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PROFESSIONAL
PROJECT
RECORDING
& SOUND

FEBRUARY • 1999

IN REVIEW

Studer V-Eight
Graham-Patten
DEADE-2

Synchro Arts
VocALign

NemeSys
Gigasampler

Minnetonka
Surround Editor
Clean! Software

The Offbeat
Film Director
Turns Project
Studio Owner

David
Lynch

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World Radio History

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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.

The Tube

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.



What turns a studio microphone into a legend?

Natural **warmth**. Rich character. Crystalline clarity that perfectly captures the fine details of every **nuance**. Most importantly, it provides an indescribable intimacy that makes listening a deeply emotional experience.

Legendary mics are made by people who share a passion for the art of sound. So we gathered together some of the most **passionate** designers in the world to create GT Electronics, a new division of Alesis that's dedicated to the qualities of **legendary** audio equipment design. It all starts with the AM Series large diaphragm studio condenser microphones, which offer **everything** you'd expect from a legendary mic except the legendary price.

GT. The new legend has arrived.



Fixed Cardioid

AM51
CLASS A FET



Cardioid, Omni, Figure 8

AM52
CLASS A FET



Fixed Cardioid

AM61
TUBE



Cardioid, Omni, Figure 8, Super-Cardioid

AM62
TUBE

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the new legend

"When A \$2,000 System Sounds As Good As A \$50,000 System, I'd Say They Got It Right."

William Wittman, Engineer/Producer

The First Fully Integrated 5.1 Monitoring System

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

Performance-Tailored Components

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

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

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



LSR 32
12" 3-way mid-field monitor with rotatable Mid/High Elements.



LSR 28P
8" 2-way close field monitor with bi-amplification and active filtering.



LSR 12P
12" Active Subwoofer with Bass Management System.

Carbon Fiber Composite Cone

Dual Top Plate

Dynamic Brake Coil

Neodymium Magnet

Aluminum Diecast Heatsink

Dual Drive Coils

Diecast Frame



H A Harman International Company

To find out more about the revolutionary LSR Monitors, visit JBL Professional at www.jblpro.com

NEVER BEFORE HAS SO MUCH
POWER BEEN SO AFFORDABLE.

It's time for you to make the move to digital mixing. Analog mixers just don't offer the performance, features and sound quality required for today's digital recording and 5.1 surround mixing environments.

The Panasonic DA7 digital mixer gives you 16 mic channels with up to 24 channels of analog or digital I/O in ADAT, TDIF or AES format; 24-bit audio quality; moving faders and automation for less than you thought possible.

Quite a remarkable feat, but it's what you have come to expect from the company with more digital experience than anyone. In fact, Panasonic set the standard for digital recording years ago with the SV Series of DAT recorders.

So if you're still on the fence about digital mixing, we're certain the DA7 will convince you that now is the time to make your move.

"The DA7 is extremely musical and easy to use in any recording environment. It offers a sound, warmth and punch that make it truly unique."

Greg Ladanyi,
producer/engineer

Jackson Browne, Don Henley,
The Violets, Fleetwood Mac,
Jody Davidson

DA7 With products like the SX-1 and DX1000 (the DA7's big brothers), and the SV Series of DAT recorders, Panasonic is truly taking digital further.
(Below - the DX1000 digital console.)

DA7 And many magazine editors have raved about the DA7's exceptional sonic quality, intuitive user interface, automation and affordability. (Some editors even bought the DA7 after the review!)



RIGHT PRODUCT.
RIGHT TIME.
RIGHT PRICE.
RIGHT NOW.

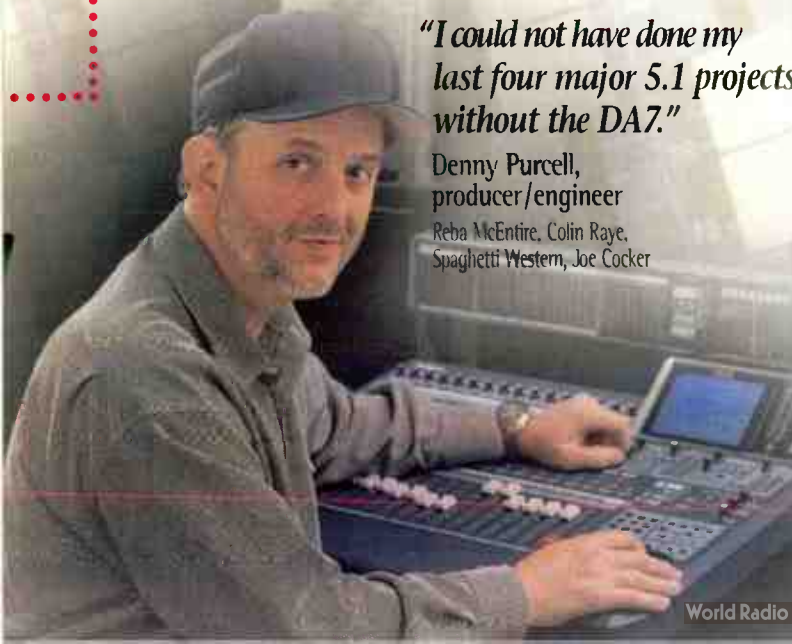
THE DA7 DIGITAL MIXER.



DA7 Don't just take our word for it. World-class producers, including Greg Ladanyi (pictured left) and Denny Purcell are using the DA7 for their high-profile projects.

"I could not have done my last four major 5.1 projects without the DA7."

Denny Purcell,
producer/engineer
Reba McEntire, Colin Raye,
Spaghetti Western, Joe Cocker



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PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 10, ISSUE 2
FEBRUARY 1999



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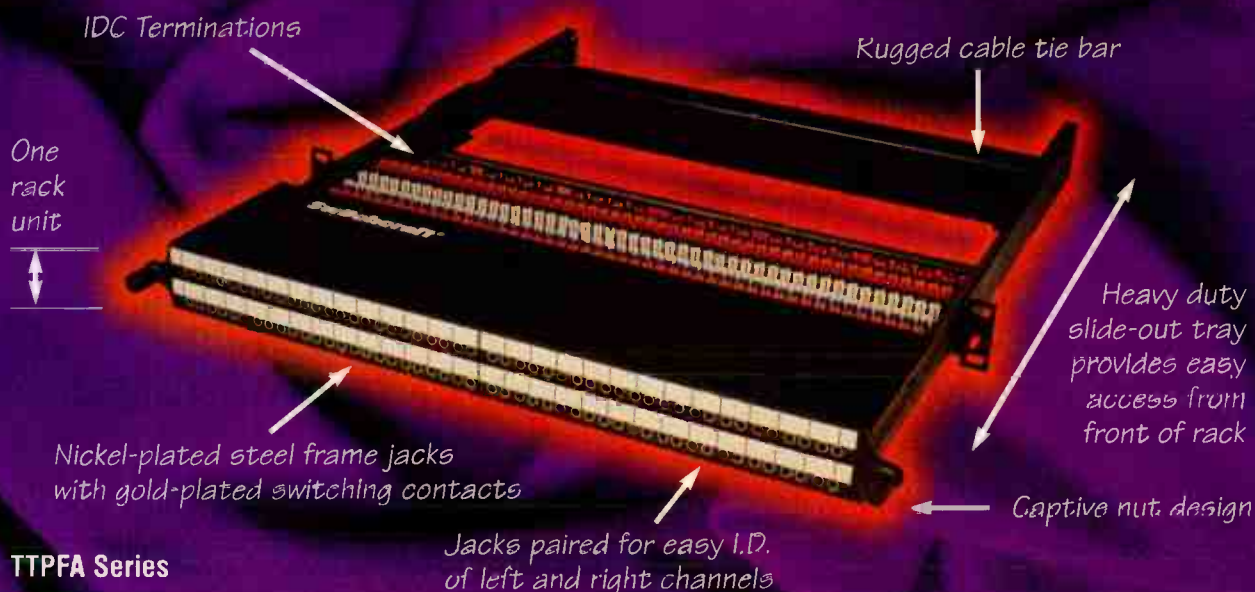
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ON THE COVER:

David Lynch in his
Asymmetrical Studio.
Photo by Mr. Bonzai.

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 for surface; 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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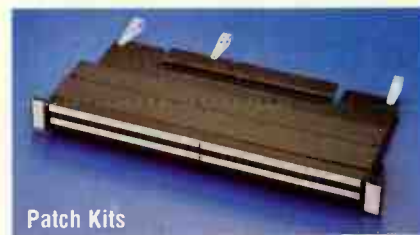
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Vol. 10, No. 2 February 1999

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PUBLISHED BY MILLER FREEMAN PSN, INC.

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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 1050-7888) 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, check drawn 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. **Printed in the U.S.A.**

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Playing Cowboys & Pirates

Once upon a time in a local computer store, a shopper filled a shopping cart full of boxes containing interesting looking programs including audio editors, audio signal processors, audio plug-ins, word processors, graphics programs — basically thousands of dollars worth of goods. The fun part was, he ignored the prices on the boxes and simply walked out of the shop.

No alarms, no eyebrows raised, no one running after him. No problems. After all, it was only software. While the scenario described above is, of course, a fantasy and sounds unlikely, it can and does happen in virtual pirate software "shops" on the Internet today.

Try walking out of a shop with a couple of cheap reverb units or anything else in a box — or even a Mars bar — and, when you get caught, you are likely to wind up with a criminal record.

So, why this discrepancy? Right now, the Internet seems like the Wild West where anything can and will happen. There appears to be no enforced rules or regulations, and the 'Net cowboys are out there "rustling" software from the owners' ranches. To make matters worse, there are many people who then think that because someone else has done the dirty work in removing copy protection and offering the software, taking a further copy is not as serious a crime.

Apply this to our audio industry and you realize how this cowboy attitude could potentially shoot a very big hole into the feet we will be trying to stand on in the future. With increasingly powerful computer platforms,

software will become a larger and larger component of our future audio toolkit. If enough software gets stolen, then the companies providing it will be forced to spend more time and effort on copy protection and less on tools. They also might stop providing so much software. Even worse, the smaller and very innovative companies could move on to other industries or, even worse, go out of business.

As it happens, there are rules and laws for this uncharted and vast territory, which provide penalties for these illegal activities. The virtual shop "owners" who provide the software storage or even links to the storage of unlicensed software are breaking copyright laws. But, more importantly, so are people who download or trade in unlicensed software.

The fact is, until recently, there were insufficient efforts being made to police the rustlers and the people they supply. As a result, a majority of the world's audio software manufacturers are supporting efforts by Copyright Control Services, which has already searched out and shut down over 300 Internet sites that either contained illegal and pirated audio software or had links to pirated software. All of us who enjoy using

the really cool audio software now should make sure we support anti-piracy efforts and directly support the future of the creative people who make this software possible.

To find out more about Copyright Control Services, visit their Web site at: www.CopyrightControl.com.

If
you pirate
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the 'Net,
you may
be ripping
yourself
(and your
studio) off
in the
process

"It's no secret that I'm a big fan of classic tube gear. I've found that with the Peavey VMP™-2 and the VC/L™-2, I get the same vibe of great vintage gear of the past, with the reliability that has always been associated with the Peavey name. Way to go guys!"

Lee Roy Parnell

Check out Lee Roy Parnell's latest release, "Every Night's a Saturday Night," as well as his earlier recordings available on Arista/Nashville CDs and tapes.
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automates nearly every D8B function and all are accessible from the console and optional monitor • **MORE CREATIVITY** Put all of these features together and you've got the Digital 8-Bus—a creativity powerhouse

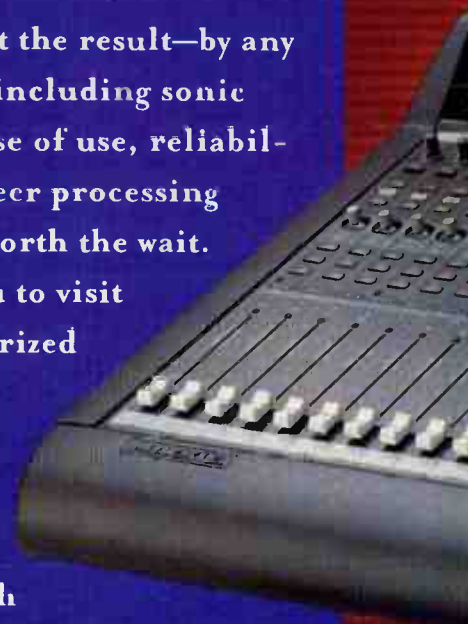
EASIEST TO USE *"It acts, walks and talks very much like an analog console."* — BRUCE NAZARIAN, VIRTUAL POST, BURBANK CA • *"With some digital consoles, you feel like you're working on a computer. The [D8B] feels just like working on a regular, analog console. Right out of the box, it's so easy to use, I couldn't believe it."* — BRIAN FORAKER, RECORDING ENGINEER FOR YES, HEART, AND OINGO BOINGO • *"With the Digital 8-Bus, you just go for it. It's very much like analog boards—not a lot of pages to step through. You can keep your mind on the music and the task at hand."* — STEVE BOYCE, AUDIO DEPT. MANAGER, REDMOND, WA • **MORE D8B DETAILS** 12 discrete high-definition mic preamps • Support of all SMPTE frame rates and MIDI Machine Control • Full 5.1 and 7.1 surround sound capabilities • **SUPERIOR AUDIO QUALITY** 24-bit, 128X oversampling A/D and D/A converters • 32-bit internal processing • Apogee UV22[®] Super CD Encoding

Instead of doing digital first, we did digital right.

