatibility effects accessibility for users of Digidesign Pro Tools, Emagic Logic Audio, and the Avid Media Composer 7.0, or Avid XPress 2.0 nonlinear video editing systems. Features of the Ionizer, version 1.2.6., combine to work for dynamic noise reduction, equalization, limiting, and compression and expansion, all of which occur at 32-bit floating point internal precision. The Ionizer has controls to eliminate the chirps, flanging, and ringing artifacts associated with other noise reduction products. Offering quick spectral analysis and 512 bands of



gated EQ per channel, the Ionizer version 1.2.6. has linear phase filters that offer equalization free of phase interference and is user-configurable. For more information, contact Arboretum: Tel: 650-738-4750. Fax: 650-738-5699. E-mail: info@arboretum.com. Web: www.arboretum.com. Circle free lit. #105.



## PALM-AID

Neutrik's Minirator MR1 analog audio generator provides a comprehensive set of audio test signals. The pocket-sized audio generator allows audio engineers to stimulate a device with appropriate signals for performance, maintenance, and repairs. Battery powered and lightweight, the Minirator provides Sinusoidal signals over the entire audio band from 20 Hz–20 kHz at levels as low as -76 dBu up to +6 dBu and includes sweep capabilities at various speeds. Users can unveil devices with inverse polarity by use of a polarity test signal. Other functions of the Minirator are accessed by the white and pink noise signals, characterized by low crest factors and high repetition rates, which act as a source for room acoustic measurements, frequency response equalizations, and signal evaluation. For more information, contact Neutrik USA: Tel: 732-901-9488. Fax: 732-901-9608. E-mail: NeutrikUSA@aol.com. Web: www.neutrikusa.com. Circle free lit. #106.

## PACKING THE PREAMP

New to the Symetrix 300 Series is the 302 dual microphone preamplifier. A 2-channel dual-mono preamp, the 302 features 20 dB–60 dB of variable gain and channels offering a 15 dB pad that enables the unit to handle microphone levels up to +14 dBV. The 302 has a polarity reversal switch on both channels that corrects the effects of improperly wired cables and mic placement problems, and has phantom power of +48 V at both inputs. For more information, contact Symetrix: Tel: 425-787-3222. Fax: 425-787-3211. Web: www.symetrixaudio.com. Circle free lit. #107.



# EQ PRODUCT VIEWS

## A MASTER AT WORK

**D**igidesign's MasterList CD Version 2.1 is a CD mastering software program that produces Red Book standard CD-DA masters. The MasterList version 2.1 can transform a Power Macintosh into a CD mastering solution that allows users to write directly at 2x and 4x without first creating an image file. The Version 2.1 supports the Sony CDU 948S/X and Yamaha CDRW4260, two new CD recorders, increasing the list of recommended recorders to 22 different models. The MasterList 2.1 is distinguished from the Version 2.0 only by its added support of Sony's and Yamaha's new CD recorders, but shares the already established support of CD recorders manufactured by Hewlett Packard, JVC, Kodak, Studer, Pinnacle Micro, Marantz, Ricoh, and Philips. For more information, contact Digidesign: Tel: 650-842-7900. Fax: 650-842-7999. Circle free lit. #108.

No.	Start Time	End Time	Length	Play Time	L	R	Gain	Q	Filter	Format	Tracks
1	0:00:02:00	0:03:00:45	0:03:00:45	0:03:02:45	0.3	0.3	X	1	1000	ms	1
2	0:03:02:45	0:03:24:32	0:06:27:03	0:06:27:03	0.0	0.0	X	1	2000	ms	1
3	0:06:29:03	0:09:25:08	0:09:56:11	0:09:56:11	-0.5	0.0	X	1	0	ms	1
4	0:09:56:11	0:03:13:08	0:13:06:20	0:13:06:20	2.0	2.0	X	1	0	ms	1
5	0:13:11:20	0:03:25:00	0:16:36:20	0:16:36:20	0.0	0.0	X	1	0	ms	1
6	0:16:36:20	0:06:30:17	0:23:06:37	0:23:06:37	0.0	0.0	X	1	3000	ms	2



## GO WEST

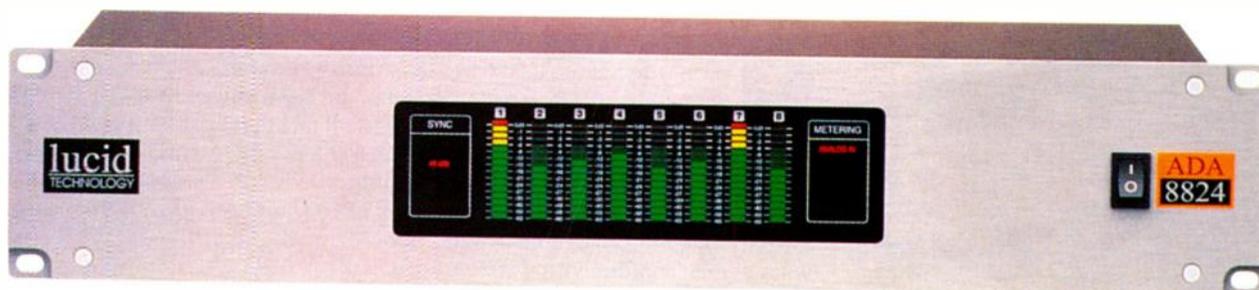
**W**estlake Audio's Lc3w10 is one of the latest additions to Westlake Audio's Lc monitor speaker series. Comprised of a 10-inch polypropylene woofer, a five-inch midrange, and a 3/4-inch tweeter with an 80-watt power handling capacity, the Lc3w10 has a sensitivity of 88 dB @ 1 M for 2.83 V input and weighs 69 lbs. The Lc3w10's frequency response is 42 Hz-20 kHz with an impedance level of 5 ohms nominal/3 ohms minimum with dual banana, five-way binding posts and bi-wire/biamp capability. For more information, contact Westlake Audio: Tel: 805-499-3686. Fax: 805-498-2571. Web: www.westlakeaudio.com. Circle free lit. #109.

## BECOME A MASTER

**S**teinberg North America is publishing and distributing the Apogee MasterTools mastering software with UV22 word-length reduction for Digidesign Pro Tools 24 and TDM systems. MasterTools UV22 includes "over" protection and logging against timecode, a 3D historical metering system, and individual channel mutes, phase, and stereo reverse. For more information about Steinberg North America and Apogee's MasterTools, contact Steinberg: Tel: 818-993-4091. Circle free lit. #110.

## LAYING THE FOUNDATION

**L**ucid Technology's new ADA8824 Platform for SonicStudio workstations is an 8-channel 24-bit A/D and D/A audio platform, designed in cooperation with Sonic Solutions. For users of SonicStudio workstations, the ADA8824 provides 24-bit conversion of eight analog and digital channels transferred simultaneously. The ADA8824 features digitally controlled analog attenuators on both inputs and outputs. The ADA8824 has a 2U rack-mount anodized aluminum chassis design and features 15-segment LED ladders for high-resolution I/O metering. For further information, contact Lucid Technology: Tel: 425-742-1518. Fax: 425-742-0564. Web: www.lucidtechnology.com. Circle free lit. #111.



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William Wittman, Engineer/Producer

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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.

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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)

# EQ

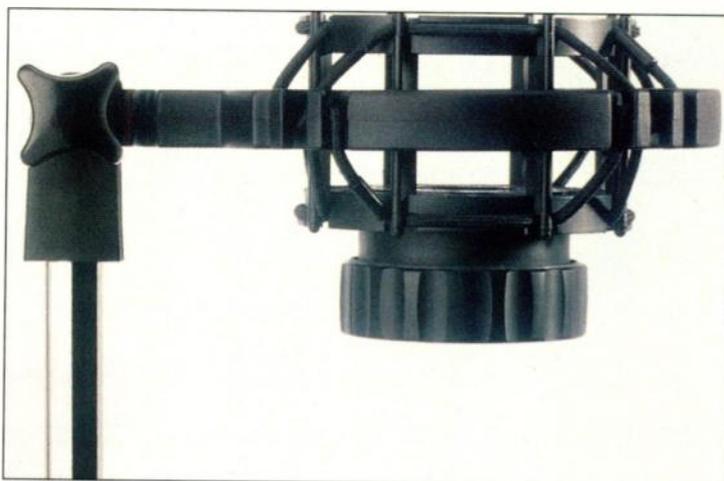
## PRODUCT VIEWS

### VERSATILITY UNBOUND

**M**icroboards Technology's 4-Drive Desktop CD-R Publisher is a new version of Cedar Technologies' Desktop CD-R Publisher. The 4-Drive Publisher package includes four 4X CD-recorders, a Fargo Signature CD Color Printer, the Cedar Autoloader, two CD holders, Cedar CD Face label-editing software, Prassi CD-Rep software for Windows 95, dedicated duplication software, printer alignment posters, power cable, printer control cable, and a user's guide. The premastering and duplication software has advanced copying and audio features, fast HFS formatting and simultaneous recording capabilities, and a discerning interface. The 4-Drive Desktop CD-R Publisher signature prints full-color, high-resolution text, graphics, logos, and photographs directly onto printable-surface CD-R media. For additional information, contact Microboards Technologies, Inc.: Tel: 612-470-1848. Fax: 612-470-1805. Web: [www.microboards.com](http://www.microboards.com). Circle free lit. #112.

### STRESS RELIEF

**A**KG's new H100 "Spider" Suspension promises to decrease mechanical noise and relieve strain on mic cables. The H100 features a new shock mount that is improved from previous models and is designed for use with AKG's large-diaphragm models such as the C3000, the C414B/ULS, and the C4141B/TLII. On the outside frame of the H100 are a pair of conic slots that relieve the strain on mic cables with diameters from 3-7 mm. The H100 decreases the effort of clamping and releasing the microphone to only a quarter-to-half turn of the large clamping screw. Other features of the H100 are the three clamping jaws that allow it to be used with microphones from other manufacturers with circular shafts of .86 inches to 1.02 inches in diameter. For more information, contact AKG Acoustics, U.S.: Tel: 615-360-0499. Fax: 615-360-0275. Circle free lit. #113.



### THE GREAT AWAKENING

**T**he Renaissance Equalizer, new from Waves LTD., is the second of the Renaissance series of DSP plug-ins. The Renaissance plug-ins are a series of high-end digital processors that re-create the sound qualities and operation of classic analog hardware in the digital domain. The Equalizer includes special filters based on vintage analog filter-designs for clarity. The Renaissance Equalizer also features 48-bit internal processing, resonant shelves, filter-curves on vintage analog equalizers, and flexible controls, including simultaneous multi-parameter adjustment. For more information, contact Waves LTD.: Tel: 423-689-5395. Fax: 423-688-4260. E-mail: [waves@waves.com](mailto:waves@waves.com). Web: [www.waves.com](http://www.waves.com). Circle free lit. #114.



### COMPACT AND CRIMSON

**N**ew from Sonifex is the Redbox series, manufactured for use in various project recordings by television and radio stations. The Sonifex Redbox series includes five different modules. The RB-DA6 is a 6-way stereo, 2x6-way mono or 1x12-way mono distribution amp, the RB-MA2 is a dual microphone amplifier, the RB-SM2 is a dual stereo to mono converter, the RB-BL2 is a balanced to unbalanced bidirectional converter, and the RB-SL2 is a twin mono or stereo limiter. Each model is housed in red anodized aluminum boxes that can be attached by screwmounting to any surface comparable to studio furniture or the underside of desks. The Redboxes can also be rack-mounted for conventional wiring in a central technical area. The units can be either 115 V 60 Hz or 230 V 50 Hz and have a front-panel LED power indicator. For additional information on Sonifex "Redboxes," contact Independent Audio LLC.: Tel: 207-773-2424. Fax: 207-773-2422. E-mail: [ia@gwi.net](mailto:ia@gwi.net). Web: [www.independentaudio.com](http://www.independentaudio.com). Circle free lit. #115

# EXPERIENCE THE WARMTH OF AKG'S SOLIDTUBE MICROPHONE.

John Guess and AKG's SOLIDTUBE Microphone Bring The Warmth of Sound to The Studio.

As a leading producer and studio engineer, John Guess appreciates the rich sound, ruggedness, high SPL capability, and extremely low self-noise of AKG's new SOLIDTUBE microphone.

The heart of AKG's SOLIDTUBE is the combination of the capsule and tube. The capsule features the same gold-sputtered mylar material as used in the legendary C12. The ECC 83 (12Ax7) tube is field replaceable and available at most pro studio dealers.

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*John Guess*



## LEGENDARY STUDIO QUALITY BY

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AKG

# EQ PRODUCT VIEWS

## PLUG IT IN, PLUG IT IN

**D**UY's DSPider is a plug-in creator and the first modular processing software for the Digidesign TDM Bus. Allowing users to "build" their own plug-ins, the DSPider yields a huge range of unique effects and processors. Consisting of 40 separate modules that can be linked by the user in different ways, the system created by the DSPider provides an innovative approach to the creation of user defined processors. The DSPider's library comprises over 170 patches, including compressors, reverbs, equalizers, 3D effects, and sound effects, among many other features. The DSPider also features two modes, Advanced and Reader, which allow for a large working surface for editing and a patch manager that allows for programmable switching between patches. The DSPider supports Pro Tools 4.1 and higher, full automation, and Pro Tools|24 hardware. For further information, contact DUY: Tel: 34-934-160-162. Fax: 34-934-160-293. E-mail: info@duy.es. Web: www.duy.es. Circle free lit. #116.

## HOW TO SCORE IN 3D

**T**he Aural A3D Pro is a TDM plug-in for Digidesign Pro Tools Systems that lets users control the position and motion of audio sources in three dimensions. The Aural A3D Pro features complete, interactive 3D source position control; 3D positional audio in an X, Y, and Z plane; automated control of all parameters in real time; variable environment sizes and a choice of 12 different material surfaces; the rendering of six first-order reflections; optimized playback for headphones or speakers; and true RMS level meters. The system works for game developers who need to add realistic audio environments to the visual worlds of games and recording artists who can use the system to construct custom venues ranging from small nightclubs to stadium events. The system also includes the crosstalk canceller, a tool to ensure optimum playback on a variety of speaker systems and to assure proper imaging of 3D effects. For more information, contact Aural: Tel: 888.332.2636. Fax: 408-399-0036. E-mail: info@aureal.com. Web: www.aureal.com. Circle free lit. #117.



## TIME SAVER

**B**ASF has introduced the new Formatted ADAT Master, which takes the time-consuming formatting out of immediate recording. The BASF Formatted Master eliminates the need to format ADAT masters before recording, allowing recording artists and engineers to go immediately to tape. By avoiding the "drum-on" hours necessary in real-time formatting, the life of ADAT recorder heads will also be significantly extended. Compatible with all ADAT Type 1, 16-bit recorders, the new Formatted ADAT Master is available in 40- and 60-minute lengths. For further information on BASF-brand magnetic recording products, contact EMTEC Pro Media, Inc.: Tel. 888-295-5551. Web: www.emtec-usa.com. Circle free lit. #118.

**PLX Amplifiers**

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is proven in our award-winning PowerLight™ Series, used by top touring companies worldwide.

For more information visit our website at [www.qscaudio.com](http://www.qscaudio.com) or call (800) 854-4079.

Model	Watts per channel *		
PLX	2Ω*	4Ω	8Ω
1202	600	325	200
1602	800	590	300
2402	1200	700	425
3002	1500	900	550

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# EQ PRODUCT VIEWS

## HEAVY-DUTY

**R**ean Products, Inc., a recently acquired Neutrik Company, has developed new 1/4-inch LF Series patchbays that are available in four colors for instant verification by color-coding and for enhanced style. Featuring 48 or 52 jacks, Rean's LF Series patchbays are manufactured with the jacks mounted in a durable insulated panel and the entire assembly is mounted in a machined aluminum extrusion. Each unit incorporates a strain relief bar on its back to help preserve the solder points. For more information, contact Rean USA: Tel: 732-901-9488. Fax: 732-901-9608. Web: [www.rean.com](http://www.rean.com). Circle EQ free lit. #140.



## WRITE ON!

**T**ASCAM's CD-RW5000 compact disc recorder can read and write to all available media, including CD, CD-R, CD-RW, CD-R-DA, and CD-RW-DA. Features include XLR balanced and RCA unbalanced analog I/O, an AES/EBU digital input, S/PDIF coaxial and optical digital I/O, a Sync Start function, and a sample-rate converter. The 2U rack-mountable CD-RW5000 also features Auto or Manual Track increment capability, an Erase function, and parallel control I/O capability. The CD-RW5000 combines functions and features to be able to support all available forms of CD media. The CD-RW5000 also provides the ability to automatically detect the sample rate of an incoming digital signal and convert that signal to the 44.1 kHz sample rate CD standard if necessary. The CD-RW5000 is available for a suggested retail price of \$1299. For more information, contact TASCAM: Tel: 323-726-0303. Fax: 323-727-7635. E-mail: [tascamsales@tascam.com](mailto:tascamsales@tascam.com). Web: [www.tascam.com](http://www.tascam.com). Circle free lit. #141.

## EVEN-FLOW

**T**he DCL-200 dual channel compressor-limiter from Summit Audio is based on a proprietary hybrid design of vacuum-tube technology and solid-state electronics. The DCL-200 has a front panel that offers silent operation, channel in/bypass switches, and continuously variable Attack and Release controls. Other features of the front panel include A.C. threshold, slope controls, dual VU type meters that indicate either output voltage or gain reduction, peak overload indi-



cators, and a stereo link switch. The DCL-200 also offers a soft-knee transition characteristic and a sidechain insert, and the DCL-200's input and output XLR connectors are electrically balanced or unbalanced. For additional information, contact Summit Audio: Tel: 408-464-2448. Fax: 408-464-7659. E-mail: [sound@summitaudio.com](mailto:sound@summitaudio.com). Web: [www.summitaudio.com](http://www.summitaudio.com). Circle EQ free lit. #142.

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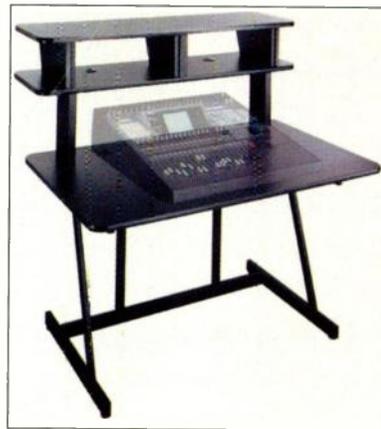
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# EQ

## PRODUCT VIEWS

### MAKING SPACE

The latest addition to Middle Atlantic's line of studio furniture, the DMD-50 Digital Mixer Desk is designed especially for digital recording mixers with tall meter bridges. A folding leg system constructed with 2-inch steel tubing supports the unit's sturdy 30 x 50 grey-speckled desktop. Users can increase available workspace on the desktop by ordering optional risers. The base DMD-50 unit is available for a suggested retail price of \$500 and the optional risers, models DMD-11 and DMD-17, are available for an additional \$200 and \$215.75, respectively. The model DMD-4 overbridge has a retail price of \$204.50. For more information, contact Middle Atlantic Products, Inc.: Tel: 973-839-1011. Fax: 973-839-1976. Circle EQ free lit. #143.



### SWITCH TO PROTECTION

A new multi-level 2 x 1 protection switcher from the ISIS Group, the ARTS-201 is designed for use in critical path applications where a source of signal transmission needs back-up, such as satellite receiver feeds, tape machines, or transmitter inputs. The ARTS-201 consists of a single channel of analog video, four channels of analog audio, and five general purpose interface in-

puts. Each ARTS-201 has video presence circuitry checks for vertical sync and can switch automatically from the primary input to the alternate input in the event of loss of signal. The ARTS-201 also has a local control panel that allows an operator to manually switch from primary to backup. The local control panel enables the user to change the operation mode from automatic to manual. For more information, contact the ISIS Group. Tel: 530-477-2984. Web: [www.isis-group.com](http://www.isis-group.com). Circle EQ free lit. #144.

### BACK TO SCHOOL

The Cool School Interactus v1.1 is an updated version of CSI v1 that includes information on Pro Tools24 hardware and a new AutoPlay feature that launches the CD-ROM into "auto-play" mode. Although the AutoPlay feature presents an educational and directional demonstration, it can be disengaged at any time for the user to assume full navigation control. Providing education in the operation of digital audio workstations, the CSI v1.1 features Digidesign's Pro Tools, Sound Designer II, and SampleCell II, and includes over 100 movie tutorials, 500 pictures/flow charts, and an interactive glossary with over 1200 digital audio-related terms. For more information, contact Cool Breeze Systems: Tel: 614-481-4000. Fax: 614-486-4690. E-mail: [steve@coolbreezesys.com](mailto:steve@coolbreezesys.com). Web: [www.coolbreezesys.com](http://www.coolbreezesys.com). Circle EQ free lit. #145.

### IMPROVEMENTS TO THE DA7

Panasonic's new 1.1 version upgrade for the DA7 has the capability to send and receive MIDI communication messages in real time. The ability to talk to other devices via MIDI could enable a Pro Tools user who uses a mouse to move a computer screen fader to see a parallel movement on the DA7, and vice versa. Enabling more confident visual status updates of a mix in real time, the system decreases the number of settings and routing combinations that must be kept in memory. Improving upon the functionality of the DA7 by enabling a single band to be flattened with the push of a button, the 1.1 also improves upon creating EQ settings, enabling their quicker creation. For additional information, contact Panasonic Pro Audio: Tel: 323-436-3500. Circle EQ free lit. #146.



# CREATIVITY

# DPS12



The concept seems so obvious.

Combine a digital disk recorder and a digital mixer in one convenient box. Eliminate complex interfacing and keep everything in the digital domain. Add optional internal effects. Creative heaven. But **up until now**, buying anything that you could afford meant settling for almost enough tracks to record your music. Or a compressed data format that sounded almost as good as CD quality. Or a user interface that you could almost make sense of.

**Now, finally**, the concept of integrated digital recording and mixing lives up to its promise with Akai's **DPS12** Digital Personal Studio. Designed for those unwilling to compromise their creative vision, the DPS12 combines a 12-track random-access digital recorder (with professional-quality uncompressed 16-bit sound and powerful non-linear editing) and a 20-channel MIDI-automatable digital mixer in one compact, incredibly easy-to-use package. All at a price that is nothing short of spectacular!

It's creativity without compromise.

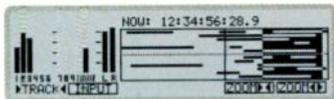
# WITHOUT COMPROMISE

Since its founding in 1984, Akai Professional has consistently pushed the boundaries of affordable recording technology. From the original MG1212 12-track recorder/mixer, to the breakthrough A-DAM digital multitrack, to the DR4/8/16 professional disk recorders and the DD family of audio post-production tools, each Akai recording product has established new levels of performance and value.

Now, with the DPS12, Akai builds on this experience to bring professional-quality digital recording and mixing to the personal and project studio at a price that's truly unexpected. (Not to prolong the suspense, it's \$1499 msrp.)

### More Is Better

At the heart of the DPS12 is a powerful random-access disk recorder capable of simultaneously playing 12 (that's twelve) tracks of uncompressed 16-bit linear audio from optional removable JAZ cartridges or SCSI hard disks. More tracks for more recording flexibility. More control of individual parts. Less need for track bouncing.



And speaking of more tracks, the DPS12 also lets you record a whopping 250 virtual tracks. At mixdown, you can assign any virtual track to any of the twelve physical tracks for playback. This gives you the freedom to compare multiple takes, experiment with alternative arrangements, even combine parts of different virtual tracks on a single track.



At the front end, the DPS12 lets you record on up to 8 tracks simultaneously through six high-quality balanced analog inputs and a S/PDIF stereo digital input at sampling rates of 48kHz, 44.1kHz or 32kHz.

### The Wait Is Over

Since the DPS12 is a random-access recorder, waiting for tape to wind is a thing of the past. The DPS12's locating functions let you move instantly to any of

12 quick-locate points and 100 stack memory points. The stack points can even be named, so you can identify locations by the part of the song (FIRST VERSE, CHORUS, etc.) or even by specific lyrics.

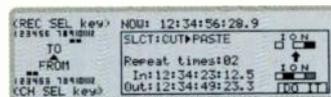
### Easy Editing

Ever wonder how people managed to write anything before word processors? Well, after experiencing non-linear editing on the DPS12, you'll wonder the same thing about audio. Insert, Delete, Erase, Copy or Move sections of single- or multi-track audio from anywhere to anywhere within your project. This is stuff you just can't do with tape.

The DPS12's high-quality jogging and graphic waveform display let you zero in on your precise edit points.



Then call up an edit screen (complete with a graphic representation of your selected operation) and Do It.



Next, use the special Play To and Play From keys to confirm that seamless edit. Changed your mind? 256 levels of Undo are only a button press away.

### Mix Master

The DPS12's digital mixer is a model of flexibility. During mixdown, for example, the inputs can be used as an additional 8-channel Thru Mix, perfect for adding tracks from sequenced MIDI modules to the 12 recorded tracks for a true 20-channel mixdown. Two AUX sends and digital EQ are also included.



Found the perfect mix? Mix setups can be saved as snapshots and recalled at any time. And since all of the DPS12's faders and panpots generate MIDI controller data, you can record your mix moves into an external MIDI sequencer (like our MPC2000, for example) and play them back in sync with the DPS12.

### Effects Inside

If you want the added convenience of integrated internal effects (not to mention keeping your mix entirely in the digital domain), add the EB2M multi-effect processor board. The EB2M gives you two independent studio-quality effects processors with a wide variety of programmable effect types.

### It Wants To Be Your Friend

It's one thing to give you all the tools you need to do the job, but it's another thing entirely to make them useable. It is, quite simply, really easy to use. At the heart of its friendliness is its informative graphic display. Backlit and easy to read, it always gives you a clear picture of what's going on with your DPS12. Frankly, it's all so simple that most of you may never have to take the manual out of the box.

### Check It Out

There's a lot more to the DPS12 than we could fit in this ad, so head down to your local Akai Professional dealer for some quality hands-on time with a DPS12. And don't forget, that's

**\$1499<sup>-</sup>** msrp.



**AKAI** Akai Musical Instrument Corporation  
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CIRCLE 02 ON FREE INFO CARD

# Audio Playground

A new hybrid Amek board and plenty of effects highlight this New Jersey-based facility

**STUDIO NAME:** Playground/Mini Mansion Recording

**LOCATION:** Bergen County, NJ

**KEY CREW:** Eddie F, owner

**CREDITS:** Eddie F (a.k.a. Edward Ferrell, II) is the former vice president of both Motown Records and LaFace Records. He has also had success as a recording artist with a 1994 Motown release entitled *Let's Get It On*.

**CONSOLE:** Amek Galileo (56-channel — 48 Rembrandt channels and eight Galileos) with SuperTRUE automation and recall

**MONITORS:** Quested 412 and VS2205; Yamaha NS-10M; Auratone Cube; Tannoy PBM 6.5x2

**RECORDERS:** Sony APR-24 [2] and MDS-JE510 MiniDisc recorder/player; TASCAM DA-88 with IF-88 AE digital audio interface unit; Marantz CDR620 [2]

**DAT MACHINES:** TASCAM DA-60mkII and DA-302; Panasonic SV-3500 and SV-3700 [2]; Pioneer D9601 [2]

**SOFTWARE:** Digidesign Pro Tools 4.2, USD Sync, 882 I/O, and 888 I/O; E-Magic Logic Audio and Sound Driver; Opcode Audio Vision; Steinberg Cubase

**EFFECTS/DYNAMICS:** Tube Tech PB 1B [2]; dbx 160XT [4], 120XP, and 929 [2]; Drawmer PS201 [3]; Amek CL01 [2]; Lexicon PCM 42 [3], PCM 70 [2], and Prime Time II; Amek 9098 compressor/limiter; Summit Audio DCL-200; Empirical Labs EL-8/Distressor [2]; UREI 1176LN and 1178; Yamaha SPX900 [2] and SPX900 II; Eventide H3000 SE and H3000 DSE; Behringer EX3100 Ultraflex; BBE B22; TC Electronic TC2290; Roland SDD-320 Dimension D

**VOCAL PROCESSING:** Amek 9098 equalizer/mic pre; Avalon VT-737SP vacuum tube/mic pre/equalizer; Teletronix LA2A leveling amp; dbx 902 de-esser [2]

**EQUALIZERS:** Amek PM01[8]; Neve 1073 [2]; API 512B [2], 550B [2], 560B [2], and 550A [4]

**MIDI:** E-mu Planet Phatt, 1200 Sound, Or-

bit, Morpheus, Vintage Keys, and Classic Keys; Alesis D4; Korg Wavestation SR; Roland JV1080, MKS-20, and Sound Canvas; Studio Electronics SE1; Kurzweil Micro Piano; Voce Electronic Piano; Ensoniq MR Rack; Oberheim Matrix 1000; Yamaha TX81Z; E-Magic Unitor 8 [5]

**KEYBOARDS:** Roland D-50 and JD-800; Korg Trinity Plus and Z1; Kurzweil K2000 V2

**SAMPLING/SOURCE PLAYERS:** Marantz PMD321; Technics SL-1210MK2; Pioneer DJM-300

**DRUM MACHINE/SAMPLERS:** Akai S3200XL, MPC-3000, MPC-2000, and MPC-60II; E-mu SP1200; Ensoniq ASR-X

**STUDIO NOTES:** Eddie F states: The studio stands out from the rest because it's a commercial-style recording studio, but is set up almost like a project studio to the point where all my gear is already normalized to the board. There is minimal patching, and it is basically catered to the producer and artist. Everything is designed around being able to work fast by having everything patched in. All of the keyboards are already patched in. Everything is set up and ready to work. All the machines are locked up and synchronized. We're ready to do vocals, remixes, and tracking. You don't have to spend time breaking down and setting up a lot of stuff. It all comes up on the bay, as opposed to other studios where you have to go patch and wire your stuff up. In this studio you can just get to work. You don't have to spend a lot of time with set-up, which is basically the bottom line.

**EQUIPMENT NOTES:** Eddie F continues: My favorite pieces of equipment are the E-Magic Logic program that works with Pro Tools and the new Amek Galileo board. The Logic TDM/Pro Tools combo ties everything together. It's like the hub of the whole room. I love the Galileo board because it has a lot of inputs and all the inputs have dual (channel and monitor) EQ on them, so I can get things to sound any way I want to without a lot of patching.

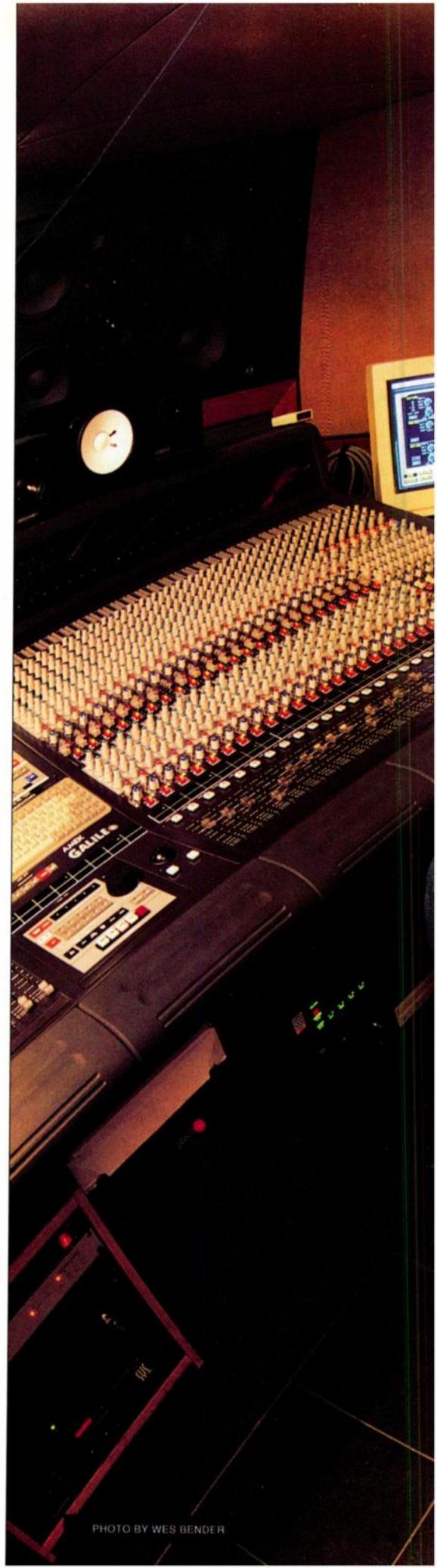


PHOTO BY WES BENDER



# Audio Engineering Associates R44C

A new mic that  
looks very  
familiar...

**MICROPHONE NAME:** AEA R44C

**TYPE OF MIC:** Ribbon

**POLAR PATTERN:** Bidirectional

**FREQUENCY RESPONSE:** 20 Hz to 20,000 Hz

**EFFICIENCY:** 2 millivolts/Pa

**RATED SOURCE IMPEDANCE:** 250 ohms (nominal)

**PRICE:** \$2000 (MSRP)

**DIMENSIONS:** 12 h x 4.75 w x 3.37 d (inches) including cushion mount

**WEIGHT:** 7.5 pounds

**MIC NOTES:** No, you are not looking at a mint-condition, vintage RCA 44BX microphone. This microphone is the R44C from Audio Engineering Associates (Pasadena, CA), a faithful new replication of the classic RCA mic that launched countless wonderful recordings. AEA's R44C captures the RCA signature sound through a faithful recreation of the parts used in construction of the 44BX. In fact, the entire design of the R44C is based upon the technology used by RCA. AEA uses original-type materials wherever possible to construct new parts, and — perhaps most importantly — employs a ribbon element made of NOS (new-old stock) ribbon material from RCA's original production of the 44BX.

For those who require the "retro" look of a '44 in live performance situations, AEA also offers the R44, a visual replica of the 44BX. This version includes an internal shock mount designed to hold a small-diameter, side-address microphone. In addition to manufacturing the R44C and R44, AEA also specializes in restoration and parts replacement for the 44BX and RCA 77DX.

For more information contact AEA at 626-798-9128 (tel.) or visit their Web site at [www.wesdooley.com](http://www.wesdooley.com).



PHOTO BY EDWARD COLVER

# Dare to Compare!



Team Impulse™ blows away the competition. Besides their superior performance, these products offer killer looks at affordable prices. Visit your local Peavey dealer today and meet the newest members of the Impulse team: the Impulse™ 200 Sub, Impulse™ 200 White and Impulse™ 500.

**The trend continues: better performance, killer cosmetics and unbeatable prices!**

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# Alesis M20 Digital Recorder

Some things you may not have known about the popular multitracker

**BY DON HANNAH, MARKETING MANAGER, RECORDING PRODUCTS, ALESIS**

Is it possible to record analog and digital inputs simultaneously to an M20? Yes. The M20 is unique in its ability to offer simultaneous digital and analog input monitoring and recording. When the M20's digital source is either ADAT optical or I/O card, use the Input Select mode to select what channels will have analog or digital input as their source.

An M20 tape has PAL-resolved 25 fps striped to its TC track. Can I setup the M20 to use the same TC track and change the timecode reference to 29.97 drop frame?

Yes. Since the M20's TC track is written as a subcode in the helical scan, a user can change the timecode output from the TC track with the push of the SMPTE Rate button. If PAL video-resolved timecode is written to tape and you want to provide the M20 with NTSC video and 29.97 drop frame, push the SMPTE Rate button until the display flashes 29.97 DROP FRAME. The M20 can now use NTSC-standard 29.97 DF and video for a tape that was originally made for use with the European PAL frame rate and video format.

In a multi-machine system, digital multitracks can have slightly different transport performance characteristics that slow lock times. How does the M20 overcome this?

The M20 employs several exclusive features that help create a uniform operation in a multiple transport, multi-track system. First, all slave M20 tapes maintain close proximity to the master M20's ABS (absolute) time tape position when a capstan engaged rewind or fast forward is performed. Accurate fast winding with a multiple M20 system assures faster lock times from a fast forward or rewind to play transition. Precise capstan control also assures accurate locating and parking. The M20 does not approximate tape park positions after a locate, therefore, typical master/slave lock times from a parked position average just over one second and are frequently sub-one second.

There are two user parameters in the Utility pages that help a multiple M20 system respond more uniformly. When "LOC BEFORE PLAY" is on, all on-line M20 slaves will locate to the master's tape location before the system enters Play mode. This is advantageous for users that operate the Rewind and Fast Forward buttons more often than the Locate button with pre-established locate points. When "MUTE UNTIL LOCK" is on, M20's will keep their digital and analog outputs muted until all M20's have established a lock. Now a singer or musician in a studio does not have to struggle with hearing parts of a performance on several digital multitracks come in separately as each machine locks.



ARE YOU GETTING THE MOST FROM YOUR M20?: The M20 is more versatile than you may have thought.

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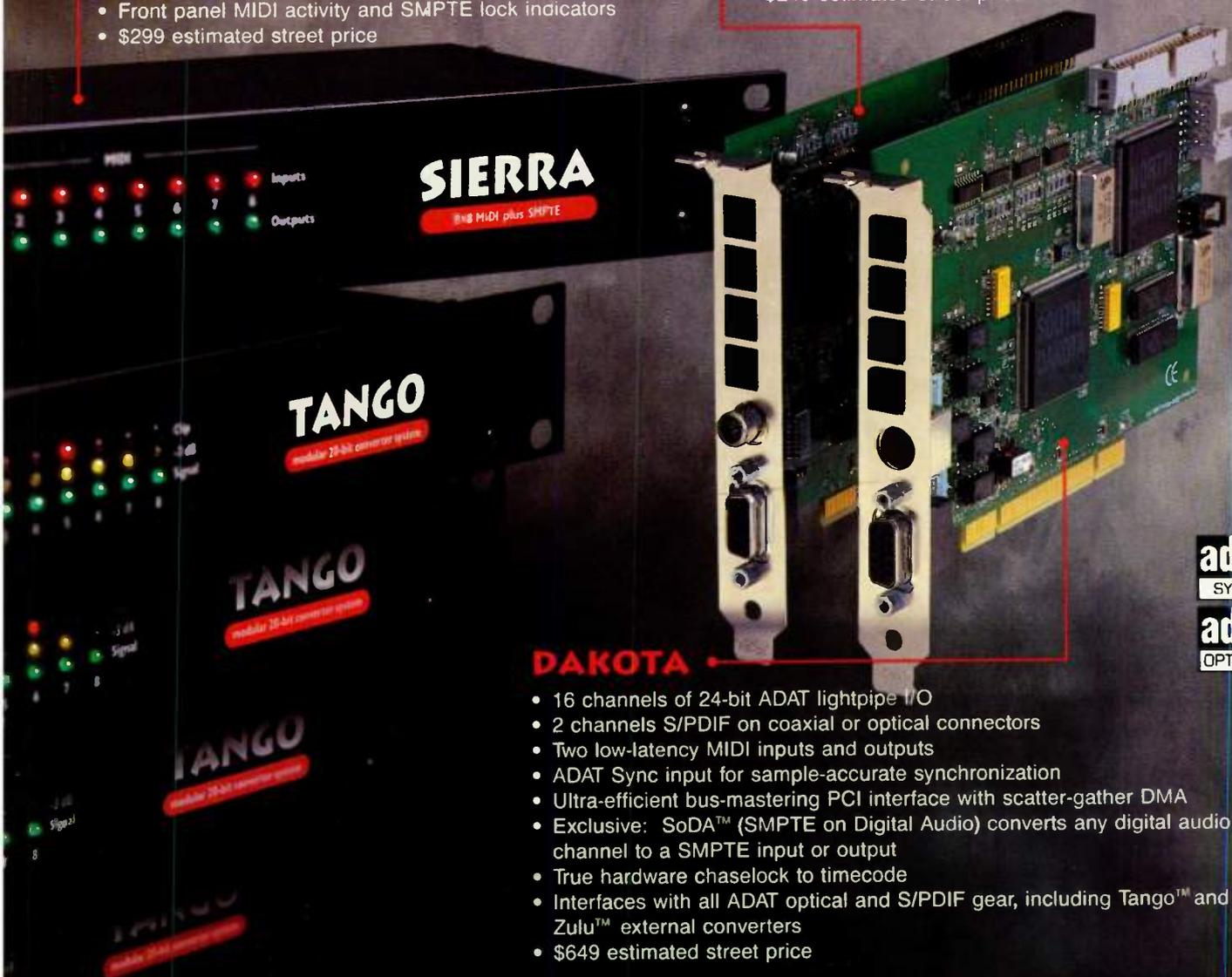
The superintegrated digital audio, MIDI, and sync solution  
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### SIERRA

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- "Quick-patch" I/O ports on front of unit
- 19" rackmount enclosure
- SMPTE input and output on 1/4" jacks
- Front panel MIDI activity and SMPTE lock indicators
- \$299 estimated street price

### MONTANA

- Doubles Dakota's ADAT optical I/O to a full 32 in, 32 out
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- ADAT Sync output
- Plugs into either PCI or ISA slot
- \$249 estimated street price



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# Yamaha D24

## Digital Multitrack Recorder

Yamaha continues  
their foray into digital  
recording with this new  
MO machine

BY ROGER MAYCOCK

At the recent AES (Audio Engineering Society) show, Yamaha introduced the D24 digital multitrack recorder to throngs of enthusiastic audio professionals. This new MO (Magneto Optical) disk recorder not only has several very unique qualities that made it one of the "buzz" products of the show [and *EQ* Blue Ribbon nominee], it represents yet another commitment on behalf of Yamaha that the company is stepping up its efforts to firmly entrench itself in the recording side of pro audio.

The D24 is a surprisingly affordable nonlinear, removable media 8-track digital recorder that, other than record duration, offers all of the benefits that have made digital multitracks so popular to begin with, and from there adds still more features that lin-

ear tape-based systems can't begin to approach. The recorder is housed in a 3U, rack-mountable enclosure with a steel gray, brushed-aluminum faceplate. Upward of eight units, or 64 tracks, can be interconnected using the supplied 15-pin serial connection for system expansion.

The D24's tape-recorder-style operation, along with its arrangement of transport keys, record ready switches, function keys, jog/shuttle wheel, and other assorted aspects of the user interface will make anyone who has ever used a tape-based digital multitrack feel right at home. This is no coincidence — Yamaha is marketing the D24 as a viable replacement for those recorders.

The unit's left-most area houses a high-intensity fluorescent display area that is large and easy to read. This display includes LED ladders for the eight individual tracks, an ABS/TC display, selectable time display, and a grid area that shows the currently selected bit rate, clock source, sampling frequency, master/slave status, and other related system parameters.

The D24 provides a dedicated function key area for operational modes including  $\pm 6$  percent Varispeed, Utility, Edit, Setup, and other assorted parameters. There is also an "enhanced" 10-key pad area for accessing and storing locate points, Song Se-

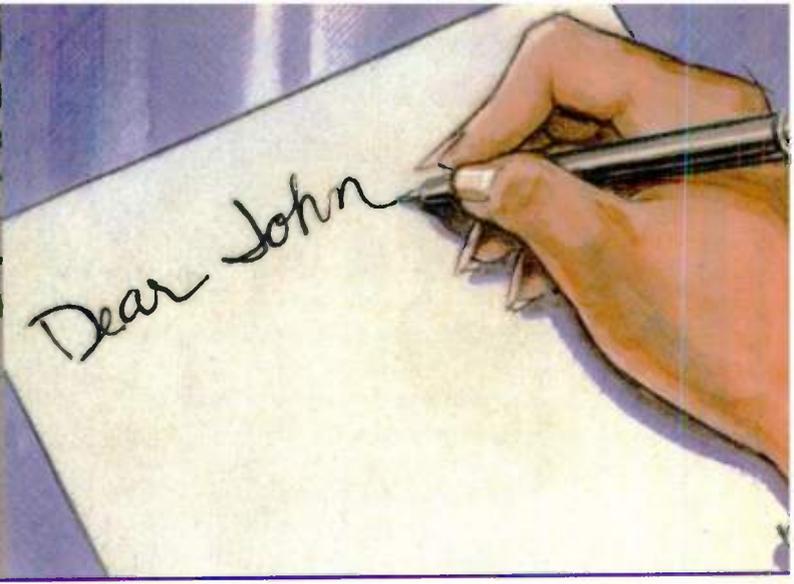
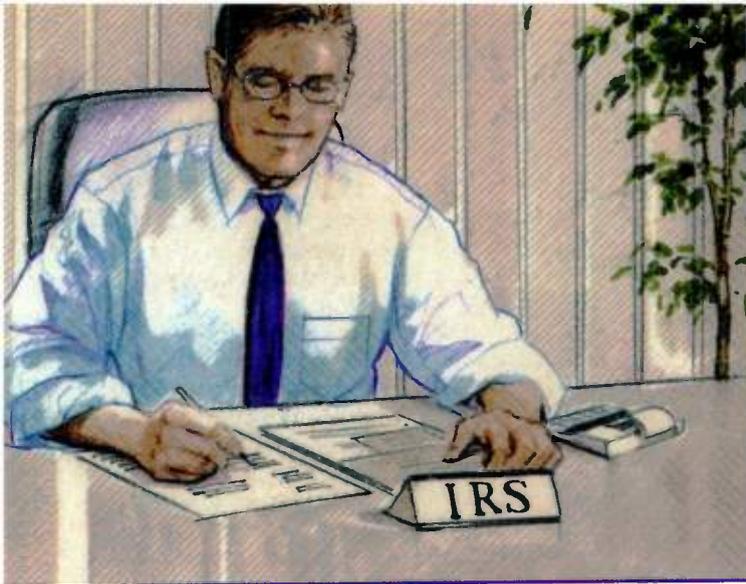
lect, Locate Memory Store, Locate Memory Recall, and related operations. The recorder has provisions for storing 512 songs to a single disk.

The right side of the D24 houses the MO drive and, directly underneath it, the transport control section. In addition to the basic transport keys, this area includes switches for Song Search, Record In/Out/Mark, Rehearsal, Auto Punch, Return to Zero, Roll-back, and A-B Repeat. To the right of the transport area are the headphone jack and level control, plus the unit's power switch.

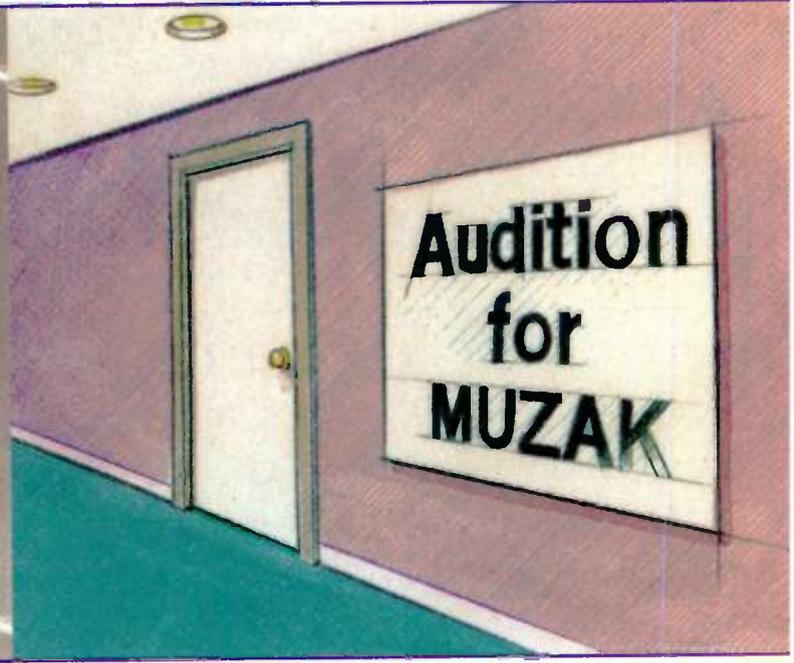
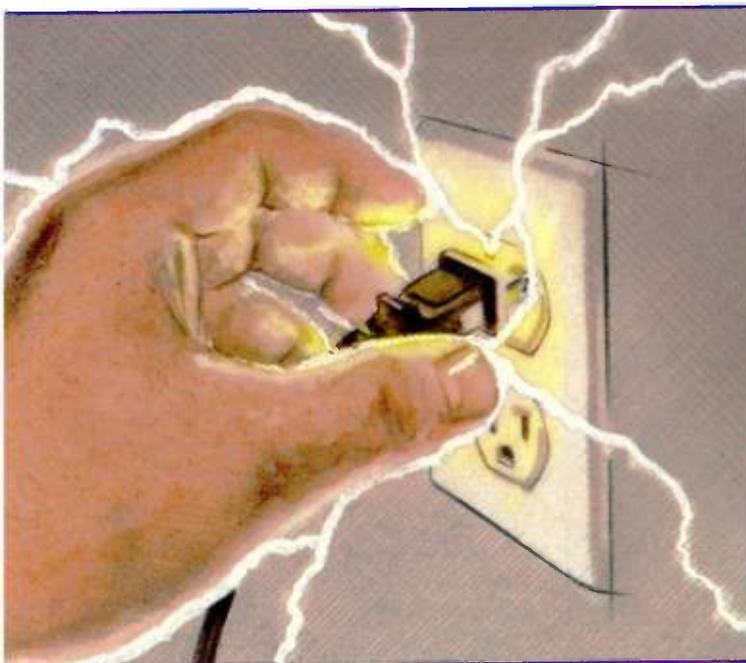
Based upon standard overwrite-type 640 MB MO disks, the D24 supports 16-, 20-, and 24-bit recording with sampling frequencies of 44.1 kHz, 48 kHz, and 96 kHz (as supported by DVD). Sampling frequency and bit rate are set on a song-by-song basis. Each track has eight virtual tracks for a total of 64 — plenty of room for comping vocals, instrumental solos, etc. With the 640 MB disk, the unit provides 120 track minutes of 16-bit, 44.1 kHz 8-track recording or 72 track minutes of 24-bit recording. At full bandwidth 24-bit, 96 kHz, the D24 becomes a 4-track recorder with 36 track minutes of record time. Be advised that silent passages don't consume record time — if you specify a threshold beneath which you want to reclaim disk space. This simple process should enable you to accommodate longer-duration recording projects. The D24 uses no data compression.