All along, our goal has been to create the first affordable no-compromise digital console. We designed the D8B to sound as pristine as the finest analog consoles—and to perform automation tricks even \$500,000 digital desks can't do. We believe that the result—by any standard—including sonic quality, ease of use, reliability, and sheer processing power—is worth the wait. I invite you to visit your authorized Mackie Digital Systems dealer for an in-depth demo and our 36-page tabloid brochure. Call us for your local dealer and a free video.



GREG MACKIE, FOUNDER



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CHIP OFF THE OL' BLOCK

In the December 1998 issue of *EQ*, David Miles Huber writes (in an article titled "Faster PC, Faster") the following: "For example, the new K6 processors from AMD cost about half as much as PII CPU's that run at the same speed, often times with little or no compromise in speed or functionality." In the following paragraph, he writes about the Intel Celeron processors, saying that the 266 MHz Celeron processor without L2 cache is slower than a 200 MHz Pentium processor.

The K6-2 processor may be comparable to the PII in normal benchmark tests in both speed and functionality. In a series of tests run by Harmony-Central (www.harmony-central.com) comparing the K6-2 processor to the Celeron processor, the K6-2 was only 3 percent faster than the Celeron. Also, the clock speed on the K6-2 was 350 MHz with a 100 MHz bus speed, and the clock speed on the Celeron was 333 MHz using a 66 MHz bus. When these processors were compared for audio applications, the Celeron processor was much faster than the K6-2 processor. For further reference, in another test they had performed at an earlier date, they had performed the same tests on a 400 MHz PII processor using a 100 MHz bus. In these tests, the PII proved to be even faster than the Celeron processor.

Karl L. Peterson
Chesterfield, MO

FAST TIMES

Let me begin by telling you that I am very pleased with your PC Quarterly feature. I found each one of the articles in the December issue interesting. However, my motivation for writing is to point out what appears to be conflicting information between the otherwise very helpful articles by Roger Maycock ("Configuring for Digital Audio," December 1998) and David Miles Huber ("Faster PC, Faster," December 1998).

I've always heard that a SCSI drive is best for hard-disk recording, not only because of speed, but because it's much more stable and more reliable during long read/write periods, and less susceptible to dropouts due to thermal recalibration, etc. Mr. Maycock's article seems to fully support this notion while, on the other hand, Mr. Huber's article focuses mainly on speed with regard to choosing a hard drive as though stability isn't an issue at all with today's EIDE drives.

Furthermore, on the issue of speed, Mr. Maycock indicates in his article that Ultra DMA systems "can transfer up to 33 MB per

second as opposed to 80 MB per second with Ultra2 SCSI..." while Mr. Huber indicates a 40 MB/sec. transfer rate for Ultra2 SCSI. Which is it?

Dale W. Neumann
Minneapolis, MN

[According to Adaptec's Web site (www.adaptec.com), Ultra2 SCSI has a burst speed of 80 MB/sec. —Ed.]

SPEED READER

In the Dec. '98 issue's "Configuring for Digital Audio" article, you had great information, but two things quickly come to mind: What is the hard drive's sustained throughput and you just mentioned redundant disk arrays RAID.

Sustained throughput is what we are after in DA. Assuming the drive interface to the computer is faster than the mechanicals of the drive, and assuming the data is defragmented, contiguous Sustained transfer rate is simply a combination of the areal density and the rotational speed of the drive.

You mention UDMA EIDE had 33 MB and SCSI 40/80/100 MB of throughput. That is BURST, or drive to computer throughput — basically how fast can you dump the cache off the drive to the RAM. On a single drive reading a 210 MB file, even with Seagate's fastest drive (or anybody's), you will not see that rate for the duration of the 210 MB read. I'm not sure what the Cheetah or Barracuda's media transfer rate is, but it will be a range. A typical high areal density 3.5-inch drive from the big names at 5400 rpm will give 6 to 16 MB of sustained output. I've seen 7200 rpm drives list up to 19 MB. It can vary depending on if you are reading near the center of the platter or the outside edge of the platter.

If the drive comes in both EIDE and SCSI versions, the sustained throughput will actually be almost the same in either version! SCSI has its tremendous advantage in finding data quickly without consuming your CPU, linking multiple devices, and getting data to your CPU fast.

Before this sounds like an ad, it's not. I'm a farmer in NY that once had two hobbies go out of control: pro audio and computers. There is a PCI product out now, Fasttrak from Promise Tech, (check out www.promise.com) that links up to four UDMA drives together and turns them into an array.

The card is but \$125. What your computer sees is a SCSI disk controller with one big drive. You can leave a separate disk in your system as long as it is the boot disk. You can also mirror drives for redundancy, up to two controllers per system. You could do four drives

— two arrayed and two mirrored — or four arrayed on one card. Two cards can get you four arrayed and four mirrored.

The card does SCSI stuff; for example, on a read it will (assume one card, four drives, two arrayed, two mirrored) read from all four drives instead of just the two in the array, on a write it will write to two drives simultaneously. You basically increase performance by 2x, 3x, or 4x depending on the number of drives. You can let one drive dump its cache while the other drives are finding data as the data is interleaved across all the arrayed drives. I'm using three quantum Fireballs 5400 rpm 2.5 GB single platter drives in a 7.5 MB array. You can use any EIDE drives you want, they should be identical. Your total space in an array is the sum of all the drives you are using. If you are mirroring, it will be half.

I usually check for a drive's media transfer rate before I buy. Quantum FireBall, IBM, WesternDigital, and Fujitsu are my usual first looks. Check the media transfer rate for your drive at www.seagate.com, www.quantum.com, www.wdc.com (western digital), www.maxtor.com, or www.fcpc.com (fujitsu).

Warren Abbott
via Internet



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Saturday 9:30-9:45am

Commercial mix You've cut a spot using your new 01V Digital Mixer. The agency loves it. Run off a final mix and you're done. Store your settings in 01V Memory just in case.



Saturday 9:45-11:55am

Demo Session Vocal overdubs. Plug a mic into one of 01V's twelve phantom powered mic inputs, press RECALL and return instantly to the exact eq, compressor and headphone settings from your last session.



Saturday 12:05-12:10pm

Commercial mix take II Agency calls — wants music up under dialogue. With 01V memory of all settings, you recall the mix, make the changes and still get to your wedding gig on time.



Saturday 12:30-3:30pm

Live Gig With 6 outputs, compressors, parametric eq and effects 01V has the tools you need to mix live sound. With MEMORY, you instantly recall your settings from the last gig.



Saturday 3:50-4:00pm

Commercial mix take III Agency calls — wants hotter dialogue. Easy. Call up 01V compressor setting to keep the music under control. Done.



Saturday-Sunday 4:15pm-3:00am

Cutting tracks — Client: You. Mixer: 01V Digital.



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CIRCLE 92 ON FREE INFO CARD

WHERE TO START?

Q My Panasonic SV-3700 DAT recently began having difficulty renumbering Start IDs. It will locate the next ID, stop, back up to before the start ID, and keep backing up! Using a cleaning tape didn't help.

Have you ever experienced this problem? Is it tape related? This problem occurred with several different Ampex tapes, but the machine worked OK with the one Sony tape I used. A Fostex DAT machine renumbered this tape correctly, so I don't know if it's tape-related or not.

Tom Kniess
Redbird Recording
via Internet

A Only two and one-half conditions can cause this problem. The machine may have a tape path problem in reverse-play mode, making the tape difficult to read. After locating an ID, it must then reverse under capstan control to locate beginning of, and renumber, the Start ID.

I suspect your problem is simpler than that. For Panasonic machines, leave 15 seconds between start IDs because it takes 13 seconds to write the entire ID. Other machines need only nine seconds. The "half" condition concerns the original recording. Was it made on the Panasonic or on another machine? Problems may arise if the alignment between two machines is too far off.

Always check the error rate! On Panasonic decks this is done by pressing MODE-RESET-PAUSE, then MODE alone until the orange "AB" appears in the display. This turns the tape counter into an ERROR DISPLAY.

Eddie Ciletti
www.tangible-technology.com
Contributing Editor
EQ magazine

MIXING MIXERS

Q Can the Mackie Ultrapilot or Ultra 34 system be used as a MIDI controller for other software-based mixers such as [Mark of the Unicorn's] Performer?

Conley Abrams
via Internet

A The Ultramix Pro automation system was designed to be a stand-alone automation package. It will work with virtually any recording console or mixer. Because of the closed-

loop nature of the system, however, the Ultrapilot and Ultra 34 communicate in a semi-proprietary language and are not suitable for use with other software packages.

If you have any further questions regarding Ultramix or any other Mackie product, please contact our excellent Technical Support folks at 800-258-6883. (Brian Stan and Michael Wrona of the Mackie Technical Support department presented this answer.)

Thanks for your interest in Mackie products.

Gregg Perry
Director of Advertising & Public
Relations
Mackie Designs, Inc.

BALANCING ACT

Q I just noticed what I at first thought was a reverse polarity problem on a consumer CD player with unbalanced outputs that was plugged into the balanced TRS inputs on my console. Just as I was getting the oscilloscope out to see what was happening, I noticed that the left 1/4-inch phone plug was pushed in only one click instead of all the way. When I pushed it in so that it seated completely, the problem disappeared. What happened?

Devon Sandoval
Racine, WI

A You said that your console had balanced TRS inputs. As you probably know, TRS stands for Tip-Ring-Sleeve, and when used in a balanced input, the tip is the plus (+) signal, the ring is the minus (-) signal, and the sleeve is the shield. When you pushed the phone plug in one click, you had the positive signal from the "tip" of the plug making contact with the negative "ring" portion of the jack. That's what reversed the polarity of the one channel, which was pretty easy to hear on a James Brown album going full tilt on "Get Up (I Feel Like Being A) Sex Machine." I've never thought of it until now, but that's a quick and dirty way to flip the polarity of an unbalanced signal in a pinch.

Mike Sokol
Contributing Editor
EQ magazine

CLICK TRACK

Q I have a problem with my Mac/Studio Vision system in that sometimes I hear a click at the beginning

of an audio event. Even if the event has total silence (all the samples are zero), I still hear a click. I thought this was a Studio Vision problem, but I find the same problem in Pro Tools. Mixing the audio events seems to help, but then the new mixed event has a big click at the beginning of it.

I have Pro Tools Project (NuBus), 882 I/O, SampleCell II, PPC 8100, and SVP 4.0.1. Am I the only one with this problem?

Christian
via Internet

A The problem is not your hardware, it's your Digisetup file. It got corrupted, so that all your events do not get sliced on the zero crossing of the wave, which causes the click. To fix the problem:

1. Remove the Digisetup file (either in system folder, or system folder—preferences)

2. Restart your computer

3. Launch Pro Tools, which will create another Digisetup file

The bad news is that you will need to re-record your audio and redo your session. If you've done a lot of edits on your previous session and want to salvage it, then, in my opinion, the following method is the most practical fix:

1. Gather up all your audio files, create a new session, and bring them all in (either in Pro Tools or Studio Vision). This is a "fixing" session, separate from your original session.

2. Play each file from start to finish and use the analog outputs to record the audio into a new file via the analog inputs. Ensure you've got correct levels and a clean signal path since you need to go analog for this one step.

3. Do one new file for each of the old audio files you created and ensure the new file is exactly the same length (and sample rate) as the old file.

This creates new audio that's free of the "misaligned" wave, and is the same length as the previous audio file. Now take the old audio files and hide them (or move them to another drive, or delete them if you have a backup). Now when you launch your problem session, it will ask to see the old files. Point them to the new duplicates you created and all your edits will now work without clicks.

Amin Bhatia
Film Composer
(and friend of EQ magazine)
www.bhatiamusic.com

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VIDEO-FOR-AUDIO?

Q I'm scheduled to record a live show soon, and I will be renting two TASCAM DA-88's with sync cards. They will also be videotaping the show. I don't know if they plan to edit the video later or not, but I want to sync up the DA-88's with the video. The video equipment is "semi-pro."

What's the easiest way to do this? I was thinking of using a DA-88 to generate sync and record/send LTC (or VTC if the video guy can take it) to the video recorder. Will this work?

I'm assuming that if they edit well enough, there will be only be minor dropouts in the LTC audio? What's the recommended LTC volume level when recording?

Daniel W.
via Internet

A You obviously are an audio guy! Here's the first question: You said the video shoot is "semi-pro." Does that mean they are shooting one or more unlocked cameras?

It should work like this: They have a house sync generator. They feed video ref to all cameras. They choose the frame rate (drop frame for long form). They distribute VIDEO REF and SMPTE to you. (You don't send to them!)

On your end, provided they keep up their end, you would slave both machines to incoming video and SMPTE, not machine to machine. DA-88's record timecode at the level they need (it becomes digitally recorded data) on the internal SMPTE track (provided the machines come with SY-88 cards).

You need to stripe tapes in advance, at the correct sample rate (48 kHz for video and 29.9 DF [Drop Frame] SMPTE) so you can slave. Otherwise, it's a crapshoot.

P.S. — All the rest that you'll need to know about the DA-88 is on my Web site.

Eddie Ciletti
Manhattan Sound
Technicians, NYC
New York, NY

TUBE POWER

Q Thanks to Mike Sokol for the interesting article on tube vs. transistor on his sound advice page. [See Contributing Editor Mike Sokol's Web site: www.soundav.com.]

I have a friend who is looking at putting together a guitar setup (preamp,

power amp, speaker cab), not assembling, mind you, just purchasing. We were talking about what component actually contributes more to the "tube" sound. Does the preamp using 12AX7's contribute as much as the power section using, say, 6L6's? I could see that, at low volumes, your distortion would be from the preamp, but when you're running the power amp close to full-out, that must be different again...I think?

Christian & Stephanie Robinson
Alberta, Canada

A You are correct in assuming that the distortion is a little different in the preamp section and the power section. The main reason is that the preamp tubes are triodes, and most of the time the output tubes are being run in pentode mode. I say "most of the time," since some modern amps have a switch that allows you to turn off the focus grids, essentially turning a pentode tube into a big triode, and losing about half the wattage in the transition. Pentodes in transformer push-pull operation (like all modern amps) have a little less soft compression than a triode and seem to be a little harsher in their distortion coloration than a preamp triode. If you like the sound of the output pentodes, then consider a power soak, which will tame the volume level while letting the amplifier have its head. But be aware that an amplifier-speaker combo running at attenuated volume (via the preamp compression or power soak) doesn't get the extra distortion of the speakers themselves being played at full tilt. And, of course, when things get really loud, your ears start to compress (no kidding).

Mike Sokol
Contributing Editor
EQ magazine

ASK US

Send your questions to:
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CIRCLE 93 ON FREE INFO CARD

THE NEW C4000B MICROPHONE IS TOO HOT TO HANDLE!

If there's someone who knows how to ignite a studio it's engineer/producer Michael Wagener.

With a rap sheet that includes fiery artists such as Metallica, Queen, Skid Row, Extreme, Mötley Crüe, and Janet Jackson, Michael demands a condenser microphone that can take the heat. That's why he uses the **New C4000B** from AKG. Contact your local dealer to find out...what Michael Wagener already knows. AKG's new C4000B will ignite your recordings too!



For more information on the new C4000B and other AKG products, visit our website at: www.akg-acoustics.com, visit your local dealer, write us or e-mail us at: akgusa@harman.com.



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DIGITAL CONTROL WITH THE HUMAN TOUCH

THE SPIRIT 328 REPRESENTS A **NEW WAY OF THINKING** IN DIGITAL CONSOLE DESIGN, BRINGING ALL THE FUNCTIONALITY AND SONIC EXCELLENCE OF DIGITAL MIXING TO ALL AUDIENCES. WITH ITS UNIQUE **CONSOLE-BASED INTERFACE**, THE DIGITAL 328 FINALLY BRIDGES THE GAP BETWEEN ANALOG AND DIGITAL MIXERS, RETAINING THE **SPONTANEITY AND EASE OF USE** OF AN ANALOG CONSOLE YET PROVIDING ALL THE ADVANTAGES OF DIGITAL, SUCH AS INSTANT TOTAL RECALL OF ALL DIGITAL PARAMETERS, MOVING FADER AUTOMATION AND ONBOARD LEXICON EFFECTS.

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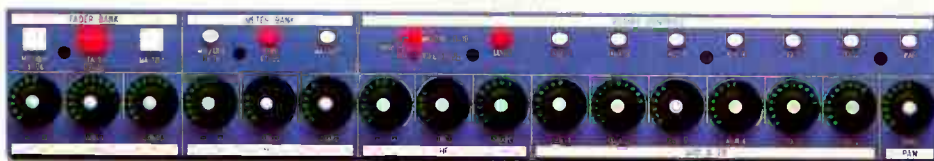
328'S E-STRIP MAY BE CONFIGURED AS...



...A HORIZONTAL INPUT CHANNEL WITH FULL EQ, AUX AND PAN FACILITIES..



...OR A ROW OF 16 AUXES OR FX SENDS FOR THE 16 FADERS BELOW THE E-STRIP...



...OR A SET OF ROTARY LEVEL CONTROLS FOR THE TAPE RETURNS.

42 INPUT/8 BUS CONFIGURATION

For a mixer with such a small footprint, Digital 328 packs an extraordinary number of inputs. Sixteen full spec. analog mono mic/line channels - each with its own balanced XLR connector, dedicated insert point and access to phantom power - come as standard, along with five stereo inputs.

With the 16 digital tape returns on 328's TDiF™ and ADAT™ optical interfaces, there's a maximum of 42 inputs. Every input is fully routable to any of the 8 groups and has access to the full complement of 328's parametric EQ, signal processing, onboard effects and auxiliaries.

AS EASY TO USE AS YOUR CURRENT ANALOG CONSOLE

Although most digital mixers offer an amazing array of functions, it can often be a nightmare to access them.

In contrast, we've designed Spirit 328 to operate like your old analog 8-bus console, and not like a computer with faders. You can practically take it out of its box and get started without even opening the manual! Unlike other digital mixers, there's instant access to any channel, group or master feature with one button press, and you can see that feature's status from the front panel without having to rely on an LCD display. Access is so immediate that you could even use 328 as a live console.

The key to it all is Spirit 328's unique "E-strip", the lighter-colored bank of encoders and switches that runs across the center of the console. Simply select a channel and the E-strip immediately becomes a "horizontal input channel" with instant access to all that channel's EQ, aux sends, channel pan and routing. Alternatively, press any button in the rotaries section above the E-strip and the encoders change to become a channel pan, auxiliary send or Lexicon effects send for each channel.

Select a fader bank to display mic/line input faders, tape returns faders or group and master faders and that's it; no delving through level after level of LCD menus to find the function you want, no delays in making alterations and no need to study complicated EQ curves. With 328, everything you need is immediately accessible from the front panel of the console - giving you the freedom to let your ears decide.

If you want the functionality of a digital console but the usability of your old analog 8-bus, then Spirit 328 is for you.

ALL THE DIGITAL I/Os YOU NEED AS STANDARD

Most digital mixers don't include digital multitrack I/Os, which means that to get digital recording and mixdown you have to buy extra, expensive I/O options. In contrast, Digital 328 includes **two** **Tascam TDiF™** and **two** **Alesis ADAT™** optical interfaces as standard, allowing you to record 16 tracks entirely in the digital domain, straight out of the box. As you would expect, we've also included a pair of **AES/EBU** and **SP/DIF** interfaces assignable to a wide range of inputs and outputs, including group and auxiliary outs. In addition, a third optical output may be used as a digital FX Send or as eight Digital Group Outs. All in all, there are 28 Digital Outs on 328 plus 20 Digital Returns, providing enough flexibility for the most demanding applications.

2 ONBOARD LEXICON EFFECTS UNITS

Only 328 can offer the world's premier name in studio effects onboard - Lexicon. Two separate effects units are included, offering a full range of reverbs, choruses, delays and flanges, all with fully editable program and parameter settings.

ONBOARD DYNAMICS

Digital 328 includes two mono or stereo signal processors which can be assigned to any input, output or groups of ins or outs. Each processor provides a choice of compression, limiting and gating, as well as combinations of these effects.

TDiF is a registered trademark of Tascam Corporation.
ADAT is a registered trademark of Alesis Corporation

digital

three two eight



COMPREHENSIVE EQ

All of 328's mic/line, tape return and stereo inputs have access to three bands of fully parametric EQ, designed by British EQ guru and co-founder of Soundcraft, Graham Blyth. A man with over five million channels of his EQ designs in the field, Graham has brought 25 years of Soundcraft analog EQ circuit experience to bear on Digital 328. If you want the warm, musical sound of real British analog EQ, with proper low, mid and high frequency bands (rather than the low resolution 20Hz - 20kHz bands found on some consoles), look no further.

UNPARALLELED SONIC SPEC

Garbage in, garbage out! It doesn't matter whether the console is digital or analog - if you have poor mic preamps, your sound will be compromised. That's why 328 includes Spirit's acclaimed UltraMic™ padless preamps, giving your input signals the cleanest, quietest start of any digital mixer on the market. With 66dB of gain range and a massive +28dBu of headroom, they offer an extremely low noise floor and are virtually transparent. Spirit 328 is 24-bit throughout, with 56-bit internal processing; your signal hits the digital domain through state-of-the-art 24-bit ADCs with 128 times oversampling, guaranteeing that it maintains its clarity, while 24-bit DACs on all main outputs equal this sonic integrity should you wish to return your signal to the analog world.

MOVING FADER AUTOMATION

All of Digital 328's 100mm faders (including the master) are motorized to allow current channel, tape return, group and aux master levels to be viewed at a glance.

ALL PARAMETERS INSTANTLY RECALLABLE

In addition to level automation, every other digital parameter of 328 is instantly recallable, allowing snapshots of the entire console's status to be taken. Up to 100 of these "scenes" may be stored internally and recalled either manually, against MIDI clock, or against MTC or SMPTE. Alternatively, every console function has been assigned its own MIDI message allowing dynamic automation via sequencer software.

EASY TO EDIT - DIRECT FROM THE CONTROL SURFACE

The majority of 328's input and routing parameters may be edited from the control surface without resorting to the console's LCD. Settings and levels may be copied and pasted from one channel to another with just two button presses and using 328's query mode, the routing or assignment status of every channel on the console may be viewed instantly simply by selecting the function (such as Group 1 or Phase Reverse) you want to question. In addition, with 328's Undo/Redo function located in the master section, editing is entirely non-destructive, allowing you to A/B test new settings with previous ones.

GROWS WITH YOUR NEEDS

Two Digital 328s may be digitally cascaded, giving you up to 84 inputs at mixdown and 32-track digital recording capability.

FULL METERING & MONITORING OPTIONS

All of the mic/line inputs, tape return inputs, group and master levels may be monitored per bank via Digital 328's 16 10-segment bargraph meters. Additionally, 328's onboard dynamics processors may be monitored using the console's master meters. Any input may be solo'd using AFL, PFL or Solo-in-Place.



TIMECODE & MACHINE CONTROL

Digital 328 reads and writes MTC and reads all SMPTE frame rates, with a large display instantly indicating current song position. Store and locate points are accessible from the console's front panel, with 328's transport bar controlling a wide range of devices including Tascam and Alesis digital recorders.

SOFTWARE UPGRADEABLE

328's open architecture means that any functional improvements and software upgrades can be made easily available off Spirit's website. 328 Mixer Maps for popular sequencing software packages are also available free of charge.

ADD-ON MODULE OPTIONS

To meet the needs of a variety of users, there are three module options:

8 Channel Analog I/O Interface

Connecting to the TDIF ports, 16 phono connectors provide eight analog group or direct outs and eight analog inputs for tape returns 17-32. Two interfaces may be connected, allowing 16 track analog recording or access to 16 more sequenced keyboard or sampler inputs.

AES/EBU interface

Four pairs of AES/EBU connectors allow optional digital interfacing to hard disk production systems such as Pro Tools. A maximum of two interfaces may be connected.

Mic Pre-Amp Interface

Each interface provides eight XLR mic ins with UltraMic+ preamps. Connecting two interfaces turns 328 into a 32 mic input, 8-bus mixer for PA or theatre applications.



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EQ PRODUCT VIEWS

EDIT INTERFACE

Studio Audio & Video Ltd., designers and manufacturers of the SADiE 24•96 and Octavia Digital Audio Workstations, announce direct file interchange with Tektronix' Lightworks V.I.P4500 online editing system. The software enables media packs from the Lightworks, Heavyworks, and V.I.P4500 editing systems from Tektronix to be connected directly to all of SADiE's workstations via a standard SCSI interface. Productions started on any of the Lightworks product range are now able to complete the sound design, track-laying, and dubbing on the SADiE 24•96 or Octavia DAWs using the original audio files and ELDs from the Lightworks system. For more information, call SADiE at 615-327-1140, fax them at 615-327-1699, or log on to www.sadieus.com. Circle EQ free lit. #115.