With its SCSI-II connector, the D24 can be interfaced to external computers and hard drives. Supplemental drives will increase recording time — be it hard disk or another removable drive. While the D24's data format is proprietary, its SCSI con-

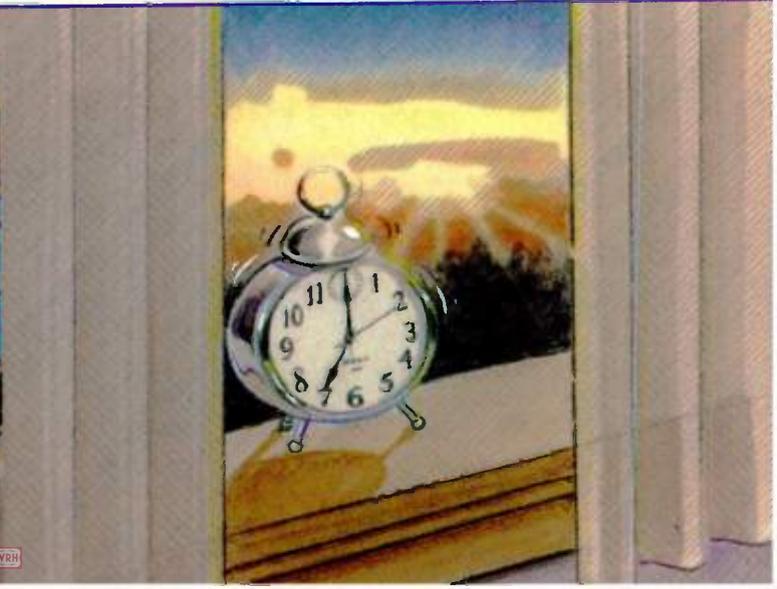
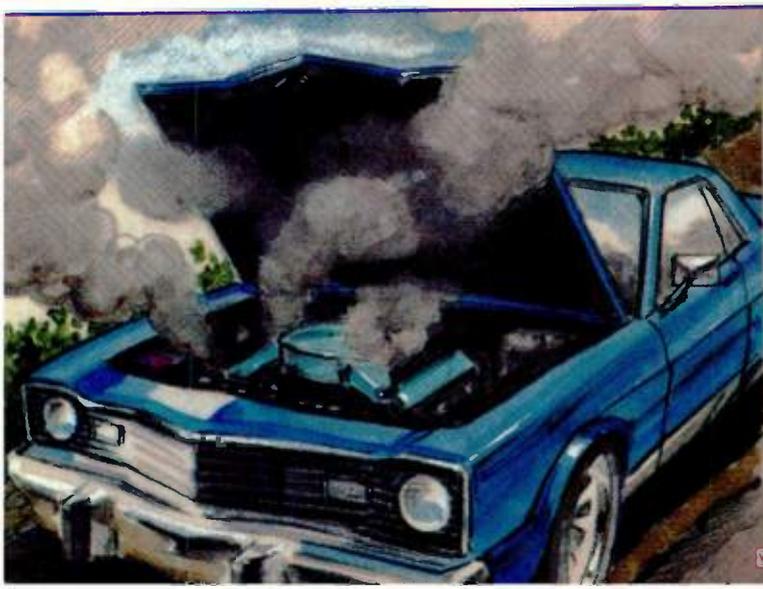




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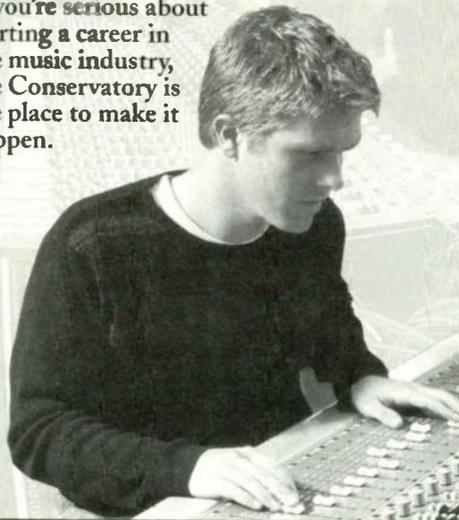
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## FIRST LOOK

nection enables the unit to appear as another drive in a computer's SCSI chain, making it easy to drag and drop for the purpose of backing up data files.

The D24's song- and part-editing capabilities include Copy, Move, Erase, Delete, and Merge with one-tenth of a frame accuracy and a nondestructive edit buffer. There are five Undo memories for Auto Punch recording, providing the ability to audition individual takes so you can select the best. One particularly interesting feature is the D24's time compression and expansion facilities for use in sound-for-picture applications. With either function, pitch remains fixed — very cool. Conversely, pitch can be adjusted over a region without affecting length or tempo. Both time compression and pitch correction utilize a proprietary Yamaha DSP in real-time across two tracks at a time.

For synchronization, the D24 supports both MIDI timecode and SMPTE with bit accuracy. Timecode In and Out ports are terminated in XLR connectors. For interconnection with other digital recording systems, the unit provides word clock BNC In and Out connectors with a 75W Terminate/Thru switch. For sound-for-picture applications, video sync In and Out BNC jacks are provided with a 75W On/Off switch. The D24 provides MIDI In/Out /Thru ports and supports MMC (MIDI Machine Control).

The new Yamaha D24 uses the same YGDAI mini interface cards as the 01V Digital Mixer. The recorder provides four card slots — providing the ability to configure the recorder for a variety of production environments. Currently, cards supporting ADAT digital I/O, TASCAM digital I/O, AES/EBU digital I/O, and analog I/O are available. The D24 also provides S/PDIF digital I/O terminated in RCA (coaxial) connectors.

For remote control operations, the D24 provides a 9-pin serial (RS-422) port for external control (such as a video edit controller) plus a Remote/Sync In port for the optional RC-D24 remote controller/locator.

Yamaha's new D24 Digital MO disk recorder serves up a host of exciting, well-thought-out features for under \$3000. Its use of a robust, transportable media, four card slots for easy integration into a variety of production environments, SCSI connectivity, and editing provisions that could never exist with tape-based systems makes this recorder an extremely attractive studio tool.

For more information, contact Yamaha, 714-522-9011 (tel.); 714-739-2680 (fax). Web: [www.yamaha.com](http://www.yamaha.com). Circle EQ free lit. #119.



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# The BBQ Project

Going beyond the corporate seminar

BY ALLEN WHITMAN

One wet mid-October weekend, 44 members of the radically diverse audio community gather in the hill country of South Central Texas to discuss and implement big issues relevant to the future of computers and music. Titled "Project BBQ" ([www.fatman.com/bbq.htm](http://www.fatman.com/bbq.htm)), this self-described, "incredibly intense, Texas-style think tank" brings together artists, engineers, developers, thinkers, and theorists in a remote setting and asks them to answer questions about standards, systems, and intelligent design for tools to create, organize, and deliver music using computers.

Employees from big corporations like Lucent, Cirrus Logic, Compaq, Yamaha, Intel, Apple, Roland, Rockwell and Phillips Semiconductor, Microsoft, and LucasArts, and smaller companies like Staccato Systems, Mpath Interactive, and Harmonix Music (to name only a few) drop corporate allegiances and rub shoulders with musicians, producers, and gamers in a dialog stemming from a shared love of music and desire for real-world, common-sense applications of new hardware and software technologies.

Created by George Sanger (a.k.a. "The Fat Man," a respected multimedia sound designer), Project BBQ offers nothing less than the opportunity to "influence hardware and software for music on computers for the next five years." Judging from the experience and energy of this group, the weekend spent at the 360-acre Guadeloupe River Ranch, 30 miles north of San Antonio, was the best place to do just that.

"In the battle for audio on PCs I wasn't in the trenches carrying a gun...I was carrying a flag," states Sanger, a Texas resident. Borne out of his frustration at being unable to help understand and streamline technologies in an often confusing and sometimes cutthroat industry, Sanger organized (with the integral assistance of his friend Theresa "Spanki" Avellone) the first Project BBQ three years ago for the purpose of asking a seemingly simple question with far-reaching implications: "What do we want to

see in hardware and software for music on computers in the next five years?" The event was a success, resulting in (among other things) the formation of an industry working group that influenced computer audio specs for both Microsoft's DirectMusic and Intel's PC 98, as well as the creation of a loose-knit network of influential people tied together by the common bond of wanting to keep audio on PCs simple and sensical.

During the weekend in October of 1998, in the deadliest flooding in the region in 77 years, the attendees hunkered down in a warm and spacious 70-year-old stone ranch house perched above the raging Guadeloupe River. They participated in presentations, demonstrations, and organized group discussions. Topics included, but certainly weren't limited to, the next generation of MIDI, standard interfaces for the next level of virtual 3D audio rendering, inventing a

road map for handling the plethora of input and output formats currently in use in computer audio and, with remarkable audacity, the creation of a system to assess the potential relevance and popularity of future audio technologies and products; the latter in the hope that vast quantities of energy and time won't be squandered by the industry on useless or short-lived schemes. (Think 8-track tape—if anyone had bothered to ask a music lover whether or not they would like to hear random dropouts while listening to their favorite song, the answer would surely have been a resounding "no.")

"Think of it as a really good summer camp, a high-

quality management training seminar, and a cowboy trail ride all rolled into one," suggests Mr. Sanger. Project BBQ is all of these. At the end of the weekend, attendees, exhausted but inspired, return to their work. A mandate has been adopted and the work of the BBQ group seeps into the culture of the computer audio industry. The effort and attention of the participants may not have immediate financial results, but the foresight engendered in Texas over that weekend is making its power felt in the corporate community. Sitting in the waiting room at the San Antonio airport, this writer overheard a synchronous, out-of-context comment from husband to wife. The man, a grizzled graybeard in boots, a big silver belt buckle, and a black cowboy hat said, in a slow Texan drawl, "Seems like an awful long way just to go to a bar-b-que." Maybe, but the trip was worth it. **EQ**



**BAR-B-QUE IN SPIRIT:** The Project BBQ may not have involved ribs, but it did let influential industry pros discuss the future of creating audio on computers.

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# Avalon Design VT-747

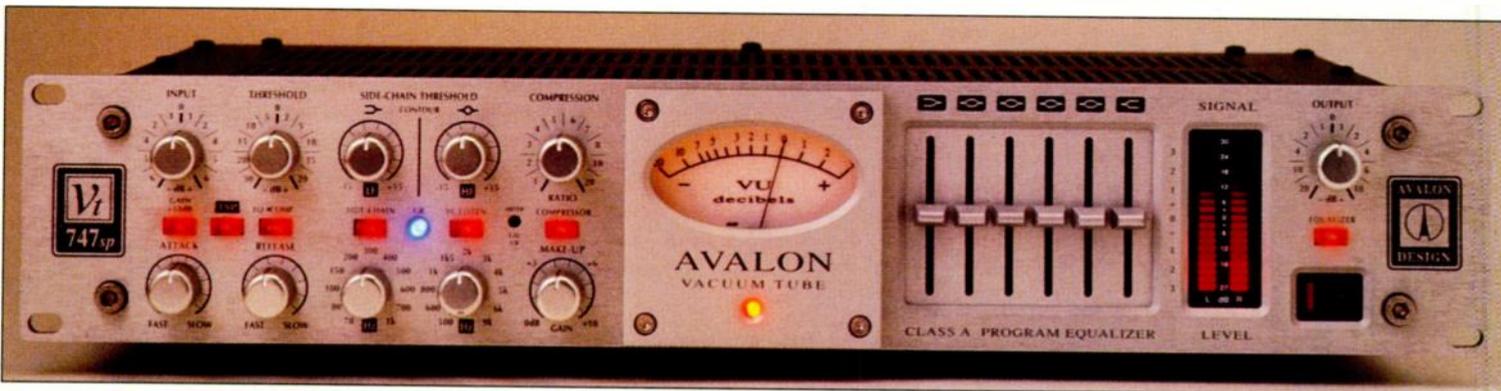
## SP Compressor/Equalizer

A multi-function processor in a classic-looking box

plies into a 2U, rack-mount enclosure. The VT-747 SP uses military vacuum tubes for extended life and their low-noise characteristics. The unit is intended for DAW input signal conditioning, stereo bus compression/EQ, and analog mastering applications.

The VT-747 SP features a twin signal path design that facilitates the choice of either tube tone or a classic, discrete transistor sound. This is accomplished by placing high-voltage, dual-triode tubes or discrete amplifiers in the primary output amplifiers. The unit uses fully balanced, DC coupled, Class A discrete amplifiers for the input/output drive interface with +36 dB of input headroom.

The VT-747 SP, as expected, uses balanced XLR inputs and outputs and provides an output trim control with a range from -45 dB to +10 dB. Frequency response (at -3 dB) ranges from 1 Hz



### BY ROGER MAYCOCK

At the AES (Audio Engineering Society) show in San Francisco, Avalon Design unveiled its newest offering, the VT-747 SP Class A, vacuum tube-discrete twin signal path opto-compressor-equalizer. *Whew!* With a name like that, I want to know more.

Like other Avalon components, the VT-747 SP (I'll keep the name short from this point forward) has a very "classic" look to it. It has very refined-looking, big rotary pots for compressor parameters like Threshold, Attack, Release, Compression, etc., and equally substantial control sliders for the various frequency bands of the equalizer. Pushbuttons such as the In key (which, of course, is a bypass function) are all big and brightly colored red. And right in the middle of the panel resides a good-sized, oval VU meter to indicate gain reduction. To the right side of the unit reside the 60-dB range, high-resolution L-R output meters.

Avalon's VT-747 SP integrates a stereo tube-discrete opto-compressor with a 6-band program equalizer, L-R output level, and gain reduction metering with internal regulated power sup-

The VT-747 SP's opto-compressor utilizes a minimum signal path design. Its optical attenuator functions as a passive level controller with a Class-A, variable gain make-up amplifier. Full dynamic control from soft compression to hard-knee limiting can be accomplished with master threshold, ratio-compression, attack, and release controls. Low- and high-frequency contour parametric spectral controls can be routed into the sidechain path for frequency-dependent compression with variable frequency and threshold levels. The unit provides a sidechain listen mode for monitoring purposes.

Located to the right side of the VT-747 SP's front panel is the 6-band stereo program equalizer. The EQ utilizes 100 percent discrete, Class A high-voltage transistors for the best possible sonic performance. The equalizer incorporates the characteristics of an all-passive design — its frequency turnover, Q, and amplitude ranges have been carefully chosen by Avalon's design team for each band to provide a natural harmonic balance and lowest phase change while offering easy-to-use, effective tone control. The EQ can be placed pre or post of the compressor for enhanced effects.

to 200 kHz while total harmonic distortion figures in at 0.5 percent. The compressor's attack is variable from 2 ms to 200 ms, and the release is variable from 100 ms to 5 seconds. The six frequency bands of the EQ are situated as follows: **Variable amplitude LF:** 14 dB 10 Hz shelf response

**Variable amplitude MF1:** 6 dB 100 Hz selected Q response

**Variable amplitude MF2:** 4 dB 550 Hz selected Q response

**Variable amplitude MF3:** 4 dB 2 kHz selected Q response

**Variable amplitude MF4:** 5 dB 5 kHz selected Q response

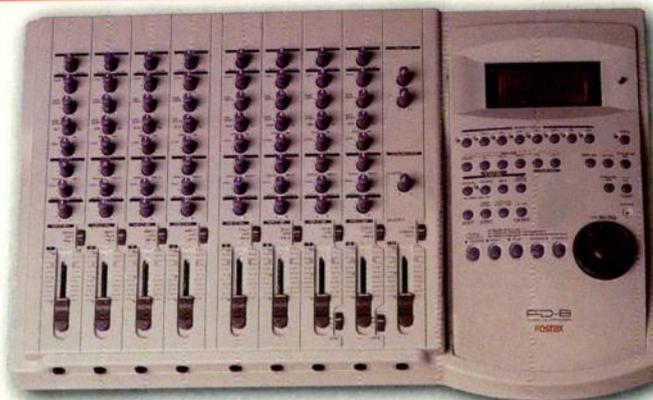
**Variable amplitude HF:** 16 dB 32 kHz shelf response

Avalon Design's VT-747 SP is a serious piece from a company that takes signal processing very seriously. If your facility is in need of such a tool for high-end audio sweetening, be certain to look into this new product offering.

*Suggested list price is \$2495. For more information, contact Avalon Design, 949-492-2000 (tel.); 949-492-4284 (fax). E-mail: [avalon@avalondesign.com](mailto:avalon@avalondesign.com). Web: [www.avalondesign.com](http://www.avalondesign.com). Circle EQ free lit. #120.*

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BUS 5	BUS 6	BUS 7	BUS 8
RET 5	RET 6	RET 7	RET 8
21	22	23	24
45	46	47	48



The core Digital 8-Bus development team



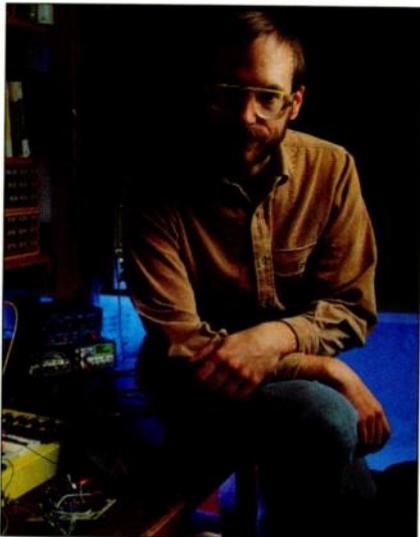
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# The Desktop Concert

Blurring the line  
between recording and  
performing



BY CRAIG ANDERTON

The studio is great, but real-time communication with an audience can make music even more special. My last band was built around MIDI sequences, which produced cool sounds but stifled spontaneity. I missed improvising, and following where the music wanted to go.

So when loop-based music arrived, I was hooked. For live performance, you generally create a collection of samples and loops, thus becoming more of a "conductor/arranger" as you mix sounds in and out, play loops against each other, and improvise based on the mood of the crowd. This doesn't demand virtuoso instrumental technique, but turning these sonic raw materials into a satisfying musical experience definitely requires musicianship.

This is also a pretty painless way to perform; I call it the "desktop concert," as you just set up a bunch of boxes on a table top, plug into the existing sound system (often set up for DJs), and go. The desktop concert also blurs the line between recording and performance, because you can simply patch a DAT or MiniDisc to the line outs. Record enough shows, splice together the best parts, and *voilà* — instant live CD.

We'll get into the desktop concert concept more in the future, including the combination of DJ+live music, stage/set-up considerations, and issues involved in live recording. Meanwhile, when *EQ*'s editors found out I had been invited to perform my loop+guitar-based solo act for the Battery Park electronic music festival in Cologne, Germany (see sidebar), they asked me to write up how someone puts together this type of act...so here we go.

## THE CONCEPT

I wanted to meld guitar (my primary instrument) with loops, not in a traditional rock way ("guitar player solos over loops"), but by integrating the guitar into the rhythmic flow. Most of the loops were sequenced on Ensoniq's ASR-X, with the Urban Dance expansion board providing most of the sounds. For guitar, I wanted to update the "psychedelic" sound of the '60s into something that worked for the '90s — i.e., de-emphasize the excesses of that era such as long, noodling solos and concentrate on using the guitar as more of an electronic, rather than electric, instrument.

Having recently spent some time in Cologne, I wrote a new set of eight tunes tailored specifically for the club audience; each piece had its own personality and a fixed collection of 12–15 sequenced loops. As most loop musicians and DJs don't know what they're going to do until it's time to start playing, the structure was

very loose. I didn't want things too prepared so that I could react to the crowd, which would rather see someone "push the envelope" (and fail in the process if necessary) than do something "safe."

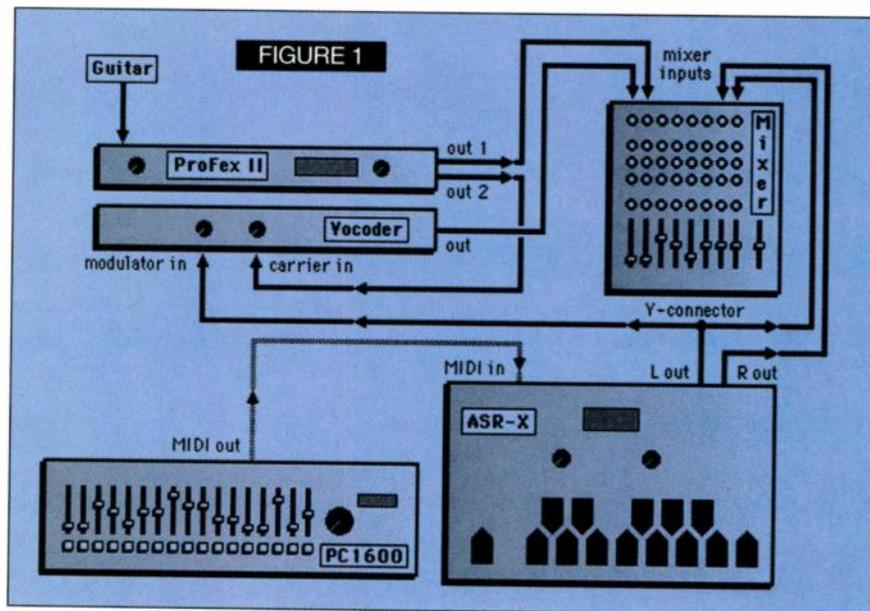
As the set progressed, the song tempos increased (from 118 to 146 BPM), and the key signatures moved up, too. However, to add some variation, the tempo dipped a bit and the key went down a couple semitones slightly before the midpoint, and a slight pullback also happened just before the final tune.

## THE LOOPS

The ASR-X was not really designed for live use — you can't group arbitrary collections of tracks for muting/soloing, and doing almost any kind of editing requires stopping the machine. Fortunately, MIDI controllers can access virtually anything worth controlling; also, a pattern mode can cue up sequences and transition to the next sequence as needed (although this pretty much locks out the rest of the machine, MIDI control remains active). This is essential to letting you change the song order "on the fly."

Control duties fell to the Peavey PC1600 MIDI control surface; its 16 faders controlled volume for each of the ASR-X's 16 channels. Fader assignments were consistent:

- 1, 2: Main drum loops
- 3, 4, 5: Percussive accents
- 6, 7: Main and secondary bass lines



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## WHY COLOGNE?

Cologne has a very active electronic music scene; the Battery Park festival was 10 (!) days of concerts, workshops, and all-night dance parties. The man behind the festival, Ingmar Koch (stage name: Dr. Walker), is a dedicated, soft-spoken performer who brings people together and makes things happen. In a way, the scene reminded me of the '60s, with bands hanging out together and treating music as a plastic medium to be experimented upon.

The "Cologne Sound" is an "anything goes" style that blends hip-hop, techno, some elements of rock, and pure sound. Audiences are much less strict about conforming to particular musical styles; some clubs, particularly the Liquid Sky venue, even have nights dedicated to experimental music.

—Craig Anderton

8, 9: Melodic synchronized parts ("synchronics") that did things in time with the beat  
10, 11: Drones/transitional sounds

12, 13: Melodies/riffs

14, 15: FX

16: "Live" channel (sounds played "live" on the ASR pads; sometimes the fader controlled parameters other than volume)

The PC1600 also has 16 programmable buttons, but I disabled them because: [1] slamming around multiple faders on a dark stage (sometimes with smoke machines going) makes it easy to trigger a button by accident; and [2] there's no visual feedback on the ASR-X or PC1600 to indicate the button status.

An unanticipated problem was that slamming a bunch of faders could generate enough MIDI data to "choke" the ASR-X and affect the timing (not a good thing for grooves). Moving five or six faders simultaneously seemed like a "safe" amount, but a workaround was to program "scenes" on the PC1600 that sent out level snapshots. I programmed a couple of special Scenes to do things that were physically impossible by moving faders, such as setting all channel levels to maximum or pushing drums to max while simultaneously muting all the melodic tracks. This allowed reassigning multiple volume levels while generating minimal data.

The ASR-X has one truly annoying "feature": when it returns to a loop's beginning, the sequence reacquires any initial programmed settings. For example, suppose you start a loop with kick, snare, and hihats turned up, and everything else muted. If during the process of building up the loop the sequence returns to the beginning, you're back to just the kick, snare, and hats again. Using 8- or 16-bar loops was out of the question, so I appended each sequence until it was 64 measures long, which seemed like the right duration before returning to the initial loop settings, where I would start building up again (or move to the next tune). Unfortunately, these long sequences use up

much more memory than shorter loops, but there was still enough memory that I didn't have to load from floppies during the set.

## THE GUITAR

The key to locking the guitar in to the loops was running two guitar channels (fig. 1). The guitar plugged into a Peavey ProFex II, with one channel going to the mixer and the other to a Roland SVC-350 vocoder's carrier input (the SVC-350 has since been replaced by a Syntovox 202 vocoder). Meanwhile, a split from the ASR-X went to the vocoder's modulator input. The vocoder outputs, processed guitar, and ASR-X stereo outputs fed a mixer so I could alter their balance (this involved more fader slamming, but this time in analog). The other key element was using an E-Bow (a handheld device that you can move over a string to generate infinite sustain) to get really cool electronic guitar textures.

One of the great things about a "desktop concert" is you don't need a ton of gear. A friend of mine from the States who was living in Cologne, Matt Isaacson, let me borrow his guitar and ASR-X. Plus, since there was already a mixer and 230-to-115 V adapter on hand, all I needed to bring was floppies, the E-Bow, ProFex II, and PC1600 — which I took as carry-on baggage.

As for the gig itself, luck was with me, and, for whatever reason, I pushed the right buttons at the right time, playing for a little under an hour. I had a blast, got a great reaction, and immediately after getting off-stage was asked by some DJs if I'd join them at another club down the street and lay down some guitar grooves. Live guitar with "two turntables and a microphone"? Of course, I said yes — but that's another story, for another time.

*Craig Anderton is the author of Home Recording for Musicians and Multieffects for Musicians, both published by AMSCO. In addition to his musical work, he lectures around the world on subjects related to technology and the arts.*

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# Bad Habits In *The Basement*



PHOTO BY JIM HERRINGTON

What not to do  
to your friends  
when you need  
them to work with  
your tape

BY AL KOOPER

With the advent of digital 8-track machines, a curious trend began to develop. Friends with project studios would send each other multitrack tapes so that their friends could play on each others demos or masters. This is actually pretty common nowadays, and I have done it enough times to begin bellyaching about the condition these tapes arrive in.

When I get other peoples multitrack tapes to work on, I scan each track like a house visitor who asks to use the bathroom and goes in, locks the door, and immediately snoops in the medicine cabinet. I am fascinated by people's bad habits in the studio. Like sending someone a multitrack tape with no track sheet. Now, that's extremely bright. Good way to get a finished vocal erased by accident

("...but I didn't see any signal on that track when the song started...").

Another common faux pas is to overdub on a track that has a pre-existing recording on it without first cleaning said track. So there's a hihat overdub, and then, 30 seconds later, a trumpet solo appears out of nowhere. That's a common, inconsiderate one.

Or you get sent a tape that has three lead vocals on it and they ask you to put three-part harmony to the lead vocal on the choruses. Which lead vocal, pal? I'm not Kreskin, here. I don't read minds. And, naturally, they don't send a lyric sheet. So you're sitting there til 3 AM trying to decipher if he's saying still or steel, hot or hard. Usually, in reality it's neither, and you look like a jackass when you send the tape back. Ahhh, these are a few of my favorite things.

Another great one is when they send you one 8-track tape with a ruff 2-track mix on it. They want organ on it, and the track is so string and horn heavy that you can't feel anyplace to put the organ. You call them up and tell them this, and they say: "Oh, once you put the organ on, we're gonna erase the strings!" I have dent marks in my forehead from conversations like this. Why did they leave the strings in the mix, and so loud at that? More friends like this, and who needs enemas?

And here is an issue I feel strongly about. Don't charge your friends to play on their records. Your gift is your music and you should share it with your friends. Now if you're a starving musi-

cian and Celine Dion is your close pal and wants you to play on her record, she can afford it. But Billy from the neighborhood should get your gift without a bill. And he should return the favor if you ever need it. Some peeps don't understand this. I have a close friend who is a virtuoso on his instrument. He asked me to play on his album and I did.

He handed me a tax form to fill out at the end of the session and I waved it away. "What are friends for?" I said. He looked shaken. I told him if I asked him to play on my next album gratis, I would expect him to do the same and he agreed that was fair. Hopefully, in the future, he won't weigh things on a one-to-one basis.

Anyone disagree with this?

Well, there's probably about 600 other nasty things you can do to a multitrack tape, but the message of this column is: BE CONSIDERATE. Also, it's good to have nice recording habits whether you send tapes to people or not. So if you've had similar bad experiences I haven't mentioned, mail 'em in. I'd love to see 'em.

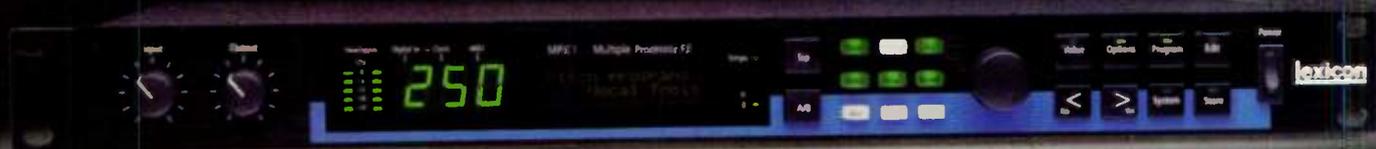
I'm just about recovered from being on the cover of *EQ* last month. I guess it's been that kind of year for the magazine — first Brian Wilson, then Al Kooper. Celebrate the dysfunctional. Thanks to *EQ* for

that, and if you like the column, you'll love the book — on sale at your favorite book or record store NOW! [Editor's Note: Al is referring to his new book, *Backstage Passes & Backstabbing Bastards*, published by *Billboard Books*, which was excerpted in these pages last month.]

*When I get other peoples multitrack tapes to work on, I scan each track like a house visitor who asks to use the bathroom and goes in, locks the door, and immediately snoops in the medicine cabinet. I am fascinated by people's bad habits in the studio.*

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# Led Ka'apana



PHOTO BY ED FREEMAN

## Hawaiian star shines in Nashville

BY MR. BONZAI

**Bonzai: Do you speak fluent Hawaiian?**  
 Led: No, I don't, and not that many people can actually speak classical Hawaiian, but there are schools now that are teaching the new generation the old language.

**Does singing Hawaiian help to keep the tradition alive?**

Yes. I listened to this music as I was growing up, and to my mom and dad speaking the language. With a little effort and a dictionary, I can translate the songs.

**Who is the greatest Hawaiian musician?**  
 Right now, I think the greatest figure in Hawaiian music is Genoa Keawe. She'll celebrate her 80th birthday soon. She does all the old songs.



**What was the first music you heard as a child?**

My mom used to sing "Punaluu." It's about the black sands of Kau — Hawaiians write songs about special places with natural beauty. **Who was your first music teacher?**

My dad, George, taught me how to play my first slack key guitar tune: "Maui Chimes." And I was influenced by my uncle, Fred Punahoa. He plays guitar, autoharp, piano, and saxophone. He once told me that he had a dream when he was a boy — he was taught how to play the guitar in seven nights. He couldn't see the visitor's face, but he was dressed all in white with a red sash. When I was growing up, I just watched my uncle and learned from him.

**What attracted you to Nashville and the sound of country music?**

I loved country music when I was growing up. We had a radio station from Honolulu called KAHU that played it a lot, and I felt as strongly about Hawaiian music as I did about country music. I was also influenced by my father

playing country music. One of the songs I learned from my dad in Hawaiian slack key was "San Antonio Rose."

**Didn't slack key start when the Mexican cowboys left Hawaii in the early 19th Century?**

Yes, around 1830 the Hawaiians picked up the guitars left behind by the *paniolo* (cowboys) and created their own tunings. It's an open tuning and you can use one finger to press in notes while you play rhythm and bass together. Hawaiian steel guitar developed from slack key in the 1880s when they experimented with playing the guitar flat on the lap with fingerpicks.

**What was your experience recording the new album in Nashville?**

It was a dream come true. When I was growing up, I used to listen to Chet Atkins, and years later I joined him onstage

in Nashville. He asked me what I wanted to play and I said, "Blue Spanish Eyes." He nodded for me to take a guitar break, and then another, and another. [Laughs.] I was overwhelmed to be playing with my hero. His style of playing and

**Suspect:** Ledward "Led" Ka'apana

**Ancestry:** Hawaiian

**Occupation:** Singer/songwriter/arranger, slack key guitar master; proficient on ukelele, steel guitar, autoharp, and bass.

**Birthplace:** Hawaii, The Big Island

**Residence:** Oahu

**Slack Key Definition:** Guitar strings are slacked from standard tuning, with thumb playing the bass while other fingers play the melody and improvise in a finger-picked style.

**Location of Investigation:** Los Angeles concert at Luna Park, debut of new album, *Waltz of the Wind*. Joined by Bob Brozman on steel guitar, Viktor Krauss on bass fiddle, Pat Bergerson on guitar and harmonica, and sister Lehua Ka'apana on guitar and vocals. Album recorded at 17 Grand studio and The Doghouse, Nashville, by engineers Gary Paczosa and Toby Seay, with assistant Greg Parker. Produced by Steve Buckingham.

**Notes:** He has recorded over 20 albums and toured North America, Asia, and Europe. His latest album on George Winston's Dancing Cat label combines Hawaiian, bluegrass, country, and cajun — teaming Ka'apana with Alison Krauss, Ricky Skaggs, Sonny Landreth, and Bob Brozman, among other accomplices.



LED KA'APANA PHOTOS BY MR. BONZAI



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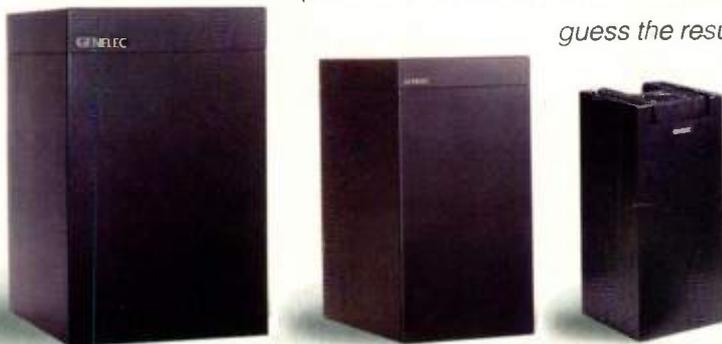
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mine are similar in some ways, like picking, you know — we could relate. He even gave me a signature Chet Atkins guitar. **Will you have a "Led" signature guitar?** Yes, it's being made by the Santa Cruz Guitar Company.

**Bob Brozman, the steel guitar virtuoso, comes from that neck of the woods...**

Yes, that's how I was introduced to the company. Bob Brozman and I have played together for years. We might do the same songs every night, but every night we improvise and it's totally different.

**How was it working with Alison Krauss?** She's got a beautiful voice and she's down to earth. We laughed and joked a lot, and the music just flowed back and forth between us. I can feel her music in my heart.

**How would you compare recording in Nashville with the Islands?**

In Hawaii, we have a laid-back style. In Nashville, you are working with the Big Guns. [Laughs.] But I try to play like back home, with no stress. Believe me, I learned a lot by recording in Nashville.

**How do you mic your ukelele?**

I usually use a DI electric pickup, but I learned from Bob Brozman about the Neumann KM-84 condenser mic that's perfect for guitars and ukeleles — it brings out the sound of the wooden body, and you combine that with the electric sound.

**What about George Winston?**

I first met George back in the '80s and he opened a lot of doors for me. His friendship is like *ohana* (family) for Hawaii, because he's opened the doors for many of our slack key guitarists. First time he heard slack key was when Chet Atkins came back from Hawaii and recorded it in Nashville. Chet couldn't pronounce *opihi moimoi*, the name of the song — which means "sleepy shellfish," so he just referred to it as Hawaiian slack key. George fell in love with this music and founded the label, Dancing Cat Records. **How about Larry Hamby, your A&R man at the record company?**

Larry's a good person, involved in my music — and through him, I met my producer, Steve Buckingham. They were strangers to me, but I'm so grateful for this big opportunity they've given me in Nashville. They trusted me and I went there and did the job. **What do you listen to while you're relaxing at home?**

Country & Western music.

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

Really old Country music. [Laughs.]

**Do you have any advice about the music business?**

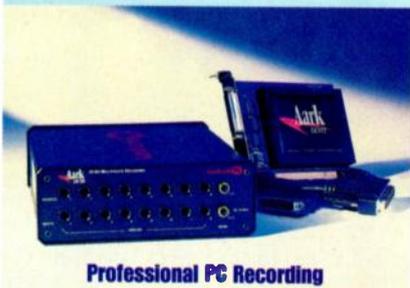
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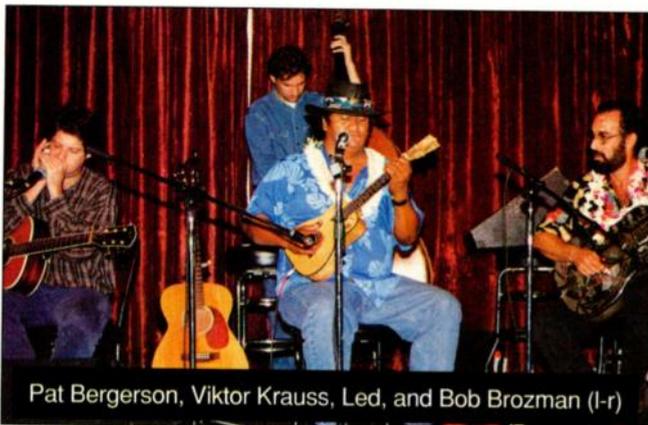
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humble to everybody and move on.  
**Who is the most amazing artist you've worked with?**  
Albert Lee, the great English guitarist. I played with him during the Masters of the Steel String Guitar tour, along with Tal Farlow and Wayne Henderson. Albert was awesome. He makes everything look easy, too.  
**What is the biggest mistake of your life?**  
I don't know. I don't have one.  
**What would you like Santa to bring you this year?**

I want Santa Claus to bring me a new house, in a new location. I want a house with a recording studio. Where we live now is right next to the highway and there's all this traffic going by. I get all these ideas and I wish I had a place to work in that was my own.  
**Hawaiian music was such a worldwide phenomenon in the '20s, and then again in the '50s. Do you think we're due for another wave to sweep around the world?**  
Could be. In my touring around the

world, as soon as I start to play the Hawaiian music I feel and hear the great response of the audience. When I get home to Hawaii, and my friends ask me about my experiences, I tell them the audience is all *haoles* (foreigners), but the response to the music is greater than back home.  
I've heard that when you were a child, you told your parents that you wanted to be a musician when you grew up...  
Yes, and they told me I had to pick one or the other.



Pat Bergerson, Viktor Krauss, Led, and Bob Brozman (l-r)



Windham Hill's Giulio Proietta, Larry Hamby, Steve Vining, and Dave Yeskel (l-r) with Led (center).

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# Been There, *Done That*

An interview with  
multi-faceted engineer  
Don Hahn

BY BOBBY OWSINSKI

*There are a lot of pretty good engineers around these days; not many, however, have the ability to record a 45- to 100-piece orchestra with the ease of someone who's done it a thousand times. Don Hahn can, and that's because he has done it a thousand times. Hahn has an unbelievable list of credits — ranging from television series such as Star Trek (The Next Generation, Deep Space Nine*

*and Voyager), Family Ties, Cheers, and Columbo to music legends such as Count Basie, Chet Atkins, Frank Sinatra, Barbra Streisand, Herb Alpert, Woody Herman, Dionne Warwick, and a host of others (actually 10 pages more).*

Don Hahn has recorded the best of the best. Starting in New York City in 1959 and eventually becoming a VP at New York's famed A&R Studios, and later at Hollywood's A&M Studios, Don has seen it all and then some. He was kind enough to let me observe during a recent *Star Trek* session, then share some of his techniques and advice for my upcoming book (yes, it is coming soon), *Mixdown*.

**EQ:** How differently do you approach recording a rhythm section from when you work with an orchestra?

Don Hahn: The approach is totally different. Because there's no rhythm section, you shoot for a nice roomy orchestral sound and get as big a sound as you can with the number of musicians you have. You start with violins, then violas (if you have them), cellos, then basses. You get all that happening, and then add woodwinds, French horns, trombones, and trumpets...then percussion and synthesizers.

**What happens when you have a rhythm section?**

Then the rhythm section starts first. Any time I do a rhythm section, it's like building a building. That's your foundation. If you don't build a foundation, the building falls down. I like to shoot for a tight rhythm, not a big roomy rhythm section. I think that comes from all the big



**STAR MAKER:** Don Hahn, shown here at O'Henry Studios, has worked with the greats in the Big Band days and currently works on all of the *Star Trek* television shows.

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bands that I did — Woody Herman, Count Basie, Thad Jones and Mel Lewis, Maynard Ferguson...

**Do you build from the drums or the bass first?**

The bass is always first. Everybody relates to the bass. I can remember doing records in New York and some of the producers would put paper over the [VU] meters. I told them I don't care, just let me get the bass and I'll balance the whole thing and it'll come out okay. The only time I can get screwed personally on any date with a rhythm section is if the bass player's late. There's nothing to relate to because everybody relates to the bass player. If he's not there, it doesn't work. Now, orchestrally, like on *Star Trek*, the bass players can be late and it doesn't matter because I'm balancing all the other strings and then adding brass and the percussion last. So if the bass player's late, it doesn't matter. But on a record date with a rhythm section, it's the bass player and the drummer that's the foundation, and the colors come from the synthesizer and the guitars.

**What's your approach to using effects?** I'll use effects to enhance what I'm doing, but not to make a bubble gum record. I don't do those kinds of records any more.

A lot of the records that I do are, for lack of a better term, legit records. I've done a zillion jazz dates. You can't put a room sound on a drummer on a jazz date. It doesn't work; I've tried it many times. It ends up like a hot pop record rhythm section, and the music doesn't jive with it.

**I saw you using the EMT 250's the other day (at Paramount Studio M during a *Star Trek* scoring session). Wasn't the room big enough or weren't you getting the room sound that you liked?**

Well, you have to put some echo on it anyway so [that] when you go to different studios and do the same show, it's gotta sound basically the same every week. It doesn't matter what studio I go to, I still rent two 250's to make it sound consistent. Some of the studios have great plates, but I don't have time to fool with them. When you're doing a live television show, there's no mix. You're mixing it as you're doing it.

**What would your approach be to adding reverb or echo?**

I mix emotionally until it feels good for me; hopefully it'll feel good for the producer and the composer and everybody

else. I don't use a lot of effects, especially on the television shows. I do on records. Not a lot, but whatever I think is necessary if it's a little dull sounding.

I can remember once, with Earl Klugh, I had a popping rhythm section, but Earl plays an acoustic guitar and you can't put a lot of effects on it. So I had to tone down the rhythm section a little, otherwise it sounded like two different entities. You can't use a gimmick on an acoustic guitar like that, so it's sort of by feel. If the record doesn't make me bounce up and down, I'm doing something wrong.

**How about panning? When you're doing a *Star Trek* date, I'm curious how you're panning the various sections. Would it be from the conductor's perspective?**

No, I do that on movies. When I'm doing *Star Trek*, I do the high strings in stereo, the low strings in stereo, the synth in stereo, the brass and woodwinds in stereo, the percussion in mono, and whatever else in mono. That's a stereo room, and I pan it hard left and hard right.

**Do you ever worry about what it's going to sound like in mono?**

No. I check it and it changes a little bit, but it's not like a record because they add dialog and sound effects. I used to worry about the studio and tape noise until I found out that every time they went into the spaceship on the show, there was a background hum in the ship. So now I get the least amount of noise that I can, but I don't spend a lot of time fixing it because I'm not making a CD. You have to take all those variables into consideration because time is money.

**I notice you weren't using much EQ or compression.**

I used a little bit. I think I had a little on the percussion, maybe a little top end on the cymbal and take some bottom end off the soft cymbal. But if you use the right microphones, hopefully you don't have to put that much EQ on anything.

**Were the Sinatra dates all recorded live?**

Yeah, I did Sinatra tracking dates in New York, but Frank never showed up, so I've never personally recorded him. He called from his plane and said, "Just do the tracks, I'll overdub them in L.A." And then on the *Duets* album, I did some extra vocals with Steve and Edie and I think Jimmy Buffet and Frank, Jr.,

and I'm not sure whom else. On the *Broadway* album I did maybe nine cuts; I'm not sure.

**Tell me about that. I'm curious if the vocalists are singing with the orchestra at the same time.**

Sure, that's the best way to make a record, especially with Sinatra or Tony Bennett or Streisand or any major artist. That's the way they're used to doing it, and it's great. I mean you really work your butt off, but you feel like you've accomplished something as opposed to sitting there all day and just overdubbing synth pads.

**What problems do you have in a situation like that?**

Headphones are the biggest problem in the studio. You never have enough separate cue systems to keep everybody happy.

**Are you worried about leakage?**

No, I try to get the least amount of leakage with as much room as I can. On Streisand, we put the bass player and the drummer in one section of the room with some gobos around them. She was in her own booth, three other singers were in another booth, and the whole rest of the studio was filled with great musicians.

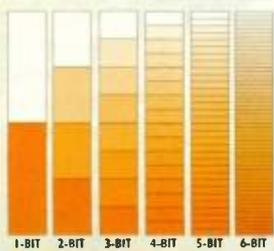
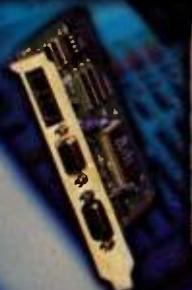
**How has recording and mixing changed over the years?**

Well, just for some perspective, when I started there was no Fender bass and one track only; mono with no computers and no click tracks. Everybody played acoustic bass. There was no synthesizer. Bob Moog used to come up to the studio sometimes with his synthesizer that he was working on. It was like 15 feet wide with big old telephone patch cords and tubes. He'd have us comment on his sounds.

Some of the problems you have now are that the younger guys don't go into the studio and listen. You must listen to what's going on in the studio. Don't just go into a control room, open faders, and grab EQs.

As an engineer, you're supposed to make it sound in the control room like it sounds in the studio, only better. You must listen in the room and hear what it sounds like, especially on acoustic or orchestral dates, and not be afraid to ask the composers questions. Your composers — and especially the musicians — are your best friends because whatever they do reflects on what you're doing. If they're not happy, you're not happy. Remember: the music comes first. 

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# Anatomy of a Studio Renovation, Pt II

Digging in a little deeper and solving some sync'ing problems

BY STEVE LA CERRA

Last month, EQ took a close look at the audio wiring and patchbay design at SOS Productions, the new studio of Manhasset Bay Associates, Inc., a member of the SOS Enterprises Group in New York. This month EQ gets out the microscope to dissect the clock and synchronization aspects of Mike Sosna's room — which proved to take a bit more time than initially anticipated...

All this machinery making modern music would quickly come to a screeching halt if it were not properly synchronized, and there are several aspects of sync that were considered for SOS Productions. First and foremost, there's the issue of an accurate, stable time base being fed to all studio devices, ensuring they'll run at exactly the same rate. Second, there's the issue of making sure that their samples are starting at the same time, because if their clocks run at the correct rate but the samples start at different times, there can be clicks, pops, and other audio glitches. And third, address information is required for proper tape or disc location, MIDI sync, and automation reference.

Mike and I initially chose a Mark Of The Unicorn Digital Time Piece for the task of acting as the Big Cheese Clock Master for the entire room, providing SMPTE, ADAT, Pro Tools, MTC (MIDI timecode), and even TASCAM DA-88 sync (ya' never know) from *one* device. Under almost all session circumstances, the DTP would act as the master for the room. We knew that there would be one type of session where the DTP would *not* be the master, and that would be when the Otari

MX-80 2-inch, 24-track machine *had* to be the master — such as a project where tracks had been cut on 2-inch analog, and now overdubs needed to be done on ADAT's or in Pro Tools. In that case, SMPTE code from the 24-track machine would feed SMPTE input of the DTP, and then the DTP would generate all of the aforementioned types of sync data.