DA BOMB

Providing an extensive menu of Industrial, Techno, and vintage synth programs for the Kurzweil 2000/2500 synthesizers, Sweetwater Sound's *Electron Bomb* CD-ROM is available for \$99. The *Electron Bomb* CD-ROM draws on the work of some of the best programmers in the music industry. It has Gary Phillips's Synthetica Volume I and Volume II, with a big selection of Techno and Electronica sounds, as well as K2500/K2VP/VX and K2000 versions of Andrew Schlesinger's DeepRaved programs for Dance/Techno/Hip Hop. The CD's vintage synth sounds are provided courtesy of Bruce Duncan's Techno/Ambient program set. For more information, call Sweetwater Sound at 800-222-4700, fax them at 219-432-1758, or go to www.sweetwater.com. Circle EQ free lit. #116.

BEAT IT

Red Sound Systems has introduced the Voyager 1 Beat Xtractor. The Voyager 1 simultaneously analyzes two channels of audio from connected vinyl/CD/tape decks and calculates the tempo or BPM of the music. The BPMs are displayed, but, more importantly, the beat information from one of the channels is used to generate a synchronized MIDI clock signal. Connect any MIDI sequencer/tone module to the Voyager 1's MIDI out socket, and it will automatically lock-in and track the tempo of the audio in perfect synchronization. The Voyager 1's intelligent software constantly monitors and corrects relative audio/MIDI beat synchronization point to keep the beats locked together and also follows any major tempo changes in real time if audio playback deck pitch controls are adjusted. For more information, call Red Sound System's exclusive U.S. distributor, Tracoman, Inc., at 954-929-8999, fax them at 954-929-0333, or visit www.tracoman.com. Circle EQ free lit. #117.



DO DIGITAL

The TM-D4000 digital recording console from TASCAM, designed for postproduction, project studio, and home recording environments, is the latest addition to TASCAM's family of digital products. The TM-D4000 has 32 mono and two stereo inputs, feeding eight busses. The input section features six aux sends and 4-band EQ, as well as dynamics on each channel.

Professional-style 100-mm motorized faders are utilized for the 32 mono inputs, the stereo inputs, and the console master fader. Three expansion slots are

available for 8-channel audio I/O on channels 9 through 32, supporting TDIF-1, ADAT, AES/EBU, or analog sources. The console includes full-featured machine control with jog/shuttle dial and record function switches and the ability to address surround sound panning via busses 1 through 6. The 320 x 240 LCD incorporates four rotary encoders for simple parameter control. The suggested retail price is \$4299. For more information, call TASCAM at 323-726-0303, fax them at 323-727-7635, or visit them on the Web at www.tascam.com. Circle EQ free lit. #118.



TAKE A STAND

Quik Lok, the world's largest manufacturer of musical instrument stands, introduces the new Optimum OS-Series Monitor Stands to their line of designer studio stands and furniture. The OS-136 and OS-142 Nearfield Speaker Stands are available in 36- and 42-inch sizes. The vertical, steel metal support column assures the 11- x 11-inch monitor platform will not flex, tilt, wobble, or vibrate under an active monitor speaker. The OS-Series stands feature a large internal compartment for "sand deadening" to eliminate stand resonance and to assure that the monitor remains sturdy. For more details, call Music Industries Corp. at 516-352-4110 or go to www.musicindustries.com. Circle EQ free lit. #119.

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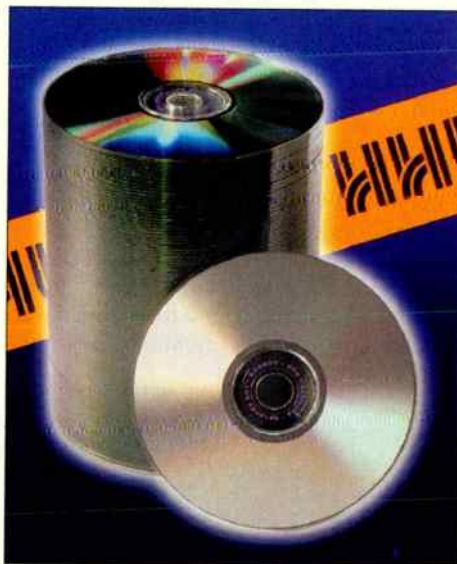
CIRCLE 66 ON FREE INFO CARD

EQ

PRODUCT VIEWS

DOING DSP

New from Prompt Publications, *Simplifying Digital Signal Processing* breaks down the processes of digital communications into their simplest forms. The book builds in a logical progression, from the basic mathematical theories to practical concepts, with plenty of charts, figures, and tables to ensure the subject is fully understood. Topics discussed include signals, transforms, D/A and A/D converters, DSP applications, and more. The price is \$29.95. For more details, call Prompt Publications at 800-428-7267. Circle EQ free lit. #120.



BULK RATE

HHB has announced the launch of a bulk-packaged CD-R disc, the HBB CDR BULK. Developed for use by recording studios, record companies, and mastering houses, the CDR BULK is a high-performance Phthalocyanine disc with a stable archival period rated at 100 years. In response to feedback from major duplication houses, these new bulk-packed discs (shrink-wrapped in quantities of 100 and packed 600 to a box) feature a silver reflective recording surface, giving the appearance of long-run mastered and pressed discs, rather than that of one-off CD-Rs. For more information, call HBB at 310-319-1111 or fax them at 310-319-1311. Circle EQ free lit. #121.

HOW SUITE IT IS

Tracer Technologies offers the Quartz Studio Suite 16, a 16-track software product that supports any sound card. Suite 16 provides eight inputs and 16 outputs of digital recording, full DirectX compatibility, level and pan automation, four auxiliary channels, a full suite of real-time effects, and, most importantly, a familiar interface designed to help a new user become instantly productive. In the effects department, Suite 16 boasts a full complement of internal effects such as reverb, chorus, digital delay, auto-pan, EQ, band-pass filter, compressor, noise gate, and vibrato. The suggested retail price is \$199. For more information, call Tracer Technologies at 717-843-5833, fax them at 717-843-2264, or log on to www.tracertek.com. Circle EQ free lit. #122.



FORM AND FUNCTION

MediaFORM introduces the CD-3706P CD-R Duplicator/Printer. This advanced system will simultaneously duplicate six CDs and then automatically print the CD-Rs with a thermal printer. Once a job is started, the system will duplicate and print up to 175 CDs before it needs to be refilled. The CD-3706P will detect defective blank media and place them in a separate reject area. The MediaFORM controller automatically detects your disc format, so you don't need to be an expert. Optional features include Easi Dat and Easi Audio, which allow you to import audio from nearly any digital or analog audio source. The system allows you to design your own personalized CD surface on your PC with Windows-based Editor software. Use any Windows-installed True Type fonts, get creative with radius type, import specific graphics and logos, or design your own graphics. For more information, call MediaFORM at 610-458-9200, fax 610-458-9554, or log on to www.mediaform.com. Circle EQ free lit. #137.



EXERCISE YOUR OPTIONS

Simultaneous with the introduction of a new flagship surround controller, the MC-1 Music and Cinema processor, Lexicon announces a flexible four-option upgrade program for owners of the MC-1's predecessor, the popular DC-1. Option 1: A dealer-installable software upgrade, incorporating new modes and functions, will also include a backlit remote control. Improvements include enhancements on several film and music modes, new crossovers, new low-frequency spaciousness enhancements, and the ability to create "virtual" rear speakers. The price is \$300. Option 2: The 20-bit D/A converters of DC-1's can be upgraded to 24 bits. All eight channels of conversion are replaced at the Lexicon factory in Bedford, MA. The price is \$600. Option 3: Option 1 and Option 2 can be purchased as a discount package for \$800. Option 4: A trade in of an original DC-1 towards the purchase of the MC-1 is being offered. For more information, call Lexicon at 781-280-0300 or log on to www.lexicon.com. Circle EQ free lit. #138.

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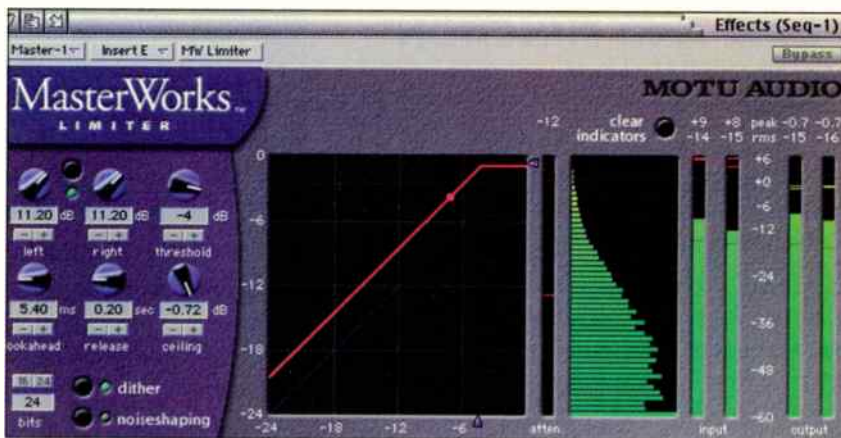


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STAR PERFORMER

Mark of the Unicorn, Inc. (MOTU) announces Digital Performer 2.5, the latest upgrade to its flagship MIDI sequencing and digital audio recording software. New features include a built-in stereo waveform editor, two 64-bit mastering plug-ins, sample accurate editing of MIDI and audio, support for Digidesign's new Pro Tools 2.4 MIX system, and many other enhancements. Other new features include Normalize/Fade In/Fade Out features, which can be applied destructively to audio regions selected in the new Waveform Editor; Insert Measures feature, which allows users to insert any number of blank measures anywhere in their project while preserving all subsequent SMPTE times; and navigation enhancements such as "Live Scrolling," which enables users to quickly and accurately scroll through data. For more information, call Mark of the Unicorn, Inc. at 617-576-2760, fax them at 617-576-3609, or visit www.motu.com. Circle EQ free lit. #126.



AKAI ENHANCEMENTS

Akai Musical Instruments Corporation has introduced several feature enhancements to their DPS12 digital personal studio. The DPS12 is a complete digital studio, combining a 12-track random-access digital disk recorder and digital mixer in one. The new Version 2.0 software for the DPS12 adds the ability to create audio CDs using CD-R/CD-RW drives that support MMC (MultiMedia Command ANSI x3) protocols in both x1 and x2 write modes. With the addition of a supported write drive, DPS12 users can now record, edit, add effects, mix projects, and produce a finished CD. A Timestretch function has also been added, allowing the phase coherent processing of stereo samples. MIDI System Exclusive have been implemented, allowing external control of DPS functions such as Control Panel and Mixer Settings. The DPS12 Version 2.0 Operating System Upgrade will be available for download free of charge on the Akai Web site at www.akai.com/akaipro. For more information, call Akai at 817-831-9203 or fax 817-222-1490. Circle EQ free lit. #127.

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t r i a
TRIAMP SYSTEM

Good things really do come in small packages.

CIRCLE 95 ON FREE INFO CARD

World Radio History

EQ PRODUCT VIEWS

MAKING ROOMS

Cakewalk has introduced the Audio FX3 Soundstage, a virtual room simulator that simulates the complex echoes and ambience produced by the walls and surfaces of a real room. Microphones and up to 20 "performers" can be defined, arranged, and saved within the room. The effects can be used with any digital audio software that supports DirectX, including Cakewalk's Home Studio 8, Professional 8, and Pro Audio 8. For more information, call Cakewalk at 617-441-7870 or visit www.cakewalk.com. Circle EQ free lit. #128.



TUBE TRIO

New from Applied Research and Technology (ART) is the Tube Channel, a single-space tube recording unit featuring a tube mic preamp, an optical compressor, and a 4-channel, tube-based parametric EQ. Inputs and outputs are XLR and 1/4-inch. Loops are provided between each section for routing flexibility, direct inputs and outputs, and inserting other processing gear. The compressor and EQ sections are bypassable and feature detented pots. It is available for \$499. For more information, call ART at 716-436-2720 or visit the company's Web site at www.artroch.com. Circle EQ free lit. #129.



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CIRCLE 61 ON FREE INFO CARD

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B : Press this button



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CIRCLE 88 ON FREE INFO CARD
World Radio History

Zoom, you can *sample* and *mold*.