Fig. 1 shows this original configuration of clock data flow. SMPTE on the 2-inch tape is sent from the MX-80 to the DTP, which converts the code into clock data. Note the DTP's various outputs such as a video sync for the video monitors and VTRs, ADAT sync, and two types of clock output: normal or "word 1x" for devices like the 02R's, and a separate "word 256x" out, a higher-than-normal-resolution clock destined for the Digidesign 888/24's (aka Superclock). Word 1x out of the DTP was connected to word clock in of the master 02R (#3), daisy-chained to word in of 02R #2, and then daisy-chained to word in of 02R #1 (as a quick side note, Yamaha suggests daisy-

chaining clock through no more than three devices. Longer chains require the use of a distribution amplifier). A separate daisy chain of Superclock from the DTP was created, going first to 888/24 #1, then to 888/24 #2, and then to 888/24 #3. Since the Digidesign 888/24's live physically next to each other in the rack, keeping the coax lines short for these connections was easy.

As Mike and I tried to run exactly this type of session — ADATs and Pro Tools chasing a 2-inch tape with SMPTE on it — we began to notice that all was not a skip down the Yellow Brick Road in the Land of Oz. It's important to remember that the ADATs and the Digidesign 888/24's were being routed *digitally* into the 02R's — which means that the 02R's, ADATs and 888/24's need common timecode for location and a *common time base for sample-accuracy*. If we were using an analog console, timecode alone would suffice, but the 02R's, ADATs, and Pro Tools must start their samples at the same instant or we'd have problems. During the session, weird things

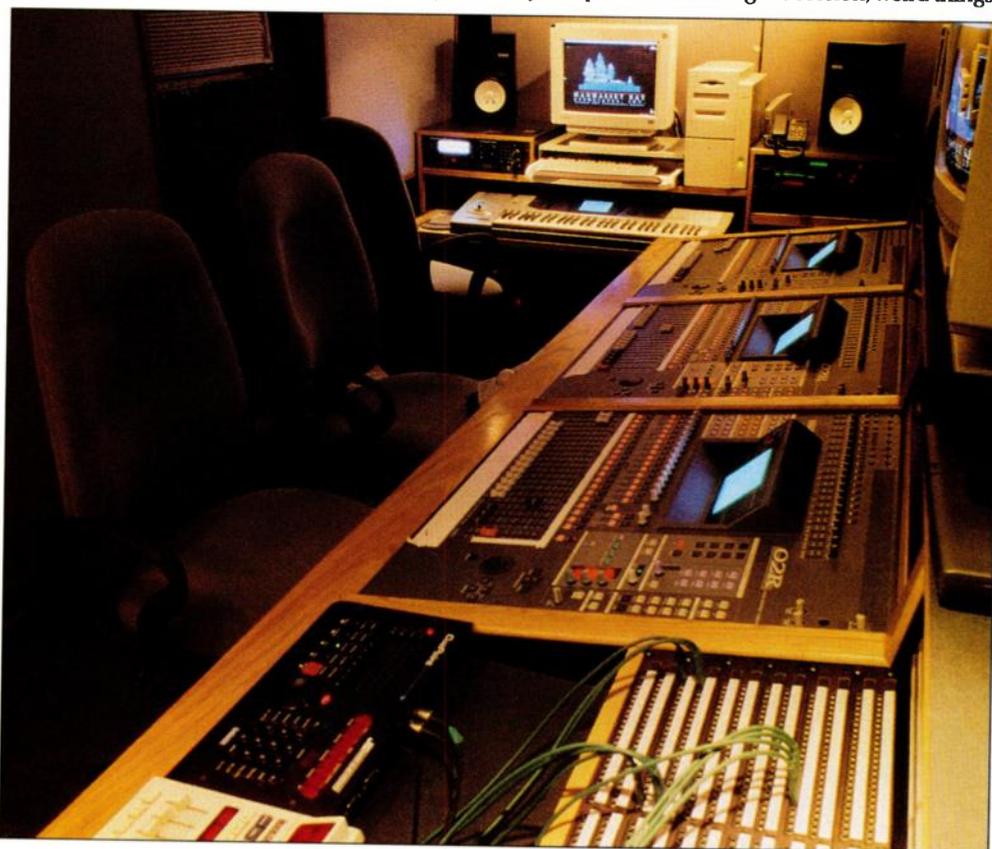
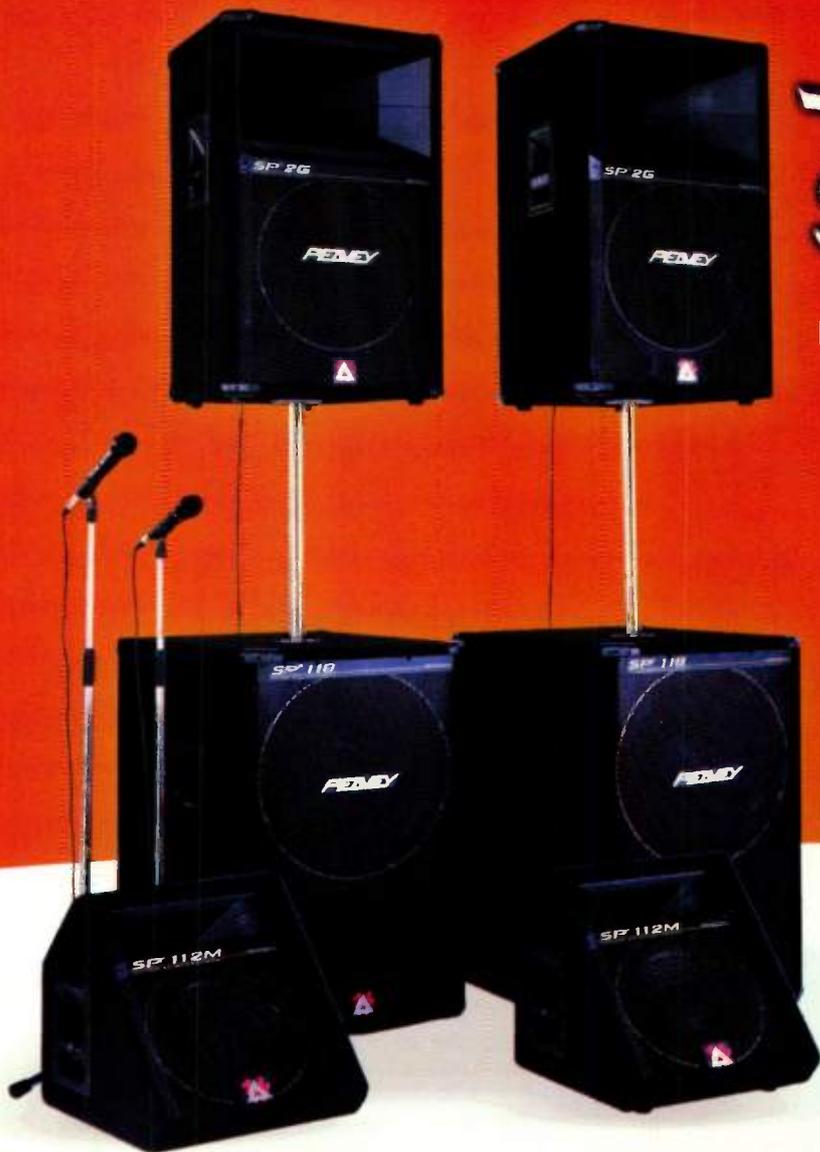


PHOTO BY JEFFREY TAYLOR

DIGITAL HEAVEN: The three 02R's sit adjacent to one of the Macintosh workstations.

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# PEAVEY

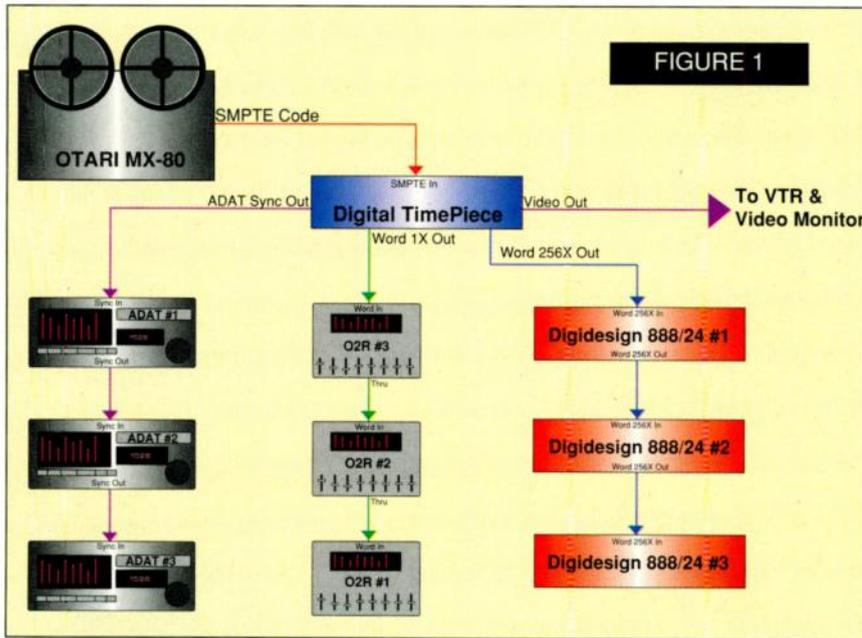


FIGURE 1

at the same *address* but they were not all starting their samples at the same *instant*. (In other words, we were experiencing jitter.) Confirming our suspicion about this jitter was a mixdown session with the same setup plus two Panasonic SV-3800 DAT machines for mixdown. Since the '3800's were fed digitally from the O2R's, they also needed a time base in order to be in-sync with the rest of the system. When the MX-80 was stopped, the DAT machines would switch back and forth between sample rates, indicating that they had no idea what the time base was. Press Play on the MX-80, and, after 7 seconds, everything was stable.

**EXTERMINATING THE BUG**

It turns out that the DTP was never designed to generate clock data under these circumstances, so we'd either have to live with the clicks and pops or find a sync generator that could do what we needed. Living with the clicks and pops was not the way to go. Enter the Aardvark TimeSync II, a low-jitter, timecode synchronization clock device with "sample rate memory" and an on-board timecode reader. If the 2-inch machine stops feeding code to the TimeSync II, (i.e., the transport is stopped or is rewinding), the TimeSync II continues generating clock at the sample rate just before the code was discontinued. Mike and I refer to this as "perpetual clock." When the 2-inch machine starts up, code is again fed to the TimeSync II, and the TimeSync II will relock — which happens quickly, and without evidence of jitter. Besides giving us perpetual clock, the TimeSync II's low-jitter clock also gives the 888/24's more accuracy and fidelity (this is not a bunch of smoke and mirrors. When you hear the difference first-hand, you'll believe it). Our first change in the system was to remove the SMPTE connections between the MX-80 and the DTP, and move them to the TimeSync II. When using SMPTE code from a 2-inch tape, the DTP is set to "MTC/Word," deriving its clock *and* MTC address from the TimeSync II. During sessions where there's no SMPTE code from the MX-80, the DTP is set to "Internal/Word," deriving address info from its internal generator and time base from the TimeSync II.

In addition to the TimeSync II, we also added Aardvark's Sync D.A., a distribution amplifier intended for use with clock and Superclock sources. Our Sync D.A. has been modified to output four word 1x streams and two Superclock streams so that every device requiring clock has a "home run" to the source without daisy-chaining. The Sync D.A. interfaces to the TimeSync II via

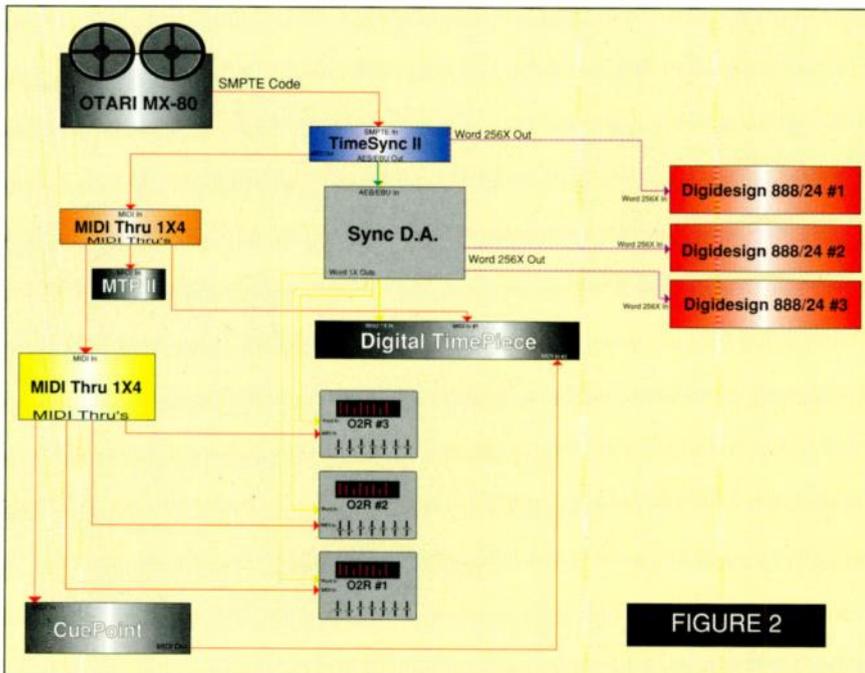


FIGURE 2

FIGURES BY GREG GENNARO

happened. With the 2-inch tape stopped, we'd hear (and see on the O2R meters) a crackling noise and, occasionally, clicks and pops. At first we thought of bad ground, bad code, bad clock and bad food on our lunch break. We ran the digital devices at 44.1 kHz or 48 kHz, re-arranged the clock cables for the O2R's, rearranged the sync cables for the ADATs, put an Alesis BRC or LRC in or out of the word clock chain, and we even tried to get Sophi to turn off her MIDI-controlled feeder (you remember Sophi — Mike's Siberian Husky). Strangely, we'd hit play on the MX-80, there'd be a few seconds of weird

noises and jitter, and after about 7 seconds, the system would settle down and lock. One afternoon while contemplating the Belt of Orion, it dawned on me: the DTP was slaving to the MX-80. Hmmm. The DTP was slaving to the *SMPTE code* on the MX-80. Yeah. The DTP was deriving clock and address information *from SMPTE on track 24 of the MX-80. If the MX-80 is not in motion, there's no SMPTE, there is no clock data being sent to the DTP and therefore, the DTP cannot send out time base.* The crackling we heard was lack of clock being sent to the O2R's, ADATs, and 888/24's: sure, they were

AES/EBU connection and has an AES/EBU thru port for future expansion.

According to the folks over at Aardvark, daisy-chaining of clock and (especially) Super-clock is a strict "no-no" so we've modified our clock connections as shown in fig. 2. An interesting dilemma is still under debate regarding the 02R's: we're not supposed to daisy chain the 02R's, but we're also not supposed to allow the clock cables between the 02R's and the Sync D.A. to exceed 20 feet. For 02R #3, this is not a problem because it's closest to the rack that holds the Aardvark devices. But the other two 02R's require longer cable lengths because they each are a few feet farther from the rack. We'll try it both ways and see what happens. To ensure consistent clock for the ADATs (and DA-88 when it arrives), we've connected both clock out and MIDI out from the TimeSync II to clock in and MIDI in of the DTP.

#### GETTIN' ON THE MIDI BUS

Once a stable clock had been established for all of the devices, we still needed to distribute MTC to the three 02R's, the DTP, a JL-Cooper CuePoint (transport controller), and a MIDI TimePiece II (which handles MIDI sync for the MIDI workstation). It's this MTC that provides timecode address information. The TimeSync II has the ability to convert SMPTE to MTC, so MIDI out from the TimeSync II is connected to the input of a MIDIMAN MIDI Thru 1x4 (thru box). One output from the thru box is connected directly into the MTP II at the MIDI workstation, another is connected to the DTP, and a third is connected to the input of a second

MIDI Thru 1x4. This last MIDI Thru 1x4 feeds the three 02R's and the JL-Cooper CuePoint (see fig. 2). You might be wondering why we didn't just daisy-chain MIDI from the master 02R through to the other two 02R's. Originally we did, but we ran into a roadblock: to take full advantage of Yamaha's Automix feature on the 02R's, the 02R's need to see MTC as an address reference. But — when setting console scenes or snapshots across all three consoles via Automix — the two slave consoles want to see a MIDI program change from the master 02R. Guess what? MIDI program change does not transmit via MIDI thru port. It is only transmitted via the master 02R's MIDI *out* port — which would then have to be connected to MIDI in of 02R #2 and then thru to 02R #1. That's why we couldn't use the 'normal' MIDI ins of the 02R's for timecode. Lucky for us, there's a separate *MTC input* on the 02R's (smart thinkin' Yamaha...), so we connected three outputs of the second MIDI Thru 1x4 to MTC in of each 02R. The last out of this MIDI Thru 1x4 is connected to MIDI in of the CuePoint. Now the CuePoint and the 02R's all know what time it is, and can display it in their respective code windows. MIDI out from the CuePoint is connected to MIDI in of the DTP, allowing CuePoint to put the entire room in motion when its 'play' button is pressed (see fig. 3).

A second MIDI "bus" was then created by patching MIDI out of the master 02R to MIDI in of 02R #2 and then thru to 02R #1 (also shown in fig. 3). Now an automated scene change from the master desk could reach the other two desks via

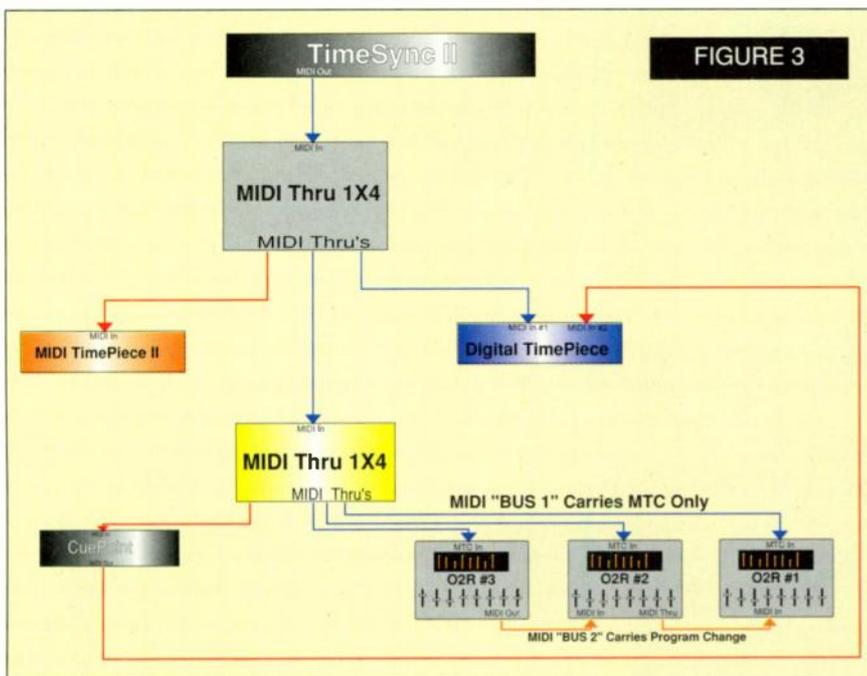
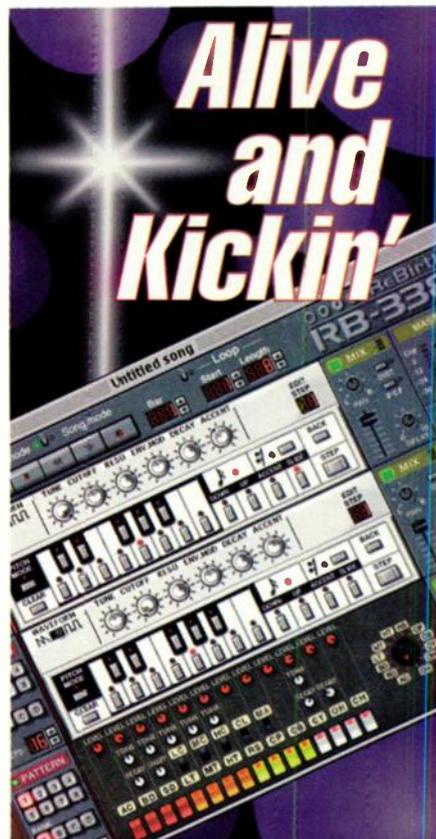


FIGURE 3



Who says all good things have to come to an end? The TR-808 and TB-303 have been reborn in all their thumping, throbbing, screaming glory. Two dance giants in one nuclear software package. There's no complex menus to learn because they operate just like the originals. With total MIDI control. And at a fraction of the cost.



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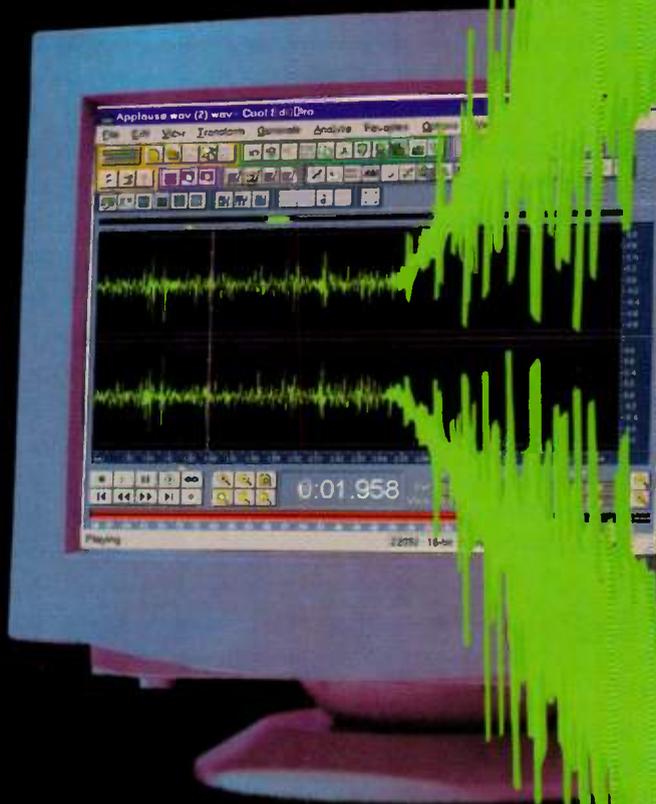
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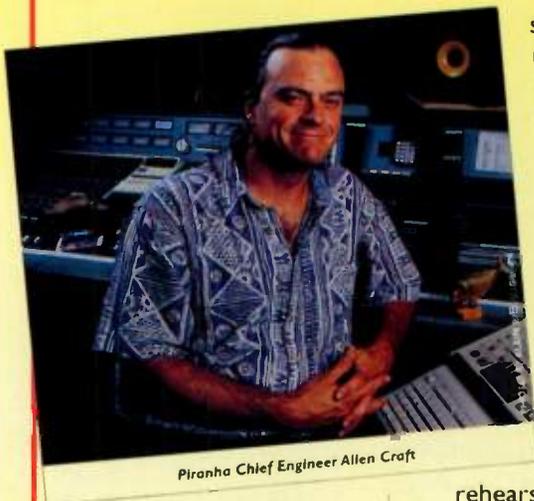
# OBSERVER

PUBLISHED BY EMTEC PRO MEDIA, INC.  
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VOLUME TWO

NUMBER FOUR

## BASF Withstands the Waters at Piranha Lounge



Piranha Chief Engineer Allen Craft

If you're planning to swim with the Piranhas, you've got to be tough. Just ask any of the dozens of tapes that didn't survive a dunk with Neal Schon, Jonathan Cain and chief engineer Allen Craft at the Piranha Lounge studio. If those first two names sound familiar, it may be because Schon was a founding member of the band Journey, and Cain (of The Baby's, Bad English) joined as a bandmate 18 years ago.

Piranha Lounge is the recording hideaway Neal Schon has called home for nearly 25 years. Taken over from Larry Graham of Graham Central Station in 1975, Piranha Lounge is located in a non-descript warehouse in Oakland, Calif. Journey used the

studio for rehearsal and recording from the very beginning of the band, but it's also been home to a number of other diverse projects.

Groups or artists who have recorded or

rehearsed at Piranha Lounge include The E Team, Strictly Roots, Walfredo Reyes, Jr., Rosie Gaines, the Tower of Power horns, Abraxis and others. Tracy Chapman called Piranha Lounge home while she developed her most recent album and auditioned and rehearsed her latest band.

"Our big selling point is our exclusivity," says chief engineer Allen "Alien" Craft. "We have a fenced-off parking lot and easy drive-in access to the front of the building. Tracy would drive right in off the street, pull the door down behind her and nobody knew she was here. In fact, nobody knew she was here for a year and a half."

Piranha Lounge takes up half of a 5,000-square-foot warehouse. Of the 2,500 square feet devoted to

recording, 800 square feet is enclosed for the control room. The rest of the space is one large tracking room with 16-foot ceilings. The other half of the building is large enough to hold a recording truck like Le' Mobile, which has been used at Piranha Lounge for in-house "live" recording. Chips Davis did acoustic design of the recording and control rooms.

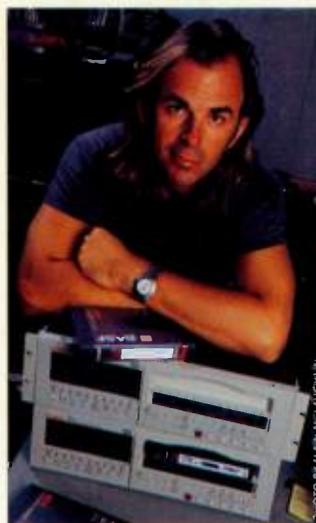
Equipment at Piranha Lounge includes a Soundcraft TS-12 with 32 inputs and 12 busses, four Fostex RD8 ADAT recorders, an Otari MX-80 two-inch analog deck, Roland DM-800 digital audio workstation, Tannoy, Meyer and KRK monitors,

various samplers and other MIDI gear. Everything is synched together, including the studio's Mac Quadra 650 running Opcode Studio Vision.

Craft, who joined Piranha Lounge in 1993 to do a few months of cleanup, hasn't left yet. He finds himself plenty busy juggling a steady stream of Schon's private projects as well as outside clients. "When Neal's on one of his recording kicks," Craft says, "I can't rent out the studio to anyone. I have to keep everything ready to go for when he shows up. When he's not here recording, I rent the studio out for other projects."

In recent years, Schon has been busy. In addition to touring with Paul Rogers, doing several instrumental albums for the Higher Octave label and an album with his band Abraxis, he recently played the anchor role in a blues/rock trio called The Piranha Blues Band. Its soon-to-be-released album, *Piranha Blues*, was recorded at Piranha Lounge.

"*Piranha Blues* features Prairie Prince (formerly of the Tubes) on drums and Ross Valory on bass," Schon says. "That's actually the original Journey right there. The music has a '70s vibe



Journey piano man and songwriter Jonathan Cain



On Neal Schon's album *Electric World*, BASF ADAT Master saved the project.

Continued from first page—

a la Jeff Beck or Rod Stewart. We've got two albums' worth of material, the first of which we've handed off to Mike Varney at Shrapnel Records. I'm also working on some wild dance music layering the EchoPlex and African/Cuban rhythms. That will be coming out soon on [Internet music distributor] music.com."

Schon and Cain are also busy writing for a new Journey album, which they'll begin recording soon. The two bounce back and forth between Piranha Lounge and Cain's Marin County, Calif.-based Wildhorse Studio, depending on the project. Regardless of where they're working, one thing is certain — these two musical legends will be using BASF tape.

Craft remembers all too well the events that led to Schon and Cain's discovery of BASF tape. "I can point to one specific project: Neal's *Electric World* album for Higher Octave," Craft says. "He came to me and said we were going to do the project here, and were going to do it on ADAT. We started using our usual tape, and it was shed city. I cleaned the decks once. I cleaned them twice. About the 16<sup>th</sup> time I cleaned the decks, I thought, 'This is crazy!' I started watching

the error counters, and they were jumping up in quantum leaps. I'd have two errors, then 20, then 40, then 200, then 400 and 500. I was even experiencing static discharge 'clicks' off the tape. I was spending more time backing up tapes to the grandfather level than I was recording. At this point, I was willing to sacrifice live chickens to the gods of recording in the hopes that they wouldn't torture this poor human soul any more!

"One time," Craft says, "I put a new tape in the machine to record Neal's guitar solos and the tape jammed. Just where the leader connects to the tape, the thing had wound in one or two revs and stretched the tape until it was all crunched up. Up to this point, I had kept my cool, but this pushed me over the edge. I pulled the tape out, walked out of the room and grabbed a screw gun and a two-inch sheetrock screw. I screwed the tape right into the wall."

Craft continues, "I started running tests at night between sessions, and I tried every kind of tape. When we started using BASF the error rates went down, the shedding was down, and the static clicks disappeared. Instead of cleaning the machines every day, I was back to normal. Jams just stopped — all the mechanical problems just went away.

"My interest in BASF was piqued, so I tried a couple rolls of the SM 900 two-inch and thought, 'This stuff is fat!' The BASF is an excellent-sounding tape. Now I'm getting into

CD-Rs, and I'm going to try BASF again."

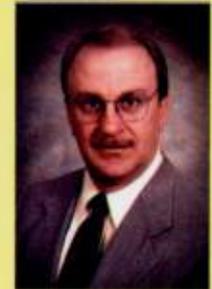
Schon also remembers the pre-BASF days vividly. "I had a nightmare with the old tapes getting eaten up," he says. "I was so angry — I had lost about three and a half months' worth of work. All my guitar solos, everything was gone. I was saying, 'Why doesn't somebody make some decent tape?' BASF did it. As soon as we switched over, everything was fine, and I haven't had any problems since."

After several tape nightmares of his own, Cain is also having excellent luck with BASF tape. "I think BASF has a great product," he says, "and I'm so amazed at the durability and reliability of their ADAT Master. It's just rock-solid, and I never have any errors or problems with it. I've thrown out lots of different tapes. I used to go into the music store and ask, 'What can I buy that won't screw up in my machine?'"

"I've also got an old two-inch machine," Cain says, "and I'm really pleased with the quality of BASF SM 900. I was a Scotch 996 guy, but when I put BASF on and listened to the bottom end, I was pretty amazed. The top was also perfect — more like what digital sounds like in terms of clarity and sonic integrity. It's neat — when I was a kid, I had a Wollensak recorder with BASF tape on it. I've come full circle."

"I'm going to use BASF tape in the future," Schon concludes, "nothing but BASF. It's killer stuff and sounds great. We're recording everything on it now." ■

For more information on other Higher Octave albums recorded to BASF tape, check out the label's website at [www.higheroctave.com](http://www.higheroctave.com).



## FROM THE TOP

Is there a future for analog audio recording or have new high-resolution digital formats finally rendered analog obsolete? That was the question posed during the Analog Option Coalition's Town Hall Meeting on Analog Recording, held during the 105<sup>th</sup> AES convention in late September.

Well-known engineer/producers Joe Chiccarelli, Bob Ludwig and Allen Sides offered updates on their current and projected use of analog. They joined other engineers and producers, as well as studio owners, manufacturers, service suppliers, to debate the outlook for analog.

The healthy turnout and lively discussion at the meeting attested to the vitality of analog, despite the prevalence of digital recording. More than 50 percent of hit records are still produced on analog two-inch tape — a fact that cannot be easily disregarded. Rather than slamming digital formats, most participants agreed that analog and digital formats must co-exist in today's professional recording community.

Chiccarelli compared audio recording to painting, claiming that "analog tape is a color I would have a hard time living without." As long as engineers and producers express such passion about analog tape, BASF will continue to produce and support its full range of analog products.

Joe Ryan

President  
EMTEC Pro Media, Inc.

# IN SESSION WITH

# CHUCK AINLAY



**T**he country music production community in Nashville is a cozy bunch, with a handful of busy engineers turning out the lion's share of the work. Tracking and mixing engineer Chuck Ainlay is one of the busiest, having spent the last 20 years recording the likes of Trisha Yearwood, Vince Gill, George Strait, Wynonna and Reba McEntire. In recent years, Chuck added Mark Knopfler to his growing list of satisfied clients, having recorded the Dire Straits reunion album *On Every Street*, as well as several Knopfler solo albums and movie soundtracks.

Whether tracking or mixing, Ainlay is known for delivering an open, natural sound. "I try to record with the least signal path possible," Ainlay says, "using high-quality microphones and outboard mic preamps. I carry a good bit of outboard equipment and generally bypass the console by going straight to tape. In general, I try to retain the natural element of the instrument rather than go for the ultra-compressed sound you hear on a lot of records.

"When tracking," Ainlay continues, "I'm trying to get the best performance out of the musicians. It's more about the vibe than anything.

"When mixing," says Ainlay, "I ask that I'm not given too much input beforehand so it doesn't affect the way I hear the song. I start by pushing up all the faders just to hear what's there. I never focus too long on any one instrument – I work a little bit on the drums, a little bit on the bass, and so on, tweaking here and there as I go along. I get everything feeling really great before I use any automation."

Ainlay continues, "I use quite a lot of outboard gear, but I try to make it sound as if it's not there. I use compression as an effect, for example, but I use the most musical-sounding compressors I can. I love the Massenberg compressor for vocals, and the Joe Meek compressor is really cool. LA-2As, 1176s, LA-4s, Tube-Tech – all are great. For tracking, I have a number of Neve modules, plus the Massenberg preamps, which are transparent but really warm."

Ainlay says that the most important thing he's learned is that recording comes down to the song and the performance. "I try to not get in the way," he says. "I don't know how many times I've found myself frantically tweaking knobs to try and make things happen. Then, all of a

sudden, the performance is there and everything sounds great."

Long before Nashville became known as a digital recording hotspot, Ainlay was a believer in digital. In fact, his commitment to the format earned him the nickname "Mr. Digital." What did it take for a digital recording evangelist to start using analog tape again? An earful of BASF SM 900.

"I've had quite a reputation for promoting digital in town," says Ainlay. "I pretty much worked all digitally for a good part of my career. I really didn't care for the other high-output analog tapes. They all seemed a bit hard to me – harder than digital, in fact. Then I ran across BASF SM 900 analog tape. I love that warm bottom end, and the tape compression you can get by pushing it.

"Another great thing about the SM 900," Ainlay continues, "is how it holds up. A tape's stability over time is definitely something to be considered. With digital formats changing so quickly, mixing to analog to retain full resolution is really important. For that reason, I've been mixing to SM 900 for archiving purposes as well as for its sound."

When asked what the future holds for him, Ainlay is quick to respond. "The thing that excites me the most is 5.1," Ainlay says. "I've been fortunate to do a number of mixes for DTS. It's a whole new world – it opens up so many avenues to explore sonically. 5.1 surround makes mixing really exciting again. With stereo, there's an established way to do things. With 5.1 you're just paving new ground all the time. What's great is there's no right or wrong way to do it." ●



## TAPE TALK

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Vice President of Sales and Marketing  
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MIDI program change. Meanwhile, MTC would still run from the Aardvark TimeSync II to the 02R's on the other MIDI "bus." And, none of this MIDI data would have to be merged, keeping the MTC stream clean.

Getting timecode into the Pro Tools|24 system is very simple because the DTP is connected via serial cable to a PowerMac 9600/350 dedicated for Pro Tools use. MTC travels into Pro Tools via the Mac's serial port. There's a second serial connection at the synth workstation, between another PowerPC 9600/350 and its serial connection to the MTP II. When the TimeSync II generates MTC, the MTC is routed around the room to the MIDI TimePiece II, which then shares it with the PPC 9600/350 #2 via serial port. This second Mac is dedicated to MIDI sequencing and in-house sample and sound effects libraries. Additionally, Mike has a PowerBook G3 for client use such as project planning, 'Net access, and games. These three computers plus a PPC 9500 located in the MIDI suite will be networked via ethernet.

As far as actually running all this gear, the CuePoint generally serves as the trans-

port master; pressing play on it puts the entire room into motion, except in cases where the MX-80 is the master. ADAT tracks may be armed via CuePoint, or via MOTU's Clockworks — a Mac software driver for the DTP and MTP II, which recognizes the number of ADATs connected to the system, provides track arming capability and transport control. Clockworks is installed on both '9600's, and eventually either PowerMac will be able to run transport control as well as arm tracks (since the DTP's two MIDI ins are already occupied, we'll need some sort of merge box to get that last MIDI in from the MTP II to the DTP). Although this might seem like overkill, the reality is that a person will be able to sit at the MIDI workstation, use PPC 9600/350 #2 to sequence with a timecode reference from either Pro Tools or ADAT, and have control over the room from the workstation.

Along the way, Mike and I made some interesting discoveries about the way some of this gear operates. For example, when using Panasonic SV-3800's, you must software-select which digital input and output you want to use. SV-3800 #2 had been set to AES out, so there

was no S/PDIF out appearing at the coax jack. To access this function, simultaneously press 'counter mode' and 'reset,' and use 'skip' to toggle through the various I/O options.

Once we decided upon the most efficient way of routing clock, timecode and MIDI, the entire system came up happy — and locked very quickly. The DAT machines receive clock information via the AES or S/PDIF I/Os, so they're actually in sync with the system as well. Taking advantage of routing audio in the digital domain has kept the noise floor of the room way down and Mike has been enjoying putting the room through its paces.

*Mike Sosna is at the console tapping his foot in time, locked to house sync, and grateful to be back to making music. He can be reached at phantom48v@aol.com and 516-902-8111. Sophi is glad to be able to eat again. Steve La Cerra will be taking a break from studio installs, during which time he hopes his hands will heal from solder burns. He can be reached at WoodmanEQ@aol.com.*

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## Son Shines

Son Volt converts a rehearsal warehouse into a creativity-inducing project studio for their latest release

BY MICHAEL SANCHEZ

What is the connection between country rock band Son Volt and women's lingerie? No, this is not another sex, drugs, and rock 'n' roll story! Singer and guitarist Jay Farrar and company decided to renovate an abandoned women's lingerie warehouse into a full-tilt project recording studio. The band used the warehouse to rehearse for about six months before they decided to move in some recording gear. With a lit-

tle help from its high ceilings, Son Volt found the "live" sound they had been searching for and realized that they did not need to look any further for a place to record their next album. The band, whose sound ranges anywhere from loose country blues to energetic rock to flat-out experimentation, felt comfortable enough in the warehouse to go in new and interesting musical directions. The results of these sessions can be heard on their latest release, *Wide Swing Tremolo*, which features a much more relaxed, more organic sound than their two previous offerings, *Trace* and *Straightaways*.

The studio, which is located just minutes away from Farrar's childhood stomping grounds in Millstadt, Illinois, is surrounded by acres of the "windswept plains" often associated with his music. With the comfort of recording in their own space and under their own time constraints, bass player Jim Boquist, multi-instrumentalist Dave Boquist, drummer Mike Heidorn, and Farrar were able to "stretch out," resulting in deeper, more textured recordings. With the help of en-

gineer David Barbie, *Wide Swing Tremolo* slowly crept to completion in about eight weeks — about twice as much time as they spent on their previous releases.

As far as turning the old lingerie factory into a recording studio, Son Volt decided that minimalism was the best approach. "The acoustic design is very basic," admits Farrar. "In fact, there was no acoustic design — just a warehouse space. We did put up one wall for some semblance of separation. We mostly used baffling." The wall was built down the middle of the warehouse, resulting in makeshift "live" and "control" rooms.

If you think that this acoustically simple recording space created recording challenges, it was nothing compared to the building's industrial location. "There is quite a bit of bleed-through, and you can hear odd noises before and after the songs. There is a wood shop next door, and I don't know if I've been able to discern any actual sawing going on, but the noise was going on quite a bit," explains Farrar. "Generally we would put on headphones to listen for extraneous noise like



FREEDOM'S SON: Son Volt turned their rehearsal studio (which used to house a lingerie warehouse) into a project studio for their new album. This newfound freedom allowed them to take their music in new directions.

PHOTO BY STEVE SMITH

traffic or crickets or cats or sawing. We did try to work around those noises.”

All glitches aside, the project studio experience proved to be a positive one. Besides having a place to store their assorted instruments and gear, the band enjoyed the studio on a more spiritual level. Farrar explains, “It’s just kind of an environment that you’re used to being in. It’s easier to find inspiration there.”

#### THE BASICS

At the heart of Son Volt’s studio lies a Mackie 24•8 console and two Alesis ADAT XTs. Farrar says that the ADATs were very important because they allowed the band to record any number of takes inexpensively. After they recorded the numerous takes on the ADATs, the band transferred the preferred takes onto 2-inch tape.

Farrar credits much of the good tone on the album to engineer David Barbie’s mic collection, which consisted of some Coles Ribbon mics and some Lawson L47’s. During one song, “Dead Man’s Clothes,” Farrar actually sang from a microphone through a Wollen-

sack reel-to-reel tape recorder from the 1950s. “It was a little bit low-fi. It sounded like a telephone microphone; in fact, its appearance was similar to an old phone mic,” he says.

As far as guitar effects go, Farrar has accumulated quite a few over the years, including Ibanez Tube Screemers, Prescription Electronics distortion pedals, “some old MXR guitar effects,” and even an old Echoplex reel-tape delay. For most of the songs, Farrar simply went from the microphone to the preamp straight to tape. The guitar tones were made possible by some Neve and API preamps.

One of the more notable recording effects on the tape is a backward guitar track on “Shanty.” To create this effect, Farrar played some harmonics on an acoustic guitar and used the Wollensack reel-to-reel to record it, cut it, and loop it backwards. “It took a lot of patience, luck, and trial and error,” he says.

On “Straightface,” the band decided to go with a distorted vocal. “The idea came about when I was doing the vocals for the song and the levels in the headphones were getting pretty hot and

started to distort,” says Farrar. He liked what he heard, so he tried to re-create that sound by running the vocal through a Telefunken tube preamp to get the distortion to tape.

Other equipment in Son Volt’s studio include a Fostex A2 2-track 1/4-inch tape machine, Alesis Monitor Twos, Audio-Technica ATH-M2X headphones, a Carvin 973 PA speaker, a TASCAM DA-20 DAT machine, a JVC TD-W718 double cassette deck, and various guitars, amplifiers, drums, and cymbals. Helping to power the studio is an Alesis RA-100 reference amplifier.

#### CONCLUSION

Overall, the band had a great time recording *Wide Swing Tremolo* in their Millstadt studio. According to Farrar: “There was no master plan going into this. It was the result of a desire to try and record in a different environment. We just wanted to see what we could do with a little bit more time.”

When asked if the experience was all he hoped it would be, Farrar answered, “Yeah, I’d like to do it again.”

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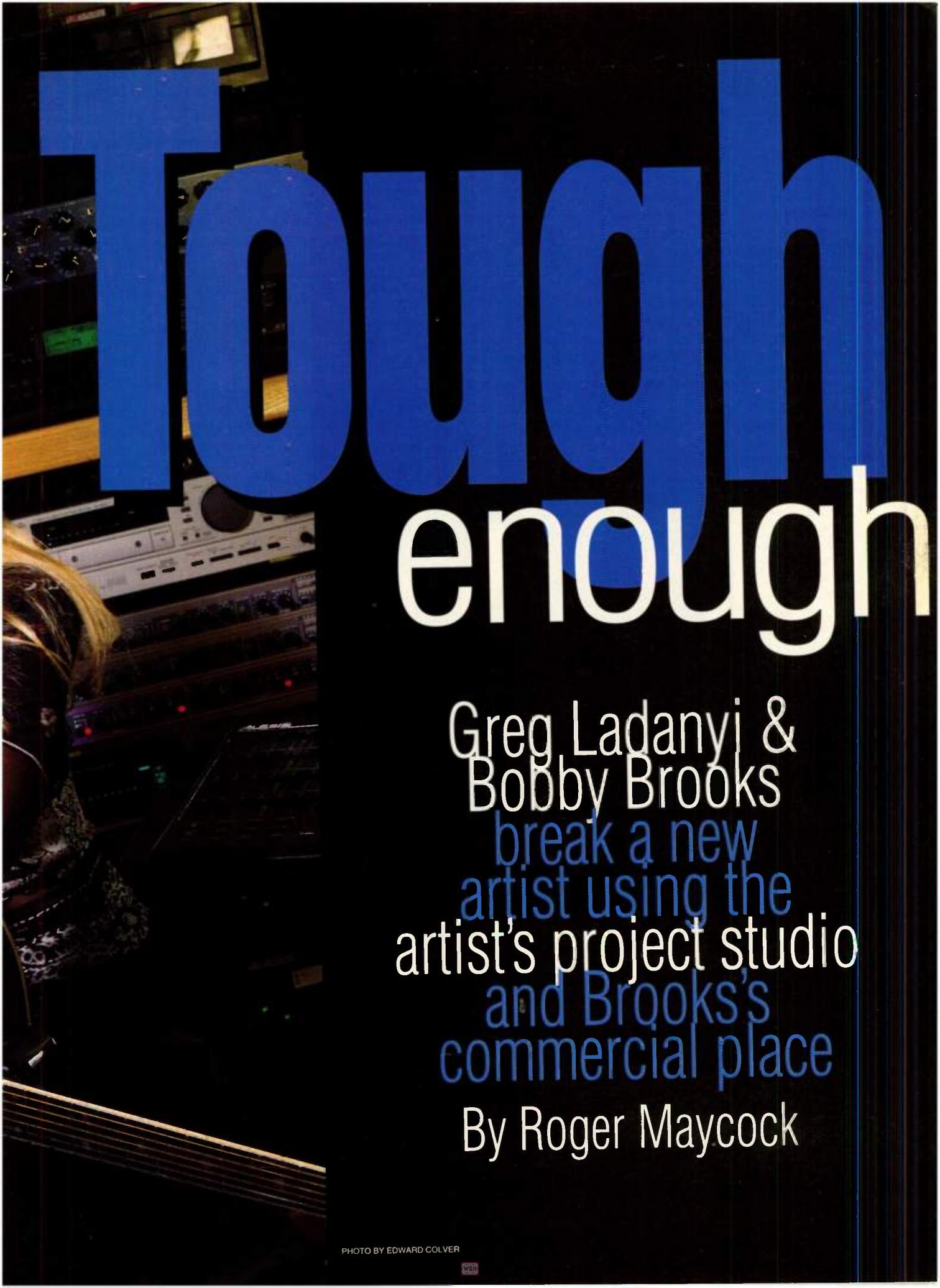
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# Tough enough

Greg Ladanyi &  
Bobby Brooks  
break a new  
artist using the  
artist's project studio  
and Brooks's  
commercial place

By Roger Maycock

# Tough enough

It really doesn't matter what type of business you're in: the "downsizing" mentality of the late '90s has forced everyone from the corner grocer to WalMart to operate with increased efficiency and less staff — all with the goal of increasing the bottom line.

The music and recording industries are no different. Gone (for the most part) are the days of big recording budgets and large advances. Artist development expenditures have been slashed, and, more often than not, artists are expected to deliver a finished product (complete with liner notes, artwork, and other supporting materials) before the record company will even consider them.

Of course, instrumentalists, vocalists, engineers, producers, and others in the music industry have long since acclimated themselves to these cold, hard realities — and this is precisely why the professional project studio has come to play such a vital role in today's production landscape. Not only have we adapted and survived, but many of us have flourished.

These seemingly adverse conditions have fostered countless upstart "indie" record labels, and manufacturers and software developers alike are providing us with studio tools that have enabled music and record production to reach astonishingly high production quality without the need for big bucks commercial facilities. Take all these factors, throw in the Internet and streaming audio technologies such as Liquid Audio, and it's no wonder why the project studio as a cottage industry has come so far.

And speaking about the whole cottage thing, nestled away in a tiny guest

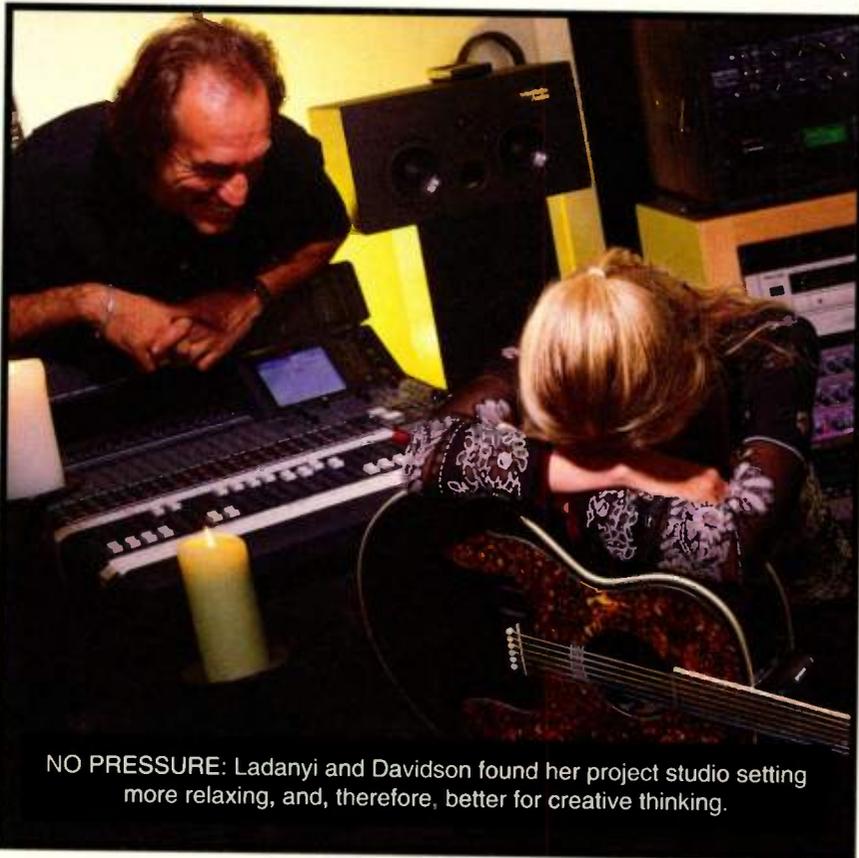
house adjacent to one of L.A.'s many golf courses is the project studio where Greg Ladanyi and Jody Davidson have been diligently recording and producing the debut release of Jody's *Fragile Tough Girl* with co-engineer Bobby Brooks. In a place as vast and impersonal as Los Angeles, it's hard to think of a hipper location for the creative process. Just far enough from the freeways and situated on a small, winding

A seasoned musician/performer with a solid grasp on recording fundamentals, Jody's creative energy is being nurtured by two of L.A.'s leading recording engineers/producers — Greg Ladanyi and Bobby Brooks. Together, these three gifted people are creating a terrific collection of songs that, when finished, should put Jody square in the middle of the pop/rock/alternative genre reminiscent of Alanis Morissette and Sheryl Crow.

Greg Ladanyi's work has included stints with many of the biggest names in rock — including Don Henley, Fleetwood Mac, Jackson Browne, and TOTO. His career includes numerous multi-platinum, gold, and Grammy Award-winning records with sales in excess of 27 million units. He received the Grammy nomination of "Producer of the Year" for his work on Don Henley's *Building the Perfect Beast* and won a Grammy for "Best Engineer" for his work on *TOTO IV*. In addition to his work with Jody

Davidson, Ladanyi's efforts can be heard on the recently released Luaka Bop/Warner Brothers CD for Latin American artist *Bloque de Busqda* as well as the forthcoming project from The Violets on Straightline/Warner Brothers Records.

Co-engineer Bobby Brooks has worked with an equally impressive roster of artists, including Michael Jackson, Stevie Wonder, Whitney Houston, and Brandy. Brooks works out of a studio known as the Gallery. The facility is well-equipped with a custom Solid State Logic F-Series console (last of the E-Series prior to the "G" models) and a live room



NO PRESSURE: Ladanyi and Davidson found her project studio setting more relaxing, and, therefore, better for creative thinking.

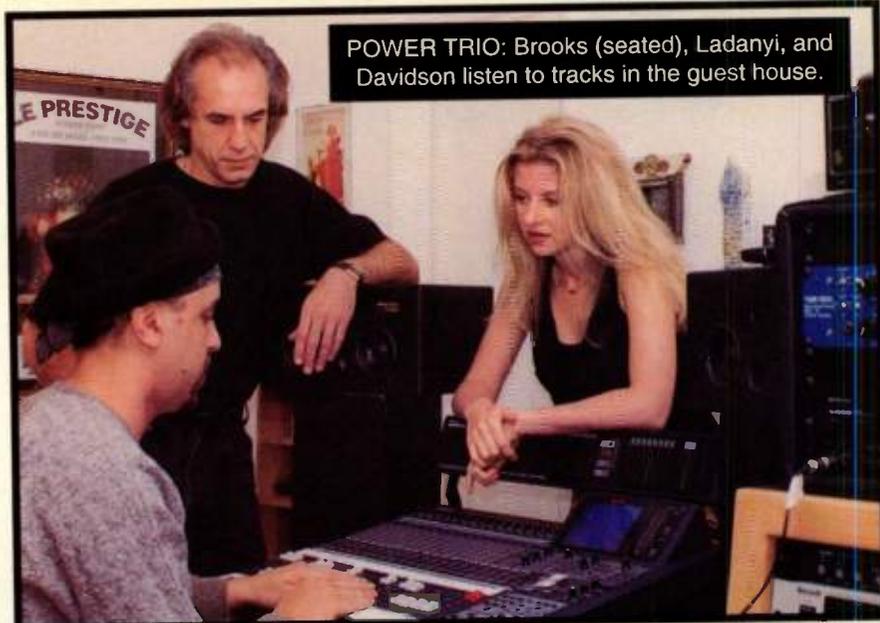
street that almost defies locating the facility with a road map, the studio's environment is such that a sense of time is almost lost.

"When I first found this place, I couldn't believe it," notes Jody. "I had been searching for a location where I could experiment with my ideas, play the piano, record my tracks, and listen a thousand times over without ever being concerned about the clock ticking away. I don't like the pressure that I feel when I work in the usual studio setting. Here, I can concentrate on getting the music just the way I want it — without that sort of restrictive mind-set."

the size of a handball court — large enough to accommodate a small orchestra. Much of his contribution for *Fragile Tough Girl* took place here due to a rather heavy production schedule — and the manner in which Ladanyi and he shared responsibilities is a key element in deciding which equipment was to be used on the project.

While Ladanyi and Brooks each have sizable studios from which to draw upon for just about any studio task imaginable, they elected to use what initially seems like a rather small studio setup. The key to their decision was that the system could be duplicated, making it easy to transport material back and forth between Jody's guest-house system and Brooks's Gallery.

At the heart of the system is Panasonic's DA7 digital mixer, tied to 24 tracks of Alesis ADAT with transport control provided via the Alesis BRC.



**POWER TRIO:** Brooks (seated), Ladanyi, and Davidson listen to tracks in the guest house.

PHOTO BY ROGER MAYCOCK

Westlake Audio BBSM-4 monitors are used at Jody's guest-house studio while BBSM-10's are in use at Bobby Brooks's studio. Panasonic SV-3800 DAT recorders are the digital 2-track machines of choice at both locations.

While sound quality was certainly

an important consideration in their equipment decision, the ability to get tracks down without a lot of "engineering" was perhaps even more important. "Jody's really good with the equipment," notes Ladanyi. "When we were deciding what gear we should use on the

## BOBBY BROOKS GETS TOUGH

One of the biggest challenges in any creative endeavor is managing all the egos involved. "If there's too many hands in the pot, things can get pretty damn ugly," laughs Bobby Brooks. "When you've got three strong personalities all working on the same project, getting a good vibe and channeling all that energy in the right way isn't always easy." Bobby should know — he's been involved with some of the biggest artists and engineers in R&B including Bruce Swedien, Howard Benson, Terry Lewis, and Jimmy Jam.

Brooks's ability to know what sounds right and how to go about getting it "on tape" (figuratively speaking) is what keeps him in demand. In addition to his co-engineering *Fragile Tough Girl* gig with Greg Ladanyi, Brooks has been working on several other projects for Zebrahead, Rick James, Teena Marie, The Ernies, Dionne Warwick, and Bleu.

"I met Jody through a drummer friend of mine, and she played me some of her songs and I thought they were really great. As a producer, I wanted to work with her, but to produce somebody, you need to be there day in and day out, and due to other obligations, I just couldn't spend as much time with her as I would have liked," states Brooks. "The arrangement where Greg and I have been working together on Jody's music has worked out really well. We can bounce ideas off one another and together, I think the record really benefits from the combined effort."

The Gallery, operated by Brooks and long-time associate Brad Buxer, is a serious facility. In addition to the SSL and Panasonic consoles, the studio is equipped with both Studer 827 and Otari MTR-90MKII 2-inch open reel recorders. For digital recording

and editing, Pro Tools Version 4.2 is on hand. The entire studio consists of a main control booth with separate areas for the vocal booth and the larger "live" room — all of it interconnected with both video and audio monitoring systems to keep the talent and engineer in close contact.

Sitting right next to the SSL console, the Panasonic DA7 looks like a postage stamp, but is valuable to Brooks in its own way. "The DA7 is a lot of board in a very small package, and it's been a tremendous asset in the production of Jody's record," notes Brooks. "The DA7 feels like an analog console, and it's a very open-sounding board. It's still faster to reach up and tweak a knob on the SSL, but other than that and the number of inputs, the DA7 is killer."

For *Fragile Tough Girl*, Brooks has been focusing much of his attention on the vocal tracks. "I've been experimenting with what I call 'vocal textures' in order to bring out the best qualities of Jody's performances. After I get the comped vocal tracks from Greg and Jody, I dump them into Pro Tools where I can experiment with different takes and listen to all the subtleties to figure out how to make those tracks really stand out. It's extremely important for the vocals and the backing tracks to complement one another."

When it comes to Jody Davidson's *Fragile Tough Girl*, Bobby Brooks brings an entirely different perspective to the party and has helped make the record a collection of songs that will be all but impossible to resist. "She's an amazing talent," says Bobby. "The three of us have been making one hell of a record."

—Roger Maycock

# Tough enough

project, I wanted it to be easy enough to operate with a minimal amount of assistance. This way, Jody would be free to record even if neither Bobby nor myself was available."

"With some artists, it's better just to get the hell out the way and let them do what they do best," says Ladanyi. "And Jody is one of those types — left alone to create, we get better results than if there were always one of us around to slow her down." For that reason, Ladanyi has

music is, in Jody's words, "very organic, earthy and raw. I want my music to reflect real-life experiences, with the lyrics speaking to the listener in such a way that the songs will really touch them."

The entire guest house is the studio. With hardwood floors and plastered walls, it makes an ideal recording location for her Steinway grand piano, acoustic guitar, and vocal tracks. Ladanyi adds, "This room has just

get really smooth sounding vocal and piano tracks that match the feeling of the songs — no fancy studio bullshit, just careful recording technique." And just like so many other project studios, the bathroom has been very useful for some "live-sounding" guitar and small percussion parts.

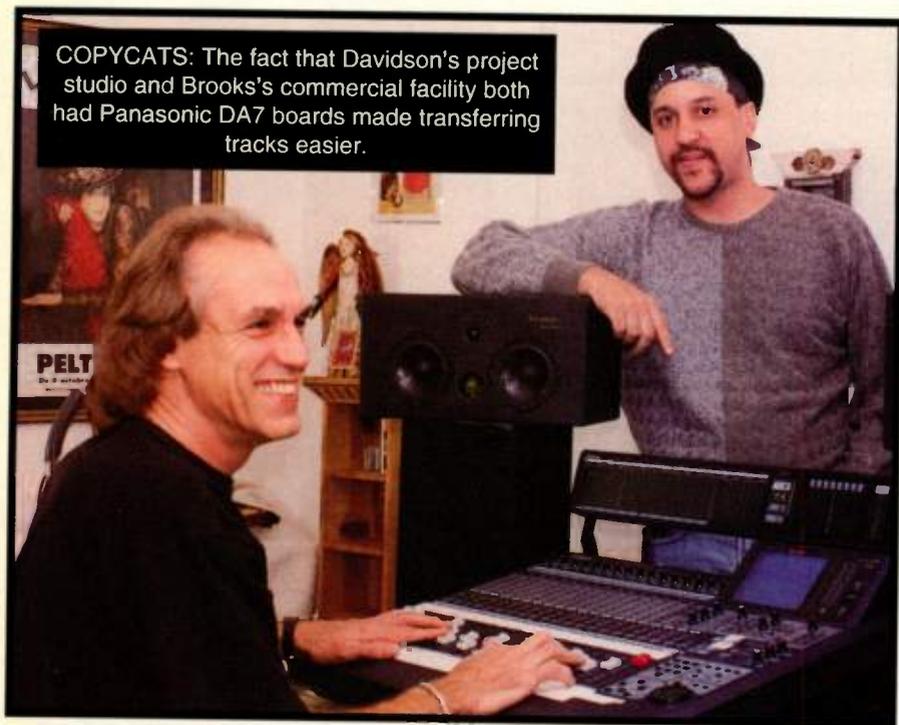
Brook's Gallery is a 180-degree departure from the guest house. In addition to the SSL-equipped control room, the facility has a dedicated vocal booth and a big live room. "By working both at the guest house and in the Gallery, we've been able to capture just the right vocal quality for the record," notes Brooks. "All drum tracks have been done here because the live room is acoustically treated, which makes getting the right sound easier."

For miking the drums, Brooks used Earthworks QTL1 and Audio-Technica AT-4050 microphones for overheads, an AKG D112E for the kick, a Shure SM57 for the snare drum, a Neumann KM54 tube mic for the hihat, and Audio-Technica AT4030's on the toms. Similarly, electric guitar tracks were recorded at the Gallery because either the booth or the live room could be taken advantage of as well as the substantial collection of microphones. Guitarist John Chase, a common friend of both Bobby and Jody and a regular studio player at the Gallery, performed the tracks.

As the mixer is the focal point for keeping track of all the various elements of a mix, the fact that both Jody's guest-house studio and Brooks's Gallery are equipped with the Panasonic DA7 has proved to be an invaluable asset throughout the entire production cycle. Since several of the songs were recorded at both locations, being able to "transport" the mix, complete with all level, pan, EQ, and other settings saved a tremendous amount of time.

Among the DA7's thorough MIDI implementation lies the ability to perform a MIDI system exclusive dump to any sequencer or other device capable of handling MIDI data. Whenever it was time to switch from one studio location to the other, a sys-ex dump was loaded into the sequencer, and then that data was merely carried to the other studio, reloaded, and played back into the other DA7. This simple procedure ensured that the project could continue

**COPYCATS:** The fact that Davidson's project studio and Brooks's commercial facility both had Panasonic DA7 boards made transferring tracks easier.



taken advantage of the DA7's automation by creating multiple scenes that bus through to different tracks on the ADATs. This way, with just a few button pushes, Jody has been able to feed signal, arm the recorders, and record tracks without getting hung up with the engineering part of the process.

As life is never a perfectly balanced, slickly produced series of events, the songs on the CD tend to shy away from being too overly produced. Jody's musical style lends itself well to this approach. Much of the music revolves around piano, acoustic and electric guitars, acoustic and electric bass, and drums/percussion. While there are synths and samplers being used for items like strings, woodwinds, and muted trumpet, the overall attitude from the

enough of a live sound so that the piano and guitar naturally sound big." A pair of Røde NT2 studio microphones, used in conjunction with a Tube-Tech MEC-1A mic preamp/EQ/compressor, have been used for virtually all miking applications at the studio.

Vocal tracks and guitar have been recorded both in Jody's guest house and the Gallery, depending upon the nature of the song. As the guest house is really quite small, it was very easy to place blankets and other sound-absorbing materials around the room to tune it to the right ambience. In describing the process of recording Jody's vocals, Ladanyi pointed out, "This room, with a few blankets strategically placed and careful placement of the Røde mics, sounds really good. We've been able to

uninterrupted at either facility, and that the songs sounded the same. "By having the same board at both locations and an easy way to reload the mix data between sessions, we were able to continue working on songs at either studio," says Brooks.

In addition to the basic recording setup at Jody's guest-house studio, several other pieces of equipment have had active roles in the recording process. One of Ladanyi's favorites is TC Electronic's M2000 studio effects processor, which Greg has been using for everything from reverb and delay to compressor, limiter, stereo enhancer, and de-esser. Ladanyi enthuses, "This processor has some incredible stuff in it, and with the digital I/O, I can tie it right into the DA7 without ever going to analog. Combined with the DA7, which has some killer EQ in it, and the ADATs, the level of control and the sound quality we're getting is awesome — it's scary to think what can be done in a small studio these days."

Rounding out the equipment roster, Jody and Ladanyi have been making good use of a Korg A3 signal proces-

sor, an Alesis NanoVerb, two Aphex 661 Expressors, and an Aphex 107 Tubessence 2-channel mic preamp. A Mackie CR-1604 VLZ compact mixer is being used as a sidecar for submixing effects into the Panasonic DA7. Ladanyi emphasizes, "We've had tremendous success with the entire system, due in no small part to Dave Carlock, who, in addition to handling much of the Pro Tools editing functions as well as the spacing and sequencing of the tunes, also configured the studio for us to make certain that we could get the best possible performance out of all the equipment."

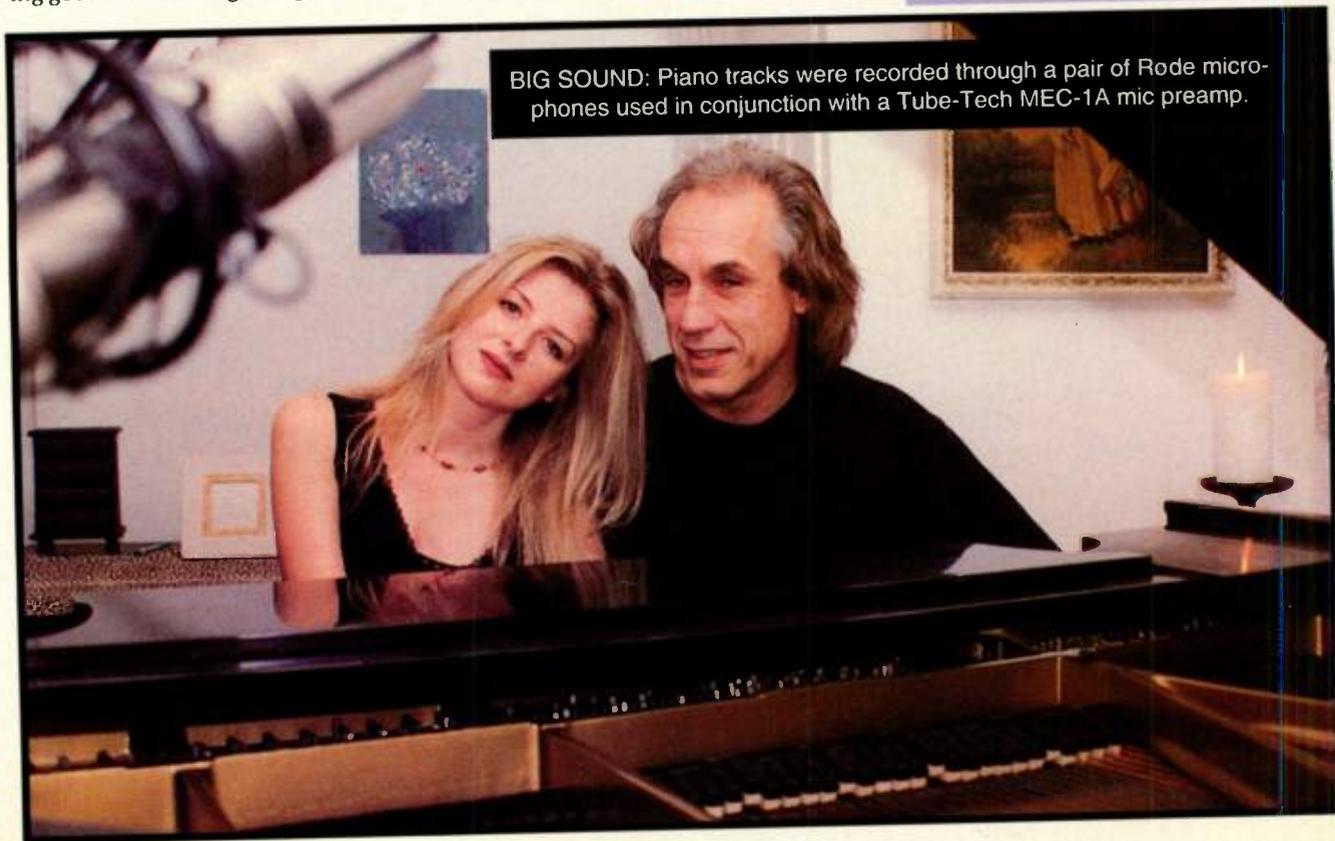
Two of the most notable songs on the CD are "Fragile Tough Girl," which was written at a point in Jody's life when "just about everything that could go wrong did," and "Secrets," which deals with "the fine line between sharing yourself completely with a loved one or keeping some things to yourself." Jody adds, "'Fragile Tough Girl' was originally written as a ballad, but since the lyrics take the listener through the tough times to a point where we all benefit and become better people as a result of those experiences, Greg's idea to

transition from a subdued start to a strong, rhythmic finish really gave the song an added sense of strength. He's been a terrific engineer and producer to work with."

Ladanyi describes Jody as, "one of the most gifted young artists I've ever worked with." They actually met about five years ago through a mutual friend when they were both involved in a recording project for another artist. "Everything about her was 'just right,'" says Ladanyi. "I knew that the only thing between Jody and a successful record was the time and effort to get it done. Well, the time's right and we're almost done."

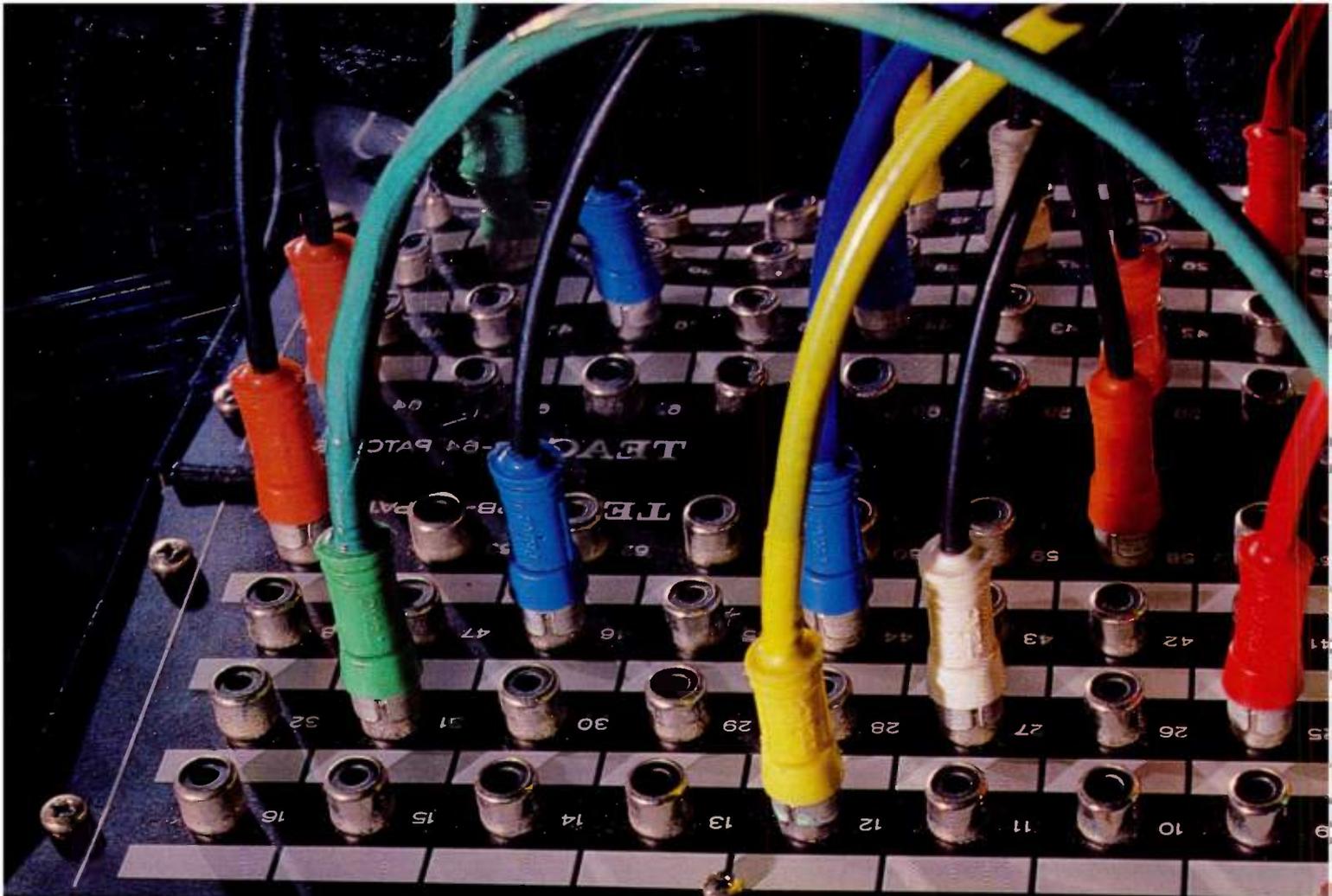
The *Fragile Tough Girl* is scheduled for completion in December, and already the project has garnered an unusually high level of interest from several record labels, distributors, and others. The project's title track will receive its first public exposure when it airs on an upcoming episode of Fox Network Television's *Brimstone*.

*Greg Ladanyi can be reached via e-mail at the following address: [greglad@aol.com](mailto:greglad@aol.com)*



**BIG SOUND:** Piano tracks were recorded through a pair of Rode microphones used in conjunction with a Tube-Tech MEC-1A mic preamp.

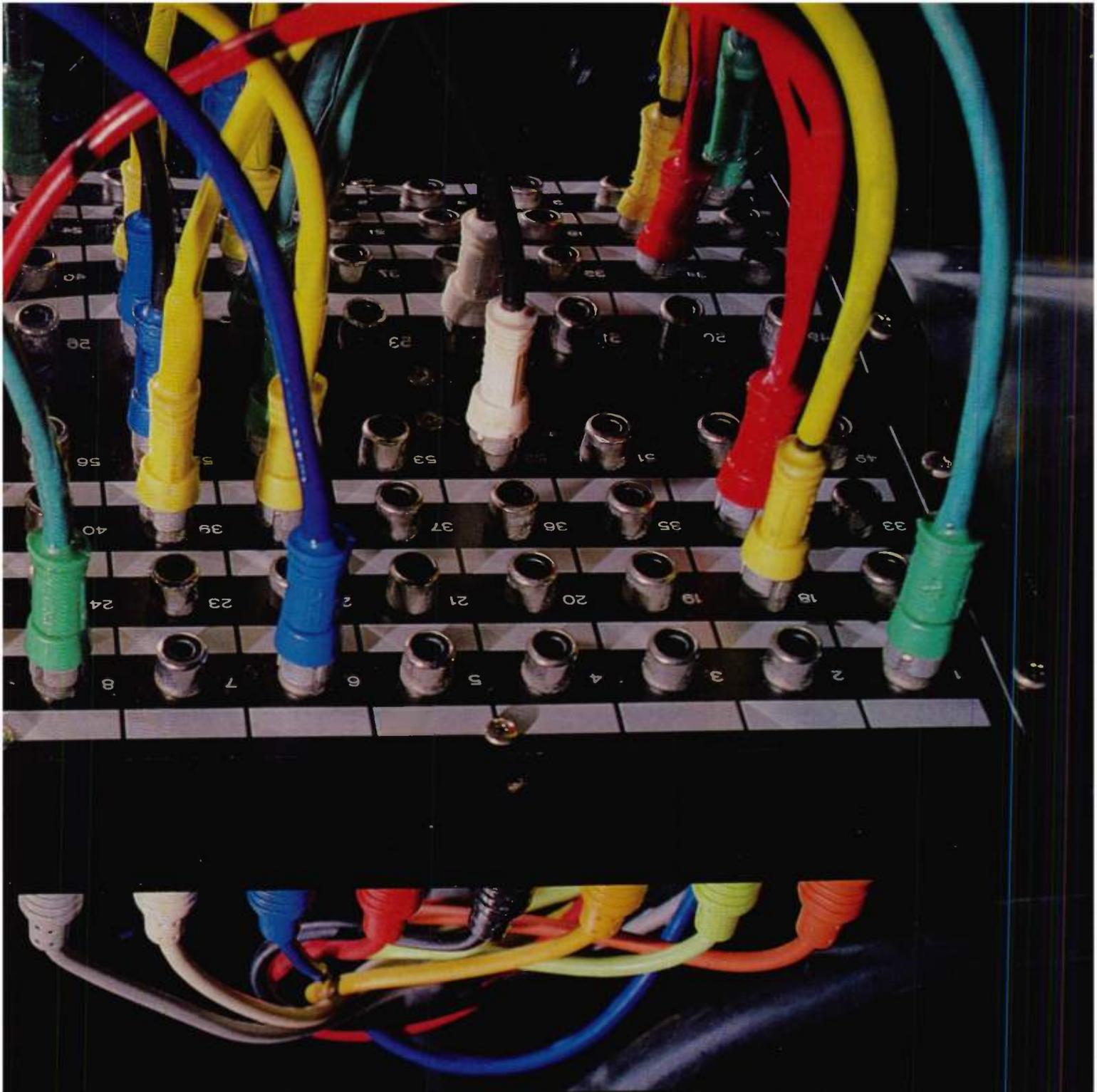
PHOTO BY ROGER MAYCOCK



Part One

# Studio **W**ir

It begins here: everything you ever wanted to know about wiring, patchbays, and anything else that links your studio together



# ing Guide

By David Frangioni

# Studio Wiring Guide

The advent of sophisticated, professional project studios has created a new need for the understanding of proper wiring and implementation of equipment in a recording studio. Now more than ever studio owners must, at the very least, pay attention to the setup and connection of their studio. Equipment is more powerful and sonically capable than ever before, and it is affordable to virtually anyone. However, equipment alone does not guarantee high performance. The proper layout, along with high-quality, properly connected patchbays, is absolutely necessary for obtaining the most from today's equipment.

The following overview is meant to provide a guide to the different components available to studio installers. It is meant as a reference that can be used as a starting point and a checklist when building a studio. During the 15 years that I have been wiring studios, I have found it helpful to have focused, comprehensive information available in an organized manner. Here, then, is Part 1 of *EQ's* Studio Wiring Guide.

## PATCHBAYS

The heart of most studios is the patchbay. There are many styles of patchbays, with differences existing on both the front and the back. Let's start with the front. The two most popular patchbays are TT (Tiny Telephone, or Bantam as they are sometimes referred to) and 1/4-inch (the same connection as found on guitars). Quarter-inch patchbays usually contain female connections both on the front and back, which makes it extremely easy for anyone to con-

nect it. The downside is that 1/4-inch patchbays typically can only house 48 points per bay, and their connections can easily pull out of the back of the bay. They generally are not as robust or flexible as soldered TT connections. Now it is possible to purchase 1/4-inch patchbays of the soldered variety, but you can still only have 48 points per bay. In the real-estate hungry world of project recording studios, every rack space counts.

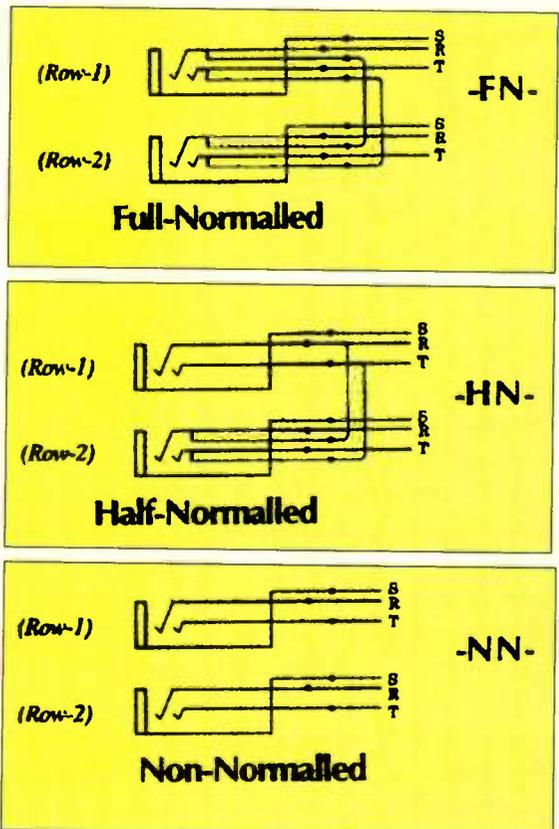
The TT patchbay allows for 96 points in a one- or two-rack space enclosure. TT patchbays are available in many flavors for rear-panel connections. For the sake of illustration, I have chosen two of the most common types: the soldered type and the multipin type.

The soldered type consists of one of three jack points on the back. These are: [1] normalled; [2] half-normalled; and [3] non-normalled. Figs. 1A, 1B, and 1C will help to illustrate these options more clearly than a written explanation, but here goes.

The three points found on the back of a non-normalled patchbay contain the three connections required for balanced audio gear: Hot, Cold, and Ground. Balanced audio gear requires three conductors

so that it can travel further distances and reject noise better than its unbalanced counterparts. The usual pinout of a balanced XLR connector is Pin 1 Ground, Pin 2 Hot (where the actual signal is sent), and Pin 3 Cold (or neutral). The signal is sent on Pin 2 and Pin 3 out-of-phase at the source and recombined in-phase at the destination. Such a procedure cancels any noise picked up by the signal during its travels. (This is also the reason that proper polarity must be maintained among all gear when wiring a studio or certain signals will be out-of-phase.)

There are many cases where the studio owner would like various units to always appear at certain inputs of the console or always be routed through certain equipment without the need to patch every time. This is where normalling is important. When first doing a layout for a project studio, you must sit down and determine the most frequently used routing combinations. Those routings can be connected to a patchbay as either fully normalled or half-normalled. Full normals mean that patching into either the top or bottom connection on the patchbay "breaks" the connection and it is no longer routed through the normalled signal path. A half-normalled point means that when you break the connection on the top row of the bay (provided that is where the half-normalled jack appears), you are



FIGURES 1A, 1B, and 1C (top to bottom)

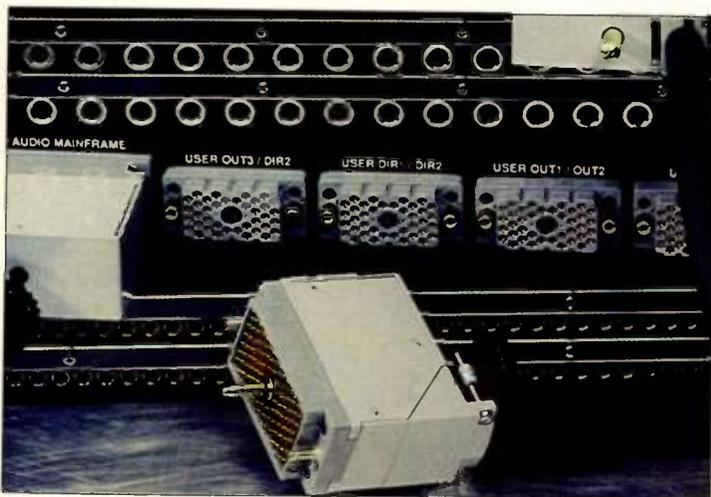


FIGURE 2: ELCO connector

still passing signal through the normal. It is not broken; this is the most popular type of normal as it allows an efficient means of "multing" the signal to two destinations from one source. For instance, the send of an insert point would appear over the return of that point. By means of half-normaling, you would always be completing the necessary path for that insert to follow. If no patching were done, the channel would pass signal through the insert (send to return) as if it were not connected at all. If you were to patch the send of that insert anywhere, the original signal would still pass through the normal. Now the send is going to two destinations.

Now that we have discussed normalizing the patchbays, let's discuss two of the types of rear-panel connections. The solder connection is the most popular type of connection as it is one of the oldest methods of patchbay connections and is straightforward in its implementation. Another means of rear patchbay connection is the multipin connection scheme. This allows for easily changing points on the back of a patchbay without the need to solder each connection. An example of multipin patchbays appears fig. 2. This style of bay contains multipin terminal blocks in the form of phoenix style, DL, or ELCO.

#### GETTING CONNECTED

After choosing the patchbay, you then need to configure the different connectors that will be wired from one end of the bay to the other. The standard connectors found on pieces of equipment are either 1/4-inch TS (tip-sleeve, unbalanced), 1/4-inch TRS (tip-ring-sleeve, balanced mono or unbalanced stereo), XLRF (female XLR connection to balanced outputs), XLRM (male XLR connected to balanced inputs), and RCA phono plugs (typically seen on unbalanced consumer gear such as cassette decks). These connectors also come in a variety of types depending on application. For instance, if you were wiring a project studio with wall-mounted panels, you would use the panel-mount version of the desired connector. This is a special connector designed for mounting to panels (see fig. 3).

#### JUST WHEN YOU THOUGHT YOU HAD SEEN IT ALL...

Equipment such as multitrack tape machines or large-frame consoles can contain

hundreds of connections. In an effort to handle the sheer number of connections, companies such as EDAC, ELCO, and Canon have developed connectors that can accommodate up to 156 pins on a single, simple connector. EDAC and ELCO make

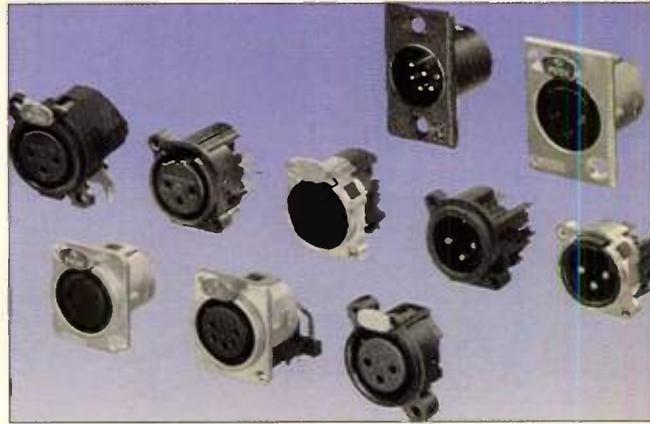


FIGURE 3: XLR panel connectors

## The Missing Ingredient Has Always Been the Amplifier!

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# Studio Wiring Guide

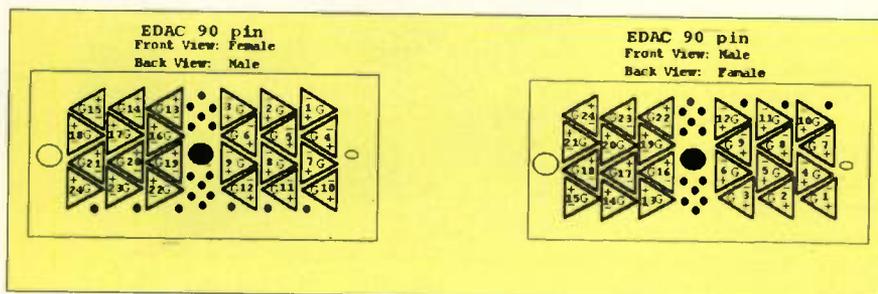


FIGURE 4A

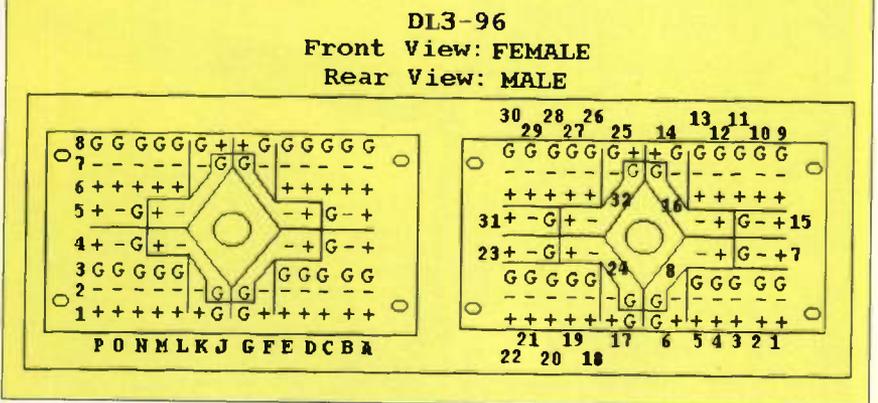
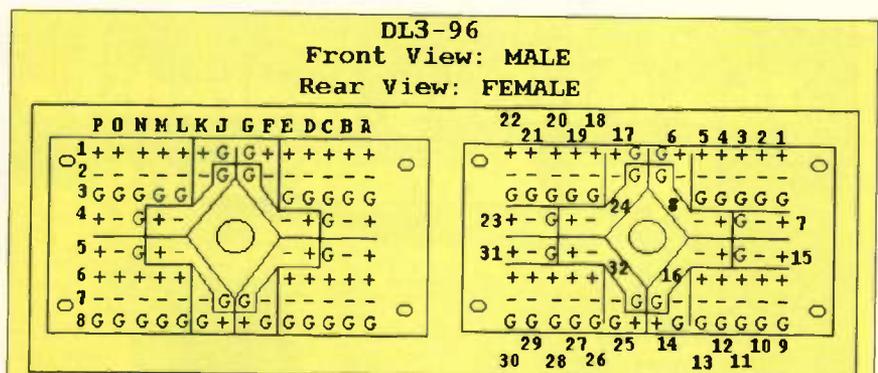


FIGURE 4B

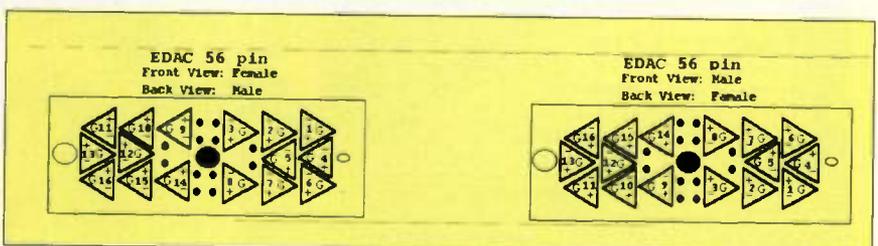


FIGURE 4C

similar connectors that come in 38-pin, 56-pin, 90-pin, and 120-pin connectors. These connectors use a male, "pinned" connector that screws into place by making contact with a female connector of the same

type. A couple of turns of the screw, and the connector makes contact to all points. The balanced inputs and outputs of an ADAT are a good example of simplifying 16 connections onto one connector. The "other"

popular style of connector is the DL by Canon. The DL comes in 56-, 96-, and 156-pin connectors, with the 96-pin DL being the most common as it is found on SSI consoles as the connector of choice. Many installers prefer DL connections because, unlike ELCO/EDAC, they are zero-force insertion connectors. They only require one half-turn of their handle and the pins make contact without having to align with one another. It is safe and reliable from potentially bending pins while providing a secure connection. The S.A.C., Standard Audio Configuration, pinout for both the 90-pin ELCO/EDAC and the 96-pin DL are provided in figs. 4A and 4B, as well as the ADAT ELCO pinout (fig. 4C).

Of course, these connectors require an understanding of signal flow and wiring. Given that there are many connections in one place, it is important to follow a consistent pinout for every multipin connector in the system. A good starting point is the aforementioned SAC pinouts.

Every multipin connector will need to terminate with either a piece of equipment, patchbay, or both. Be sure to keep track of what pins connect all the way through the signal path. It is all too easy to get confused and pin the connections backwards. Follow the orientation of pinouts very carefully.

## GENERAL OVERVIEW OF OTHER TYPES OF CONNECTORS

There are hundreds of different connectors for virtually every type of installation: A/C power, speaker level, computer, and SCSI, etc. It would be exhaustive and quite possibly incomplete to attempt a listing of every option. I have, though, provided an overview of some popular models as a reference. A good rule of thumb is that, chances are, if you need it, someone manufactures it.

Stay tuned for a coming issue when we present Part II with an in-depth look at all types and styles of analog, digital, and video cable.

Thanks to Noel Lee and Tom Menrath of Monster Cable, Tim Symonds of Audio Accessories, and Kathi Evans of Neutrik for their invaluable help and exemplary products.