Postproduction *Down Under*

Australia's Bedford Street Studio scores big with some help from neighboring studios

STUDIO NAME: Bedford Street Studio

LOCATION: Collingwood, 3161 VIC Australia

ESTABLISHED: February 1998

KEY CREW: David Hirschfelder, Sam Schwarz, Christian Scallan, Peter Hoyland

PROJECTS: Composition, orchestration, music desktop publishing, MIDI/audio multitrack recording, editing and mixing, CD production and mastering; *Elizabeth* (film-score soundtrack released 1998), *Inside This Room* (album of new music by David Hirschfelder and David Hobson to be released March 1999)

CREDITS: Staff credits include the work on the films *Elizabeth*, *Shine*, *Sliding Doors*, *The Interview* and *Strictly Ballroom*

CONSOLES: Yamaha 02R (with meter bridge and 16 digital inputs) [2]; Mackie HUI

KEYBOARDS: Yamaha 9-foot Concert Grand piano, DX7 Mk II, and KX-88 controller; Peavey C8P controller keyboard; Roland A-80 controller and JV-90; Korg T2; Rhodes 73 electric piano

MIDI SOUND MODULES: Roland JV-1080 [3]; Yamaha P50m (piano module) [3] and VL70m; Kurzweil K2000R, SX1000+ [2], HX1000+, and GX1000+; EMU Ultra Proteus, Proteus 2 (orchestral) [2], Proteus 2 (world), and Procussion [2]

MONITORS: Meyer HD-1 [2 pairs]; Alesis Monitor One; Yamaha NS-10; Desiére, Monitor Audio

AMPLIFIERS: Meyer HD-1 (powered monitors) [2]; Alesis RA-100; Dex 200; Audiolab 8000X

RECORDERS: Fostex RD-8; Alesis ADAT; TASCAM DA-88

DAT MACHINES: TASCAM DA-30 Mk II and DA-30; Sony PCM-R500

REVERBS: Lexicon PCM80 and NuVerb [2]; TC Electronic M2000

COMPRESSORS: Manley Vari-Mu; Amek

9098; JOEMEEK SC2, Anthony DeMaria

Labs ADL 1500; Summit TLA 100

EQUALIZERS: Focusrite ISA 215; Amek 9098 [2]; Avalon VT-737 SP

MICROPHONES: AKG C414 TLII [2]; Neumann TLM103 [2]; Calrec Soundfield

COMPUTERS AND SOFTWARE:

Apple Macintosh PowerPC 9500/200 (with two 17-inch screens either side of a central 21-inch screen), Macintosh PPC 7300/180, Macintosh PPC 9600/180 (with three 17-inch screens), and Macintosh G3 Powerbook; Digidesign Pro Tools 4.1.1 32-track system [2] and 888 audio interfaces [4]; SampleCell II 32 MB cards (with TDM) [12]; Miro-motion DC20 AV cards [2]; Logic Audio Platinum 3.6

continued on page 159



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NICHOLAS BATZDÖRF,
RECORDING MAGAZINE



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PETE LEONI, PRO-REC MAGAZINE ONLINE

"The ATR-1 saves us an unbelievable amount of time. It goes with me wherever I go."

AL SCHMITT, PRODUCER



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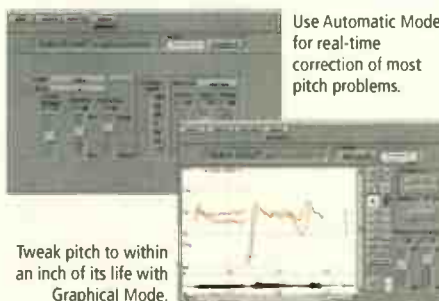
GEORGE DUKE
MUSICIAN/COMPOSER/PRODUCER

REMEMBER THE NOT-SO-GOOD OLD DAYS? Like way back in early '97, when capturing that perfect vocal — the one with emotional power and rock-steady pitch — still often meant hours of frustrating retakes. Or the time-consuming process of comping a track from many separate takes. Or both.

Well, in the two short years since its introduction, Antares's Auto-Tune™ pitch-correction software has, quite literally, revolutionized the practice of recording vocals. Using Antares's proprietary DSP technology, Auto-Tune corrects intonation problems in vocals or solo instruments, in real time, without distortion or artifacts, while preserving all of the expressive nuance of the original performance. With audio quality so pristine that the only difference between what goes in and what comes out is the intonation.

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Back when Auto-Tune was available only as a Pro Tools™ plug-in, we knew of quite a few people who bought kilo-buck Pro Tools systems just to be able to run Auto-Tune. Today (as a quick scan of our bashful spokesmodels will show), there are versions of Auto-Tune compatible with virtually all the leading computer-based digital audio platforms.



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The Professional Standard

Auto-Tune and ATR-1s are used daily by thousands of audio professionals around the world. Whether to save studio and editing time, ease the frustration of endless retakes, or save that otherwise once-in-a-lifetime performance, Antares pitch-correction is the overwhelming tool of choice. Whatever your favorite flavor, check it out at your Antares dealer or call us for a free demo CDROM. And prepare to be amazed.

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World Radio History

CIRCLE 06 ON FREE INFO CARD

Korby Audio Technologies CM3

A new mic from a
tube mic restoration/
repair company

MICROPHONE NAME: Korby Audio Technologies CM3

PRICE: \$2700, including power supply, shock mount, wood case, and cable

TYPE OF MIC: Large-diaphragm, vacuum tube condenser (dual-backplate design)

TUBE: 5703

FILAMENT VOLTAGE: 6.3 volts

POLAR PATTERN: Variable (see notes)

FREQUENCY RESPONSE: 30 Hz to 18,000 Hz

SENSITIVITY: 1.5 millivolts (re: 1 dyne/centimeter squared)

RATED SOURCE IMPEDANCE: 200 ohms

SELF NOISE: Approximately 18 dB, A-weighted

MAXIMUM SPL: 135 dB for 0.5% THD

FRONT-TO-REAR REJECTION: Cardioid: greater than 20 dB between 0 and 180 degrees; Figure eight: greater than 20 dB between 0 and 90 degrees

HARMONIC DISTORTION: Less than 0.5% @ 1 dyne/centimeter squared

DIMENSIONS: 7 inches (length) x 2 inches (diameter)

WEIGHT: 0.6 pounds

MIC NOTES: Development of the Korby Audio Technologies CM3 microphone stems from Korby's background in repair, restoration, and modification of vintage tube mics. The diaphragm in the CM3 is gold-sputtered on capacitor-grade Mylar in Korby's own vacuum chamber. Backplates for the hand-made capsules are individually drilled. Diaphragm thickness varies depending upon the desired sound. The CM3's outboard power supply features a switch for changing the polar pattern from omnidirectional through cardioid to figure eight, with intermediate positions. A stone set in sterling silver on the CM3's anodized brass body provides a unique look to the microphone.

USER TIPS: Engineer/coproducer Richard Mullen and engineer Max Crace have been using the Korby CM3 to record tracks with Eric Johnson for the guitarist's upcoming release. According to Max, "The CM3 is the mic we have been using for all of the vocals on

Eric's project. Typically, we'll run the CM3 through an API 312 mic pre and go straight into Pro Tools. We've also been using the CM3 along with an AKG C414 for Eric's acoustic guitar tracks. The C414 is placed near the 12th fret, between 6 and 18 inches away from the fretboard. Placement of the CM3 varies depending upon the particular guitar, and can be anywhere from directly in front of the sound hole to behind the bridge of the guitar. We usually record Eric's acoustic guitars without compression, either into Pro Tools using an 888 interface or to 2-inch tape, depending on the sound we're trying to get."

CONTACT: For more information, contact Korby Audio Technologies at www.korbyaudio.com or call 412-937-1439. 



PHOTO BY EDWARD COLVER

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CIRCLE 20 ON FREE INFO CARD

Fostex CR200 *and* DAT Machines

A look at getting the most from your Fostex digital recorders

**BY RICK CANNATA,
FOSTEX DIGITAL APPLICATIONS
SPECIALIST**

Many people ask what are the advantages of using a dedicated CD burner as opposed to a computer add-on model. Below I will list the benefits of going with a stand-alone unit, such as the Fostex CR200.

1. The CR200 was designed as a CD mastering unit from its conception. The unit uses one of the best full-disc clamping drives on the market designed for high-end audiophile CD players. Most computer models are designed for writing standard computer data without concerns for plat-

add-on cards or software are necessary to make perfect CD masters or CD clones. Computer models need a driver and related software to operate with the computer of choice. Installing the card and software can be confusing and frustrating for the end user.

COMMONLY ASKED DAT QUESTIONS

Can I use the new "Data Grade" tapes on my machine?

Fostex does not recommend using these tapes for a variety of reasons. The two most important being: [1] the tape is thinner and more prone to stretching and [2] the shells are slightly different than the common audio variety. This can cause loading and shell detection problems.

tapes are very abrasive and can cause premature head wear. In a worst-case scenario, you can clean the heads with a foam swab and freon, rotating the drum and holding the swab stationary with very light pressure. Manual cleaning is best left to a qualified service tech.

Are start ID's and Sub ID's compatible between different manufacturer's machines?

At this time, the Fostex units are compatible with all machines on the market (except



ter stability, jitter components, or tracking accuracy.

2. The CR200 has a multitude of input connectors for any given application: AES/EBU digital, coaxial and optical S/PDIF, RCA unbalanced analog in, and XLR balanced in. Most computers need a sound card, which normally has just a couple of input options. This can be limiting when trying to interface a piece of gear with dissimilar connectors.

3. The CR200 offers the convenience of everything you need straight out of the box. No

those very early machines, which were not corrected).

How should the meters be set?

The meters on the D series machines are calibrated with a reference level of -18 dB. This gives you 22 dB of headroom (the -18 marker on the meter is analogous to the 0 VU point on a VU meter). With the DAT format, there is no need to print the tape with a very hot signal, because there is no noise floor to contend with. When a tape is recorded with signal right up to the end of the unit's meters, there is the possibility of distortion occurring on signal peaks such as a drum hit or an explosive type of sound. In the digital realm, when you overload the level in the machine, you create very severe distortion because you run out of bits. While it is true that the higher up the audio scale you go, the higher the resolution, today's machines offer outstanding audio signal-to-noise ratios with these levels. Levels should be set so that the medium range of the signal should average around the reference level mark. This practice leaves you 22 dB of headroom (at -18 ref. level) for any transient peaks in the signal. **EQ**

How often should I calibrate my machine?

Generally, you should check your machine approximately every eight months under normal conditions. Modern electronics can be very stable, but circuits can drift due to environmental conditions. Also, head wear must be compensated for. This calls for transport alignment and RF adjustments, which should be performed by qualified service personnel.

How often should I clean the machine's heads?

DAT heads are very small and extremely fragile. Unlike analog machines, the heads should be cleaned only when you start noticing high bit error rates. The easiest way to clean a DAT machine is to put in a dry cleaning tape for a maximum of 5-10 seconds. DAT cleaning

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

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- Front panel MIDI activity and SMPTE lock indicators
- \$299 estimated street price

MONTANA

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- Video sync/word clock input locks audio to standard NTSC/PAL video frame rates, or to external word clock
- ADAT Sync output
- Plugs into either PCI or ISA slot
- \$249 estimated street price

DAKOTA

- 16 channels of 24-bit ADAT lightpipe I/O
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- Ultra-efficient bus-mastering PCI interface with scatter-gather DMA
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CIRCLE 69 ON FREE INFO CARD

Liquid Audio **Liquifier Pro 4.0**

Liquid Audio debuts
some new tools to get
your music on the Web
and out to surfers

BY ROGER MAYCOCK

Liquid Audio is recognized throughout our industry as a solution for encoding, storing, promoting, selling, and delivering music over the Internet. The Liquid Audio "system" consists of the Liquifier Pro, the Liquid Music Server, and the Liquid Music Player software. There's also Liquid Express, which is designed for postproduction professionals and their clients as a secure means of handling approval and delivery of projects.

Liquid Audio recently introduced their new Liquifier Pro 4.0 software that provides all the necessary tools for encoding music files, as well as incorporating graphics and descriptive text as part of the publishing process. While we're going to focus primarily on the Liquifier Pro 4.0 software for this article, it's important to have a basic understanding of how the overall system works.

SYSTEM BASICS

You begin by taking one of two options in terms of the server requirements: [1] Establish an ac-

count with Liquid Audio or another Liquid Music System (LMS) provider such as Internet Underground Music Archives (IUMA). This buys you "space" on their servers. Or, if you prefer, [2] set-up your own server — which requires not only an investment in hardware, but also in the server software. Most users will go with option [1] — it's ultimately easier and less expensive if you're not yet generating any significant revenue from your efforts.