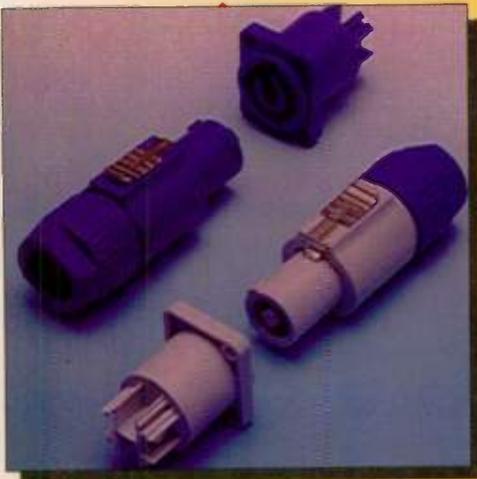
*David Frangioni is an accomplished studio designer and installer who has built rooms for Aerosmith, Desmond Child, Mark Hudson, and many more.*

# Guide to Patchbays & Connectors

## Various Audio Connectors



RCA CONNECTORS



SPEAKON



DOUBLE FEMALE XLR



MALE AND FEMALE XLR



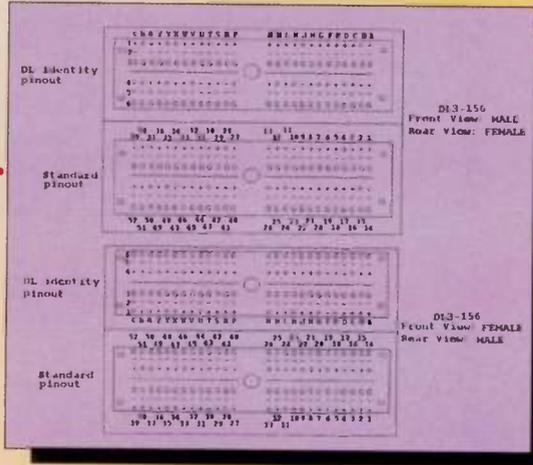
TS CONNECTORS



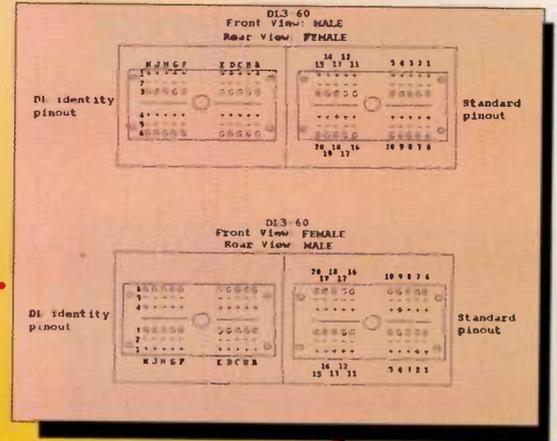
ELCO

# Guide to Patchbays

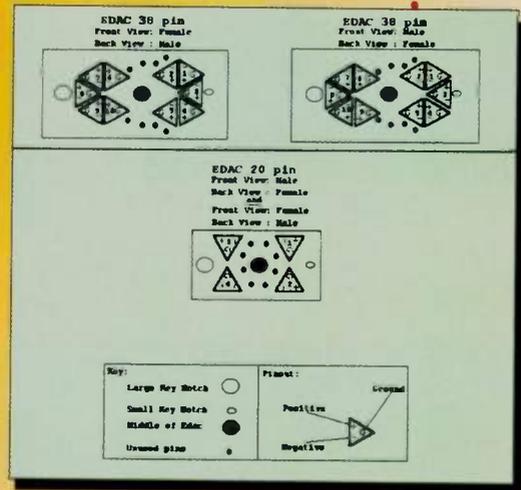
## Various Connector Pinouts



DL3-156



DL3-60



EDAC 38 and EDAC 20

## Various Wall Mounts

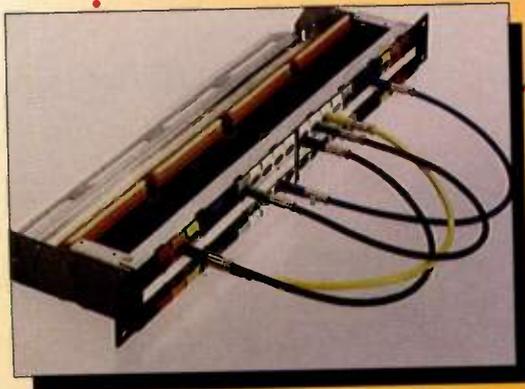


XLR MALE

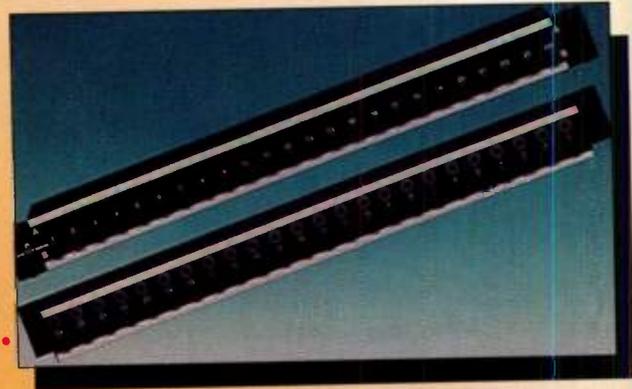


# & Connectors

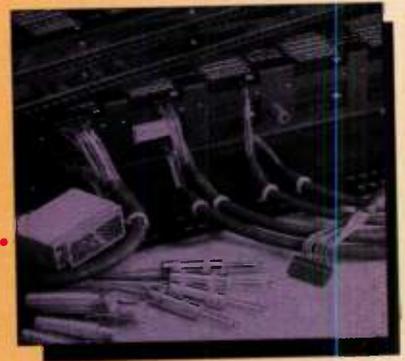
## Various Patchbays



TT PATCHBAY



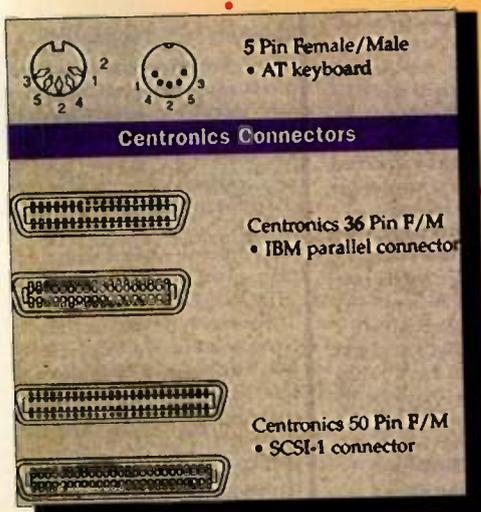
1/4-INCH PATCHBAY



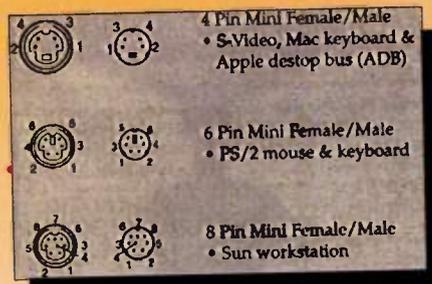
ELCO TO TT PATCHBAY

PATCHBAY PHOTOS COURTESY OF NEUTRIK

## Various Computer Connectors

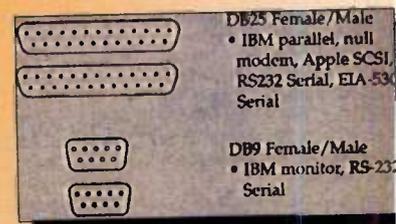


DIN & CENTRONICS CONNECTORS

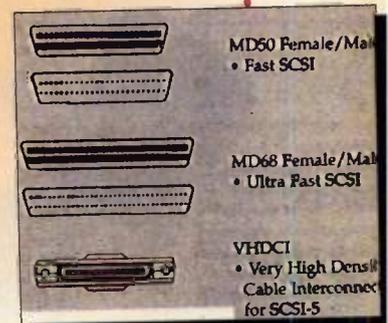


MINI DIN

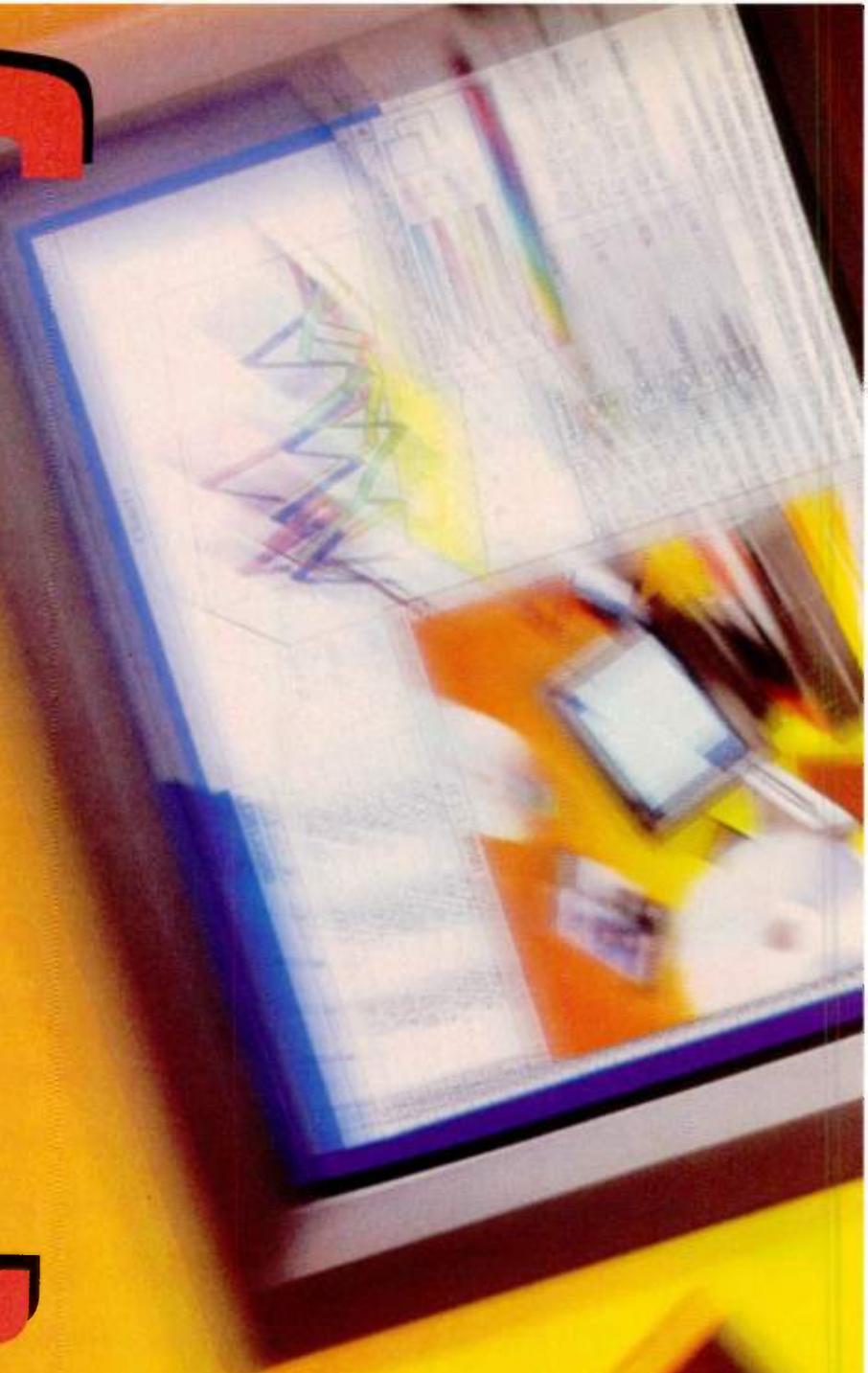
MICRO DB CONNECTORS

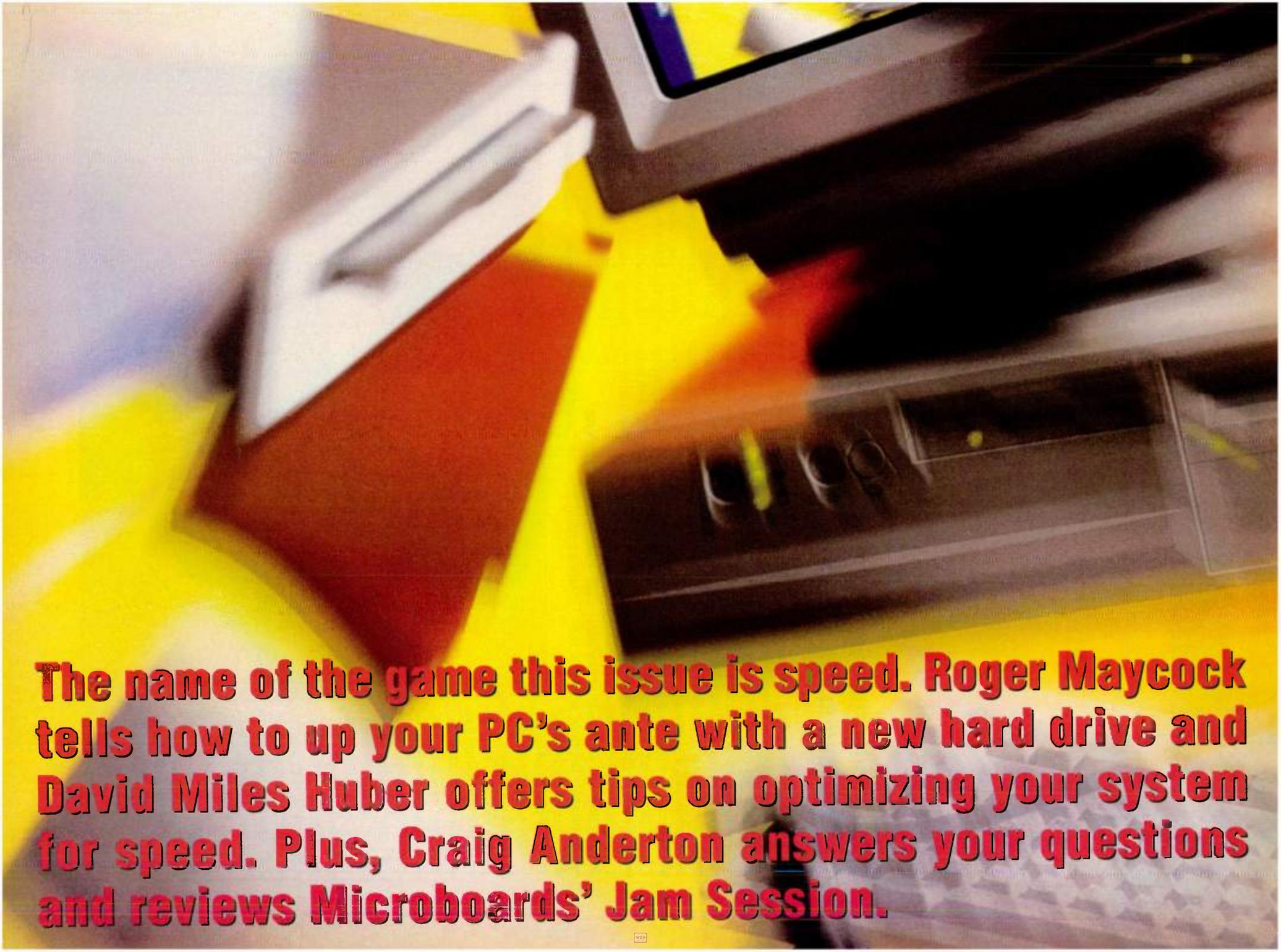


DB CONNECTORS



# PC Quantary





**The name of the game this issue is speed. Roger Maycock tells how to up your PC's ante with a new hard drive and David Miles Huber offers tips on optimizing your system for speed. Plus, Craig Anderton answers your questions and reviews Microboards' Jam Session.**

## Configuring for Digital Audio

By  
Roger  
Maycock

**A look under the hood for creating a stable, performance-driven system**

Hard-disk audio recording, while not exactly new, really began to take off over the past 12 to 15 months. Whether we examine stand-alone random-access recorders or computer-based systems with additional hardware, a genuine revolution is in the process, and it's opening up greater levels of creative opportunity for all of us.

While I firmly believe that tape-based recording still has a viable place in our industry, the improvements in hard-drive technology, combined with a dramatic reduction in prices, has made random-access recording absolutely irresistible to musicians, engineers, and manufacturers alike.

Perhaps no area of hard-disk recording has taken off faster than the computer-based audio stations. With the prolific release of affordable digital audio cards, getting audio into and out of the computer is now easier than ever — and this too, has fueled the frenzy. The computer-based, integrated MIDI/audio environment is the area that appears to show faster growth than all other categories; but this is also where much confusion lies, as a computer can be much more prone to crashes and other anomalies than stand-alone systems.

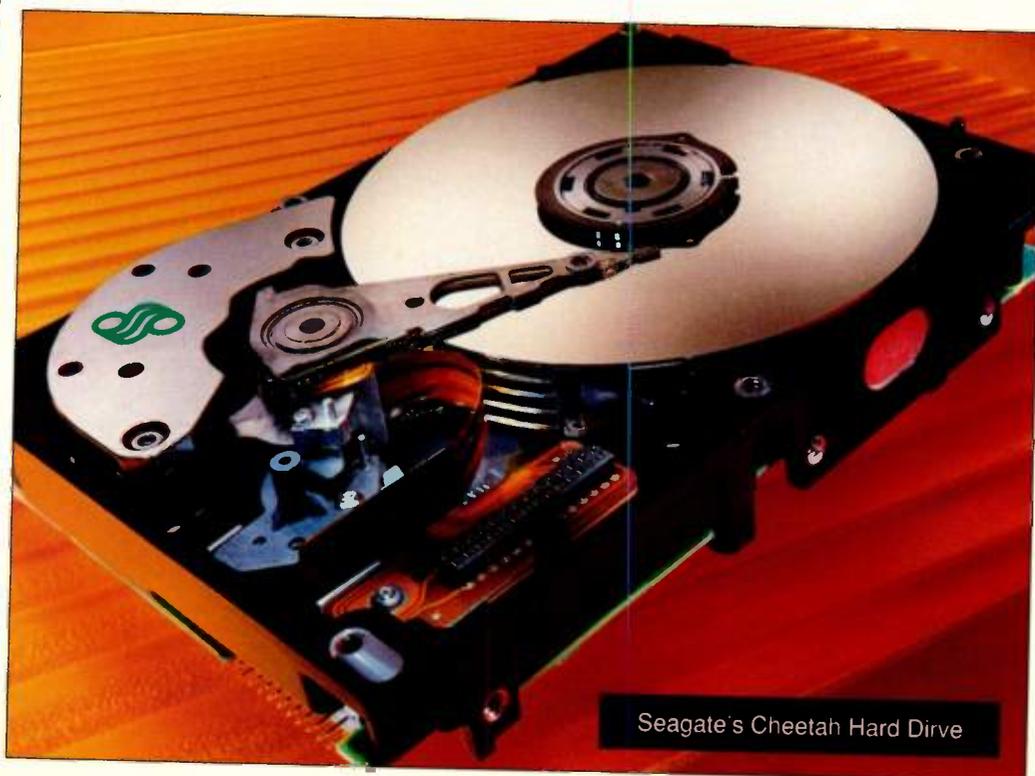
Because a computer isn't "optimized" for digital

audio straight out of the box, there are a variety of issues you should be aware of both in terms of system configuration and your choice of hard drive in order to get the best results from your hardware and software. Let's take a look at some points that are relatively easy to control, then we'll examine what makes a hard drive appropriate for digital audio and which drive dominates our industry and why.

### **USE A (NEW) DEDICATED DRIVE**

Make it a point to use a separate drive for

your digital audio work, and use the fastest, largest capacity drive you can afford, as digital audio consumes significant amounts of drive space. As a general rule, each stereo minute of 16-bit, 44.1 kHz digital audio consumes roughly 10 MB of disk space. Now, consider that a 5-minute, 16-bit, 44.1 kHz 8-track recording consumes approximately 210 MB of space — and it doesn't take long to fill any drive. If you plan on recording 24-bit digital audio, the numbers increase significantly. This, of course, is why you always need to archive



Seagate's Cheetah Hard Drive



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to an external device — but that's another story.

By keeping your operating system, programs, swap files, and disk caches on your main "system" drive, you isolate the drive activity of these operations from the constant reading and writing of your audio data. Generally, this arrangement minimizes head movement and facilitates a higher level of throughput for digital audio.

Never, ever use any kind of data compression on your audio drive. We've all heard what data compression typically does to the quality of audio, but if by chance you've enabled something like Windows' Drive Space for the sake of conserving space on the drive, another adverse condition arises. Since your computer must now divert resources to compressing and uncompressing files, you're likely to experience fewer available audio tracks as a result.

The reason for installing a new drive into your system stems from an irritating characteristic of earlier hard drives — thermal recalibration. While this is rarely a problem nowadays, older hard drives had an annoying tendency to interrupt the

data flow as they warmed up during usage. This compensation for mechanical and physical changes in the drive as it heated up would frequently result in audio dropouts. The term "A-V rated" was given to drives that were specifically designed to eliminate this phenomenon. So if you have a spare hard disk lying around from an earlier computer, resist the temptation to use it.

### SPORADIC DISK ACTIVITY

Any kind of application or utility that might cause sporadic disk activity during your audio work should be disabled. A sampling of culprits can include screen savers, virus checkers, any scheduled maintenance tasks such as ScanDisk or automatic disk defragmentation, the Microsoft Office Fast Find Utility, or Windows' CD-ROM Auto-Insert Notification.

To put this sort of unwanted activity into perspective, Frontier Design Group's Barry Braksick offers the following, "Some applications think they're doing you a big favor by hanging around in the background until the last crucial 10 seconds of

your mixdown, when they awaken and start pounding your disk like frenzied Northeasterners stocking up on milk and bread before the big blizzard!" Bottom line: don't run anything that's not essential and forget about multitasking.

### DEFRAG THAT DRIVE!

The easiest, single most important thing you can do to ensure optimum performance for digital audio recording is to defragment your hard drive regularly. Over time, particularly with the kind of heavy usage that random access audio involves, the data on your hard drive gets scattered all over the surface of your disk — making your files discontinuous.

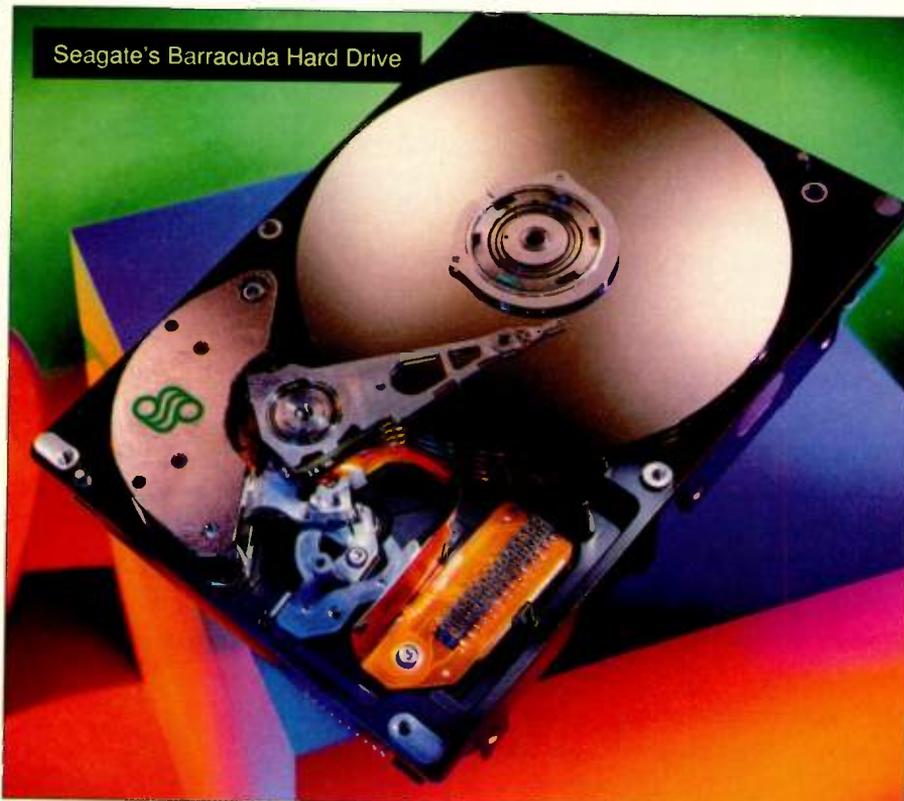
With discontinuous files, your hard drive must work that much harder since the drive head must now jump all over the place to retrieve the data packets. This condition dramatically slows the performance of your drive. Get into the habit of running your disk defragmentation utility on a regular basis at the end of the workday. By defragmenting your drive, your system reorganizes all the files on the disk into contiguous areas so those files can be accessed with a minimal amount of head movement.

### SO WHAT MAKES SCSI SO GREAT?

First and foremost: data transfer rates. If you intend to use a Macintosh for digital audio recording, you've already got a SCSI system — with the exception of the recently released iMac, which is a USB (Universal Serial Bus) structured environment. Be advised that USB, while easy to add disk drives and other devices, does not have the data throughput rate of SCSI.

If you intend to use a PC (which also means Windows), then you need to carefully consider the differences between EIDE (Enhanced Intelligent Drive Electronics) and SCSI. Your typical off-the-shelf Windows PC will undoubtedly be based on EIDE components as opposed to SCSI. While an EIDE-based system will save you money up front, it is likely to prove less flexible in terms of system expansion, and the data throughput rate of such systems is generally quite a bit less than that of a SCSI-equipped PC.

If you examine the throughput rates of these two environments, you will find that EIDE systems (now known as Ultra DMA)



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can transfer up to 33 MB per second as opposed to 80 MB per second with Ultra 2 SCSI or 100 MB per second for the new fibre channel technology — a significant difference to say the least. This difference in the data throughput rates will have a direct impact on your system's ability to handle crossfades,

punch recording, and other common recording applications, not to mention the number of available tracks. Then there's the issue of adding devices.

As mentioned earlier, you should make every effort to use a dedicated drive for audio. Again, SCSI makes this easier than does an EIDE system. The

availability of ports to "hang" additional devices from is more limited with an EIDE system. On an EIDE system, the controller ports are embedded on the motherboard. Generally, there are two such controllers, each with their own IRQ and each capable of communicating to a master and slave device — resulting in support for a maximum of four devices.

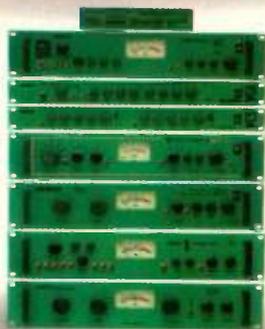
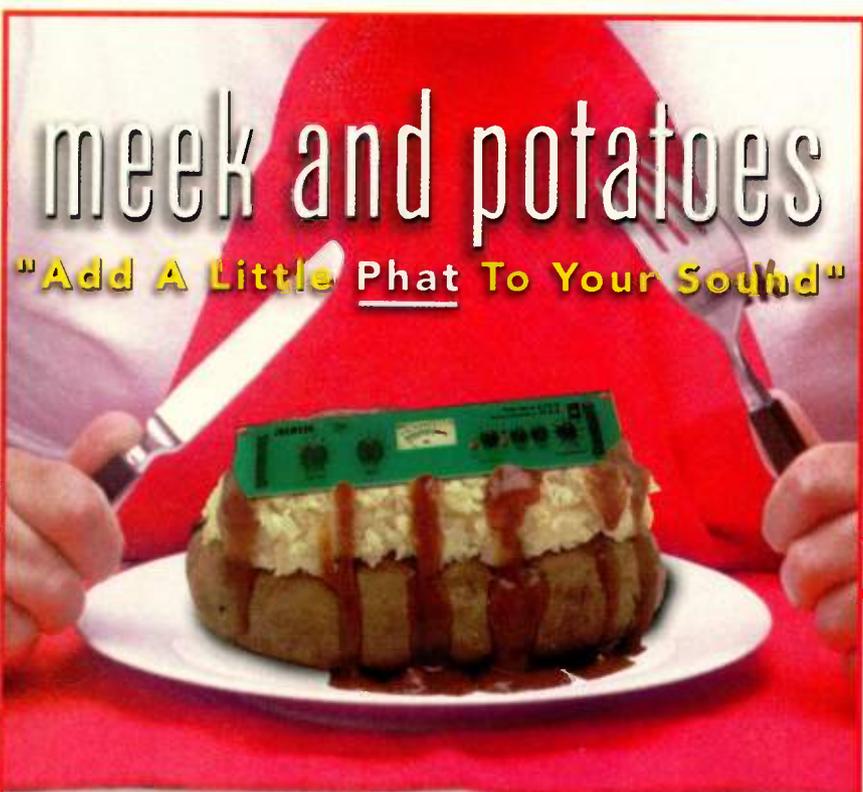
With today's multimedia computer systems, it's quite common to have two of these ports assigned straight out of the box — severely limiting your ability to add much more. By comparison, a SCSI-equipped system will cost you more up front, but will be much more adaptable for your future needs.

With SCSI, you'll start with a host adapter card (an Adaptec 2940 Ultra is a good choice), and from there you'll begin building your system (I say that figuratively. Let Dell, Gateway, or some other reputable company assemble your PC). Your SCSI host adapter will occupy an IRQ, but from there, you'll be able to hang upwards of seven devices from that card on a single IRQ. The host adapter will probably default to a SCSI ID of 7, with each additional device having its own unique SCSI ID. In my own system, the various devices are identified as follows:

Device	SCSI ID #
Hard Drive C	0
Hard Drive D	1
Removable Jaz Drive E	2
CD-ROM Drive F	3
CD-R Drive G	5

Recently, many off-the-shelf PC computer systems have begun to incorporate Ultra DMA (Direct Memory Access) controllers. While the data throughput rates of these newer systems approach that of SCSI, they are still limited in terms of expansion due to the PC's archaic IRQ structure. It's next to impossible to build a true redundant array of disk drives without the flexibility of SCSI, and as engineers and artists move toward 96, 128, or even more audio tracks, multiple drives become essential in order to provide the data throughput rate necessary for such involved projects.

Now that we have a better understanding of why SCSI and, hence, a SCSI drive is better suited to hard disk recording,



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let's see what people are actually using.

Seagate Technology — specifically, the Barracuda and Cheetah models. No matter whether we're talking computer-based or stand-alone systems, Seagate drives have gained the all-important "mindshare" among audio professionals. As an example of their popularity, TASCAM's MMR-8

and MMP-16 recorder/players, which can be found in substantial numbers throughout Universal Studios Hollywood, all have Seagate Barracuda drives. Universal recently purchased approximately 200 Barracudas for use in these recorders plus their Avid AudioVision workstations, their Pro Tools systems, Akai DD8's, and their

DoReMi nonlinear video decks.

According to TimeLine Vista director of marketing Ron Franklin, whose company is a development partner for the MM-Series products, "The Seagate Barracuda and Cheetah drives have proven to be well-suited for the demands of digital audio due to their high data throughput rates and their reliability. Digital audio places some rather heavy demands on a hard drive, and these Seagate models have consistently performed well."

Seagate's Cheetah has gained an enormous reputation among audio professionals, and this model is currently the fastest A/V drive available. So what makes the Cheetah such a big deal? Let's examine what takes place inside a hard disk during multitrack recording so that we can make sense of the drive's feature set.

When recording, each individual track that you're working with is processed by the drive in what's known as a "sequential access." During this process, the drive employs a stack of heads going to multiple platters. Starting, for example, at one end of the drive's E block (which is what holds the head stack assembly), the read and write process will begin with head 0, write that full revolution, and continue all the way up through the drive's 24 heads and 12 platters. Once the cylinder is filled on the 24th head, an actual movement of the head will occur and the process begins again. According to Seagate product marketing manager Mike Walton, "The less movement that occurs on the heads of the drive, the faster the sequential access can proceed."

The challenge for audio applications stems from the fact that the drive must accommodate multiple tracks. Since all of the drive's heads are fixed in one position, it ends up trying to combine all these tracks together simultaneously. This means that the drive must be able to pull, for example, 10 seconds of the sequential access of one file (or track) and put it in line to go into the computer while it also needs to pull 10 seconds of another file (or track). What results throughout this process is that the drive must rapidly switch back and forth between the various tracks. Since these files aren't stored next to each other, think of it as building up the wax on a candle, as this is roughly the same way the cylinders on

*continued on page 146*



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For more information on the 1212 I/O visit the Korg website at <http://www.korg.com>

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## Ask Doctor Data

By  
Craig  
Anderton

**You've got questions: we've got two tips on making your Windows machines happier and more productive**

**Question 1:** I collaborate with a lyricist/guitarist. We both use PCs and bought Zip drives so we could exchange digital audio files. Now we've upgraded to multitrack and regularly use more memory than you can store in 100 MB. We don't want to spend a lot of bucks, so what storage medium would you recommend as the most cost-effective?

If all you need to do is transfer files bigger than 100 MB, you can still use the Zip drives in conjunction with the Windows 95 Backup utility. This program, like most other backup programs, allows segmenting a large file over multiple disks. For example, if you need to transfer a 340-MB file, you'd need four Zip disks.

Do a Search on Backup.exe to make sure it has been installed. If not:

1. Go Start > Settings > Control Panel.
2. Double-click on Add/Remove Programs.
3. Click on the Windows Setup tab.
4. Double-click on Disk Tools, then check the Backup box.
5. Hit OK, click on Apply (you may need to insert the Windows 95 distribution disk), then, if needed, click on OK.

To use the Backup program, double-click on Backup.exe. An Explorer-type interface opens (when the screen pops up that says "Backup has created a file set for you," click on OK). Open folders until you find the files you want to backup. For example, in fig. 2, all the files (listed in the right pane) within "Loops4Acid" (highlighted in the left pane) have been checked.

From there, click on Next Step, and then select the backup device by double clicking on it. Click on Start Backup, and the backup process begins.

One very important point is to label each disk in order. On restore, it's necessary to insert the *last* disk of a series first to obtain information about the backup, then go back and insert the first disk, second, third, and so on.

To restore at the other end:

1. Call up Backup.exe and click on the Restore tab.
2. Double-click on the device that holds the files you want to restore.
3. Click on Next Step.
4. Click on the files to restore.
5. Click on Start Restore.

A file transfer box will inform you of what's going on. It may take a while to restore, so be patient. The program will ask for additional disks as needed. When the operation is done, click on OK.

Of course, it's easier just to buy a high-capacity removable drive, but you asked for cost-effective — and with this method, the most you'll need is a few more Zips.

**Question 2:** I've heard that you can speed up your hard drive by changing the "Typical Role of This Machine" from "desktop" to "network," but if you have the original version of Windows 95, you also have to do some Registry editing for this to work. I'm terrified to mess with the Registry, but I wouldn't mind faster disk access. Is the performance boost worth the risk?

I had heard the same thing, too, but didn't know the full story. So, I implemented my usual solution of asking someone who knows more about all this than me (in this case, Barry Braksick from Frontier Designs), and he was glad to help out.

The Role of This Machine setting determines how the file access driver (VFAT)

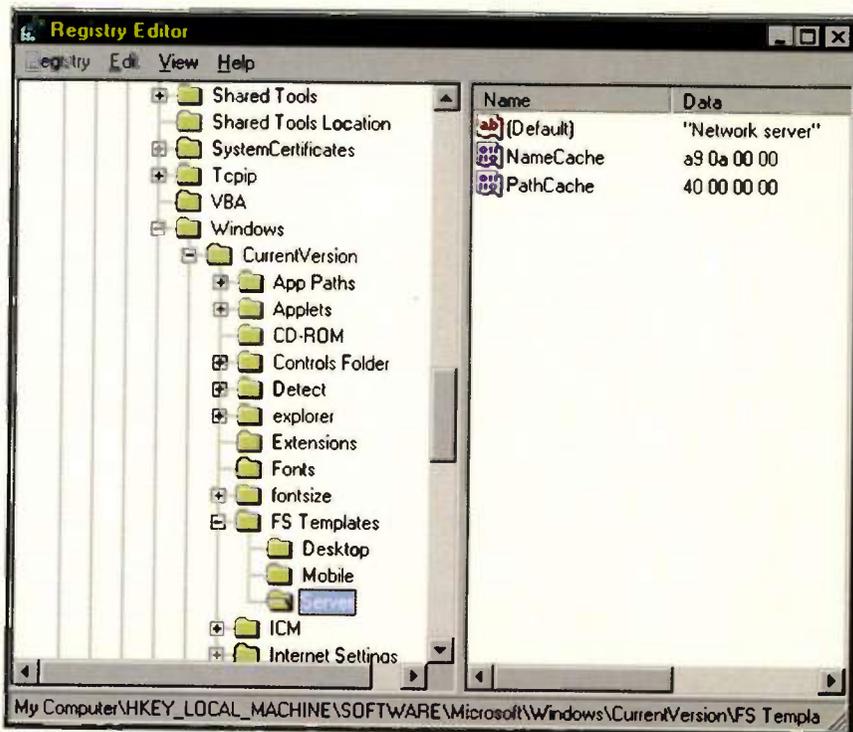


FIGURE 1

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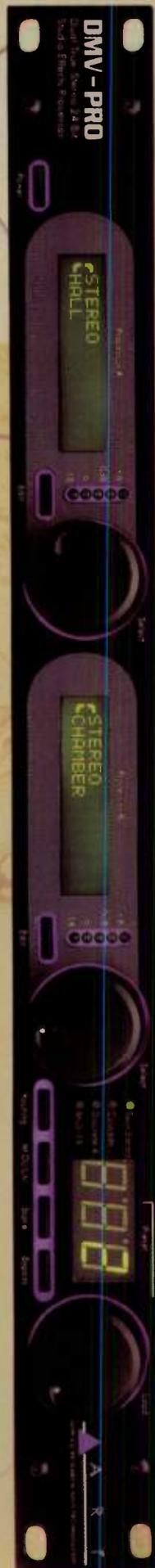
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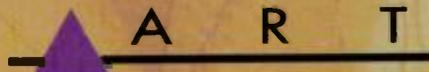
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allocates memory. When set to Desktop Computer, VFAT allocates about 10k of memory to keep track of the 32 most recently accessed folders and 677 most recently accessed files. The Network Server setting stores the 64 most recently accessed folders and 2729 most recently accessed files in about 40k of memory.

When recording or playing back digital audio, this fix won't do anything significant to improve hard-drive access time where it counts. If, however, you have a lot of files in your machine (e.g., samples you're pulling in to create loops), this mod is worth doing anyway. Doing so will mean the disk doesn't have to search for the location of stored file names and folders, which speeds up the time it takes to find and open files.

To change the machine's role:

1. Go Start > Settings > Control Panel.
2. Double-click the System icon.
3. Click on the Performance tab.
4. Click on File System.

5. Click on the Hard Disk tab, select Network Server, then click OK.

If you have a pre-OSR2 version of Windows, there's a bug that has been fixed using the Registry Editor. You shouldn't be too worried about hacking the editor, as it uses a Windows Explorer-type interface. However, you must work slowly and carefully, as mistakes could topple the system and might even require re-installing Windows 95. In any event, back up the Registry by copying the System.dat and User.dat files in the Windows directory. If something goes wrong, hopefully you'll be able to copy them back while in Safe mode.

To fix the bug:

1. Click Start > Run.
2. Type Regedit.
3. Click OK.

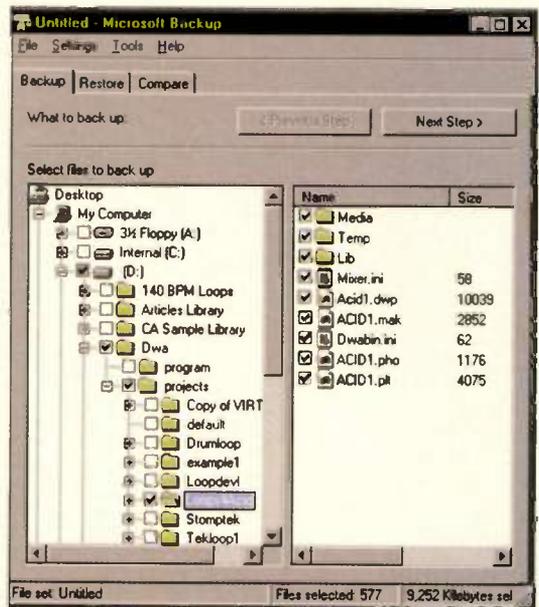


FIGURE 2

4. Double-click on HKEY\_LOCAL\_MACHINE.

*continued on page 145*

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## Faster PC, Faster

By  
David Miles  
Huber

### Some tips and ideas that can squeeze more speed out of your computer system

Speed! It's the name of the game these days. It almost goes without saying that everyone would like to have access to more multichannel hard-disk tracks, process files in a fraction of the time, or load more programs into the PC's memory. Over the last year, some major advances in PC hardware technology have made it possible for your computer to be sped up at prices that range from reasonable to bargain basement (and, in some cases, free). Let's take a look at a few of these options that can help you squeeze more speed and power out of your system.

#### CHOOSING A CPU

To most folk, the quest for more speed begins with a newer, faster central processing unit (CPU). The vast majority will simply go with the industry standard and pick up a Pentium II 300 MHz or faster processor. Although the decision to go with a PII is a tried-n-true one, there are other, less expensive options that can do the job just as well. For example, the new K6 processors from AMD cost about half as much as PII CPUs that run at the same speed, often with little or no compromise in speed or functionality. Cyrix's MII processors are slated to go onto the market any time now, and at slightly over a third the price of a PII, these processors are reported to be just as fast.

As a caveat, it's been reported that the new and cheaper Celeron chips from Intel should be avoided, since they've reduced the cost by leaving out the L2 cache (a form of high-speed memory that speeds up processing functions). Until they begin shipping new versions that include this cache memory (which might happen by the end of the year), it's said that a 266 MHz

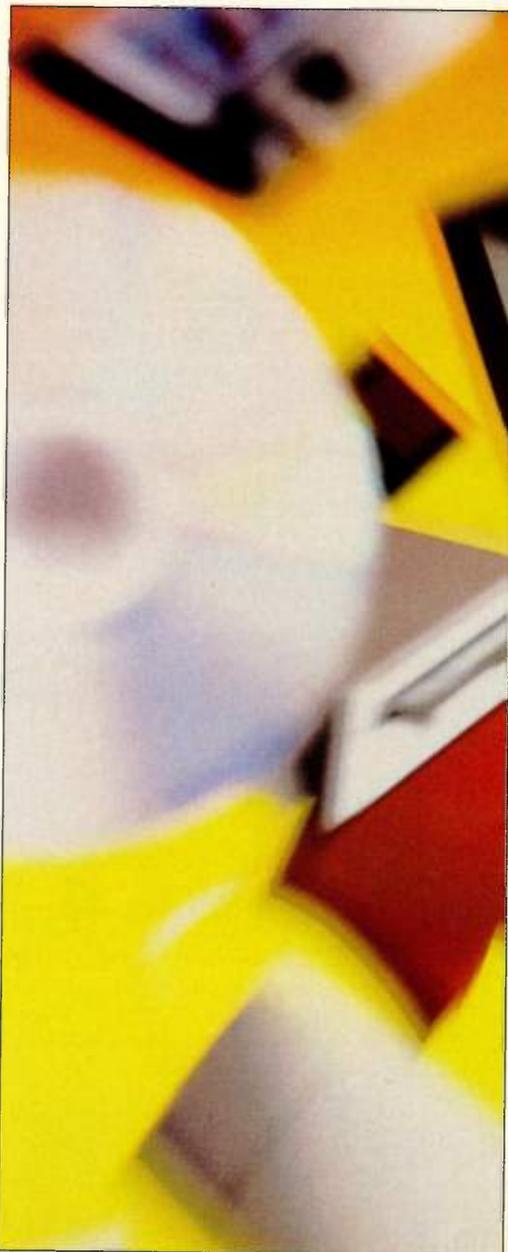
Celeron will actually run slower than a 200 MHz Pentium.

#### GET ON A FASTER BUS

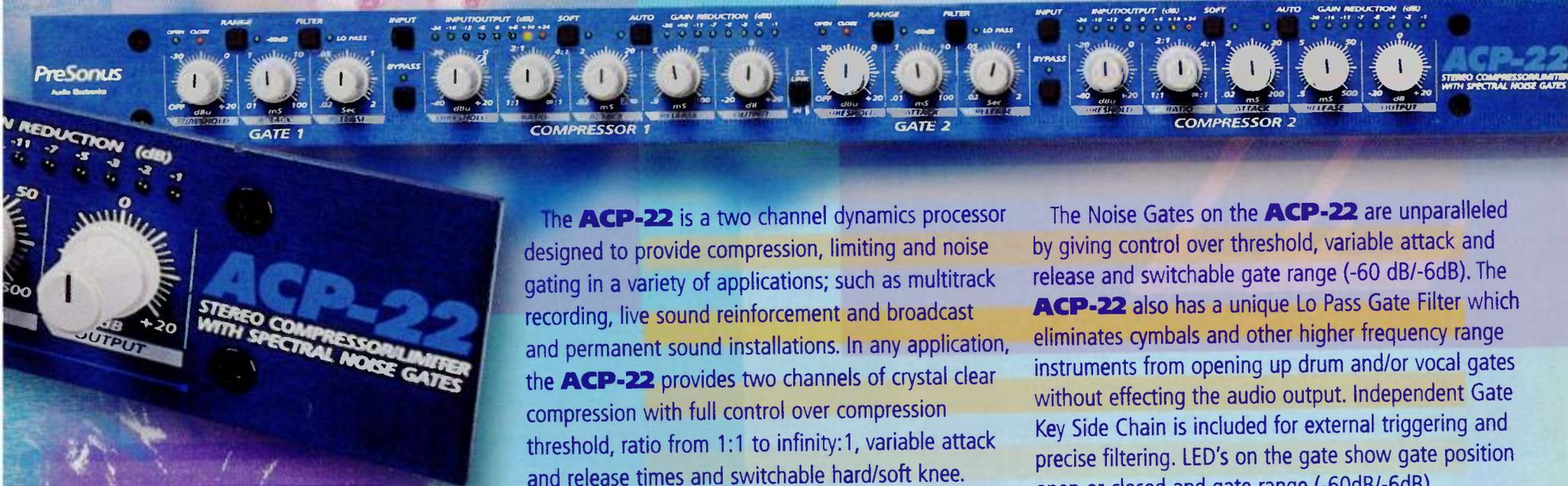
Now that you've got a faster CPU, you're going to want to communicate with it at a faster rate, right? This means buying a motherboard that can interface the CPU to your hardware cards and other system devices at the newer 100 MHz-bus speeds, instead of the more traditional 66 MHz rate. This feature might add some bucks to the cost of a PC or motherboard, but it's well worth the added speed and future upgrade capability. In fact, some of the faster CPUs have to communicate data at the 100 MHz-bus speed in order to work.

#### GOT SDRAM?

Some of you may remember when 30-pin and 72-pin memory chips ran at 60 ns (that's 60 billionths a second!). Well, that's all history, folks. The word of the day is SDRAM. SDRAM is a newer 168-pin memory convention that comes in two speeds: 66 MHz and 100 MHz. The later runs at a blazing 7ns speed and is designed for PCs that make use of the faster 100 MHz-bus speeds. When considering a new PC or motherboard, make sure that it accepts 7 ns SDRAM. If it doesn't, you'll end up buying new memory chips all over again next time you expand to a 100 MHz-based PC. For memory, your best bet is to bypass all the smaller chips



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The Noise Gates on the **ACP-22** are unparalleled by giving control over threshold, variable attack and release and switchable gate range (-60 dB/-6dB). The **ACP-22** also has a unique Lo Pass Gate Filter which eliminates cymbals and other higher frequency range instruments from opening up drum and/or vocal gates without effecting the audio output. Independent Gate Key Side Chain is included for external triggering and precise filtering. LED's on the gate show gate position open or closed and gate range (-60dB/-6dB).

Inputs and outputs on the **ACP-22** are either XLR Balanced or 1/4" TS Unbalanced. Each channel operates at +4dBu or -10dBV, selected via rear panel switch. The **ACP-22** is housed in a one-rack space, all steel chassis. In keeping with the PreSonus "no wall wart" tradition, an internal power supply with voltage (for international use) is standard.

**PreSonus** 

Audio Electronics

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and start off with a single 128 MB SDRAM chipset. At \$175 each, the price is definitely right.

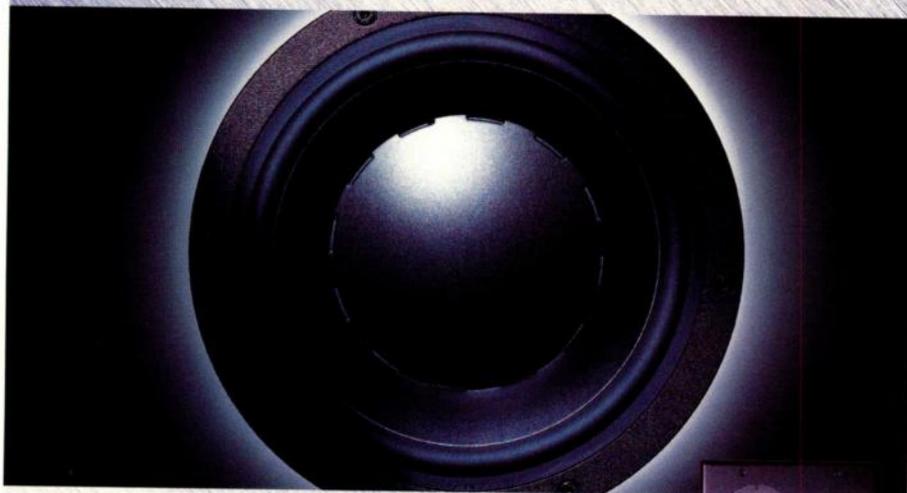
### THE NEW VIDEO STAR: AGP

The latest speedster for video gamers and high-end graphic dudes is the AGP (Accelerated Graphics Port) video card.

Motherboards that are equipped with an AGP slot make it possible for these special video cards to work at four times the speed of traditional cards by bypassing the PCI and ISA hardware data bus entirely. In addition to reducing data congestion, AGP cards don't need to be fitted with local video memory

chips (which are typically limited to 2 and 4 MB). Instead, these much less expensive cards communicate directly with the motherboard's SDRAM memory, making it possible for newer 3D graphic programs that require in excess of 20 MB of video memory to be run. Although audio people won't see much benefit from AGP, the cards will at least bring down the cost of high-end video cards, reduce system conflicts, and ease the installation process.

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### SCSI HARD-DRIVE SPEEDS AT EIDE PRICES

One of the biggest advances to hit the streets (from a practical standpoint) is the new UDMA hard drive data transfer protocol. Don't let the techno-babble scare you: This simply means that newer, larger hard drives that support UDMA (Ultra DMA) can transmit data from the hard drive at a blazing 33.3 MB per second. This is twice the standard EIDE transfer rate and faster than most SCSI rates. So what does this mean? For audio folk, practically everything! It means your hard-disk editor can handle more simultaneous tracks, your PC can access the drive much faster, and you'll be a happier camper.

Two things are worth mentioning here. One is that UDMA is *cheap!* A buddy of mine is looking to buy a 12 GB Ultra SCSI-2 hard drive for his Mac that cost \$1600. Truth is, I just bought an 11.5 GB PC-based UDMA drive for \$269. When comparing their respective 40 MB and a 33 MB transfer rates...well, you do the budget math. Secondly, not all motherboards support UDMA. If the motherboard *and* the drive support

*continued on page 146*

**TABLE 1**

Data Transfer Type	Transfer Speeds
IIDE/ATA:	2.1-8.3 MB/sec
EIDE (Enhanced IIDE):	11.1-16.6 MB/sec
UDMA 2 (Ultra ATA):	33.3 MB/sec
SCSI:	5 MB/sec
Fast SCSI:	10 MB/sec
Fast Wide SCSI:	20 MB/sec.
Ultra SCSI:	20 MB/sec.
Ultra2 SCSI:	40 MB/sec.

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# Microboards Technology Jam Session

By  
Craig  
Anderton

Easily create audio and data CDs from your Macintosh



- DirectCD (packet-writing software that can update a CD archive with new material, just like a floppy or hard disk)
- Adaptec Jam software (audio CD creation program)
- Peak LE (digital audio editor)
- SCSI cable (25-pin D-connector to 50-pin SCSI connector)
- SCSI terminator block
- Two blank, recordable CDs

Jam Session is positioned as a complete CD-burning solution; let's see if it lives up to the claim.

## THE HARDWARE

After connecting the CD-R and booting my computer (a Power Computing 225 MHz PowerTower running System 8.1 with 64 MB RAM), the OS wouldn't recognize an external 1 GB hard drive on the same SCSI bus as the CD-R. That was the first, last, and only remotely significant glitch with the package; after rebooting, all was well, and stayed that way. (There was one other freeze, but this occurred *after* writing a CD, and the CD played fine.)

By the way, while sold as a MacOS product, I tested the CD-R by itself with a Windows machine and it worked fine with both WaveLab and CD Architect.

## PT. 1: DATA BACKUP

As luck would have it, I needed to back up hard-disk files from a multitrack project do a one-off of the final mixes and archive my articles — an ideal combination for putting Jam Session through its paces.

Toast is the utility of choice for basic backup. It's a simple, effective program that can generate CDs in several formats (Mac, ISO 9660, Mac HFS+, Mac/ISO hybrid, Red Book CD, CDi, Video CD, Enhanced Audio CD, etc.). Toast allows renaming and rearranging files, doing multisession or standard CDs, and copying from one CD to another.

Simulating a burn (i.e., going through the motions of recording a CD but with the laser turned off) showed no problem with backing up the multitrack files, so I went for the real thing. About 13 minutes later (writing at 4X on the fly), 477 MB of multitrack data was saved on CD-R. Cool! And since Toast also lets you copy a CD in the CD-ROM drive to CD-R, it was easy to make a backup of the backup to send to others involved in the session.

## PT. 2: THE AUDIO CD FACTORY

Next, it was time to burn 35 minutes of 2-track mixes. Although Toast can create audio CDs, Jam is optimized for that purpose. The source files were WAV format; although Toast supports AIFF or SD2 formats, Peak LE (also included) can import other file types and "save as" the preferred formats. Once the tunes were assembled in the right order, simulation and burning proceeded smoothly.

Jam isn't a bare-bones program; you can adjust track spacing, crossfades, levels, and PQ codes, as well as "preview" a CD by

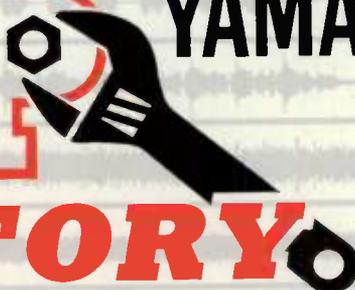
Although cutting recordable CDs has been chancy in the past, the bugs are pretty much getting worked out, allowing musicians to create CDs from their computer with relative ease. Microboards caught this wave early, and now offers several "desktop CD"-related products (hardware/software bundles for both Windows and MacOS, labelers, and duplicators). Their latest MacOS offering, Jam Session, includes:

- PlayWrite 4080 CD-R drive (an unterminated Matsushita CW-7502 with 4X write, 8X read, and SCSI interface)
- Adaptec Toast V3.5 software (general-purpose backup program; also can read audio from most CD-R drives)

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**FACTORY**



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(\*48 input channels with 2 cards)

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- Group Crossfade
- Group Trim
- Group Split
- Group Gain Change
- Group Normalize
- Group Move in Time
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- Play Selection
- Play from Cursor
- Play to In Point
- Play to Out Point
- Loop
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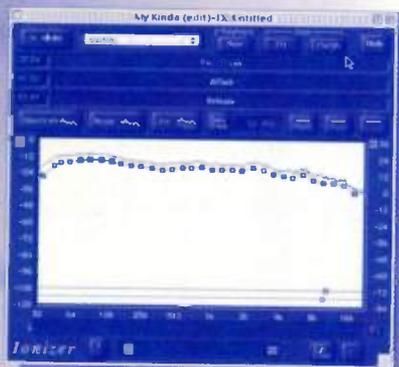
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FIGURE 1: With Adaptec's Jam (bundled with Jam Session), it's easy to arrange song order, add crossfades, listen to transitions between tunes, and adjust levels.

playing transitions between tunes and import Sound Designer II regions as tracks (see fig. 1). For serious editing, Peak is handy to have around, but for putting together a CD, Jam has all the needed tools.

### PT. 3: PACKETS OF DATA

The CW-7502 CD-R supports fixed or variable packet writing (see David Miles Huber's article on packet writing in the Feb. '98 issue of *EQ*). In a nutshell, once you initialize a CD for packet writing, you can treat the CD like any floppy or hard drive — drag over files or folders whenever you feel like saving something. Although you can't reuse a previously written section, you can "erase" a file by hiding it from the directory. Packet writing is the best solution for backing up a

*continued on page 145*

**MANUFACTURER:** Microboards Technology, Inc., 1480 Park Road, Suite B, Box 846, Chanhassen, MN 55317. Tel. 612-470-1848. Web: [www.microboards.com](http://www.microboards.com).

**APPLICATION:** Create data and audio CDs on your Macintosh, with audio file editing if needed.

**SUMMARY:** The package installs easily and the included software does the job.

**STRENGTHS:** Includes everything you need in one box; reliable; can deal with older machines and system 7.1, not just the "latest and greatest"; easy to use and install; versatile backup programs.

**WEAKNESSES:** I'll let you know if I think of any.

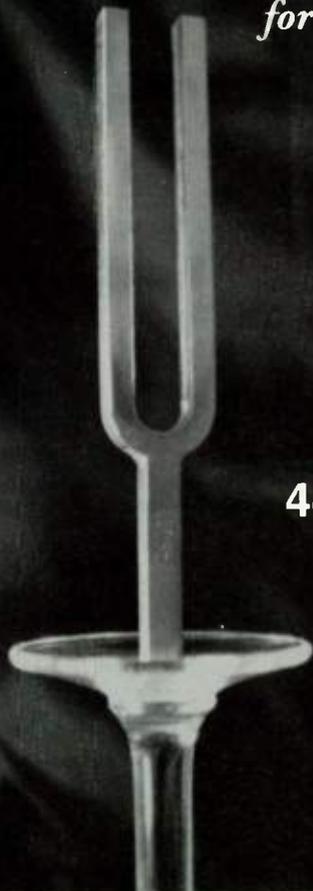
**SYSTEM REQUIREMENTS:** MacOS V 7.1 or higher, 68040 or PowerPC processor. Bundled software requirements vary but generally work with typical systems, including older machines. Note: PowerBooks that do not support SCSI Manager 4.3 are not recommended for burning CDs; only the 3400 series is approved.

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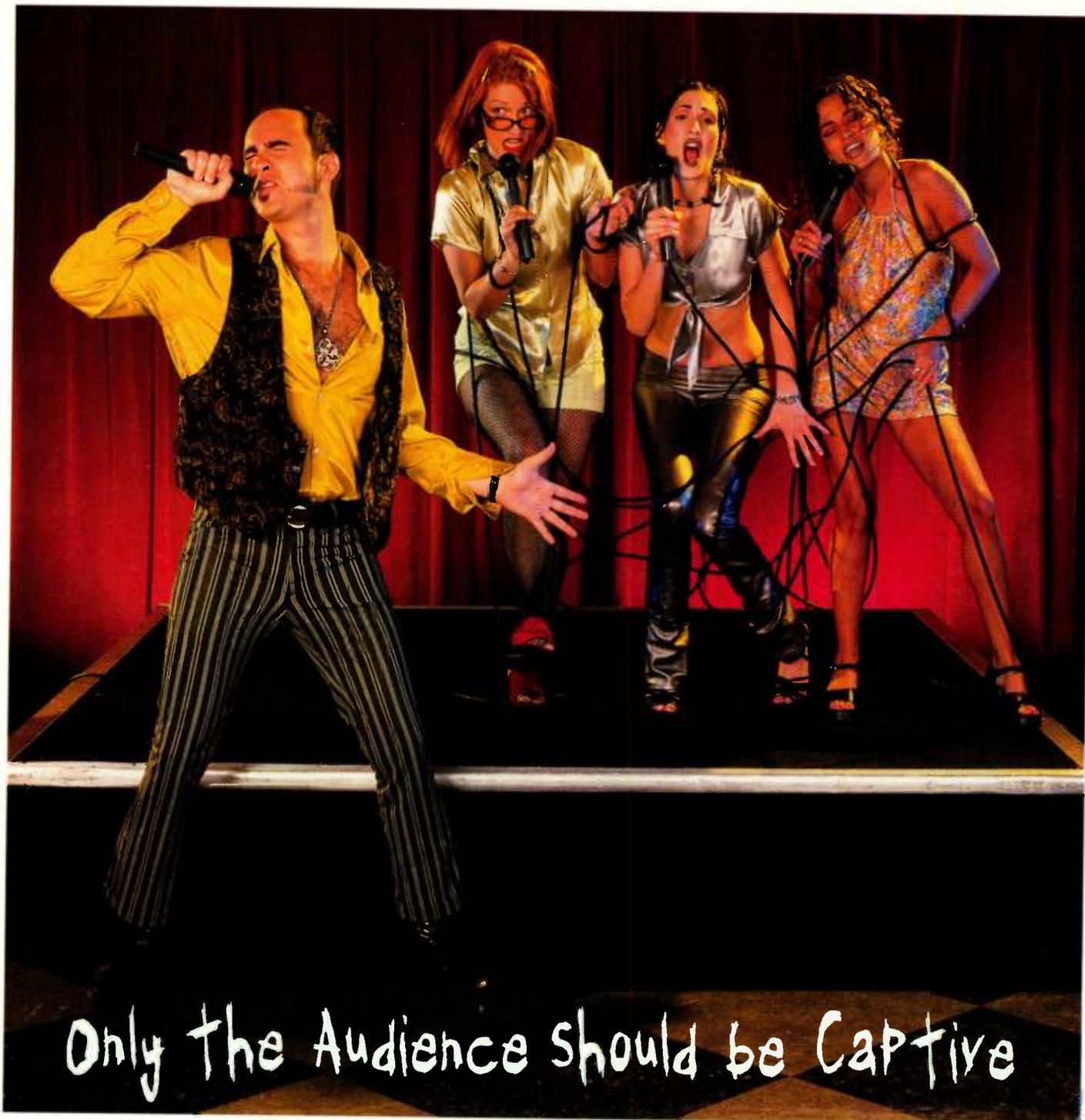
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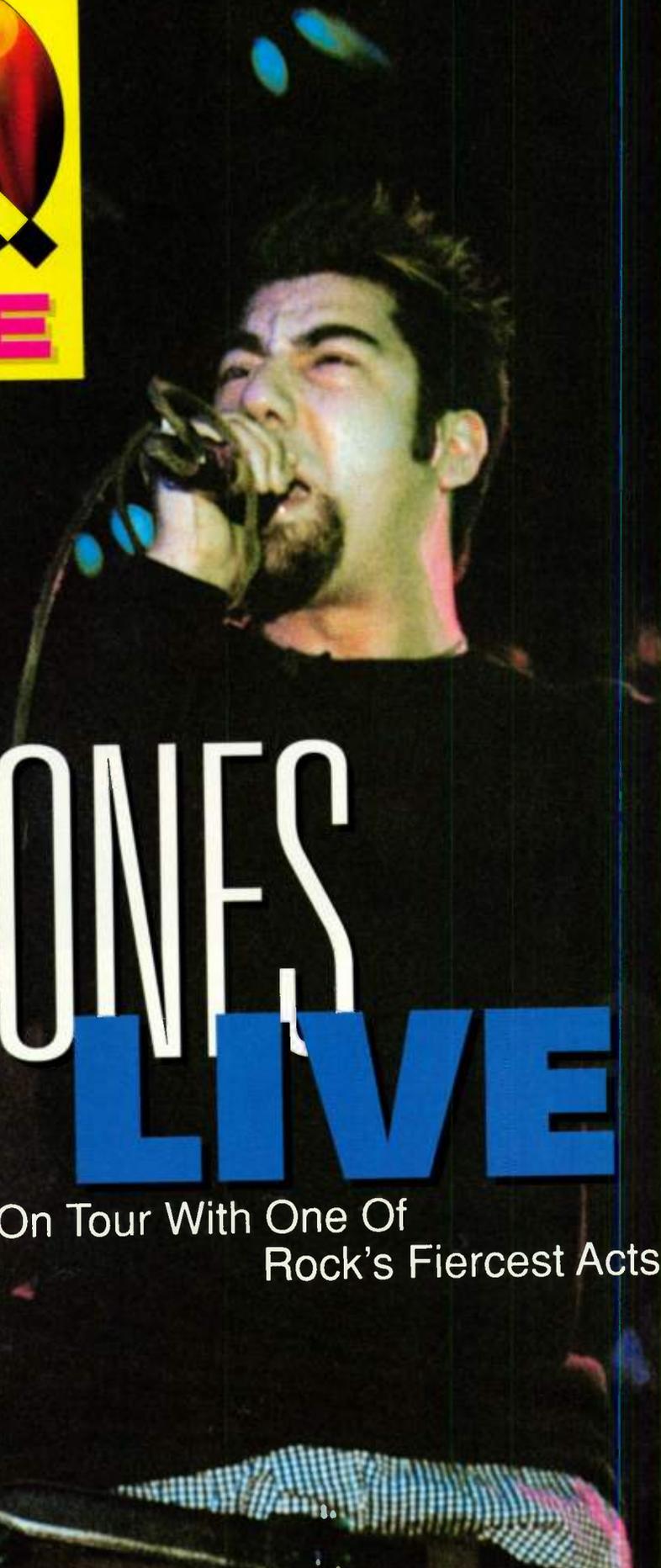
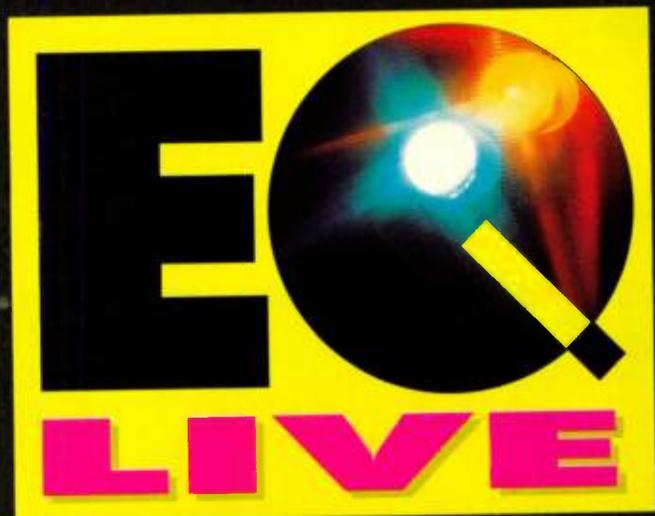
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# DEFTONES LIVE

On Tour With One Of  
Rock's Fiercest Acts



**NEW GEAR PG 116**

PHOTO BY STEVEN J. MESSINA

# 'TONE CONTROL

ENGINEER RON  
MUSARRA KEEPS ON  
HIS TOES MIXING THE  
DIVERSE SOUNDS OF  
THE DEFTONES

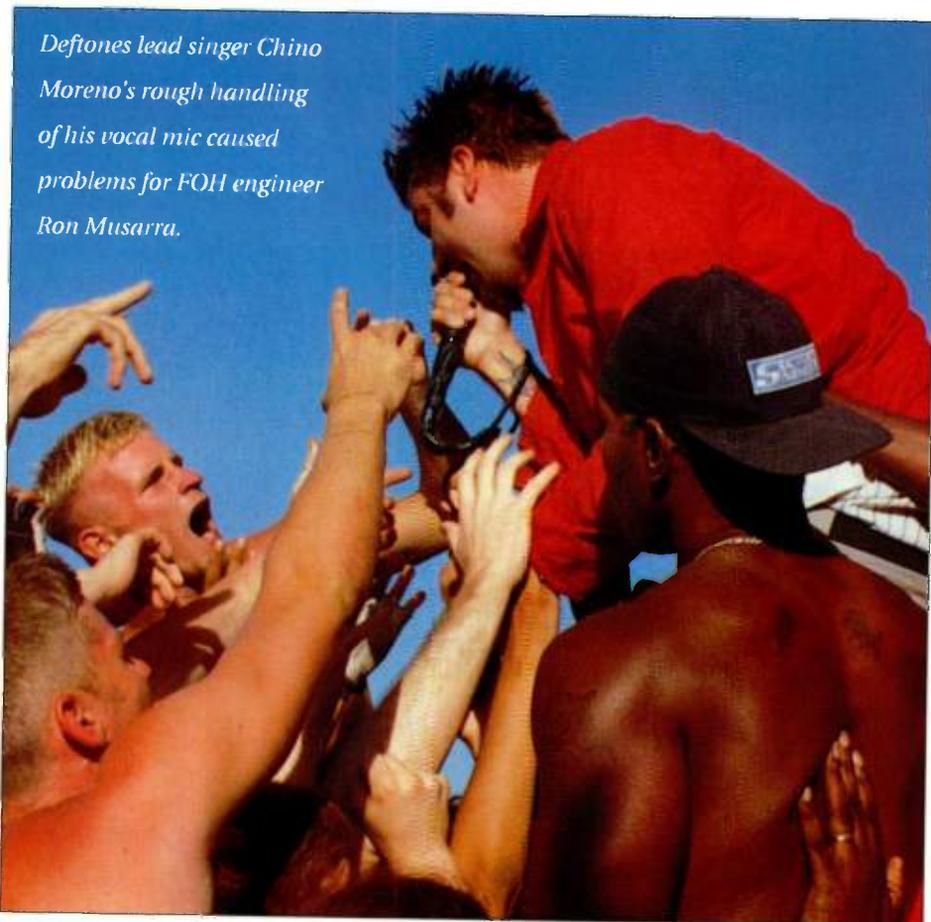
By Robert  
Granger

With a live sound resume that includes the likes of Leah Andreone, Pete Droge, and Matthew Sweet, and a quiet, laid-back demeanor, you would never believe that Ron Musarra is the man behind the Deftones's brutal live sound. Musarra, who has been on the road with the band for just about a year in support of their most recent Maverick release, *Around The Fur*, got his break with them at a New Year's Eve gig in San Francisco.

"Sean Beavan actually passed my name on to their tour manager who was looking for someone to do FOH," explains Musarra. "They called me and asked me to mix the band who was opening for Primus at their annual New Year's Eve show in San Francisco. I had never heard the band before, so they sent me the CD about three days before the gig and I did my best to learn the songs. There was basically no soundcheck, and after the show I was kind of scared — I didn't know if I was really into it or if the band was into it. When I spoke to the band and their management they told me they were happy with the sound, so I went home and listened to the CD a little more, learned the intricacies of the songs, and hit the road running."

In the earlier stages of the tour,

*Deftones lead singer Chino Moreno's rough handling of his vocal mic caused problems for FOH engineer Ron Musarra.*



Musarra and the Deftones carried nothing more than their monitor rig and an effects rack. "Way back, we did some European dates and we tried to carry some stuff with us and it didn't work out — it just didn't make sense. Some of the clubs we played in Germany and throughout Europe were so small that it didn't make any sense for us to use a monstrous PA, so we just used the house setup. Eventually we decided just to carry our monitors. I kept part of the front-of-house rack with me, that's all, and when we got to the States, I had my own rack, but we never carried any more than the monitors — until now."

Musarra's effects rack houses a full compliment of processors and effects, including an Eventide H3000, a Yamaha SPX 90 and SPX 900, an okl ADA 88 one-second delay, and a Roland SD1000 delay, as well as

Behringer gates and compressors, dbx 166 and 160, a BSS 901-2 dynamic equalizer, and a Zoom 9030. "I picked up the Zoom unit for some project studio stuff I was working on, and, as a fluke, I decided to bring it out on the road. It's funny, when Chino (Moreno, the band's vocalist) saw it he freaked out because he had used it for vocals in the studio. So we worked on some patches for it and I started using it — it's a little noisy, but it's got a great sound."

When Musarra first started working with the Deftones, Moreno insisted on using Shure SM58's for his vocal duties. The problem that Musarra faced was that Moreno was not just using one '58, but between five and six mics a show. So in an effort to limit the number of mics the band was going through, Musarra and the band's monitor engineer, Eddie Kercher, suggest-

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ed switching to Shure SM57. "Chino tends to get really wound up when he's performing, and in the heat of a moment he had a tendency of swinging the mics around and slamming them down — we'd have completely flat windscreens and we were just eating the mics," offers Musarra. "So Eddie and I tried to convince him to use '57s. We finally got him to convert when Eddie, who used to work for Faith No More, told him that Mike Patton (Faith No More's vocalist) used to use SM57's — Chino is a huge fan of those guys, so he made the switch. We also had to explain to him that they're a little more delicate, but they'll work better — Chino has kind of slowed down in terms of throwing the mics."

through, the switch did not affect Moreno's vocals or mic technique. "Chino has a very distinct vocal style and sort of an 'anti' mic technique. He subscribes to your standard, 'grab the mic as close up right over the cartridge as possible' technique, so the mic's polar patterns don't really matter," explains Musarra. "I do tend to use a lot of compression on the vocals. Our monitor mix is incredibly loud. In some of the smaller clubs in Europe, if I couldn't get enough bottom end in the mix, I'd have them turn up the kick drum in the side fills and that would fatten everything out."

In addition to compression, Musarra uses a number of effects to color Moreno's vocals throughout the set. "Chino loves effects," states Musar-

ra, but not intense enough to make it too cluttered."

Guitarist Stephen Carpenter relies on a wide number of textured guitar tones, ranging from warm, well-rounded clean tones, to cascading distortions, to convey the Deftones's dynamic material. Originally, Musarra and Carpenter were using a combination of a Shure SM57 along with a Hughes & Kettner Red Box. "Shure suggested that we try using their Beta 52's on Stephen's Marshall cabinets (he has four and we mic two for a stereo split). Stephen says that he can hear a distinct difference in the mic, and he really likes the way the 52's look. The 52's are good because Stephen's got so much bottom end coming out of his amps and they can handle it pretty well."

The thunderous low-end generated by bassist Chi Cheng has also helped keep Musarra on his toes. "With Stephen, he's got his sound dialed in — he pretty much knows he's got his tone dialed in, so he doesn't tweak things during the show. With Chi, it's the complete opposite. Every show it changes, and it tends to get really frustrating. It's like a big constant, 'let's change the bass tone.' The only thing that stays consistent, and not even necessarily that, is his SansAmp." Cheng is using a Hughes & Kettner Model 600 amplifier with four cabinets, an array of rack-based processors, as well as the aforementioned Tech 21 SansAmp, one of the main sources of his tone. "Chi's got a setting on the SansAmp that he runs through all of the time. They used it in the studio, and we were supposed to get all of the settings to use live and we never did. So the basic sound is when he kicks it into the distortion. He's gone through a whole chain of pedals, and we finally got him down to just the SansAmp."

In order to capture Cheng's bass tone, Musarra is using a combination of two Countryman DIs, one pre-effects and one post-effects, and a Shure Beta 52 on one of the cabinets to fatten out the sound. "I like to have the pre-effects DI just in case Chi loses anything — this way we cover all the bases. In case he loses the wireless, he's got a hard wire right there. If the rig goes down, at least I have the bass before the effects. Normally I use a blend of the mic and post-effects. I'll use the pre-effect



MIND YOUR TONES: Top: Guitarist Stephen Carpenter and vocalist Chino Moreno. Bottom: Bassist Chi Cheng.

While effectively changing the number of mics that the band was going

to play with effects in the mix. Little by little I've been adding more and more



channel every once in a while if I feel like I need it."

Rounding out the Deftones's rhythm section is drummer Abe Cunningham. Being a drummer himself (Nine Inch Nails' *Pretty Hate Machine*), Musarra truly enjoys mixing Cunningham's solid beats. "That's what's so cool about mixing the Deftones — the fact that Abe is such a great drummer. The Orange County Percussion kit that

we're using here in the states (we also have one we use in Europe) is great. Generally I feel I

do have an advantage because I am a drummer and drums tend to be the easiest thing for me. I know what I'm looking for. I don't worry about it; instead, I have to worry about making sure the vocals are loud enough."

Musarra has definitely put some thought into miking the drum kit. The top and the bottom of the snare is covered with a Beta 56 on top and a SM98 on the bottom, each tom is miked with a SM98, and Musarra chose SM81's for the overheads. Musarra also uses a combination of two microphones — a Beta 52

and an SM91 — to capture the full depth of the kick drum. "I use both mics right in the kick because they both sound completely different. I've found that you can get some snap out of the '91 while the '52 makes it big and fat sounding. In terms of blending the two mics, it's really on a gig-by-gig basis. The venue really plays a big part in the blending process."

The newest touring member of the Deftones, DJ Frank Delgado also helps add to the band's overall sonic experience. "He adds some ambient noise and effected sounds to about five or six songs in the set," explains Musarra. "He's manipulating a regular turntable. I talked with him about going the digital route with his rig via a sampler, which we will incorporate in the near future. Basically, he's set up via a Countryman DI and I don't do too much to EQ him — I just try to get his level happening and I let him go."

In all, Musarra's time with the Deftones has been quite the learning experience. "I find mixing the Deftones so fun because it's a real challenge. They're so creative and their sound is so large that it really keeps me on my toes."

EQ

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CHANGING TONES: Musarra claims that his biggest challenge working with the band is their constant musical changes.

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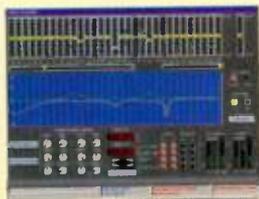
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# CHECKING FOR BASS

GETTING THE  
BEST LOW END  
BY ASSESSING  
THE CLUB BEFORE  
THE SHOW

By Steve  
La Cerra

It's a really unfortunate fact of life, but the vast majority of live music venues that we work in were never acoustically designed for music. Of the venues that *were* designed with music in mind — such as theaters — many of the designs never anticipated amplification. A majority of the live music venues engineers deal with are converted bowling alleys, beer halls, theaters, dance halls, barns, strip clubs, conference centers, hockey arenas, and football fields. All of these are wonderful places in which to hold an event — as long as it's not a musical event. The sound quality in such rooms is typically less than optimum (to be polite) — and that's given a competent engineer with a high-quality sound system. A lot of funky things happen to low end in rooms like this, so here's a couple of ideas about how to evaluate the bottom end in a room you're working in and possibly fix a problem or two.

## OLD TRICKS

Probably the most popular thing for an engineer to do when confronted with a new room and PA system is put on a CD, crank it up, and listen. Usually it's a familiar CD — one you've heard in a lot of different places on a lot of different systems. Well that's wonderful, but there's a

good chance this CD has nothing to do with the show you're mixing. You'll probably learn a lot more about the PA system (especially the midrange) if you play a CD from the band you're working with.

Bypass the house EQ and compressor (if any) and patch the CD player into a pair of channels so that you have access to bussing, EQ, aux sends, and, perhaps most importantly, a phase reverse switch. Start with the two channels panned hard left and hard right. Bring up the faders until sound is coming from the system at a very soft level. Then get yer butt out from behind the mix position and walk up to each speaker stack. Put your ear near each driver to make sure they're all working (common sense you say? You'd be amazed at how many venues with installed systems don't even *know* when they have a blown driver).

Obviously, this is more difficult on flown systems, but it's not impossible. A down-'n'-dirty way to test a suspect driver is to connect one end of a cable to the speaker and touch the conductors at the other end to the terminals of an AA battery. A driver that's dead will produce no sound, but if you hear a click or pop, then you know that the driver has at least some life to it. In cases where a driver is lunched, you have the politically delicate task of coaxing the PA company or venue into coming up with a working replacement.

When you've ascertained to your best ability that all amps are on and none of the drivers are blown, go back to the mix position. Pan those two channels to the center. The stereo image should collapse, but the timbre of the system should remain essentially the same (pay close attention to the bottom end).



*New York's China Club was designed with music in mind, but here are tips on how to handle the many venues that weren't.*

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## DISAPPEARING BOTTOM

Next, press the phase reverse switch on *one* channel and listen. The bottom end should disappear and chances are that the snare drum and lead vocal will go away with it (and you'll probably hear a lot of reverb). If all of these instruments get *louder*, you're in big trouble — there's a fundamental problem with the system, in that the left and right sides of the PA are probably out of phase. We say "probably" because you might be hearing an acoustical phenomena in the room. You now have to walk the room to make sure that you're not mixing on a low-frequency node. Now what idiot would locate the mix position at a low-frequency node? Most venue owners don't give a flying-you-know-what about where you mix from. They want to sell tickets and pack the house, so your mix position is little more than an afterthought. Walk the room. If the bass reappears when you step five feet to the left, you're mixing in a node. Good luck. At least you know it's not a malfunctioning PA system (read on for more about nodes).

Once you've confirmed that the problem is not acoustical (lucky you!) you can address the electronic aspects of the system. In a multi-way system, it's possible for only one range of the system to be out of phase. For example, someone might have connected a crossover output to an amp input using an XLR cable that has pins 2 and 3 reversed at one end (this is more likely to happen than you'd care to think). Listen carefully. If only the bass and kick sound weird, there's a phasing problem in the bottom end. Check the appropriate cables for phase reversal. If you have any doubts, mute the multi-way outputs from the crossover and check each range individually for proper phase.

Problems such as these can really be pinpointed by using a system test CD such as *Sound Check*, produced by Alan Parsons and Stephen Court (reviewed in the July 1998 *EQ*). Most test discs contain pure tones at varying frequencies, as well as varying types of noise and other goodies — helping reveal exactly how a PA system behaves. By repeating the CD-playing procedure with test tones you can accurately check phase in the low, low-mid, high-mid, and high frequencies. Let's suppose you find that a 100 Hz tone is out of phase, but that the other tones are in phase. Well, you know that the frequency range containing 100 Hz

(i.e., the LF output) has a problem.

Although your course of action is limited, there are things that can be done to find and correct wiring problems. Start by checking all cables. If necessary, disconnect each one in the chain and test them pin for pin with a VOM. Remember that when a banana connector has been replaced, it only takes a momentary lapse of reason for someone to connect the + wire to the ground terminal. As previously mentioned, an XLR cable with pins 2 and 3 reversed at one end is another likely culprit (don't neglect the cables between the house console and house EQ or the house EQ and compressor). Find out if any of the drivers has been recently replaced or repaired because the leads might have been connected in a hurry or in poor lighting and may have been reversed. And — though this is a rarity — make sure that the power amps are plugged into properly wired AC circuits. If a low-frequency amp on one side of the stage is on an AC service where the phase is reversed, guess what? The amp runs out-of-phase relative to the other amplifiers. The solution: take a quad box, reverse the hot and neutral conductors at the plug side, *mark the box*, and reconnect the amp.

If you run down all of these possibilities and the bottom end still sounds weird at the mix position, then you're probably the victim of an acoustically unfriendly room. Unless you're on a *major* budget and can bring in acoustical treatment, you now have limited options. Play some music, walk the room, and note carefully where the bass changes. Ask the house engineer how the room will react when it is full. You may have to make serious mental adjustments to your mixing approach for the simple reason that we try to achieve good sound *at the spot where we are listening*. This is

a natural thing to do. But you may have to do the old scoot-and-mix technique where you make mix adjustments, run out to the house, listen, make more adjustments, run back out to listen, etc.... If the house engineer is very kind to you (and if you trust their ears), they can be your ears by walking around the room, coming back to the mix position, and letting you know what it *really* sounds like. This is a huge help during shows where you have a lot of console moves and cannot leave the desk unattended.

**A down-'n'-dirty way to test a suspect driver is to connect one end of a cable to the speaker and touch the conductors at the other end to an AA battery. A driver that's dead will produce no sound.**

## PARDON THE DELAY

If you're taking an electric bass or kick drum through more than one channel, always check phase between the channels, especially if you have one direct and one mic channel. The signal path of a miked channel is slightly longer than that of a DI, simply because sound from the amp must travel through air before it reaches the mic. While this time difference is minimal, it can cause phase problems. We've seen some engineers use a digital delay to time-align the direct and mic signals (with varying success) by delaying the DI a few milliseconds — allowing the mic to "catch up" to the DI and returning phase coherency (similar problems can occur when mixing a triggered kick sample with a mic on the kick). If you *really* want to get tweaky, you can even delay the entire PA system to match the position of the backline,

which — in some rooms — can help tighten the bass response considerably. But, whatever you do, don't delay the soundcheck — it could be an important learning experience.

*In addition to being the senior editor of EQ, Steve "Woody" La Cerra mixes front of house for Blue Öyster Cult and never gets any sleep. He hates when people confuse "bass" with "bass."*



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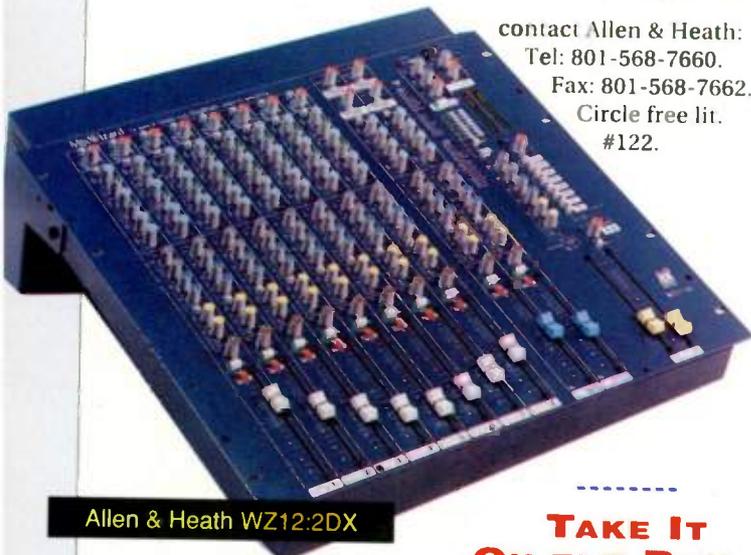
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and vocals. Features of the Passport include 250-watt stereo powered mixer with four mic/line inputs, two stereo program inputs, "One Touch" controls for level, EQ, and effects, two full-range speaker cabinets, and two microphones. The Passport also includes an adjustable Vocal Input Priority, which can lower program level when someone speaks into microphone input 1, and an optional DC-DC converter for 12-volt battery operation. For further information, contact Fender Musical Instruments Corp.: Tel: 602-596-9690. Fax: 602-596-1384. Web: www.fender.com. Circle free lit. #129.

to-read icons used for navigation by users through their effects and signal paths. The S200's dual-engine processor allows users to place any one of five different effect configurations in any order. Featuring a -96 dB S/N Ratio and 20-bit A/D and D/A conversion, the S200 works quietly, an important element for both studio and live use. The effects menu includes Reverb, Delay, Chorus, Flange, Karaoke, Pitch Shifting, Vocoder, Compressor, and Rotary Speaker, among other effects. For more information, contact DigiTech Studio. Tel: 801-566-8800. Fax: 801-566-7005. Circle free lit. #130.



Signal-1 GS-1

# RADIAN AUDIO ENGINEERING RPX-112P LOUDSPEAKER



By **STEVE LA CERRA**

Although you may not be familiar with the name Radian Audio Engineering, there's a good chance you've already heard their technology. Radian has been manufacturing component drivers and diaphragms for about 10 years. Until recently their drivers have mainly been used in OEM applications, but now Radian has started marketing complete loudspeaker systems that incorporate the driver technology they've developed.

One of those systems is the RPX-112P, a full-range, two-way loudspeaker designed primarily for use as a stage monitor. While its shape and size suggest that it is intended for horizontal use as a floor wedge, it can also be used vertically for small house systems, or as a fill speaker in large PAs. Unlike most of the wedges we encounter, the RPX-112P uses a single, 12-inch coaxial driver in a ported cabinet. Radian sent EQ a pair of RPX-112P's, which we dragged around the country for three months, using them mainly as vocal monitors in venues that ranged from several-hun-

dred-seat clubs to outdoor festivals of more than 5000.

The RPX-112P cabinet is a serious piece of construction — exterior-grade, 13-ply, Baltic birch with a very strong, perforated-steel grille protecting the driver. This kind of construction does make the cabinet heavy (59 pounds), but a recessed carrying handle makes it possible for a single person to lift. As are all of the loudspeakers in the RP Series, the RPX-112P is finished with a proprietary cabinet covering called Duradian™, which appears to

be a rubberized coating applied to the birch. In any case, it looks good, resists scratching, and can even be provided in custom colors.

Our first show with the RPX-112P's was outdoors on a stage of approximately 40 x 25 feet. Our PA company had already placed three monitor mixes downstage. We decided to leave the stage-right and center mixes as is — each with two 1x15-and-a-horn wedges. We placed a single RPX-112P at the stage-left position, and when we grabbed a Speakon® cable to wire the cabinet, we noticed a minor annoyance. The input panel of our RPX-112P was mislabeled "pin 1 = LF, pin 2 = HF." In fact, we were using the full-range, passive version where the pin 1 pair of the Speakon accepts full-range audio (the biampable RPX-112B accepts audio as labeled). After we knocked our heads a bit, we realized that the worst thing that could happen was that we'd send full-range audio to the woofer, so we connected the amp, powered it up, and everything was

## ROAD TEST

**MANUFACTURER:** Radian Audio Engineering, Inc., 600 North Batavia Street, Orange, CA 92868. Tel: 714-288-8900. E-mail: Info@Radianaudio.com.

**APPLICATION:** Full-range speaker for professional live sound reinforcement.

**SUMMARY:** Single 12-inch coax driver with 2-inch-exit high-frequency compression driver in a ported cabinet. Speakon® input and parallel connectors.

**STRENGTHS:** Well-built cabinet; very clear reproduction in the vocal range; looks good.

**WEAKNESSES:** Angle of front baffle is somewhat steep; cabinet is heavy.

**PRICE:** \$1695

**EQ FREE LIT. #:** 131



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fine. Radian Audio Engineering has now corrected the label problem, which appeared on a few early RPX-112P's. If you own a '112P with a mislabeled input panel, Radian has a correction label for you.

We started our monitor check with the other mixes, which — on two 1x15-plus-horn cabinets per mix — were able to produce some pretty loud sound. It appeared initially as if the one Radian box really wouldn't be enough against these giants, but the *one* Radian cabinet held its own quite nicely. The RPX-112P produced very clear audio in the vocal range

without making us feel like there was a horn sticking a dagger in our ears. In other words, it sounded smooth in the top end and didn't produce peaky, high-mid crap like most other monitors. The bottom end of the vocal range sounded tight and controlled, possibly due in part to the dampening of cabinet resonance from the Duradian finish.

We continued using the RPX-112P's, sometimes as a pair, sometimes with one cab on a mix. For the most part, results were consistent regardless of room/equipment variations: clear vocals that cut through on-stage din without poking you

in the eardrum. There was one aspect of this Radian cabinet that we were a bit mystified with: the angle of the front baffle. We felt that it was a bit on the steep side. If a tall person (say, six feet) stands directly in front of this cabinet, the baffle blows toward their waist. Shorter people, or people who stand back farther from their monitors, will find this less of a problem. It didn't really sound off-axis, probably because the conical coax dispersion pattern results in wider vertical coverage compared to traditional rectangular horns (which tend to have more narrow vertical dispersion). In general, the coax design kept spill contained because the *horizontal* dispersion is considerably *tighter* than a 60 x 90 horn. We placed a 2x4 under the cabinet to modify the angle. Radian has informed EQ that they are changing the angle, and may build a cabinet that can be rolled to rest at a different angle on each side.

As part of our "experiments" on the RPX-112P, we used them as keyboard monitors. It's interesting to note that a seated keyboard player (or drummer) is directly on-axis to the front baffle. We ran a foldback mix, which included an Alesis NanoPiano, Korg M1, and Yamaha DX7-II, into the RP-112P's. Although the cabinet didn't produce earth-shattering low end (nor was it designed to), the mix was tonally full and balanced. Radian's engineers have done their homework on the crossover to filter out low frequencies that the 12-inch driver might otherwise struggle to reproduce. The result is that the RPX-112P doesn't sound like it's trying to do something it really can't.

Radian Audio Engineering has come up with a serious monitor in the RPX-112P. It might be on the pricey side for the MI market, but professional users who prefer to buy once and buy right will find the money well spent. (The RPX-112P does come in more affordably than some of its competition.) It sounds very good and the cabinet will hold up to road use. If you're looking for professional-quality, compact vocal stage monitors, the RPX-112P is a strong recommendation. **EQ**

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TECHNOLOGY

### MANUFACTURER'S SPECIFICATIONS

**Components:** One 12-inch coaxial driver with 2-inch exit HF driver  
**Power Handling:** 500 watts RMS or 1000 watts program  
**Impedance:** 8 ohms  
**Frequency Response:** 60 Hz to 20 kHz  
**Dispersion:** 60 degrees, conical  
**Sensitivity:** 96 dB

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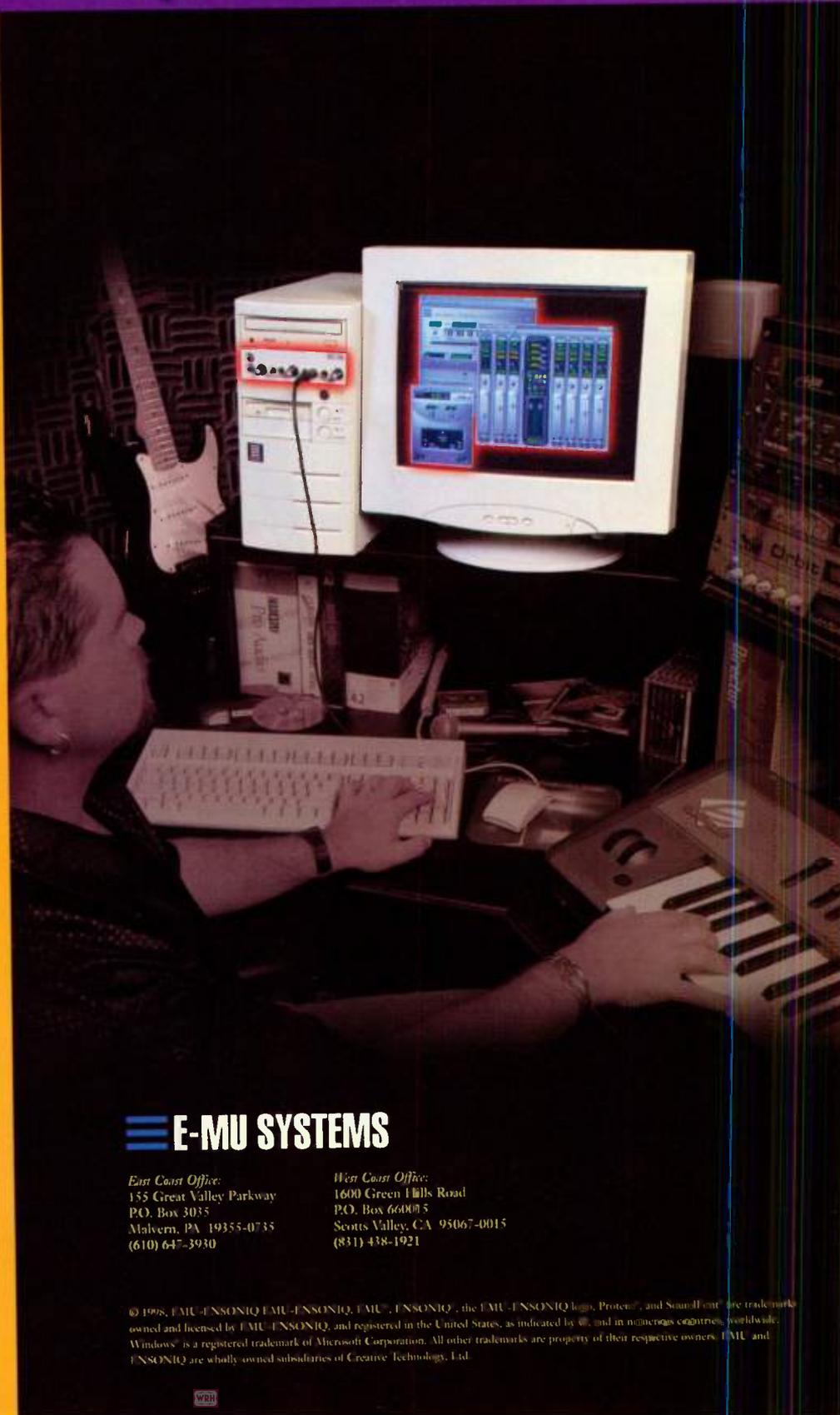
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CIRCLE 79 ON FREE INFO CARD

WRM

# XWIRE X9505 20-BIT DIGITAL WIRELESS SYSTEM



By MIKE SOKOL

When I find a new product that utilizes a different technology, my first question usually is: "Does it really serve a purpose or is it just a gimmick?"

I consider wireless mics in general to be a necessary evil in today's mobile society (well, maybe not an evil...just a nuisance). Their built-in compander circuitry often adds a layer of compression you can't control; they have a way of dropping out at the worst possible moment; and you occasionally get rude noises either from squelching action or interference from other RF entities. I've even had the local police-band come blaring through a beauty contestant's microphone channel, and it wasn't a very pretty sight. (Can you say "tantrum"?)

The utilization of UHF frequencies produced a big performance gain over VHF and the dreaded CB-Band units of just a few years ago. UHF, however, initially was prohibitive to all but the biggest productions. Now that UHF wireless units are available for under \$1000, many of the problems associated with VHF band transmis-

sion should go away. But UHF can still have dropout and interference from television transmitters (yes, you're in the middle of the bandwidth allocated for TV broadcast), and they still use compressors to get the necessary dynamic range.

All of which brings us to the Xwire X905 wireless microphone system. This system has a digital 20-bit A/D converter built right into the handheld unit. Instead of transmitting a frequency-modulated signal, it sends a digital data stream to a receiver with a D/A converter. Furthermore, because it's a digi-

tal signal, it doesn't have the bandwidth and dynamic limitations imposed by standard FM carrier tech-

## ROAD TEST

**MANUFACTURER:** Xwire Corporation, 4630 Beloit Drive, Suite 10, Sacramento, CA 95838. Tel: 916-929-9473. Web: [www.xwire.com](http://www.xwire.com).

**APPLICATION:** Live performance and studio recording.

**SUMMARY:** Twenty-bit digital wireless system available with both handheld and instrument transmitters. Quadiversity™ receiver with four internal antennas. No compander ICs. Offers five selectable channels at 900 MHz.

**STRENGTHS:** Twenty-bit A/D conversion without companding results in 120-dB dynamic range — sounds like you're "on a wire"; built-in quad antenna is one less thing to lose or break; Audix mic capsule available as an option.

**WEAKNESSES:** Three-hundred-foot range may be too short for some applications; only five field-selectable frequencies available; battery replacement in handheld mic (four AA batteries) is a little tricky under pressure.

**PRICE:** \$1295 w/XH905 handheld mic; \$895 w/XT905 instrument transmitter.

EQ FREE LIT. #: 132

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## FEATURES INCLUDE –

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- 48v phantom power
- Optional 'plug-in' crossover
- Headphone bus
- 60mm calibrated faders
- Stereo return w/send to monitor
- 166 memory - digital reverb/effects
- 19 user programs – 15 w/MIDI
- Alpha numeric display window
- Built-in electronic processor 'help' menu
- Programmable System mute, Auxillary mute, 4 point processor EQ, Reverb on/off & Delay on/off

nology. In theory it should be possible to build an RF mic that doesn't sound like an RF mic, and, to a large extent, Xwire has succeeded in doing so. This is one transparent-sounding mic. Whether a vocalist was screaming or whispering, I never heard any compression, noise, or alias tones of any type. It really was like having a good hard-wired mic in use.

I also took the X905 to a regional airport. Talk about RF traffic! At an airport, everything runs on RF, and airport personnel use walkie-talkies like you and I use the telephone. Other lesser RF mics have failed in this environment, but the Xwire just ignored everything except its own signal.

Ergonomically, the XH905 handheld transmitter is easy to hold and lightweight, even for long sets. And you can now get the Audix OM6 mic capsule, which is becoming very popular for live sound. The only thing I didn't like about the handheld mic was that replacing the four AA batteries on a dimly lit stage was a little

cumbersome. I like dropping in one 9-volt battery and throwing the mic back to the performer — as I'm sure

many of you have also done.

Xwire also offers the XT905 belt-pack transmitter for plugging in your guitar, bass, or zither. It has the same range and performance features of the XH905, but without the mic capsule. Just plug into the 1/4-inch phone jack and you're jammin' in style without any nasty RF artifacts.

The XR905 receiver provides needed display features such as: percentage of data (up to 100 percent) picked up by each receiver (sort of an RF-level indicator); hours of battery life expected from the remote transmitter; and an eight-segment meter for audio level. Also included is a channel indicator and Channel Select button. Just enough to get the job done and see what's happening. There are four internally mounted antennas with a diversity receiver, and the 150–300-foot range, while not outstanding, should get the job done in

almost any sane application. The XR905 uses, unfortunately, a wall-wart power supply.

The real big deal with this system is that its performance is good enough to record with. I generally refuse to record a live performance with an RF mic — there are usually too many RF artifacts to contend with. I would, though, consider the X905 for recording simply because I couldn't make it do anything bad under any circumstance. Even when you go to the limits of the distance range, the sound just sort of "thins out." There's never any thumping or nasty RF squeaks to spoil your performance. You just fade into the bits, as it were. Some studios already are using this unit for in-house recording, so that gives you a hint that this may be the technology to watch in the future. Some day, all RF mics will probably be digital. But right now you can get an Xwire X905 and be ahead of the pack. **EQ**

## IS "DIGITAL" REALLY DIGITAL?

What's all this talk about "digital" microphones? It's become popular advertising hype to slap a "digital ready" sticker on just about anything audio. A good example is so called "digital" headphones that have nothing really digital about them. The hype is that they can reproduce the dynamics and frequency response of 16-bit audio...or so the theory goes. In reality, though, they're just plain-old analog products in fancy wrappers — without a D/A converter in sight. Just wraps of wire and magnets...business as usual.

A few new microphones have the word "digital" attached, but is there really anything "digital" going on?

[Check out Roger Nichols's review of the beyerdynamic MCD 100 digital mic in the September '98 EQ.] Well, the X905 mic from Xwire is the real deal, with some distinct performance advantages over traditional "analog" transmission technology. Here's how it works.

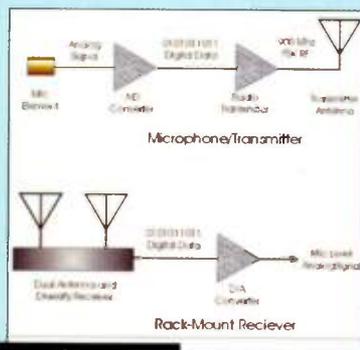
The microphone element itself is analog, of course. Yes, indeed the world is an analog place until you get down to quantum physics levels...you could probably query Roger Nichols on that subject. From there it goes directly into a 20-bit A/D converter that's encased within the microphone. (Read my sidebars on A/D converter theory from the October and November '98 issues of EQ, if you need a refresher.) Then the 20-bit data stream is used to modulate a 900

MHz Radio Frequency carrier-wave producing an FSK (Frequency Shift Keyed) signal, which goes to a radio transmitter that is also encased in the body of the mic. After this RF signal passes through the airwaves, it's picked up by a receiver and demodulated back into a 20-bit data stream. From there it goes into a D/A (digital-to-analog) converter and output as a standard analog signal. Whew! This sounds, and is, complicated, so I've included fig. 1 for clarity.