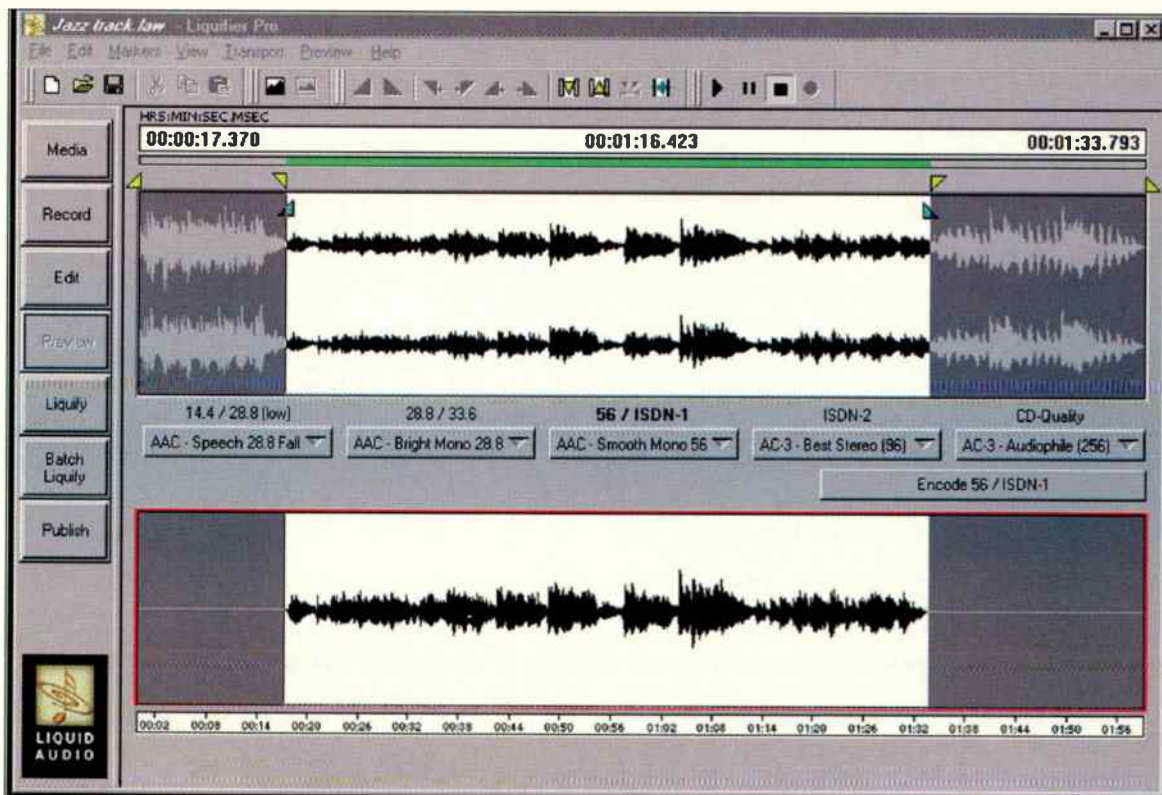
The Liquid Music Server monitors traffic on the 'Net and ensures smooth delivery of your files to the Liquid Player. The server software also allows you to embed product or promotional information (such as tour schedules) along with the audio file (known as a Liquid Track) to be received by the consumer's Liquid Player.

The next step is installing the Liquifier Pro 4.0 software onto your system. If you're part of the Macintosh camp, you'll need a PowerMac, preferably with 64 MB of RAM and System

7.5.3 or higher. Windows users will need a Pentium class machine, ideally with 64 MB of RAM, a 16-bit sound card, and a supported Plextor CD-ROM drive. Both Mac and Windows require 500 MB minimum and prefer 1 GB of available hard disk space.

Once you've published your music to the server, the Liquid Music Player is the final destination for your music. Available as a free download from the Liquid Audio Web site, the player is the key to conducting "music commerce" as it enables your potential customers to preview or purchase your music. Most importantly, the Liquid Music Player handles the purchasing of both downloadable files and the creation of actual CDs. When you click "Buy Download" or "Buy CD," the customer is then prompted for credit card information, contact and shipping information, etc.

The Liquid Music Player also facilitates the viewing of your album graphics, lyrics, liner notes, and promotions while listening. In essence, the Liquid



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LIQUIFIER PRO 4.0

While this may seem obvious, it's important to recognize that you must get your music into the computer before you can expect to use the Liquifier software for encoding and publishing. Assuming you already have a finished product that was mastered to CD, you can use the Liquifier's included audio extraction software to grab the music from the disc and write it to your hard drive as a WAV file. Liquid Audio provides support for Plextor CD-ROM drives. If you have a drive from another manufacturer, you'll need to obtain third-party software to perform this function. Most CD-ROM drives have a utility for this very purpose. Audio extraction is quite fast — a typical 4-minute song is usually processed in roughly 40 seconds.

If your music is on DAT, you'll need to dump it into your computer. I used a sound card with S/PDIF digital capability and re-recorded a song into Sound Forge for the purpose of this article. From there, my WAV file was ready to go.

You'll want to have all your lyrics, credits, copyright notices, artist and composer names, artwork, etc., ready to go, as all of this information gets entered using the Liquifier software. You'll also need to decide whether you want to encode your audio using Dolby Digital or MPEG AAC (Advanced Audio Coding).

MPEG AAC is new to 4.0, and provides high-quality audio at lower data rates for the fastest possible downloads.

Liquifier Pro 4.0 now runs on Windows 98 or NT 4.0 and Macintosh platforms. It also incorporates improved digital watermarking that inaudibly

embeds digital data into the audio file that identifies authentic copies of the music. This is part of a "multi-layer security" process that provides data on who owns the music and who purchased the music. This watermarking process can trace the origin of the music even if it is recorded to analog media such as a cassette tape.

Liquifier Pro 4.0 uses RSA Data Security technology for file encryption — tying specific music to an individual. First-time purchasers of Liquid Audio are issued a Music Passport — allowing them to purchase a Liquid Track and be licensed to play it back on their computer and record it once to a recordable CD. Copies of Liquid Tracks can not be distributed.

On Pentium II class machines, Liquifier Pro 4.0 provides faster than real-time encoding. Version 4.0 also has improved DSP functions for its equalization, dynamics, and sample-rate conversion modules, and has new simplified controls for pre-processing your audio with dynamics and EQ. The new version also provides faster drawing of audio waveforms.

Liquifier Pro 4.0 now has provisions for creating media templates that load automatically upon startup and reduce the time involved in entering routine information required by each file. You can also import text and graphics from an external database — a feature that will

be of considerable significance to publishing houses.

Publishing your music to the Internet with Liquifier Pro 4.0 is easier than you would think. The software takes care of everything. The process involves what boils down to six steps:

1. Enter text and graphics in the Media window.
2. Import the source audio by way of audio extraction or via a sound card.
3. Edit the source audio file.
4. Preview your work from the consumer's perspective.
5. "Liquify" all the images, text, etc., along with the audio to generate a Liquid Master file.
6. Publish the Liquid Master file to the server.

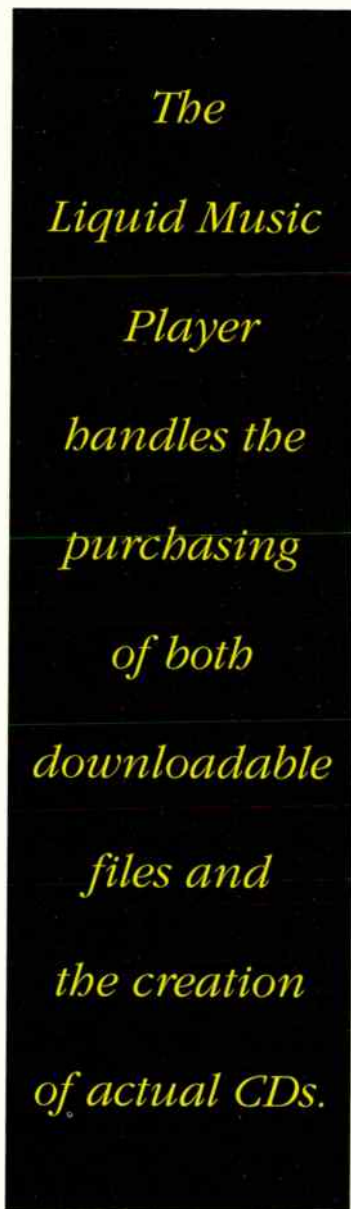
THE LIQUIFIER PRO 4.0 CD

In addition to installers for both the Liquifier and the Liquid Music Player, the Liquifier Pro 4.0 CD includes installers for Adobe Acrobat Reader, Microsoft Internet Explorer, and an extensive assortment of sample and test files. The program's documentation is also provided on the disc. The documentation is very thorough — so much so, in fact, that a printout of the entire 16 chapters and the glossary ends up looking akin to *War and Peace*. The owner's manual is included in Adobe PDF format and is very easy to search through.

IN CONCLUSION

Liquid Audio represents, in my mind, the future of music publishing. For anyone who has ever wrestled with all the legalities of a music publishing deal, the Liquid Audio System represents a quantum leap forward as the software incorporates everything into a highly organized, well-designed process for establishing an e-commerce music presence on the Internet. The Liquifier's screens make sense, are relatively easy to come to terms with, and enable just about anyone to bring their music to the masses. If you're looking to put your music on the 'Net, I can't think of a better-sounding, more secure way to do so.

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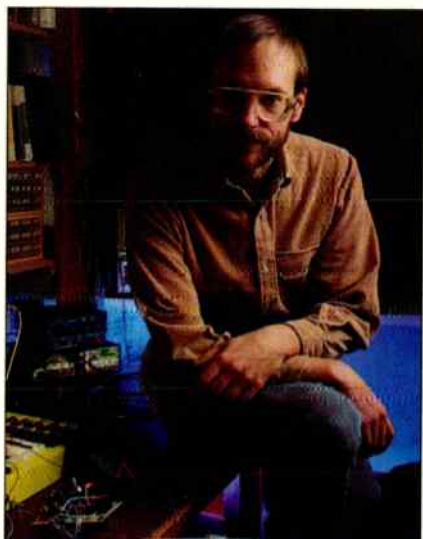
CIRCLE 28 ON FREE INFO CARD

World Radio History

The Underrated World of Stereo MiniDisc

Don't scoff — the audio MD has many more possibilities than you may realize

BY CRAIG ANDERTON



The multitrack MiniDisc has achieved some success among budget-oriented musicians by offering a higher-quality, and far more editable, alternative to the cassette-based multitrack. But what about the original, stereo format from which the multitrack format was derived — is it of any use to us?

Perhaps surprisingly, the answer can be a resounding “yes,” depending on your needs. Let’s take a quick look at MD basics, then some useful applications.

MEET THE MD

The audio MD, championed by Sony, is a recordable, magneto-optical storage format, protected inside a plastic casing that makes it less fragile than a CD. MD recorders use a laser to heat up the disc’s surface; this causes demagnetization, whereupon the recorder ap-

plies a magnetic field that re-magnetizes the particles to “etch” the digital audio signal into the disc. Like a floppy disk, the MD has a file directory (Table of Contents, or TOC) that keeps track of recorded audio. When you enter a track number, the TOC tells the MD where to look for the audio data. These TOC entries can also be named.

Unlike tape, when you want to record, you just record — you don’t have to find an open space, as you do with tape. The MD will find a place on the disc to store the material, and tack on its number to the existing TOC. You can’t get much simpler than that.

The disc’s small size means a limited storage capacity (about 140 MB), so MD uses a data-omission algorithm called ATRAC (Adaptive TRAnsform Acoustic Coding) that throws away about 80 percent of the audio information. This allows 74 minutes of stereo recording, or 148 minutes of mono recording, which would normally require around 770 MB of storage space. Magneto-optical systems are sensitive to vibration; as a result, a RAM buffer keeps enough data “in reserve” so that even if there is a momentary interruption, the music continues.

After a glacially slow start, MD has become extremely popular in Japan, and is rapidly gaining ground in Europe. Because it’s small and portable, MD has replaced the “Walkman”-style cassette player for upscale consumers (MDs are not cheap). Acceptance has lagged in the U.S., but chains such as Circuit City are putting a promotional push on the format; slowly but surely, MD is making inroads in the U.S. In any event, MD has reached enough “critical mass” in terms of worldwide popularity that it should be around for a while (unlike the now dead DCC, which was introduced to the market at roughly the same time).

WHAT IT MEANS TO MUSICIANS

Purchasing an MD has been well worth it to me, despite the expense (\$280 for the recorder, \$40 for a special cable so I could do digital transfers into the MD, and about \$4 per blank disc). Almost immediately after buying it, various applications started becoming apparent.

Before proceeding, though, let’s address the issue of sound quality. No, it’s not quite as good as CD or DAT; however, MD sounds light years ahead of the cassette, which is a fairer comparison. MD isn’t really for master recording, but it does sound just fine, thank you. Those who haven’t auditioned the format since ATRAC’s screechy infancy are in for a major surprise: sound quality has improved dramatically.

So much for details, what follows are some ideas on how to take advantage of MD.

Sampling in the field. I formerly used a Sony Walkman Pro, which had sub-Yugo reliability and sound quality that (despite Dolby B) didn’t cut it in the digital age. MD — which is more compact, handles vibration, fits in a shirt pocket, and has virtually no hiss — is a major improvement. It holds almost as much audio as a C-90 cassette, but doesn’t require flipping something over halfway through. Another bonus: you can label tracks and time-stamp recordings to make it easier to remember what/where you recorded. Yes, small DAT machines have better fidelity for sampling, but optical beats tape for durability and access.

There is one main drawback, though: many DATs have digital outs, but portable MD recorders don’t because they take SCMS seriously. Record digitally into an MD and you can’t make a digital copy; because manufacturers assume your main use will be digital recording, they rarely provide digital outs for portable models. The only workaround for digital transfers is to find a unit that can produce S/PDIF out from standard audio MiniDiscs (e.g. TASCAM’s 564 multitrack).

Testing song orders. One truly nifty feature is that you can edit song orders simply by changing one TOC song number into another. When assembling a CD recently, I recorded all the cuts into MD, then took it with me on the road. I rearranged the tunes in various orders, lived with each order for a while, and eventually ended up with something that worked really well.

Catching inspirations. Because I always keep a mic in an MD carrying



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A Defining of Terms

PHOTO BY JONATHAN POSTAL



Who writes the songs
the whole world sings?

BY AL KOOPER

I received a phone call today from a journalist who was using my quotes in a debate about songwriting. It seems that there are more than a few lawsuits emanating from the Hip-Hop community about who-did-what. Some people feel that if they come up with a signature bass, guitar line, or drum-loop, they are entitled to be songwriters. Bullshit. They are entitled to be musicians, producers, or arrangers.

A song is distilled down to a chord pattern with melody and lyrics riding above it. In the case of many Hip-Hop songs, there is no melody line. A Rap or Hip-Hop song can be distilled down to someone slammin' 4/4 and reciting original verbiage. That is the song itself. If your record or song is sampled by these people, you should be paid royalties. That is another issue entirely. Anything else that is added to that is an arrangement, musician, or production embellishment. Should Nelson Riddle be given songwriter credit on "Love and Marriage" because his arrangement on Sinatra's recording made it much more listenable than some songwriters huddled around a piano? Should George Martin's

name be on The Beatles records of "Yesterday" or "Eleanor Rigby" because you can't think of those songs without recalling melodies from his string charts? No. It was their job to embellish the material and make it more listenable. That is what arrangers and producers do for a living and have pride about in their work. Should Mike Bloomfield or myself be given writers' credits on "Like A Rolling Stone"? I think not. Did that record benefit from our contributions? Yes. Is the song itself any better a song because of it? No.

Legal retaliation is beyond the scope of what most "wronged" people can afford today. That is an injustice in itself. Large corporate monsters can cheat you because you can't afford to do anything about it. Legal counsel, like hotel rooms and airplane tickets, is ludicrously overpriced, generally speaking. Let me give you an example:

Recently, I was, in my opinion, libeled by MCA Records in new liner notes for a reissued catalog CD. I called them the week it was released after I bought it (God forbid they should send the producer a copy) and told them they were libeling me and had a lawyer's letter sent as well. They said they would pull the offending booklet out, rewrite it to tell the truth, and reserve the disc after they sold the initial run of 10,000. Guess what? A year later, and far beyond the sale of 10,000 units, that booklet remains for sale in the same re-pressed CD. It would cost tens of thousands of legal-help dollars to chase these wrongdoers, and the burden of

proof would be on me to substantiate the libel, substantiate the career damage, etc. They win, and I lose. They lied, continue to lie, and they are beyond my legal reach. What's fair?

I'll tell you what's fair. If Puff Daddy samples your record or composition, you should be paid royalties. If you play on or create a drum loop for that record, you should be paid as a musician for that session. If the drum loop, guitar part, or bassline you contribute make that record a hit, you are *not* a songwriter. You're a damned good studio musician doing the job you were paid to do.

If you're hired to write a string arrangement on a Jewel track, and you come up with soaring original counter-melodies and take a 5-chord song and make it sound like Debussy, you are *not* a songwriter. You're a damn good arranger doing a great job and being compensated for it.

If you're hired to produce the Rolling Stones and take them into the next millennium kicking and screaming their 55-year-old heads off, and you succeed and they have a number one album for the first time in 30 years, you are *not* a songwriter. You're a damn good producer doing what you're supposed to do and being compensated for it.

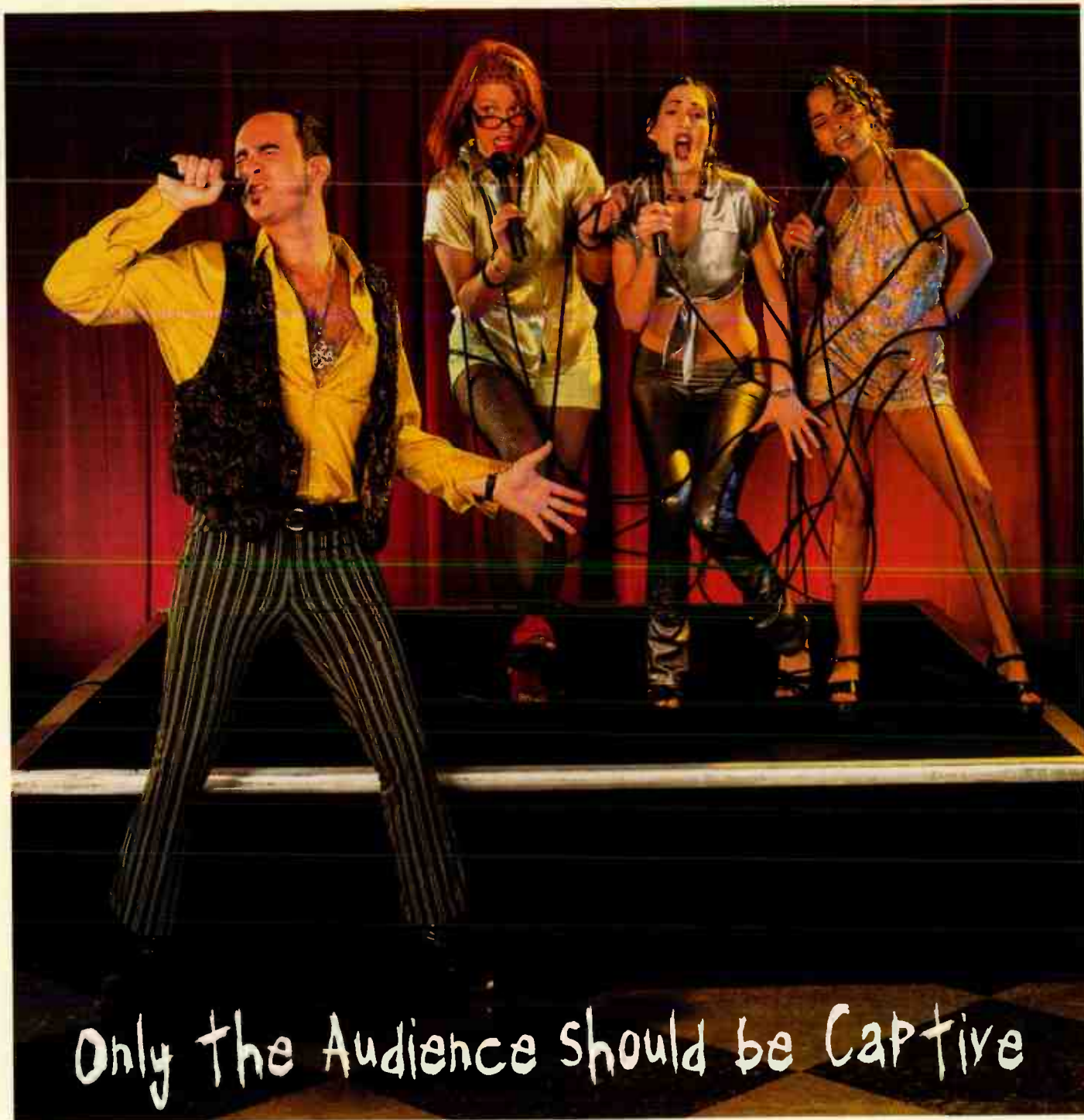
However, if you can lay claim to changing a song in its distilled form; i.e., if you change the

melody or the lyric in a significant way, then you are, indeed, a songwriter.

If you do that and remain uncredited,

continued on page 146

*Some people
feel that if they
come up with a
signature bass
or guitar line,
they are
entitled to be
songwriters.
Bullshit. They
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World Radio History

Guide to *Critical Listening*

The what, why,
and how of proper
monitoring

BY CHRIS PELONIS

What is critical listening?

Throughout our daily activities, our sense of sound plays a remarkable role in our perceptions and abilities relating to the world around us. From the obvious use in communication to the more subliminal effects such as balance and proximity, our interpretation of sound, aside from instinctual reactions, is learned from the time we're born. A good analogy of the difference between casual listening and critical listening is the sound of the surf crashing as you enjoy a day at the beach or the sound of an intruder picking the lock on your front door. All attention is focused on the sound of the intruder, whereas the surf is background.

Training and experience play the important role when it comes to critical listening. Early Native Americans depended on the trained ear for survival when listening for prey or predator. Let's apply this brief introduction to the listening environment of the recording studio. Training to understand image, phase, frequency and amplitude are the stepping stones to successful listening, recording, and mixing.

Balance is a word you will see repeatedly in this article. Critically listening for the balance of artifacts that accumulatively create the material you listen to is the goal. The mind must be trained to interpret and isolate the intricacies of the material you are inspecting. The purpose of this article is to help point the way to a better understanding of what you are or are not hearing in hopes of enabling more articulate expression sonically.

THE TOOLS

There are many choices when it comes to speakers, amplifiers, pre-

amplifiers, cable, connectors, etc. The choice comes down to personal preference and priorities. Hopefully, after reading this article, your choice in monitors will be easier and more confident. There are several things to consider when choosing a monitor. I will go over the qualities of monitors to consider in what I believe to be the order of priority.

Phase is typically my first priority. The way in which sound arrives in the time domain is what gives us the perception of space and placement. Sound travels relatively slow (about 1130 feet per second, which is like a hot-loaded .38 special), so time plays an extremely important role. To re-create the most natural reproduction of sound, the re-creation of the time arrival across the frequency spectrum is crucial. Consider that every millisecond of deviation is 1.13 feet of misplacement. Think about only misjudging the edge of a cliff by 1.13 feet or being only a few inches in the way of a speeding train.

Having sound arrive at your ear with as much of the time information intact is the idea. If a specific frequency or range of frequencies is even ever so slightly out of time, the reproduction of the source is distorted. A visual would be like separating the part of the snare that creates say, 1 kHz and moving it an inch or two closer or further away. As unnatural and out of focus as that would look, it sounds at least as wrong. Try to select a monitor that is ca-

pable of producing accurate phase. With this, achieved imaging becomes most accurate.

Frequency response is a very close second in the priority list. The balance of amplitude across the sound spectrum is very important in the way our brain interprets sound. How much rumble can mean how big of an explosion and how much crack can mean how hard of an impact. Too much sibilance may go undetected if the high end is too recessed or sibilance that is not actually there may be detected if the high end is boosted. The better drivers are typically more capable of producing fairly linear response with less manipulation from the crossover. The less in the path usually means the less phase shift and also the less [fewer] artificial characteristics.

Next on the list is what I call friendliness. All those buzzwords like "silky," "warm," "rich," "sweet," "fat," etc. I love all that stuff, but if I'm making critical decisions, I only want to hear it if it's really there. I have worked on speakers that make mistakes sound good. That's a lot of fun in the living room, but in the studio I don't mind earning a great mix. Whatever monitors you prefer, understand what you are hearing is the bottom line. The more in-focus the picture, the more clearly the imperfections show and the more effectively they can be understood and dealt with.