Some of the advantages of a digital transmission system over an analog FM (frequency modulated) system are improved dynamic range (since you just need to add more bits to get more dynamic range) and inherent rejection of

any other RF signals. Since the D/A converter in the receiver is looking for a valid digital signal with a proper ID, it will automatically ignore the RF garbage from other sources, such as VHF and police-band radios. This digital keying and error correction is what helps makes the transmission path so stable.

There are also some hard-wired digital mics with similar technology. In that case, there's a digital AES/EBU or S/PDIF output, which you can plug directly into a digital port on your console, sound card, or DAT machine. Of course, hum pickup and frequency roll-off from long cable runs just goes away. It's a beautiful thing.

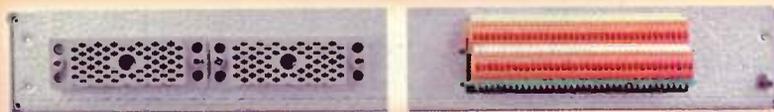


**FIGURE 1**

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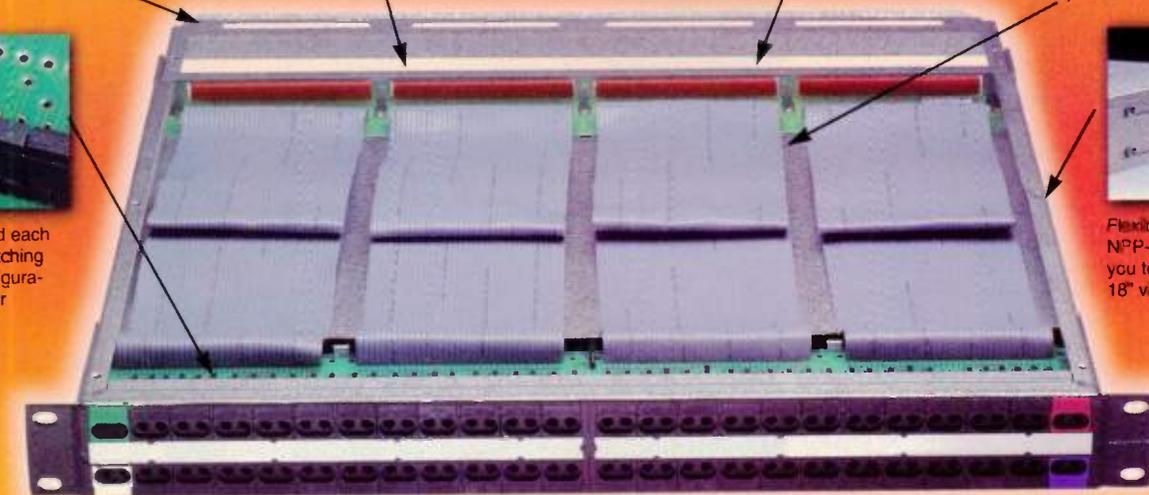


Heavy duty cable bar

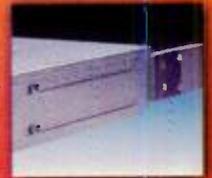
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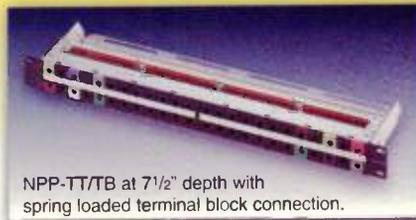
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# Brauner VM-1 *Tube Microphone*

A well-crafted mic  
that's worth its  
substantial  
price

BY MIKE SOKOL

Did you ever fantasize about a date with a supermodel? Or how about a fast lap around the track in a Ferrari? Now that I've got your attention, let's talk microphones. Admittedly, microphones are among the sexy "gotta have" gear used in studios and live productions. They're simply the first link in the audio chain — your sound will never be better than the mics you use to capture it. So if you're a microphone junkie like me, then reviewing one that's been rumored as one of the best sounding in the world can really get your heart pumping.

Now, I've got to admit right up front, I too doubted that any microphone was worth five grand, but after auditioning the VM-1, I'm now a believer. If there was some extra money in my microphone budget, I would seriously consider getting one — or maybe even two for stereo — for my studio.

## THE FEW, THE PROUD, THE MICS...

As we're all beginning to rediscover, in most recording studios we don't need armies of GI (General Issue) microphones, we really just need a few excellent and versatile mics. A roomful of junk mics is still just junk, but one really great microphone can elevate your recording to new levels.

The VM-1 is a very large and heavy microphone [8.75 inches; 54 oz. w/mount and windscreen] built in the tradition of professional gear from the '50s and '60s. During that time, computer modeling didn't exist, and much of the really great-sounding gear of the time was designed by ear. And because the manufacturers weren't owned by large mega-companies, you simply



**MANUFACTURER:** Brauner of Germany. Distributed in the U.S. by Transamerica Audio Group, Inc., 2721 Calle Olivo, Thousand Oaks, CA 91360. Tel: 805-241-4443. Web: [www.transaudiogroup.com](http://www.transaudiogroup.com).

**APPLICATION:** Variable-pattern tube microphone for studio recording.

**SUMMARY:** Dual large-diaphragm tube mic with remote continuously variable pattern selection, including omnidirectional, cardioid, hypercardioid, and bidirectional.

**STRENGTHS:** Absolute world-class sound; remote pattern control; very low self-noise; excellent shock mount and pop filter.

**WEAKNESSES:** Shock-mount and pop-filter assembly is a little cumbersome, but worth the trouble.

**PRICE:** \$4995  
**EQ FREE LIT. #:** 133

spent whatever you had to in order to make the best product you possibly could. Modern mass-production and mass-marketing techniques have eliminated that mind-set to a large degree, but there are still a few hardy souls out there building audio devices that somehow transcend the performance of computer design, and which no board of directors would gamble on building because of the price.

The VM-1 and its designer-builder

Dirk Brauner are throwbacks to that era of build-it-by-ear and don't worry about the cost. As a *Tönmeister* and well-known old microphone upgrade expert, Dirk became dissatisfied with what he felt were budget and bureaucratic limitations that didn't allow the best products to be built. So Dirk set out on his own, and now lovingly builds every one of his microphones by hand in Germany. This makes for an expen-

*continued on page 146*

PHOTO BY EDWARD COYLER



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# Lexicon Signature 284 Guitar Stereo Amp



## A look at Lexicon's recording-oriented amplifier

BY CRAIG ANDERTON

When Lexicon introduced a tube guitar preamp/amp, the general reaction seemed to be, "Don't we have enough of these already?" For me, though, it took only about one minute after plugging in to realize that this is no ordinary box. Designed specifically for the studio, the 284 is most certainly not all things to all people, but will hit the bullseye big-time for some. Here's why.

The 2U-rack space 284 is long on recording-oriented features — starting with Class A operation, which trades off high power for better fidelity. While 3 watts RMS per side (courtesy EL84 output tubes) may seem minimal, there's more than enough punch with efficient speakers to allow miking them, or combining direct and miked sounds (according to Lexicon, the 284 can generate over 100 dB SPL at 1 meter with the companion SB210 cabinet).

You can access the input (a standard, high-impedance type) from either the rear or front panel; the preamp stages uses three 12AX7's. Past this point, the signal splits into two channels. There are outputs for stereo speakers (each out can switch between 4 and 8 ohms), as well as for direct recording and additional line-

level outs to drive higher-powered slave amps. All outs are post-EL84, so you get the sonic benefits of having the output stage in the equation.

The recording outputs consist of line level, +4 dB, balanced XLR connectors with ground lift (these are the only non-phone jacks in the unit); an emulation switch for each channel selects a darker 4-x12-inch speaker cabinet sound or brighter 2-x10-inch timbre. Thanks to the recording outs and passive speaker load, the 284's naturally sweet sound makes it to your console intact.

The effects loop is well implemented, although designed solely for -20 dB, stomp box-type signal levels. Line-level effects will work if you crank up the effect's input and pad the output. With stereo effects, the two sends carry the same signal; the returns feed the left and right

power amp inputs. This also works as a dual mono configuration for patching two different processors into the two channels. There are two options with mono effects: either the mono processor affects both channels or, in "split" mode, the mono effect can insert in only one channel while leaving the other channel unaffected (it carries the straight preamp sound).

Controls include gain (with pull for boost), tone (bass, midrange, treble, presence), left and right volume, and switches for power on/off and standby. The presence control, which gives a subtle high-frequency "sheen," works in tandem with treble; the more you turn up the treble, the greater the effect of turning up the presence. The midrange covers a fairly broad bandwidth and is more for adding character than taming



## LAB REPORT

**MANUFACTURER:** Lexicon, 3 Oak Park, Bedford, MA 01730-1441. Tel: 781-280-0300. Web: [www.lexicon.com](http://www.lexicon.com).

**APPLICATION:** Provide tube guitar tone for direct and low-power recording applications.

**SUMMARY:** It's pricey and the tonal qualities are not exceptionally flexible, but the recording-oriented features are tops and the tone is sugar-sweet.

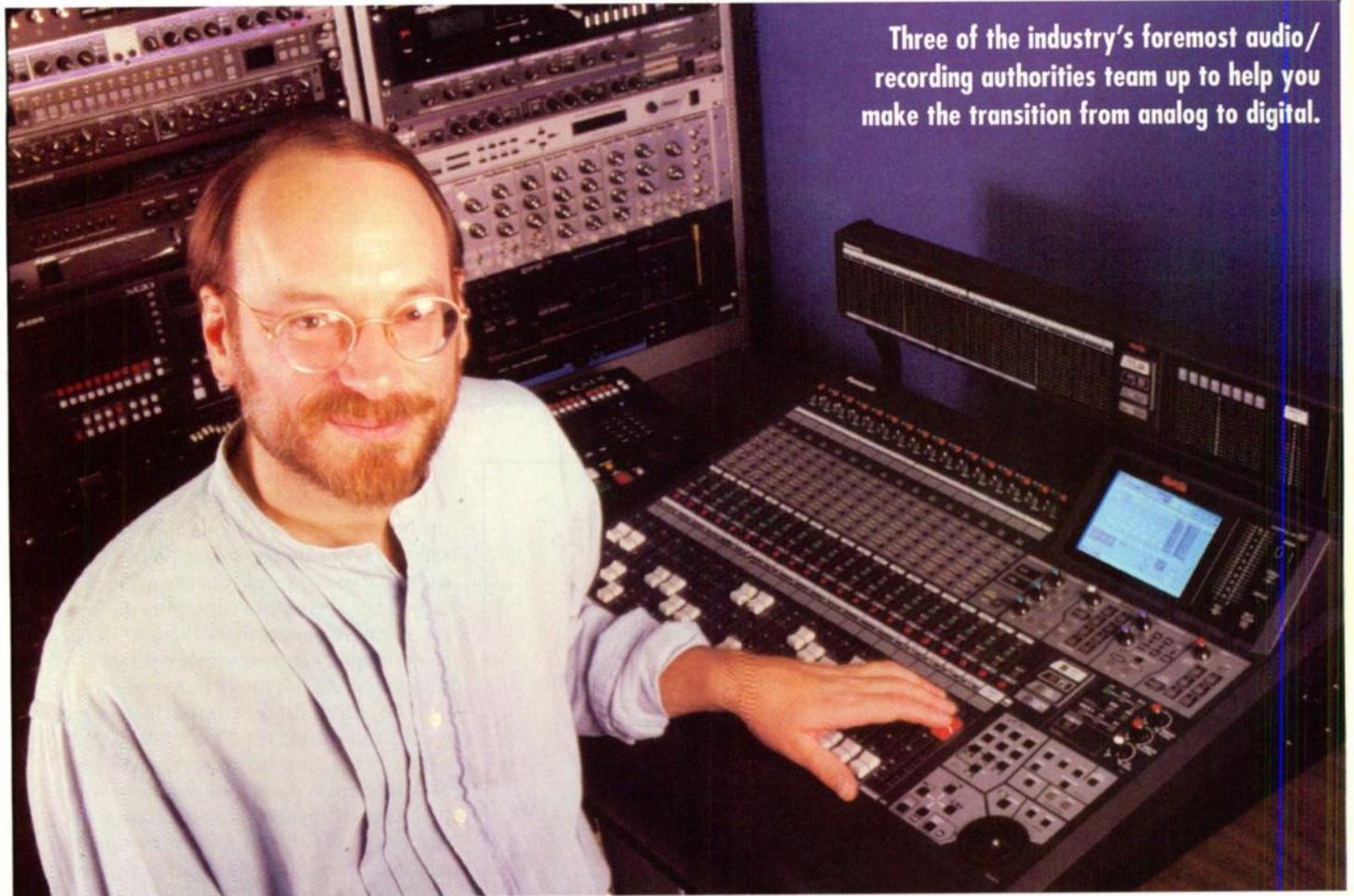
**STRENGTHS:** Smooth, singing sound; excellent, pleasing tube crunch, even at low volume; mono input splits into stereo operation, including effects loop, recording outs, speaker outs, and slave outs; gentle but effective tone controls.

**WEAKNESSES:** Only one basic sound quality; not exactly cheap; effects loop not switchable between low- and line-level operation.

**PRICE:** \$1099

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## SB210 CABINET

The SB210 (\$499), made by Mojo Music Supply (a source of vintage tubes and supplier of components to other manufacturers), is a compact, closed-back cabinet with two 10-inch Mojotone speakers (8-ohm, ceramic magnets, 35 W peak). Voiced specifically for the 284, most of the cab is 3/4-inch, 4-ply fir; the front baffle (which is angled slightly to provide a bit more stereo separation and projection) is 1/2-inch pine, and, for density, the rear panel is [made from] particleboard. Connections for each speaker are brought out separately.

specific frequency-related problems.

The volume controls determine the level going to the power amps, and their setting influences the overall sound. In other words, if you've dialed in a certain sound with the level set to 8 and want a lower level, pulling them back will change not just the level, but the tone. However, when going direct, this isn't an issue as you can trim back at the mixer. With speakers, the volume remains reasonable even with the level controls all the way up, so I didn't find the lack of a "real" master volume control problematic.

One of the 284's beautiful surprises is that when you play with the gain control, the sound never gets "ragged" as the amount of distortion changes. When a note decays, there's no obvious crossover point where the signal goes from dirty to clean; the timbre follows a very linear curve from the lowest playing dynamics to the highest. That's a very tough — and extremely desirable — trick to pull off, but the 284 succeeds.

An immediate comparison that comes to mind is the Line 6 AxSys 212, which for the same list price emulates several different types of amps, comes with two 12-inch speakers and a cabinet, includes a ton of effects, and can be updated via software. But, really, this is an apples and oranges situation. Amps like the 212 are fabulous for throwing into the back of your car and taking to a gig, and while the 212 is no slouch when it comes to recording, the 284 has that indefinable tube quality that even some tube amps don't really exhibit. The 284 is also very clean and generates big sounds at fairly low SPLs.

I think the target 284 buyer has a somewhat upscale studio, an ear for quality sound, and the need to get a family of guitar tones that are accurate yet warm. Maybe the best analogy for the 284 is that of a crusty old blues player dressed in a dapper, perfectly pressed suit: maybe he plays in only one basic style, but the presentation is excellent, and there's some real soul inside as well. **EQ**



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# Digidesign *Pro Tools/24 MIX*



An exclusive look at  
this major upgrade to  
Pro Tools/24

**BY ROGER NICHOLS**

What is the hot news from Digidesign? The new DSP-booster Pro Tools/24 MIX and Pro Tools/24 MIXplus 24-bit hardware systems, that's what's hot. How much improvement can they come up with, you ask? Well, plenty, I answer.

The heart of the new Pro Tools/24 MIX system is one new card that contains enough DSP power to allow 64 tracks with 16 channels of I/O. I said one card. On that single card are six of the new 56301 Motorola DSP chips. With the new DSPs and DSP-sharing software, you can get up to four times more plug-ins per DSP. If this card came with a little red cape, it would be leaping tall buildings in a single bound. (Honk, if you get it.) If you need more DSP power or more I/O, just add one more card, and along with those 64 tracks you have more than double the

Some of my sessions have 105 tracks of stuff, but I only listen to 25 to 30 of them.

What first comes to mind is that you no longer need a six-slot Mac or expansion chassis if you want to do some serious Pro Tools work. (Especially since Apple no longer makes a six-slot box, and the price of what's left of the used 9600 Macs is starting to escalate.) What second comes to mind is that these new cards and the price-reduced Pro Tools/24 system will now work with Windows NT. Yup, you can now have Pro Tools 64-track systems on a PC. The audio files and session documents can be created on either platform and then completely accessed on the other. Can I say "Cool" now?

DSP capacity of the one-card system and up to 32 channels of I/O. Plus, let me add that 64 tracks means 64 voices playing at one time. You can have 120 audio tracks containing on-screen audio in a session, and up to 86 instruments that don't happen at the same time can share a voice. Each can have its own plug-ins and be routed to its own output, but they just can't play at the same time if they share one voice. I use the extra tracks to store extra vocal tracks, or tracks that I have comp'd pieces from and may want to go back later and get something else.

I have a Pro Tools 24-bit system based on two d24 cards (to give me 64 tracks) and two DSP farms. I wanted to stay away from an expansion chassis just so I could be more portable, at the expense of DSP power. I pulled out my four cards and installed the MIXplus pair of cards in my Mac 9600/350. I powered up, started Pro Tools, and went to work. Pro Tools booted up faster, every operation went smoother, and DSP plug-ins loaded instantly. From Pro Tools launch to audio playback was faster than opening a

## EQ LAB REPORT

**MANUFACTURER:** Digidesign, 3401-A Hillview Avenue, Palo Alto, CA 94304. Tel: 650-842-7900. Web: [www.digidesign.com](http://www.digidesign.com).

**APPLICATION:** Multitrack digital editing and mixing on Mac or Windows NT platform.

**SUMMARY:** Opposite of Wintry. A must-have upgrade for the power user.

**STRENGTHS:** Faster and more DSP power than any previous system; 24-bit recording and editing; 64 tracks.

**WEAKNESSES:** Requires upgrades of plug-ins to work with new MIX Farm DSPs.

**PRICE:** Pro Tools/24 MIX, \$7995; Pro Tools/24 MIXplus, \$9995; additional MIX Farm, \$3995; MIX I/O (adds 16 channels of I/O connectivity), \$795; Pro Tools/24 (price reduced), \$5995

EQ FREE LIT. #: 135

document in Microsoft Word. (Well, I did have a little bit of extra time to wash my car while Word was loading.) With 12 DSP chips at my disposal, I was able to have EQ on every track, headphone submixes, and reverb up to my neck. With a quick check of the Allocator program, I found that the DSP usage was just at high-speed cruise, with plenty left over for a de-esser or a couple of limiters.

There are some enhancements in Pro Tools 4.3 software also. First, of course, is the support for the new hardware. New DigiRack EQ and Dynamic plug-ins are included with 4.3. The EQ II features improved high-shelf and low-shelf filters and soft clipping for extreme gain situations. The Dynamics II plug-ins include separate Limiter, Compressor, Expander, and Gate modules. Each plug-in contains response curve graphics display and sidechain/key inputs for external control of plug-in parameters. The DigiRack plug-ins are totally new algorithms that stand up sonically to the Drawmer and Focusrite, and they are free.

Version 4.3 supports AIFC (AIFF Compressed) file formats for compatibility with Avid Media Composer. Automatic muting

of DAC outputs on the 888/24 I/O to keep idle noise down when tons of tracks are being fed to an analog console is now supported. In conjunction with the USD interface, GPI outputs can be fired based on Pro Tools fader position. The USD can now plug into the Digi serial port on the d24 card or PTI24 MIX card, which frees up both Mac serial ports for MIDI or printers. Track arming directly from Pro Tools is supported with Digidesign's Machine Control option.

There is one more software addition that I saved for last: Smart Tool. No, it has nothing to do with the Presidency. The Smart Tool has been added to the Edit window. It combines the functions of the Selector, Grabber, and Trimmer tool depending on where you move the cursor in the edit window. No more mousing back and forth to change tools during intense editing sessions. The Smart Tool also allows you to create fades and crossfades with one mouse click. Can I say "Cool" again?

This may be the first time that you can upgrade your system a little at a time. The new 24 MIX and 24 MIXplus systems are backward compatible with the d24 system that came out a year ago. You can mix and

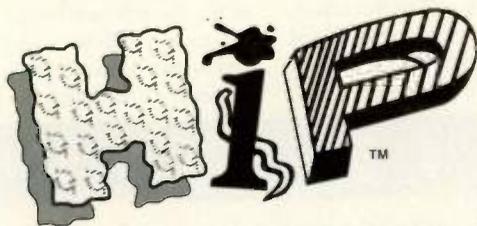
match d24 cards, DSP Farms, and new MIX Farms any way you want. If you have a system with one d24 card and one DSP Farm, then the addition of one MIX Farm card will give you 32 more tracks, 16 more I/O, and 6 of the new fast, shareable DSP chips. If you get the new 24 MIXplus systems (2 cards, 12 DSPs), you can still use your old DSP Farms for additional DSP power.

Is there a downside? Well, the only thing that you have to watch out for is plug-in compatibility. As you read this, all of the plug-in manufacturers are upgrading their plug-ins to utilize the new DSP sharing capabilities of the MIX Farm. Until all of the upgrades are available, I would hang on to an old DSP Farm so that the old Plug-ins will work. [The need to keep an old Farm in your system, therefore, depends on your use of some of the not-yet-upgraded Development Partners plug-ins.] The DSP Manager will automatically put old plug-ins out to pasture in the old Farms. All of the Digidesign DigiRack plug-ins have been upgraded [as have all non-core plug-ins; that is, those not included in the basic core system, including D-Verb, DINR, DPP-1, D-Fi, Maxim, D-Fx, etc.],

*continued on page 145*

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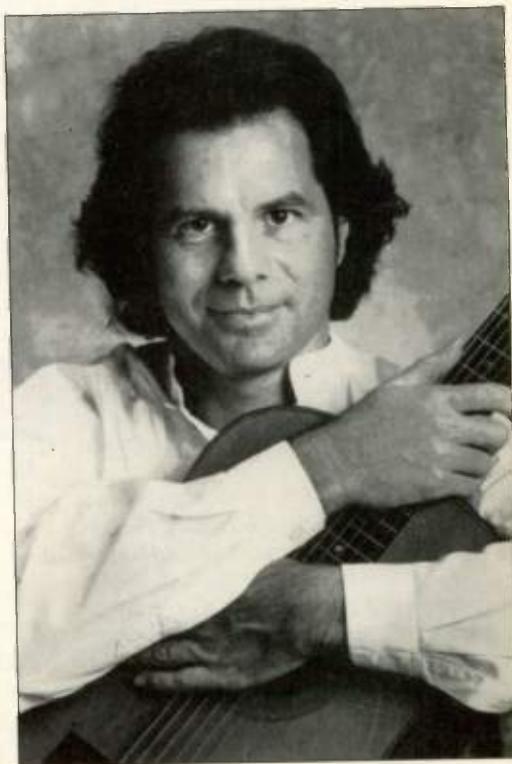


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# Virtual *DSP* Midiaxe



Will the Midiaxe be the MIDI guitar solution we've been waiting for?

BY CRAIG ANDERTON

We've all been waiting for the "magic bullet" of MIDI guitar — the one that would finally translate all the nuances of our playing, glitchlessly and with zero delay, into a stream of accurate MIDI data. Despite cumulative improvements over the last two decades of guitar synthesis, we're not there yet — and, frankly, thanks to those pesky laws of physics, we may never get there.

Manufacturers keep trying, though, and the latest is the Midiaxe from Virtual DSP. Unlike the Yamaha G50 converter (reviewed in the March '97 issue) for hex-pickup equipped guitars, or the Roland GR-30, which bundles a converter with a sound generator, the Midiaxe is a guitar controller system with MIDI, magnetic pickup, and piezo outputs. It includes no on-board sounds, and is designed to play through MIDI-compatible external sound generators or computer sound cards.

There are two models available, Standard and Elite. Electronics are the same for both: Seymour Duncan Humbucker JB bridge pickup, Classic Stack mid pickup, and choice of neck pickups (Hot Stack H-S-S type or Alnico Pro II H-S-H type). The RMC piezo bridge pickups feed an on-board preamp.

A custom cable that carries MIDI, audio, and phantom power plugs into the guitar's audio out jack and MIDI out, then runs back to a "wall wart"-powered breakout box that offers the three sepa-

rate outputs mentioned above. An additional MIDI in jack on the guitar is used for changing default settings of the MIDI converter, MIDI merge functions, and software updates, which are available for free from the Midiaxe Web site. Note that plugging a standard, mono guitar cord into the audio out (which is a stereo jack with piezo on the ring and magnetic on the tip connection) gives you the magnetic pickup output — no power required.

Guitar controls include volume and tone for the magnetic pickups, concentric volume controls for synth and piezo volume, and a five-way pickup selector switch. Two additional mini-toggles handle MIDI-related functions. One three-way octave switch transposes pitch up or down one octave in addition to normal, while another three-way switch selects three MIDI modes: poly mode with pitch bend off, poly mode with pitch bend on (pitch bend messages are sent as long as only one note is sounding; playing a second note cancels the bend), and pitch bend on/mono mode, where each string's data appears over its own MIDI channel. Unfortunately, there are no on-board controls for modulation, such as a pressure pad or "pinky-accessible"

knob to send out controller 1 or 4 messages. However, the MIDI in can act as a merger connection for messages from something like a breath controller or footpedal.

Both models allow three choices of neck/fingerboard (maple/maple, maple/rosewood, or maple/ebony), with 22 frets and a 25.5-inch scale length. The Strat-style body types are somewhat different; the Standard is swamp ash only, whereas the Elite can be either figured maple/swamp ash or figured maple/mahogany.

The Elite offers seven translucent or four two-color burst finishes, whereas the Standard has six finishes (translucent or solid). Other differences include gold instead of chrome hardware for the Elite.

Overall, the guitar plays and looks great; this is certainly not a case where the electronics are grafted on to a cheap guitar, and is one reason for the system's relatively high price.

The Midiaxe excels with pitch bend disabled. The feel is tight, fast, and responsive, with minimal false triggering. It definitely prefers flat picks instead of thumb picks, although playing with fingers was reasonably good; while you do have to play somewhat carefully (as with all MIDI guitars), the Midiaxe is relatively forgiving of the way you play.

Pitch bending is another matter. While the Midiaxe tracks whammy bar variations perfectly, with plucked strings you need to bend carefully to avoid "hiccuping." These aren't the nasty, octave-

## EQ LAB REPORT

**MANUFACTURER:** Virtual DSP Corporation, 4119 125th St. SE, Everett, WA 98208. Tel: 425-379-8888. Web: [www.midiaxe.com](http://www.midiaxe.com).

**APPLICATION:** Converts the Midiaxe guitar output into three outputs: standard magnetic pickups, piezo pickups, and MIDI data stream.

**SUMMARY:** It's pricey, but does give an extra level of performance — as long as you're careful when pitch-bending.

**STRENGTHS:** Very fast response with pitch-bend disabled — tracks whammy bar motion extremely well; easy to use; configuration utilities; quality guitar and electronics.

**WEAKNESSES:** Inconsistent pitch-bend response requires careful playing technique; no MIDI controllers are accessible from guitar other than controller 7 (volume); nonstandard cable.

**PRICE:** Standard model, \$3595; Elite model, \$3995.

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FIGURE 1

jumping glitches normally associated with misbehaving MIDI guitars, but rather slight tuning shifts and lack of smoothness during the bend itself. Decent bending also requires care in tuning, which must be dead-on for the guitar to deal properly with pitch variations.

As with all other MIDI guitars, performance depends a lot on the synth being used. Those old standbys, the Yamaha TX81Z and TX802, were the best all-around performers. Curiously, the Ensoniq TS series, which was designed with MIDI guitar modes, worked better in straight poly or omni. For most synths, omni was the best choice with Midaixe bending turned off; mono was best for bending, although poly is acceptable if your bending is confined to single-note leads.

Midaixe supplies a Windows utility (fig. 1) that allows adjusting string sensitivity, channel assignments for the various MIDI modes, velocity curve selection (three options), computer MIDI I/O selection, and updating the guitar's on-board software (MacOS fans can send sys-ex strings from their MIDI program of choice). There's also a tuner.

The Midaixe is extremely well suited for some types of playing, such as flat-picked jazz. For rockers who like to bend and torment their guitars, matters aren't quite as rosy. You'll be most satisfied if you think of the Midaixe as a keyboard substitute rather than an electronic guitar.

In a way, the Midaixe reminds me of today's ultra-fast microprocessors: a 450 MHz Pentium II costs several hundred dollars more than a 400-MHz type, but typically delivers only about a 10 percent performance increase. I'm sure some musicians will gladly pay top dollar for the extra boost the Midaixe offers, just as some animation programmers will pay anything that will render their pictures a little faster. The Midaixe doesn't solve all the limitations inherent in MIDI guitar, but as is typical in the history of the genre, provides yet another incremental improvement, and raises the bar another notch.

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# TC | Native Essentials DirectX Signal Processing Pack



Get that "TC Sound"  
on your PC

BY DAVID MILES HUBER

Many of us have over the years lusted over TC Electronic's fantastic sounding effects gear. Well, now even those of us who have a PC-based studio can have that "TC Sound" in the form of the TC|Native Essentials Signal Processing Pack. (TC|Works is a German-based subsidiary of TC Electronic.)

This breakthrough comes in the form of a suite of signal processors for the PC-compatible, which includes not one, not two, but three high-quality plug-ins designed to run offline or in real-time (depending upon your processor's speed and type of audio editing software) in the Windows DirectX environment.

The Native Essentials pack is made up of separate plug-ins designed to perform equalization, reverb, and dynam-

ics processing functions. These plug-ins, which go by the respective abbreviations of "Q," "R," and "X," all share a common general layout: the in/out metering and level controls are located to the left, general parameter controls are located in the middle, and overall parameter data adjustments are placed at the right of the plug-ins window (with the exception of X).

At the top of each window is a pull-down menu that lets you choose from up to

18+ standard preset settings that can be called up at any time, altered, and saved under a new preset name. Basically, all that's left is the Preview button, which auditions the soundfile or track selec-

tion until you've gotten the sound that you've been looking for, as well as a Help button, which gives a graphic overview of the various plug-in parameters and functions. Beyond that, Q, R, and X are so easy to use that all you do is experiment 'til you've gotten the sound you want and then get on with the job of processing.

All three Native Essentials plug-ins include a very special "SoftSat" algorithm that prevents the plug-ins from being excessively driven to the point of hard clipping (and thereby creating digital distortion). Instead, the plug-ins are designed to emulate the warmth and even-order harmonic distortion characteristics often associated with analog tube equipment. SoftSat is always active in Q and can be turned on or off in X, or disabled by double-clicking the "Q" icon at the bottom left and selecting "Parametric without SoftSat." (There are other preset band settings there, as well.)

## "Q"

Q (equalization) features three bands of TC-quality parametric EQ that can each be fully configured to offer notch, parametric, and shelving curves over the entire bandwidth. A virtual joystick lets you

## EQ LAB REPORT

**MANUFACTURER:** TC|Works, TC Electronic, 790-H Hampshire Road, Westlake Village, CA 91361. Tel: 805-373-1828. Web & demo: [www.tcworks.de](http://www.tcworks.de).

**APPLICATION:** A single suite of signal processing plug-ins for the Windows PC-compatible that covers most processing functions needed for tracking and mixing-down a project.

**SUMMARY:** Three high-quality DirectX plug-in DSP tools that cover all your basic needs for equalization, dynamics processing, and reverb.

**STRENGTHS:** High-quality algorithms that give you straightforward control over the parameters in an easy-to-use graphic environment; takes up less processing overhead than many DirectX plug-ins.

**WEAKNESSES:** I was going to say "none," but upon recently opening the EQ filter, the pack asked me to insert the original CD for authorization (which I had left at the studio). I know that copy protection is a big issue, but crap like this is a big *no-no* in my book. Bad dog!

**SYSTEM REQUIREMENTS:** Pentium 133 (200 or faster for use with Cubase VST or other multitrack software that supports real-time DirectX processing); 32 MB of RAM (64 recommended); Windows 9x/NT; 4.x, DirectX-compatible editing software

**PRICE:** \$249

**EQ FREE LIT. #:** 137

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Bandwidth settings depend on the type of EQ being used. Band 2's bandwidth range is configurable from 0.1 to 4 dB/octave (making it great for creating sharp notch filters). Bands 1 and 3, by default, are low-pass (band 1) and high-pass (band 3). The low-pass/high-pass filters are scaled from 3 dB to 12 dB per octave in 3-dB increments. If, however, a different filter is selected, say a parametric or notch filter, rather than the default low- or high-pass filters, then bands 1 and 3 are equally as flexible as band 2. Bandwidth settings can be selected by clicking on the BW window, which calls up a fader-like slider control.

"R"

R (reverb) supplies you with all the basic types of reverb — from small room and spring emulation all the way to a large cathedral. Making changes to this plug-in is a breeze. All you need to do is play around with the room type, decay time, and mix ratio (dry-to-reverb mix) settings, using the mouse to move the Alpha dial parameters. That's all there is to it!

"X"

X (dynamics processing) is an easy-to-use, low-overhead compressor that can be used to process several tracks on a multichannel editor, even on slower computers. Using the straightforward interface, simply set the standard dynamics-related parameters, or call up a setting from the various presets, and you're in biz! In addition to the SoftSat feature, a SoftKnee feature can be inserted, allowing the compression to be applied over a wide threshold range, thereby reducing audible side-effect noises and gain pumping.

### MY 2 CENTS

From the moment I installed it, the TCNative Essentials processing pack became one of my favorites. I won't pull any punches, though, because I like the Waves Q10 series of equalizers and L1 dynamics plug-ins as well or better than their Native Essentials counterparts. The TCNative reverb, however, is simply superb! That alone is well worth the asking price.

In a nutshell, the whole pack is simple; sounds great-to-fantastic; won't break the budget; and is programmed well enough that it won't bog down your PC — even if you're using a slower CPU. The combined forces of the Waves Power Pack and TCNative Essentials pack would make a PC-based DSP "dream team" that's almost too good to pass up!



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# JOEMEEK SC3

## Optical Compressor With Digital Interface



Check out this compressor with a built-in, 24-bit DAC

BY EDDIE CILETTI

What exactly is a JOEMEEK compressor? Is it really made by little lime-green creatures living precariously on the international dateline? Perhaps!

What's inside is plain and simple. All JOEMEEK compressors are based on an optical gain reduction module sandwiched between a modern IC opamp interface. Optical gain manipulation is inherently smooth.

Classic limiters like the Teletronics LA2A and the UREI LA3 had a "sound," one being tubular, the other, transistorized. JOEMEEK products have more in common with a UREI LA4, the "sound" comes from the optics, with minimal contribution from the surrounding electronics. What makes the SC3 different from the rest of the JOEMEEK line is the addition of a 24-bit digital audio converter. With analog and digital I/O, the SC3 can be connected to whatever insert points are available or used as an A-to-D on the way to the digital world from a mic preamp. Either way, the underlying idea is that 24-bit resolution delivers confidence by way of resolution.

Missing from vintage optical dynamics processors was control of Attack and Release times. These parameters were once the sole domain of the opti-

cal device itself — a photo-resistor whose inherent time-domain characteristics required hand selection for consistency from product to product. That was in the mono daze — matching a pair for stereo operation is a real bear!

JOEMEEK has tamed the optical beast with versatile Attack, Release, and Transient controls that deliver a wide range of compression "effects," some of which you are not likely to hear on VCA-based dynamics products. While the Attack control is labeled from "Fast" to "Slow," Release legend starts at a medium-range 250 milliseconds and extends all the way to 2.5 seconds! I don't think any VCA box goes that far.

The SC3 has balanced XLR analog I/O, plus a TRS insert port to access the output of the D-to-A converter. Both the digital and the analog signals feed a "mixer" so that both can be used at the same time. (A switch interrupts the digital input, post conversion.) This is an unusual but potentially useful feature.

Digital I/O is via XLR and optical connectors, but notice I didn't specify the format. More words on that in a moment. Also on the back panel: a word clock output and a sample-rate switch: 44.1 kHz and 48 kHz.

### TEST #1

With a CD player as source via analog I/O, everything was cool. I dug the range of compression effects. Yes, I use the word "effect," because unlike an LA2, which is mostly subtle (and perfect for bass and vocals), the SC3's sound starts there and can be tweaked obvious in a way that is almost Beatlesque. A five-position Slope control goes from smooth to radical (1-5).

With a long reverb setting and just the right setting of the Attack and Transient controls you can almost "reverse" the envelope. The backward effect — in this case — is completely dependent on the program material. The mix that "did it" must have had the right

## EQ LAB REPORT

**MANUFACTURER:** JOEMEEK, distributed by PMI AUDIO, 23773 Madison Street, Torrance, CA 90505. Tel: 877-JOEMEEK (563-6335) or 310-373-9129. Web: [www.joemEEK.com](http://www.joemEEK.com).

**APPLICATION:** Stereo dynamics processing.

**SUMMARY:** Stereo analog/optical compressor with built-in, 24-bit digital audio converter.

**STRENGTHS:** Foolproof compressor has real knobs; digital and analog signals can be mixed; TRS Insert allows access to D-to-A converter.

**WEAKNESSES:** No hard-wire bypass; Digital Out is "stuck in consumer mode"; no digital input select switch.

**PRICE:** \$2199.99

**EQ FREE LIT. #:** 138

combo of RMS meat and transient tickle. By contrast, I couldn't make it happen on a Hole (the band) track.

## TEST #2

Same audio source as in Test 1, but now the SC3's XLR digital output is feeding a Sony PCM-7040 timecode DAT deck. No lock, not even when taking advantage of the SC3's word clock output. Same when connecting to a Panasonic SV-3700 DAT machine. What gives?

I then brought the SC3 into my control room, routing it — via a Z-Systems Detangler — to a Sony PCM-R500 DAT deck's S/PDIF input. Contact! Further investigation required the aid of Prism's Digital Signal Analyzer, the DSA-1. With it I was able to determine that the SC3's digital data stream is consumer-flavored. This is an imperfection that needs tweaking.

While I wouldn't mind all three digital outputs, it's odd that the choice was optical over coaxial. The data flags are set to consumer, so the optical port is completely functional, if less popular. That both XLR and optical ports are live is a good start, even though the current implementation is buggy. Whenever multiple digital output ports are provided, I do want to encourage all manufacturers to make all ports live at all times. There is also no digital input select.

Operation of the SC3 is a no-brainer, yet its cleverness of design might get under the skin of some folks needing specific functionality. On the plus side, the In/Out switch merely disables the feed to the detector circuit, making the transition smoothly silent. In fact, if the Release is set to 2.5 seconds, it takes that long for the unit to be "out."

With no hard-wire bypass, the Output Gain (recovery) is always in-circuit, making true comparison between In and Out impossible under certain conditions. In addition, there is an Input Gain and a Compression (threshold) control; the Threshold setting changes with input gain. This is redundant.

Ya gotta love a box with knobs. The JOEMEER SC3 has 'em, but I'd trade in the Compression control for two switches. Selection of digital input and digital output flavor must be front-panel, essential features. If this is a real-estate issue, I'd also trade the On LED for a Bypass switch. (The smooth In/Out switch can stay.) The lit VU meter clearly indicates that the unit is powered.

The SC3 combines a foolproof stereo compressor with a 24-bit digital converter. It's got a few bugs to exterminate, but the concept is cool and nearly in focus. **EC**

## JOEMEER SC2.2 STEREO COMPRESSOR

By Steve La Cerra

JOEMEER's SC2.2 is a stereo, analog, optical compressor based on the design of the company's successful SC2, but with a few operational and sonic differences. There's also a price difference between the two units: the SC2.2 retails for \$1499, and the SC2 for \$1999. Working on a new CD with Trailside Rangers (Jericho Hill Records) seemed like a perfect opportunity to take an SC2.2 for a test spin. In addition to the SC2.2, PMI (JOEMEER's U.S. distributor) was kind enough to send us an SC2 for a side-by-side evaluation.

Certain differences between these units are obvious: the 2.2 adds a front-panel power switch and moves the output gain knob around to the front panel. Housed in a somewhat smaller chassis, the SC2.2 also adds a fifth setting for "slope" versus the SC2's four. This extra setting was a definite plus because sometimes when using the SC2, we found the difference between the "1" and "2" settings too dramatic. While the SC2 has XLR and TRS I/Os, the SC2.2 has only XLRs. One welcome change is that the SC2.2's meter may be set to show either input level or amount of compression, so there's no question about how hard you're driving the input. Both the units essentially employ the same optical compression circuit as described by Mr. Ciletti in his review of the SC3.

Initially these two units sounded very similar. At one point I substituted another stereo comp' for the SC2 just to make sure that there wasn't something wrong with my hearing. Fortunately my hearing was fine: with similar control settings on stereo program, the SC2 and the SC2.2 do sound very much alike. Then we patched the comps on various instruments using a simple A/B setup: a tape track was patched into a mult, one out from the mult went into the SC2.2 and another out from the mult went into the SC2. Output

from the comps was brought to two spare channels on the console. At any moment the SC2 could be compared with the SC2.2 simply by muting or unmuting a channel (for stereo instruments, this arrangement was doubled).

Though similar, Attack and Release times for the SC2.2 are not identical to those of the SC2. Maximum release time on the 2.2 is longer than for the SC2, and the 2.2's release seems more linear. If you have (e.g.) 7 dB of compression happening on both units, when the source goes above threshold, the 2.2 will release more evenly over time.

The SC2 seems to "hold" gain down for a few milliseconds and then release, almost like a synth's sustain/release envelope. Generally, the SC2 generally had a slightly quicker "fast" Attack time than the 2.2 — except for slope 1 where Attack time was almost the same for both units. Because it can produce more "obvious" compression, the 2.2 can make instruments jump out of the mix more (particularly acoustic piano and drums). The SC2.2 could be made to pump and breathe, but we really couldn't get the SC2 to do so.

Overall, the SC2 produces more subtle compression, while the SC2.2 produced a wider range of effects. By winding up the SC2.2 for heavy compression, we were able to closely produce the piano sound you might hear on "Lady Madonna" or "Let It Be" from The Beatles. We were unable to make the SC2 produce this same effect.

There's no question that both the SC2.2 and SC2 are quality compressors. Operational differences aside, the units sound very similar. When you really hit the SC2.2 hard, the top end closes in a bit, whereas the SC2 maintains an open-ness in the high frequencies under the same conditions. We'd say that while the SC2 is more subtle, the SC2.2 is able to produce a wider range of greens!



# Internet Chivalry Isn't Dead

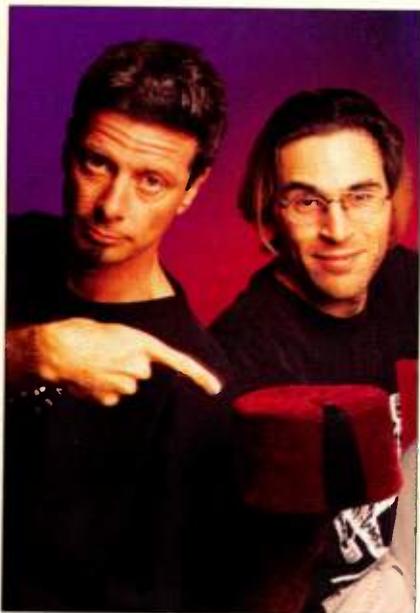


PHOTO BY STEVE JENNINGS

A look at some recent litigation and a few new Internet record companies

BY JON LUINI AND ALLEN WHITMAN

"Wintertime winds blow cold this season, falling in love I'm hopin' to be..."

—The Doors

Welcome to the last full winter in the Second Millennium! A magical dragon is slaving somewhere in the Enchanted Forest so us rowdy FezGuy/Minstrels will bounce from hamlet to town within the city-state of Internet Audio, examining legal tussles and Proclamations. Knights Errant (in the form of new online music companies), and those pesky weapons-makers, the technology companies and their rampant alliances. Maybe we can draw some Medieval conclusions. Maybe you can draw them for us by giving us a sound dunking. We need all the help we can get.

First off: what's up in the litigious record business? Unless you've been living under a rock, you've heard about the

excitable Recording Industry Association of America (RIAA, [www.riaa.com](http://www.riaa.com)) having a restraining order struck down by a Federal Court in Washington, DC, last October 26th against the sale and distribution of Diamond Multimedia's ([www.diamondmm.com](http://www.diamondmm.com)) RIO PMP300 audio device. RIAA will appeal of course. The PMP300 is a tiny, 2.4 oz. playback device capable of storing 60 minutes of MP3 encoded music files from your computer (via an included cable that plugs into the computer's parallel port) for playback anywhere. It retails for under \$200, uses one AA battery (not included) for 12 hours of playback, and fits in the palm of your hand. The PMP300 also comes with software that converts CD audio (or any AIFF or WAV file on your desktop) to MP3-encoded audio before transferring the files to memory on your handheld RIO. The RIAA claims the item is a "digital audio recording device" and will increase music piracy. Diamond Multimedia offers the RIO as merely a "player," and therefore not subject to royalty payment requirements dictated by the Audio Home Recording Act (AHRA, see: [www.riaa.com/aarc/aarcsum.htm](http://www.riaa.com/aarc/aarcsum.htm) for a brief overview).

Naturally, we empathize with the financial terror the big labels are feeling, but it's helpful to remember some recent history. Big labels cried that cassettes would be the death of the music industry. Big movie studios howled that video would be the end of the cinema. Even the most cursory glance at those two industries shows that the exact opposite happened. Revenues increased and both hegemonies are experiencing their fattest dollar ever. RIAA has said they want to work with companies like Diamond Multimedia to use technology and still protect rights-holders. Perhaps they should approach the situation in an open manner before resorting to strong-arm tactics.

The bottom line of this tempest in a teapot: if you own the rights to your recordings you can do anything you want with them. If you've got an agent like ASCAP, BMI, Sesac, etc. representing your rights, let them know how you feel about these issues — they work for you! Always keep your publishing. Think of it as a mantra. You can order the RIO online.

In other legal news: On October 28, 1998, our friendly President Clinton

signed the Digital Millennium Copyright Act (DMCA) into law. This new and wordy amendment to the Constitution of the United States focuses on Internet broadcasters (or Webcasters). The law is the quick and dirty outcome of heavy negotiations between the broadcast industry and the music business. The DMCA (a clear explanation is available at: [www.dig-media.org/DMCAexp.htm](http://www.dig-media.org/DMCAexp.htm)) allows for guidelines and restrictions on the number of servers and streams allowed, the frequency and length of specific Webcasts, nonposting of setlists, and the responsibility of the Webcaster to make sure software designed to prevent copying data streams is not tampered with at the source. The DMCA also has a little provision requesting Webcasters to *not* suggest copying and redistributing content. It's the little things. There is much more on the above-mentioned Web site. Check it out. It's concisely explained and relevant. The fees and methods by which revenue will be collected and distributed is in negotiation for another six months, and you can bet they'll use all of it. The terms of this contract between the music business and the broadcast industry will be renegotiated every two years.

Meanwhile, in the realm of marketing and sales, music business people are experimenting with any number of wacky, Rube Goldberg ideas to make money out of your music on the Web. Here's a couple of things we've recently come across...

We got some spam the other day from mp3.com ([www.mp3.com](http://www.mp3.com)) offering to join their artist area and the Digital Automatic Music (D.A.M.) program. In this program, mp3.com would produce and sell CDs for a 50-percent cut of the profit. We thought we might consider the idea under its fair cloak and see what they're really offering. First of all, we were spammed, which is not the best beginning.

The mp3.com site is huge, though. It's got everything; from Dionne Warwick to ultra heavy audio experimental noise corruption. The site gets a lot of attention. It's widely reported that the second most-entered word in search engines (after "sex") is "MP3."

The offer states it is free to join ("no sign-up fees, no monthly premiums, no costs!"), provides free promotion to "over

3 million music lovers per month" (that must be their "hit" statistic), a nonexclusive contract that you can terminate any time (a very good thing), unlimited song posting (individual song files have a 5 MB limit), and free links to your site and retailers. mp3.com mentions "material may not be defamatory, trade libelous, pornographic, or obscene."

They seem to be representing themselves as a new-model online music company. While they will host your music and information, mp3.com's real hope is that people will use the United States Postal Service to order your CD through them, of which they will retain 50 percent of the net gain. They do allow you to choose the retail price (within the \$5 to \$10 range).

So, what's the downside? Well, to "defray their costs," mp3.com reserves the right to press (and sell) compilation CDs that may include your music and not pay you for the privilege. But consider the benefits of such high Web-visibility. We FezGuys feel the equation comes up in the black.

So what is it, really? It's a mail-order record store, which has been attempted before, but with a difference. Most of the music on this site is not available anywhere else, and there's a lot of it. Downloads are not encrypted or watermarked and they're free. There's a lot of participation and, while that's not a reasonable argument for you to join, we think the site is worth the time and effort. Certainly the contract terms are way better for the artist than a standard record company would ever offer.

And another site: The Orchard ([www.theorchard.com](http://www.theorchard.com)) spammed us with a personal touch. They told us that they got our e-mail address after viewing one of our band's Web sites. Sort of like an A&R guy giving you a call after a show. Similar to mp3.com, The Orchard (adline: "A Place To Grow") offers to manufacture and sell your CD through mail-order and keep 50 percent of the 'Net. But, unlike mp3.com, they charge money up front to host your music, artwork, photos, bios, and itinerary. It adds up quickly. We think \$7 is too much to ask to add every live show entry. This tells us the site is probably not automated. We also think a \$30 fee for placing an individual song file on the site and a \$10 fee for each link is silly. Perhaps if they used automating technology, they could drop the recurring fees.

The Orchard reassures us they will "make albums available in major online record stores," "make albums available to traditional record stores through the largest one-stop distributor in the world," and that "we never make judgments" and "give our artists the opportunity to develop and grow." The first two statements are not clear about what "available" means and the last two are fatuous, at best.

In the introductory spam, the company founder informed us he wrote some big hits from the '60s. Unfortunately, that doesn't qualify them in the new Internet music model. They seem to be missing the inherent benefits of the Internet, like grass-roots marketing and the use of new technologies. The folks seem like nice people, but the service is not worth the

money. mp3.com is a better deal.

On to the horrors of marketing technology! Internet audio technology companies know there is strength and longevity in numbers. RealNetworks continues its astonishing series of corporate sleepovers — the tart. The RealNetworks RealPlayer 5.0 (G2 coming "soon") will now be bundled with AOL v4.0 (currently Windows only, but Mac is coming) shipping now. That's good for both parties and their users. Tons more people can listen to their (and your) content. In a gutsy vote of confidence, the Microsoft-partnered RealNetworks has also joined with Netscape. Now you don't have to download RealNetworks products at the source. It's automatically included when you download the Netscape browser.

As if that weren't enough, Intel's Streaming Web Video Technology is now integrated into RealSystems G2 suite of tools. Intel gets to increase the saturation of their new video streaming technology. Intel says their video encoding is 4X faster than the RealNetworks 5.0 video tools, and offers "improved decoding performance." That should translate into a clearer, less jerky, and perhaps faster image for those viewing individual streams using a phone modem.

Think of marketing press releases as a Mad Lib. Just insert your product name between the hyperbolic adjectives and off you go! Just once we'd love to see a company explain their product or technology in plain English. We'd fall on our knees and kiss their feet.

*We send greetings to all! Visit us at: [www.fezguys.com](http://www.fezguys.com).*

## LIQUID AUDIO 4.0 DEBUTS

The Liquid Music Player 4.0 (download for Mac or Windows, [www.liquidaudio.com](http://www.liquidaudio.com)) is out and it's free. Along with the Dolby AC-3 audio codec, Liquid now supports an early version of the new AAC codec ([www.iis.fhg.de/amm/techinf/aac/](http://www.iis.fhg.de/amm/techinf/aac/)). AAC technology was developed in partnership by Dolby, Sony, AT&T, and Fraunhofer-Gesellschaft (the same people who released MP3 on an unsuspecting world). We'll cover AAC in more depth as soon as we distill the dense language of audio physics and compression algorithms. The new Liquid Music Player 4.0 allows you to compile tracklists from a site and download all of them at once (a time-saver). The Player also allows you to create a playlist to purchase or stream audio (similar to [www.ifez.com/audio/TheFez/](http://www.ifez.com/audio/TheFez/)). You can customize the faceplate of any track and the Player software supports "more" CD writables (burners and their soft-

ware) if you are planning on purchasing tracks and burning your own CDs.

Liquid Audio is all about providing copyright protection for the online distribution of music files. That means they're interested in playing the Major Label Distribution Game with all of the attendant negotiations and alliances. That tends to leave the independent musician out of the picture. But Liquid never wanted to be a love-slave for promoting your name and music on the Web. They're hoping to be the online music distribution system when it finally achieves consumer and industry acceptance. We're not sure if they're going to survive the big Internet audio distribution war, but even potential failure provides useful information. The lessons learned watching Liquid's arc through the Internet audio heavens will be put to good use by the next generation of audio content delivery systems.

# The X-Mas Files

Thoughts produced by  
my end-of-year clean-  
ing/reorganizing

BY EDDIE CILETTI



It's the end of the year and I'm in "data mastering" mode, trying to organize four years worth of maintenance columns and pictures. The process of housekeeping has unearthed a few loose ends that either haven't made it to print (yet) or are worth repeating. If you have any idea seeds that need cultivating, send them to [edaudio@interport.net](mailto:edaudio@interport.net).

Here are The X-Mas Files...

## FILE FORMAT

After nearly four years of writing for *EQ* [Jeez, Eddie, it seems like sooo much longer! —HGL], I have files all over the place. Call it "accidental redundancy!" Sure, I've been backing up to DAT, but tape is linear, not random access. A CD-ROM would make the material more accessible, so I've been experimenting with Adaptec's Easy CD Creator.

I like having the files in the standard CD-ROM format. Backed up files can only be read by the program that made them. Worse yet, sometimes the data drive has some idiosyncrasy — intentional or otherwise — that can make tapes unplayable on another drive.

Whatever media you rely on, have a backup plan for your backup system. Find a friend with a similar system and confirm that the files can be read. Always "verify" after backing up. It takes longer, but it's worth it.

## CLONING

You know I repair tape machines, right? Well here's a tip that will help you avoid a techno-wedgie. This tip applies to any or all of the following:

- studios using rental machines
- tapes made on rental machines
- any out-of-house tapes
- tapes started on a machine that required major service in the middle of a project
- any tape that is part of a long-term project, requiring lots of overdubs
- a tape that has such a high error rate as to have noticeable glitches and/or drop-outs

If any of these items apply to you, then I highly suggest making a clone. If a tape is problematic, do not overdub until it is cloned. Find a machine on which the tape plays best and clone it. Always check the error rate on two machines for a second opinion.

## THE SKINNY

Do you know how long a 120-minute audio DAT tape is? No, this is not a trick question. It's 60 meters. By contrast, data DATs are specified by length — not time — so a 90-meter DAT lasts three hours while a 120-meter DAT can hold four hours of audio information. The data tape shell has an extra "dimple," which some machines use to detect the "thin" factor, making the deck inoperative rather than potentially hungry.

## THE ONE AND ONLY (DICK) CAVEAT

I mention the use of data DATs because I am not afraid of them. They are great for backing up a workstation or other hard-disk-based audio system. The extra time is also perfect for long-format recording projects. Feel free to use the longer tapes — just press Record and go — but be sure to make a copy ASAP to a shorter, more robust tape.

You should always make a safety, in this case, because data tape is thinner, and therefore more vulnerable — especially in machines whose transports are

sloppy. Do not use Shuttle and Search modes unless you are absolutely confident of the transport in your DAT machine. (Have a technician confirm its performance.)

## HEY YOU! SEE?

There is a new organization called the Audio Underground Coalition (AUC). It was formed to help smaller companies have a bigger impact at tradeshowes as well as in print via advertising.

I have submitted a questionnaire to the current membership and hope to have responses posted on my Web site ([www.tangible-technology.com](http://www.tangible-technology.com)) by the time this *EQ* issue hits the streets.

## NEW 4 REVIEW

I have two TC products in for review. The Gold Channel is a stereo mic pre-amp with 24-bit converters and dynamics processing. This is a great concept for folks who want to get a great signal to digital tape with a minimal number of obstacles. Considering the popularity of the Finalizer, the Gold Channel could be another winner.

TC's DBMAX is a 5-band digital stereo dynamics processor specifically geared for broadcast applications. I have always wished that TC had located its Finalizer's de-esser later in the chain — after EQ and compression. DBMAX has the potential to be "Finalizer Gold" in that it should provide the extra power I've needed.

Studer has sent me the V-Eight high-performance ADAT-compatible recorder. I have been waiting to peek under this hood for a long time. Inside is a Panasonic, medical-grade transport with separate reel motors for smooth, safe, and fast tape handling. Everyone has been asking me for the skinny on TASCAM's DA-45 24-bit DAT recorder, but I haven't been inside to know what makes it move. I'm waiting for the review unit and the service manual, both of which are on their way.

## GEMINI: THE TWINS

Well, it's official. I am relocating my life and my business to St. Paul, Minnesota effective Spring '99. The transition from the Twin Towers to the Twin Cities may seem a bit bizarre. The decision was based on my biological clock, which has

been ticking out the message, "Stop Renting," for some time. The biz phone will ring through "on my dime," and I will absorb the shipping costs for loyal customers.

#### SHIP THIS

Most New Yorkers don't have room to store the original shipping containers. Even if you have this luxury, I highly recommend "double-boxing" for anyone who must ship for service. Here are a few other shipping tips:

1. Remove the rack ears (if applicable) to minimize potential ear damage and to maximize the efficacy of the packing material.
  2. Do not ship power, or any other, cables unless they are suspect. (Wall warts are the possible exception.)
  3. Do tape to the lid of the unit a list of problems, your name, and phone number. Don't assume the service technician will remember the details of a phone conversation.
  4. Do not rely on the factory-provided packing material (this is especially true for the DA-88).
  5. Cover tape machines in plastic to minimize potential ingestion of packing material. (Include a tape if it demonstrates the problem.)
  6. Make sure there is no "slop" between the device and the box. Shifting during shipping can destroy some packing material. (Alesis and Soundscape use the best packing foam.)
  7. Insure for the list price.
- Have a prosperous New Year. I know I'll be partying like it's 1999! **EQ**

## ASK DR. DATA

*continued from page 96*

5. Within that directory, double-click on the folder SOFTWARE.
6. Similarly, double-click on Microsoft.
7. Keep moving down the "tree" by double clicking on Windows, then Current Version, then FS Templates, then Server. You will see a screen something like fig. 1.

NameCache should read a9 0a 00 00, and PathCache should read 40 00 00 00. If these values are reversed:

1. Double-click on NameCache.
2. Under *Value data*, enter a9 0a 00 00.
3. Double-click on PathCache.
4. Enter 40 00 00 00.
4. Click on OK, close the editor, and the bug is fixed. **EQ**

## MICROBOARDS

*continued from page 104*

changing collection of files (e.g., an articles archive), as you can add to the CD whenever there's something new to back up.

By the way, the Read Me files for these programs are very important, as they document performance quirks associated with various drives (e.g., some can't mount audio CDs if they start with a pause that contains data, some don't allow test modes, etc.)

#### THE BIG SPIN

I really tried to get the bundle to act up so the review wouldn't be so relentlessly rosy, but for whatever reason, Jam Session just kept spitting out flawless, consistent CDs—even at the highest (4X) write speed. The audio CDs played on anything—even my circa 1984 Sony Portable, which is getting pretty crotchety. It's great that the package includes three different backup options so you can deal with all kinds of data (not just audio), and the drive performed superbly.

Aside from some printed "quick start" materials, the manuals are all PDF-based. I appreciate not wasting paper, but miss the convenience of printed versions. However, these are easy programs to learn and use, so you probably won't spend too much time in manual-land anyway.

Need to make CDs and back up data on your Mac? Look no further: Jam Session does it all, and does it right. **EQ**

## DIGIDESIGN

*continued from page 133*

and Focusrite upgrades are included on the 4.3 CD-ROM.

I almost forgot. The PT124 MIX and MIXplus systems come with the TC|Works MegaReverb plug-in (they told me to say, "for a limited time"). [This Plug-in provides two reverbs from one chip.]

#### CONCLUSION

For those of you who are budget-minded and torn between buying either a new pair of high heels for your wife or a Pro Tools upgrade (this is a tough one), keep in mind that Digidesign is offering a great trade-up discount, even if you still have the old Pro Tools III NuBus system. When you go to your local friendly Pro Tools dealer, tell them Roger Nichols sent you. If they don't throw you out of the store, they may even give you a Gear Slut discount. **EQ**

# EQ

## COMING UP IN JANUARY

#### NAMM PREVIEW.

Wondering what to do with the money grandma gave you for the holidays? EQ presents a look at the products that are sure to be turning heads in Los Angeles this year.

#### KISS FROM BRUCE FAIRBAIRN.

You know him from his work with Van Halen, Aerosmith, Bon Jovi, and AC/DC, now he takes on the greatest band in the world (just ask them)...KISS. Go behind the board with Bruce, Paul, Gene, Peter, and Ace and find out the production secrets on KISS' latest release, *Psycho Circus*.

To be a part of this exciting issue, contact:  
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**Albert Margolis; Midwest Regional Sales Manager (949-582-5951);**  
**Dan Brown, West Coast Regional Sales Manager (650-345-7199)**

**Tel: 212-378-0400**  
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## HARD DISK

continued from page 92

the drive are arranged.

Let's say you want to work with an earlier track and a new track — with several other tracks stored on the drive somewhere between these two. One track is located at the outer sector of the drive, and the other is located at the inner sector. As you want to hear both of these in a multitrack environment, the drive needs to make the head movements very, very rapidly. This is what constitutes random access. The fact that the drive must be accessing these and other tracks from multiple locations causes the drive to make a "whirring" sound, sometimes fairly loud. This is where better access time comes into play. The drive's access (or seek) time becomes more and more critical as we want more audio tracks — and this translates to higher RPMs (revolutions per minute).

The Cheetah's 10,000 RPM rate, combined with an average seek time of 5.2 msec makes this drive the highest performance model currently available. By rotating at 10,000 RPM, its latency time (the time necessary to rotate a platter to the point where the head is positioned at the beginning of the data stream to be read) is reduced to 2.99 msec, which represents nearly a 40 percent improvement over the more common 7200 RPM drives. The drive ships in a standard 3.5-inch form factor, but it actually uses 3-inch disks and has an increased areal (pronounced "aerial") density (or the number of tracks that can be stored per inch), which also contributes to the drive's rapid access time.

The Cheetah also employs a programmable multisegmented cache that facilitates higher throughput, which, as we've discovered, is another key consideration for hard-disk audio applications. The drive's 512 Kbyte RAM buffer (which can be increased to 2048 Kbyte) can be divided into as many as 16 equal segments for independent read and write data caching.

Understanding how our computers and their various components process data can be a significant help in configuring a system that meets our recording needs. It can also be a tremendous asset when it comes to troubleshooting our setups. There's much to consider, but no better time than now to start.

*Special thanks to: Tyson Heyn, Seagate Technologies; Mike Walton, Seagate Technologies; Barry Braksick, Frontier Design Group; Jim Lucas, TASCAM; Mike Flood, TimeLine Vista; and Ron Franklin, TimeLine Vista.*

## FASTER PC

continued from page 100

this feature, you'll probably need to manually turn UDMA support on for that drive in your BIOS setup. If you have any questions about UDMA, I'd recommend you read the hardware manuals and/or call your local computer shop about compatibility issues. If both can handle UDMA, go into your BIOS settings and turn UDMA on for that drive, reset the PC, and watch the rubber burn! Data transfer speeds are compared in table 1.

### THE MOTHER(BOARD) CONNECTION

Now that you're more aware of the latest and greatest PC speed issues, the first place to look for taking advantage of them is your motherboard. You should ask several key questions when buying a new PC or simply upgrading to a faster system.

1. What kind of CPU do I need or want to pay for? Can I upgrade to a faster CPU in the future without buying a new motherboard? Can the motherboard run at a bus speed of 100 MHz?

2. Will it support the newer 7 ns SDRAM memory chips? If not, keep looking.

3. Does it have an AGP slot? If not, it probably won't be the end of the world as most audio folks won't see/hear a major difference.

4. Will it support a UDMA hard drive? Does the system have such a drive? If not, definitely look elsewhere!

5. What's the hardware slot configuration? If you still need four ISA slots and the motherboard only gives you two, keep looking. I found an Amptron (amptron.com) VX-twoC motherboard with four ISA and four PCI slots that handle all the above speed issues (except AGP) for \$44!

In short, the ability to upgrade or install some of the latest speed-demon technologies will depend upon your motherboard's ability to communicate with and handle them. If it doesn't support any of these new hardware standards, you'll probably run into some serious roadblocks before you even get out of the gate. The moral of this story: Choosing the right motherboard that best fits the budget, present hardware requirements, and speed and power needs is serious business. If you make the right choices, you can successfully burn rubber well into the new millennium, or at least a few years into it — until the next latest and greatest thing comes along. **EQ**

## BRAUNER VM-1

continued from page 126

sive product, but one that's built without compromise.

So how does it sound? In a word, "Wow!" This is one flattering microphone! It's just beautiful on acoustic guitars, and on female vocals it could make you fall in love — so be careful whom you have in your vocal booth. The remote power supply has a variable-pattern control, which worked perfectly. You can dial in anything from an omnidirectional-pattern (perfect for clustering several backup singers in a circle) to hypercardioid or even a bidirectional (figure 8) pattern, which is great for M-S (mid-side) stereo.

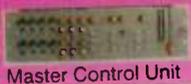
Because of the VM-1's substantial weight, it needs a big stand, and mounting its shockmount and windscreen is a little awkward. But that's part of the ritual of getting ready to record. Packed in an aluminum flight case (21 lbs. shipping weight), it's an imposing-looking piece of hardware, sure to instill respect at first sight in even the most jaded Gear Slut. I really liked opening up the lid and showing first-time users the VM-1 — it really got their attention. And yes, the sonic performance was every bit as good as expected.

As a mechanical engineer (my original schooling), I'm not supposed to get emotional about technology, but there's something about really great engineering that allows a device to become more than the sum of its parts. Dirk has found a way to instill what I'll call "soul" into his creation, and, in a metaphysical way, it's alive. No, I'm not nuts! It's like a great song where you can feel the intent of the songwriter and say, "I understand. I've been there." So it is with the VM-1. I had to send it back after a few short weeks of experimentation, and I miss it already. But Christmas is just around the corner and I've been a very good boy. We'll just have to wait and see. (Remember Santa, it takes two for stereo....)

*Mike Sokol is a live production and studio engineer with too many microphones and keyboards. If you happened to be in Hagerstown, MD for the Mummers Parade last October, he was the guy on the Blues-Fest float playing a Hammond B3 and Leslie (the original "heavy" rock 'n' roll). Check out his Web site at [www.soundav.com](http://www.soundav.com) for details.*

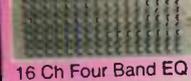
## PROBLEM SOLVERS

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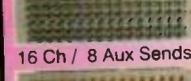


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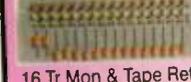
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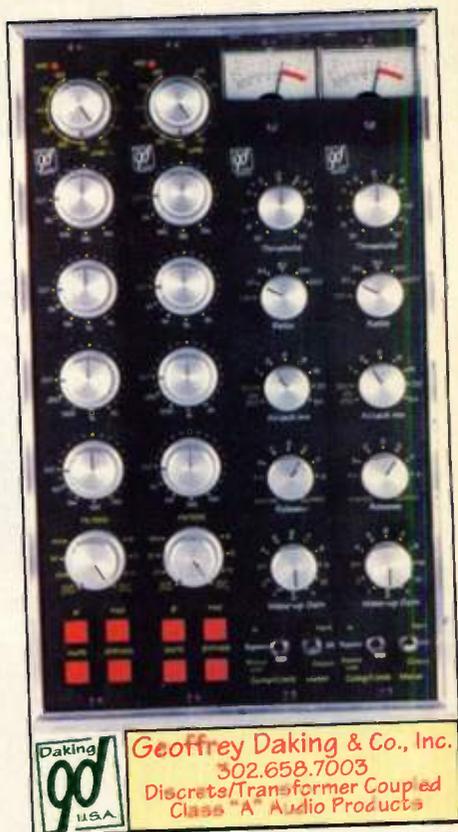
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## DIGITAL MIXERS

# MACKIE

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### 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.



# 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



# TASCAM

## TMD1000 Digital Mixing Console



You want to see what all the digital mixing buzz is about? The NEW TMD1000 from Tascam will have you smiling & automating 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.



## MIC PREAMPS

# Focusrite

## Green 3 "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-

- Same mic pre section as found on the Green Dual Mic Pre includes +48V phantom power, phase reverse, and a 75Hz high-pass filter. Mute control and a true-VU response LED bargraph are also provided
- EQ section includes a mid parametric band with frequency and gain control as well as a gentle bell shape to bring out the character of the voice
- Dynamics section offers important voice processing functions of compression and de-essing combined with a noise-reducing expander
- Single balanced Class A VCA delivers low distortion and a S/N ratio as low as -96dBu



## EFFECTS PROCESSING

# t.c. electronic

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## Finalizer Plus



Improving on the multi-award winning Finalizer platform, The Finalizer Plus delivers an unprecedented level of clarity, warmth and punch to your mix. Inserted between the stereo output of your mixer or workstation and your master recording media, the Finalizer Plus dramatically rounds out your material, creating that "radio ready" sound.

### FEATURES-

- Balanced Analog as well as Digital outputs including AES/EBU, S/PDIF, & TOS.
- 24-bit precision A/d & D/A Converters
- 5-band 24-bit stereo EQ
- Enhance - De-essing, stereo adjust or digital radiance
- Real-time gain maximizer
- Variable slope multi-band expander
- Multi-band compressor • Word Clock Sync
- MIDI section useful for controlling sequencer fades or any of the Finalizer's parameters from a remote MIDI controller.

# Lexicon

## PCM81

### Multi-Effects Processor



The PCM-81 has everything that made the PCM80 the top choice among studio effects processors, and more. More effects, more algorithms, longer delay and full AES/EBU I/O.

### FEATURES-

- 300 Presets include pitch, reverb, ambience, sophisticated modulators, 20 second stereo delays, and dynamic spatialization effects for 2-channel or surround sound applications
- 2 digital processors including Lexicon's Lexchip for the reverb and a second DSP engine for the other effects.
- 24-bit internal processing
- Dynamic patching matrix for maximum effects control.
- PCM card slot

## EQUALIZERS

# Focusrite

## Green 2 "Focus EQ"



The Green 2 Focus EQ is suitable for a variety of applications combining a Focusrite equalizer section with a multi-source input section. Use it as a high-quality front end for recording applications or patch it into the send/return loop to upgrade a single channel of console eq, either way, it sounds great.

### FEATURES-

- XLR & 1/4" inputs are similar to the Dual Mic Pre but have been adapted to cope with a wider range of levels.
- VU metering via a 10-LED bargraph
- EQ section derived from the Red and Blue range processors for superb audio quality.

## COMPRESSORS

# JOE MEEK

## VC1

### Studio Channel



The Joe Meek Studio Channel offers three pieces of studio gear in one. It features an excellent transformer coupled mic preamp, a great compressor and an enhancer unit all in a 2U rackmount design. Find out why more and more studio owners can live without one.

### FEATURES-

- 48V phantom power. Fully balanced operation
- Mic/Line input switch
- Mono photo-optical compressor
- High pass filter for large diaphragm mics
- Extra XLR input on front makes for easy patching
- Compression In/Out and VU/compression meter switches
- Twin balanced XLR outputs with one DI XLR output for stage use
- Enhancer In/Out switch and enhance indicator
- Internal power supply 115/230V AC



# dbx

## Blue Series 160S

### Stereo Compressor

The dbx 160S combines the best features of all the great dbx compressors in a well-built unit where the craftsmanship is as stunning as the engineering is innovative. This is truly a desirable compressor.

### FEATURES-

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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-COR-16 CD recorder.

## AKAI DR16 16-Track HD Recorder

The Akai DR16 is a digital hard disk recorder with sophisticated non-destructive editing functions for near instant data access. Recording & playback is as straight forward as tape. The DR16HD ships with an internal 2GB drive for 24 minutes per track of record time.

### TURN YOUR DR16 INTO A PRODUCTION WORKHORSE WITH THESE POWERFUL EXPANSION OPTIONS!

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- IB807V VGS monitor interface board • EQ16 16-channel digital EQ board • ALX50 Remote Cable



## DIGITAL MULTI-TRACK RECORDERS

### TASCAM DA-98 Digital Audio Recorder

The DA-98 takes all the advantages offered by the DTRS format and significantly ups the ante for the professional and post-production professional alike. With enhanced A/D and D/A converters, a comprehensive LCD display and full compatibility with the DA-88 and DA-38, the DA-98 delivers the absolute best in digital multitrack functionality.

#### FEATURES-

- Confidence monitoring for playback and metering
- Individual input monitor select switch facilitates easier checking of Source/Tape levels
- Switchable reference levels for integration into a variety of recording environments with internal tone generator
- Digital track copy/electronic patch bay functionality
- Comprehensive LCD display for easy system navigation
- Dedicated function/numeric keys make operation easier
- Built-in sync with support for MMC and Sony P2
- D-sub connector (37-pin) for parallel interface with external controller
- Optional RM-98 rack-mount ear for use with Accuride 200 system



**DA-88** A standard digital multitrack for post-production and winner of the Emmy award for technical excellence, 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.

**DA-38** The DA-38 was designed for musicians. Using the same Hi-8 format as the highly acclaimed DA-88, the DA-38 is an 8 track modular design that sounds great. It features an extremely fast transport, compatibility with Hi-8 tapes recorded on other machines, rugged construction, ergonomic design and sync compatibility with DA-88s.

## ALESIS 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-pin 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 or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder.



## SOFTWARE



### SONIC FOUNDRY CD Architect & CD Factory

CD Architect is the perfect solution for designing professional audio CDs to Red Book spec on Windows NT and Windows 95. Sample audio from compact disks, record from DAT, or digitize material through a sound card. It comes complete with an editor including dozens of effects and tools to process sound files and can optionally operate as a Sound Forge plug-in. CD Factory adds a CD burner, SCSI card and cable for a complete production package.

#### FEATURES-

- Multi file playlisting
- Master volume faders (-96dB to +20dB)
- Adjustable envelope levels for any region
- Mix or crossfade overlapped regions
- Convert from mono to stereo on the fly



- Multiple levels of undo/redo
- Up to 99 tracks with 99 subindexes per track
- Make glass-masters directly from burned CDs

## STUDIO DAT-RECORDERS

### Panasonic SV-3800 & SV-4100

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, +/-10dBu
- L/R independent record levels
- Front panel hour meter display
- 8-pin parallel remote terminal
- 250x normal speed search

## TASCAM DA-30mkII

A great sounding DAT, the DA-30MKII is a standard mastering deck used in post-production houses around the world. Among many other pro features, its DATA/SHUTTLE wheel allows for high-speed cueing, quick program entry and fast locating.

#### FEATURES-

- Multiple sampling rates (48, 44.1, and 32kHz).
- Extended (4-hour) play at 32kHz
- Digital I/O featuring both AES/EBU and S/PDIF.
- XLR balanced and RCA unbalanced connections.



- Full function wireless remote.
- Variable speed shuttle wheel.
- SCMS-free recording with selectable ID.
- Parallel port for control I/O from external equipment.

## Fostex D-15

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 4D.D. 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
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## MIDI HARDWARE



### Mark of the Unicorn **MIDI Time Piece™ AV** 8x8 Mac/PC MIDI Interface



The MTP AV takes the world renowned MTP II and adds synchronization that you really need like video genlock, ADA™ sync, word clock sync, and even Digidesign superclock!

- FEATURES—**
- Same unit works on both Mac & PC platforms.
  - 8x8 MIDI merge matrix, 128 MIDI channels.
  - Fully programmable from the front panel.
  - 128 scene, battery-backed memory.
  - Fast 1x mode for high-speed MIDI data transfer.

### **Digital Time Piece™** Digital Interface



Think of it as the digital synchronization hub for your recording studio. The Digital Timepiece provides stable, centralized sync for most analog, digital audio, and video equipment. Lock together ADATs, DA 88s, ProTools, word clock, S/PDIF, video, SMPTE, and MMIO computers and devices flawlessly. It ships with "Clockworks" software which gives you access to its many advanced features and remote control of some equipment settings such as record arm.

## OPCODE

### **Studio 64XTC** Mac/PC MIDI Interface



The Studio 64XTC takes the assorted, individual pieces of your studio—your computer, MIDI devices, digital and analog multitracks and even pro video decks, and puts them all in sync.

- FEATURES—**
- 4 In / 4 Out, 64 channel MIDI/SMPTE interface/patch-bay with powerful multitrack & video sync features
  - ADAT sync with MIDI machine control
  - Simultaneous wordclock and Superclock output, 44.1kHz or 48kHz for perfect sync with ADAT, DA-88 and ProTools
  - Video and Blackburst in (NTSC and PAL)
  - Cross-platform Mac and Windows compatibility

## SAMPLING

### **E-MU e-6400** Sampling and more!



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 balanced analog outputs, SCSI, stereo phase-locked time compression, digital re-sampling and more. A dream machine.

## KEYBOARDS & SOUND MODULES



### **XP60 & XP80 Music Workstations**

The XP-80 delivers everything you've ever wanted in a music workstation. An unprecedented collection of carefully integrated features provide instant response, maximum realtime control and incredible user expandability. The XP-80 features a pro-quality 76-note weighted action keyboard while the NEW XP-60 features the same sound engine in a 61-note keyboard.



#### **XP80 FEATURES—**

- 64-voice polyphony and 16-part multitimbral capability
- 16 Mbytes of internal waveform memory; 80Mbytes when fully expanded (16-bit linear format)
- 16-track MRG-pro sequencer with direct from disk playback. Sequencer holds approx. 60,000 notes
- New sequencer functions like "non-stop" loop recording and refined Groove Quantize™ template

- Enhanced realtime performance capability with advanced Arpeggiator including MIDI sync and guitar strum mode and Realtime Phrase Sequence (RPS) for on-the-fly triggering of patterns
- 40 insert effects in addition to reverb and chorus
- 2 pairs of independent stereo outputs, click output jack with volume knob
- Large backlit LCD display

### **SR-JV80 Series Expansion Boards**

Roland's SR-JV80-Series wave expansion boards provide JV and XP instrument owners a great-sounding, cost-effective way to customize their instruments. Each board holds approx. 8Mb of entirely new waveforms, ready to be played or programmed as you desire.

#### **Boards Include—**

- **Pop, Orchestral, Piano, Vintage Synths, World, Super Sound Set, Keys of the 60's & 70's, Session, Bass & Drums, Techno & Hip-Hop Collection.**



## KURZWEIL

### **K2500 Series Music Workstations**

The K2500 series from Kurzweil utilizes the acclaimed V.A.S.T. technology for top-quality professional sound. Available in Rack mount, 76-key, and 88 weighted key keyboard configurations, these keyboards combine ROM based samples, on-board effects, V.A.S.T. synthesis technology and full sampling capabilities on some units.

#### **FEATURES—**

- True 48-voice polyphony
- Fluorescent 64 x 240 backlit display
- Up to 128MB sample memory
- Full MIDI controller capabilities
- 32-track sequencer
- Sampling option available
- Dual SCSI ports
- DMTI Digital Multitrack interface option for data format and sample rate conversion (Interfaces with ADATs or DA-88s)



### **Trinity Series Music Workstations DRS**

Korg's Trinity Series represents a breakthrough in sound synthesis and an incredible user interface. It's touch-screen display is like nothing else in the industry, allowing you to select and program patches with the touch of a finger. The 24MB of internal ROM are sampled using ACCESS which fully digitizes sound production from source to filter to effects. Korg's DSP based Multi Oscillator Synthesis System (MOSS) is capable of reproducing 5 different synthesis methods like Analog synthesis, Physical Modeling, and variable Phase Modulation (VPM).



#### **FEATURES—**

- 16 track, 80.00 note MIDI sequencer
- Flexible, assignable controllers
- **DRS (Digital Recording System)** features a hard disk recorder and various digital interfaces for networking a digital recording system configured with ADAT, DAT recorder and hard disk.
- 256 programs, 256 combinations
- Reads KORG sample DATA library and AKAI sample library using optional 8MB Flash ROM board



**88 Weighted-key/Solo Synth**

**76-key/Solo Synth**

**61-key/Solo Synth**

**61-key**

*\*(Digital IF, SCSI, Hard Disk Recorder, and sample Playback/Flash ROM functions are supplied by optional upgrade boards)*

## MONITORS



### **V8**

#### **Powered Studio Monitors**

These new powered studio monitors from KRK supply 130 watts of clean performance. Their 8" woofer & 1" silk dome tweeter ensure crystal highs as well as the bass response needed for today's studio environments.

#### **FEATURES—**

- 49Hz - 22kHz
- Magnetically shielded for use near video monitors



## Hafler

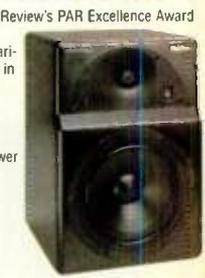
### **TRM-8**

#### **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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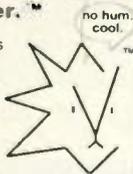
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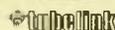
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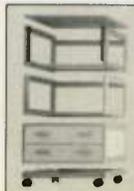
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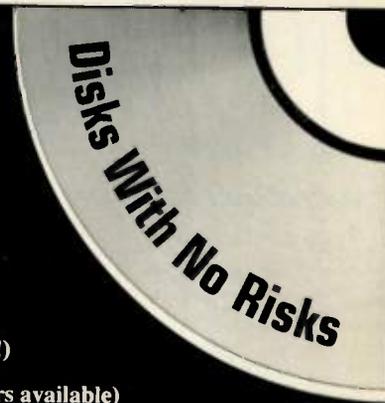
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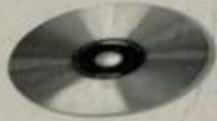
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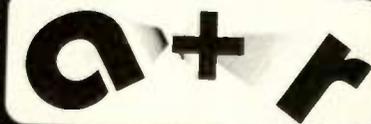
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# Lightning Striking

Lightning strikes — both direct and through surges — can do plenty of damage to an unprepared studio



BY MARTIN POLON

There is no other natural phenomenon that threatens the recording studio with total or partial annihilation like lightning strikes do. What is viewed by most as a summer-time nuisance is in fact a phenomenon that operates in some parts of the country for nine or ten months a year, and potentially thousands of lightning strikes occur each day (in season) nationwide.

One insurance adjuster queried about the number of claims filed for lightning damage, felt that more recording studios suffered some kind of damage from lightning strikes than from earthquakes, tornadoes, funnel spouts, and hurricanes. His reasoning is that the former occurs every day, whereas the latter are occasional events.

It is perhaps useful to consider some facts and figures about lightning strikes. First, and perhaps most important, some insurance policies will not cover studio equipment and/or the building housing the studio for any damage directly or indirectly related to lightning strikes. In many cases, there is a clause in the insurance policies for Acts of God. The same can be said for many manufacturer-provider service policies (as opposed to regular insurance) on computers and other similar components. Often there is a section of the service contract that exempts lightning strikes from

the provider's service obligations.

Second, you may not be safe from lightning hits if you have expectations that your power company will protect you. Your familiar and trusted power company may be the so-called villain even if direct lightning hits are not! The inability of many power systems to keep lightning-caused spikes off of the power network is a minor scandal and a major secret of the power business. Executives of the power companies will and do stand on their head to deny that this happens. The number of lawsuits that would be filed against the power distributors if they admitted even some responsibility for the pass-through of lightning hits on their systems is the reason they deny culpability.

Third, another misconception is that lightning will not damage electronic equipment if it is turned off, though still plugged in to the AC line. Lightning strikes can take many physical forms and have been known to destroy equipment unplugged and sitting in a closet, as well as kill and maim individuals sitting in the bathroom, in an office at a desk, and in rubber-tired vehicles — although none of that is considered usual behavior for lightning hits. But as one university lightning researcher always said in his classes, "If lightning hits you, it really doesn't matter how untypical the blast is — you're dead or you'll soon want to be!"

So the question is, how do we protect ourselves in the studio from lightning? For a starter, lightning protection can be accomplished without budget-breaking expenditure. It is another one of those "little" things that seem to escape the focus of project studio owners (as well as larger studios), yet can jeopardize a million-dollar investment. The following tips can help to keep the lightning "wolf" from the door!

1. Hire a competent electrician to install a system-wide surge and spike protector at your studio's electrical input point. Such devices may cost a thousand

dollars or better, depending on the capacity, level of protection and life cycle, but saving just one RAID hard-disk recorder justifies the overall expenditure. Also, if you have a multi-room setup or just a lot of stuff, the cost of individual surge protectors could make the use of a large-scale device at the input just good business sense.

2. Use power strips for each logical grouping of equipment and keep equipment switched off both at the unit itself and at the power strip when not in use. One frequently hears about how "switching power on and off shortens equipment

life." That may have been true for old tube gear, but today's equipment is designed for on and off duty cycles. If you use a professional AC volt scope meter and look at the truly awful waveform and electrical garbage you are being presented with by many of America's power companies, you will understand that leaving power on at all times is a lot like walking barefoot at Copacabana Beach in Rio De Janiero and expecting to avoid exotic disease.

3. Consider having an electrician check all system grounds and neutrals in your facility. This can help to guide spikes and "hits" away from equipment and may help to reduce ground current loops.

4. Not all lightning comes down the power lines. Make sure that all telephone lines are properly protected, even if you have to call for and pay for a service call by your telephone provider.

5. Consider having a specialist contractor install rooftop lightning arrester systems using rods and special wiring to guide the electricity from a strike away to ground. Lessons learned from oil refineries, ammunition plants, fireworks factories, and gas works, among others, over the last several decades have improved the reliability of such systems to nearly 100 percent during lightning events and thunderstorms.

*Lightning protection can be accomplished without budget-breaking expenditure.*

## ACROSS THE BOARD

continued from page 162

been approved by the FCC, but none of the U.S. dealers will carry it for fear of liability if a customer accidentally sets it off. It makes me want one all the more.

13. Need eight mic preamps in a single rack space for your Pro Tools system? Try the Precision 8 mic preamps by TRUE Audio Systems: balanced in and out, phantom, switchable DI on inputs 1 and 2, and adjustable peak meter settings. And I almost forgot — it sounds great feeding those 24-bit converters. [See Roger's review in the Oct. '98 issue.]

14. Acoustic Sciences, maker of the famous Tube Trap system, now has the Attack Wall. A plethora of tube traps that you place around your mixing console to turn any spare room into a great mixing environment. I've tried it and it works great. Don't buy them all, though. Leave some more for me.

15. Yamaha gets in here twice this year with their D24 8-track optical recorder. It will record 16-bit, 24-bit, 2-track, 8-track...just about anything you want, at a price that will knock your socks off. (See the First Look on page 36.)

16. Anything from Rane. They still don't know that they charge too little for the quality of gear that they produce. Get some before they figure it out.

17. Marantz has a new CD recorder, the CDR-630. It is a stand-alone recorder that will record from AES, optical, coax, or analog inputs directly to CD-R or CD-RW. It has a built-in sample-rate converter so that you can record CDs digitally from your 48k DAT or ADAT tapes. I use one for printing safety mixes. If you use CD-Rs, nobody (read: second engineer) can accidentally erase your mix.

18. What about the Caravell CDR-N820S SCSI CD recorder? It records CDs at 8X. That means you can crank out a 74-minute CD every 10 minutes. For most cases this means you can get by with one 8X machine instead of buying two or more 4X machines for multiple copies. Owning a dozen 4X machines doesn't make one CD-R any faster than one 4X machine.

19. I just got another Titanium bicycle from Ernesto's Cyclery in Miami. If you notice the prices going up, it must be because I am cornering the market. Titanium looks good between my legs. Also blow-up rubber mannequins, but that is another story.

20. I have talked about the sound system in my Lexus that I tuned up with my Meyer SIM machine. Well, my lease ran out and I couldn't find another car with a stock sound system that sounded as good as the ES-300, so I got a brand-new '99 of the same exact car, this time with the Nakamichi upgraded sound system. More power, more speakers, lower bottom end, and it tuned up real nice with the SIM machine. Plug your ears if I pull up next to you at a traffic signal.

21. Since I'm talking about cars, I've gotta plug my leasing guy. He supplies all the music-business types in Nashville with their wheels. This is my third car from Performance Leasing, and even though I live in Miami, I saved so much money that I flew to Nashville, picked up the new car, and drove it to Miami. Ask for Damon Beard. Ask for your Gear Slut discount. Next year my wife's car lease is up. Maybe I'll get my next one free!

If I left out some things, it is only because I ran out of room. I could easily fill a whole magazine with the cool stuff I have seen and want to add to my world of goodies. Let me know if you find any cool stuff, like Titanium clothespins or a Mac track ball that works. **EQ**

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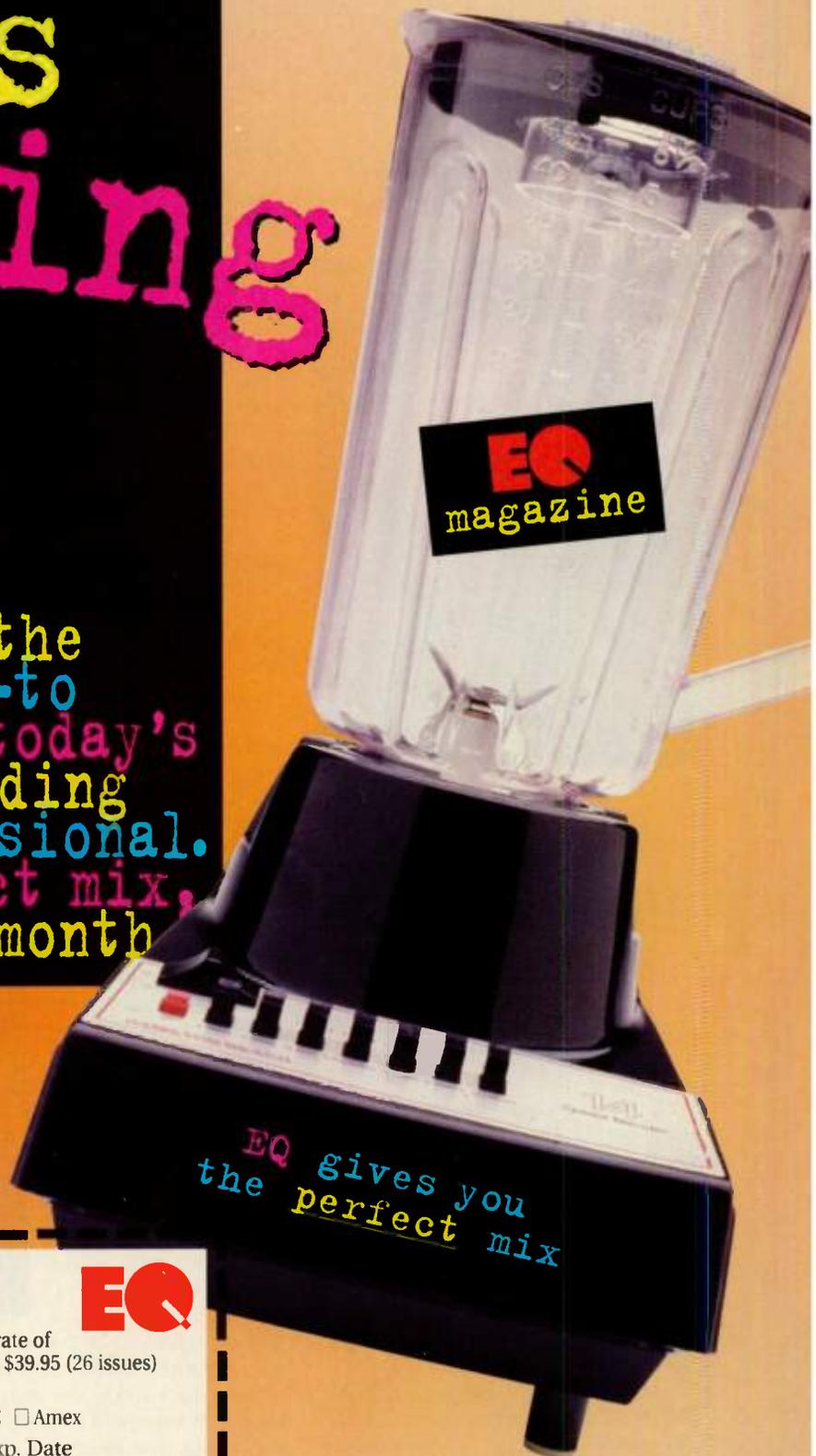
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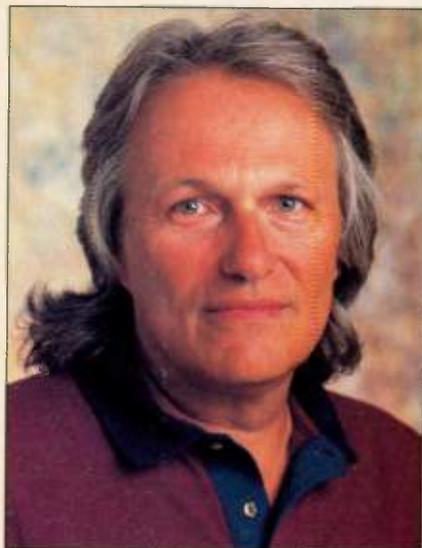
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# Wishful Thinking



Write your wish on a \$100 bill and send it to me now!

BY ROGER NICHOLS

Well, it's that time of year again, and there are plenty of stocking stuffers on my Christmas wish list. A lot of these tidbits I already have, but as the famous song lyric states, "If I had to do it all over again, I would do it all over you."

1. Pro Control from Digidesign. Maybe a little big for the stocking, but the gift certificate should fit nicely. Mix projects with million dollar budgets right in your bedroom.

2. StudioSuite 4.0 from AlterMedia. This is a FileMaker Pro system for studio paperwork control, including billing, work orders, inventory control, tape and CD labels, engineer scheduling, studio booking, track sheets, and equipment recall sheets. I thought it was so cool that I gave AlterMedia all of my recall drawings to add to their collection.

3. MSP 5 from Dave Zicareli and Cy-

cling 74. For all of you Opcode MAX fans, MSP allows object control over DSP functions so you can be creative with the audio as well as MIDI information. You can easily build your own plug-ins, and with the aid of Pluggo, run them under Cubase VST, Vision DSP, or Logic Audio.

4. VocAlign software from Synchro Arts. Sync'ing up double vocals and chorus harmony parts just became routine. Pick the reference track, pick the destination track, and let 'er rip. Week's worth of work completed in minutes. Good job!

5. Yamaha 01V, the world's least expensive digital console. Digital I/O, built-in reverbs, automation, total reset of all parameters. I just got back from Buenos Aires, and an act I went to see was using one to provide their own mix and send a feed to the house PA. I am using one for "more me" headphone applications (a memory for each song), and another one for reverb returns to my 02R.

6. Garmin has come out with more cool GPS receivers. The Street Pilot has all of the numbered highways in the U.S. and plug-in (see, everyone uses plug-ins) cartridges for each major city that includes all streets, motels, food, and gas, but no recording studios. Then there is the GPS III pilot that I have mounted on my bicycle. All of the numbered highways, plus all of the airports with runways over 1000 ft. I was using it on the flight to Buenos Aires and the pilot came back and took it away from me. He said he wanted to play with it. He did give it back after we landed. There is going to be a new one, the GPS III plus, that will allow you to download map data from CD-ROM into the unit. *Where's mine!*

7. Waves Gold Bundle. If you had a choice between a Playmate under your tree or all of the best plug-ins on the

market, which would you choose? The Waves Gold Bundle is much cheaper than a divorce lawyer, won't run off with a richer guy, and can do a lot more for making your mixes sound great! Waves uses a dongle for copy protection so you can take your bundle with you, plug in the dongle, and mix on someone else's Pro Tools. When you pull out your dongle (isn't that what Clinton is getting impeached for?), the plug-ins quit and your friend has to buy his own.

8. Opcode Vision DSP. The thin line between MIDI sequencing software and audio-based recording with DSP plug-ins has vanished. The sequencing software of choice for the Steely Dan guys.

9. Did I mention Pro Tools24 MIX

and MIXplus? Half the number of card slots for three times the power. You can now have 64 tracks with 32 I/O channels in a three-slot Mac G3. If you are a PC fan, the whole system works flawlessly under Windows NT, so you don't have to waste a Mac. (See Roger's exclusive review on page 132.)

10. TC Electronic's new reverb engine is about to be shipped. The M3000 uses new digital reverb algorithms to up the ante for all of the other reverb manufacturers. TC Electronic has laid the cornerstone for reverb building blocks of the next century.

11. Anything from Sweetwater Sound. The best service and emergency replacement police in the country. They'll practically send you the new one *before* your old one breaks.

12. You know I had to throw in a watch. Breitling has a version of their Aerospace called the Emergency. It has a built in E.I.T (Emergency Locator Transmitter) that can be directly picked up by satellite and rescue crews dispatched anywhere in the world. It has

*If you had a choice between a Playmate under your tree or all of the best plug-ins on the market, which would you choose?*

*continued on page 160*

"The magic of the HD 600s  
is their midrange—a purity of tone...  
that is quite special."  
—Sam Tellig, *Stereophile*  
February 1998



"WP, KR, and ST are unanimous  
in calling these the best dynamic  
headphones they've ever heard."  
— *Stereophile Recommended Component*  
April 1998

## makes raves

The Sennheiser HD 600 is, quite simply, the finest dynamic headphone ever created. With its exceptionally smooth frequency response, remarkable clarity, and unparalleled comfort, it virtually speaks for itself. It's reassuring to know, of course, that everyone else seems to agree with what it has to say.

"...the Sennheiser HD 600s  
are a must-audition product—  
even, dare I suggest, a must-own."  
—Wes Phillips, *Stereophile*  
February 1998

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