I am concentrating on the control

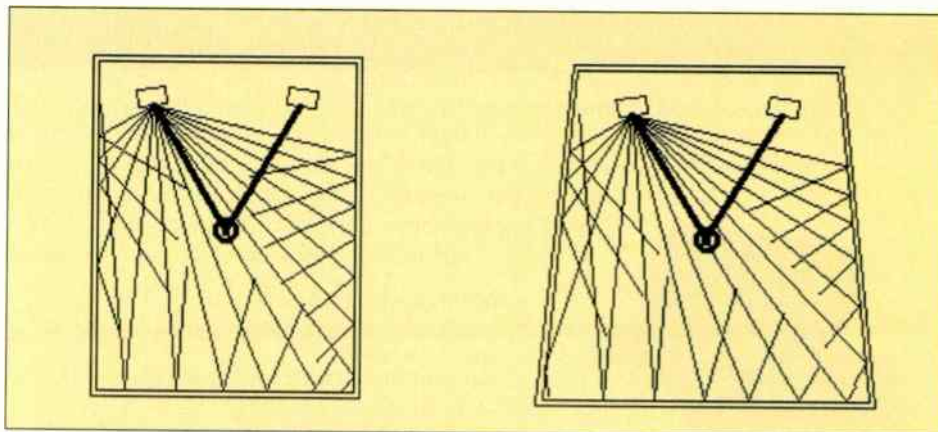


FIGURE 1: Left — Specular reflections in a room with parallel walls. Right — The same rays with the same speaker positioning, only splaying out the side walls helps direct the energy past the listening area.

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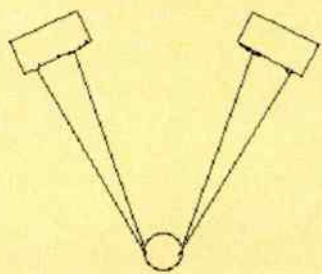
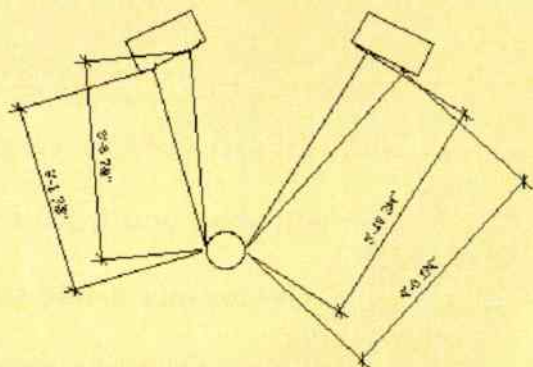


FIGURE 2: Top — All lines are the same length and arrive at the same point. Bottom — Moving the head only 1 foot creates a 2-inch deviation that is one half the wavelength of about 3.5 kHz.



THE ENVIRONMENT

This is where we get down to the goods. You can have the most perfect monitor system on the planet, but if the room is wrong and/or the speakers are improperly installed or positioned, the response at the listening position can be disastrous. This section of the article is most valuable. We are talking about critical listening and have discussed why it is important to have clarity and resolution, etc., but how do we create a situation where critical listening is possible? How can we trust what we hear? The key to these questions lies in the acoustical

environment, and how it couples with the equipment.

Let's assume you have selected your monitors. The first step is properly positioning the speakers. Be aware of boundaries around the speakers and how they affect the response, especially when positioning your near- and mid-field speakers. The more nondirectional low-frequency energy wraps around the backside of the monitor and redirects from the front part of the room back to the listener, but delayed, causing interference with the initial source.

There are some excellent software programs that can assist you in determining speaker and listener positions in rooms with parallel walls (e.g., RPG Room Optimizer and Pilchner Shoustal, Inc. AcousticX). At this point, I haven't heard of software for irregular-shaped rooms. The good old fashion way to determine speaker and listener position is to run an RTA with the mic where you want to sit and move the speaker in 6-inch increments until the low end gets as flat as possible. Or the opposite. Move the microphone while the speaker is station-

ary. It is a bit of work, but it's worth it.

The dispersion characteristics of the monitor must be taken into account in order to realize any potential interference in the room. If possible, acquire polar plots of the speaker so you may understand which frequencies are colliding with which objects or boundaries. First reflections must be eliminated to help ensure that you hear only the speaker. Consider the mid and high frequencies to have a light-beam-like characteristic. If a surface is hard or reflective, the light will reflect off the surface at the same angle it hit. A simple ray-tracing diagram can be of assistance to recognize potential problems (fig. 1). Try to keep equipment racks and other furniture below the line of fire. Not all hard surfaces are bad. Some hard objects may have irregular shape, thus causing diffusion that, in many cases, if it is in the proper location can be an enhancement (Peter D'Antonio of RPG has written many valuable papers on the subject of diffusion, as well as manufacturing several diffusion devices).

It is also very important to understand the on- and off-axis response of the speaker. Some speakers are designed to be a bit off-axis, while others get the optimum results when the listener is perpendicular to the tweeter. In most situations, it is preferred to have good off-axis response to achieve a wider listening area.

The orientation of the drivers (woofer to the tweeter, etc.) is critical to the time arrival and should dictate how the speaker is positioned. The phase characteristics will vary from speaker to speaker, depending on delays caused electronically and the physical alignment of the drivers, so I suggest acoustical measurements to determine the proper alignment to the drivers for the best phase response. (I'm a fan of the JBL SMAART software. It provides phase and frequency, as well as room decay information. My only complaint is that it's not yet available for Mac.)

One big mistake I see often is to lay 2-way nearfield monitors in such a way that the woofer and tweeter are horizontal. This creates a time domain problem where the accurate listening spot is about the size of a dime. In the case of discrete monitors (separate woofer and tweeter as opposed to coaxial or dual concentric, where all frequencies have a common point as the source. With dual-concentric speak-

room mainly, however, critical listening is not by any means limited to the control room. We are talking about tools. The microphone is the main ingredient in capturing sound for reproduction. Critical listening when positioning microphones can definitely make or break a tracking session. Use your ears to determine what you are trying to capture. Once you hear the spot you like, place the mic there. If you choose the right microphone, it's a done deal. Having plenty of high-quality mics and preamps and really knowing them is key. By choosing the right mic and position, the need for equalization and processing is lessened, thus creating a more accurate representation of the subject being recorded. In this situation, the processing may be used for effect rather than repair. Through experience, we determine our likes and dislikes that dictate our decision-making when searching for sounds. The more accurate your reference, the better your choices in the recording process and the more control you have in the mixing process, so choose your weapons carefully.

ers, the vertical and horizontal response is similar), determine the best orientation between the woofer and tweeter for optimum phase and frequency response and focus that point on the same plane as your ears. By having the woofer and tweeter vertical, you can move from left to right across the board with little deviation from the... shall we call it the "Phase Plane." If the drivers are horizontal, moving left to right will cause vary drastic deviations in the time arrival (fig. 2).

Don't get stuck on what you have seen. There's a good chance it was wrong. If being more on-axis to the tweeter gives you better response, flip the speaker upside down. It might look a little funny, but, more often than not, that is the better position for nearfields on a meter bridge that's a little high. As far as soffit-mounted main monitors go, be careful. It's much more difficult to tear the front wall apart then to flip a little nearfield around. Be sure you understand the monitor before you build a home for it.

About low frequency: Out of control

low frequency can definitely ruin your day. In fact, control of the low frequency is the foundation of a good critical listening space. I don't want to get too far into design in this article, but be very aware that the low frequency needs to be understood and treated properly to have a critical listening environment. Where mid and high frequencies act more like light, low-frequency response is dictated by wave acoustics. The relationship of the wavelength to the room dimension does not allow for the directionality required in ray acoustics to be applied. The dimensions of the room dictate the root and thus the harmonic frequencies that will resonate in that room. Low-frequency resonance tends to

Critical listening when positioning mics can definitely make or break a session.

accumulate in the far boundaries of the room, like the corners of a room or where acute angles may exist. Also where parallel surfaces exist, standing waves will occur. This energy loading and crashing back into itself is a bit like a train wreck. The effects of this occurrence disturb the entire spectrum both harmonically and in the perception of balance across the frequency spectrum.

The key is to eliminate the interference without overly affecting the efficiency or musicality of the room. The same way an accomplished martial artist can use or redirect the energy of an attacker to control or subdue with the most efficient use of his own

continued on page 159

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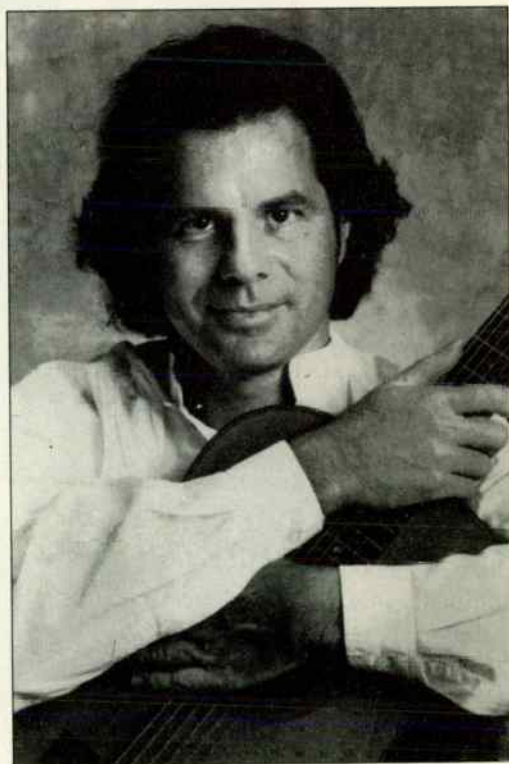
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Bus a Move

Using a digital board
and several project
studios for the
recording of *L.A. Zoo*

BY BUNNY BRUNEL

As a bassist, I've been incredibly fortunate to work with some really terrific people over the years — including Chick Corea, Herbie Hancock, Wayne Shorter, Tony Williams, Al Jarreau, and several others. The experience gained with these people enabled me to branch out into composition for TV and film, as well as the release of six albums of my own. My latest CD, *L.A. Zoo*, has just reached the store shelves and, hopefully, will do well.

Like musicians everywhere, I too am grappling with the transition to digital. Some days all my gear cooperates, and other times it fights me tooth and nail. While I've been working with digital multitracks, sequencers, synths, and samplers for quite some time, the decision to go with a digital mixer was perhaps the most difficult of all. Like so many other project studio operators, the sudden disappearance of so many of the knobs and switches that have dominated recording consoles for years was intimidating as hell. Suddenly, I found myself peering into LCDs, trying to make sense of matters and flipping through multiple functions for the same one button — all the while thinking, "How the hell does anyone ever get comfortable with these things?"

After enduring seemingly countless demonstrations where the salesman ultimately didn't know how to work the board, I was finally able to reach one important conclusion — I wanted a console whose video monitor was tightly integrated into the operating system. I had gotten accustomed to using software-based recording and sequencing programs, and came to appreciate all the information that they typically display. I reasoned that, for me, this approach would be the easiest to come to terms with.

By this point, I had listened to numerous digital consoles and discovered that there is indeed a distinct difference between them when it comes to sound quality. While they all seem to sound great at first, this opinion can change after you've been sitting in front of the board for several hours. Over long sessions, I discovered that some boards sounded harsh to my ear while others seemed "thin" — not at all like the warm, full sound of so many good analog consoles.

Finally, I had reached a decision. My

first digital console would be the Mackie Digital 8•Bus (D8B). Its look seemed quite familiar, the video display delivered all those knobs and switches that I felt I needed to see, and, best of all, I liked the way it sounded. I had been fortunate to observe the board during some sessions I was involved in and never once experienced the kind of ear fatigue I had encountered elsewhere.

My recorders are a combination of two TASCAM DA-88's and the MOTU (Mark of the Unicorn) 2408 tied to a Macintosh. The 2408 provides the ability to interconnect using either Alesis's Lightpipe or TASCAM's TDIF digital interface. I prefer optical, and, as a result, my 2408 connects to the D8B optically while the DA-88's use TDIF. For this reason, I had my console configured for both Lightpipe and TDIF.

L.A. Zoo (released on Shrapnel Records) is an all-instrumental, progressive rock effort that includes performances by Vivian Campbell on guitar, Brian Auger on keyboards, John Wackerman on drums, and special performances by guitarists Ray



PHOTO BY ROGER MAYCOCK

BUS RIDERS: Bunny Brunel (standing) and Barry Rudolph found that Mackie's Digital 8•Bus board gave them increased flexibility when recording.

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Gomez and Mike Stern, plus Jeff Grossberg on harmonica. The actual tracks were recorded in a variety of project studios belonging to these artists and others, and, as a result, the project was recorded in L.A., Chicago, New York, and a few other places over a period of about two years. Like so many other record projects, the DA-88 makes this type of long-distance effort manageable because all you ever need is a rough mix of the music and a few additional tapes and machines to lock to.

By the time all the tracks for the CD had been compiled and edited, I ended up with an average of 32 tracks spread across four DA-88's. With the help of my good friend and recording engineer Barry Rudolph, we transferred 16 of the tracks into the computer via the 2408 and were ready to begin final mixing. Hence, our mix-down configuration consisted of 16 digital tracks via the computer in sync with 16 tracks of DA-88 — all going through the D8B. Now it was up to my new Mackie board to help us deliver the music that had consumed so much of my life for the past two years.

I'm much more of a musician than a recording engineer, and, for this reason, Barry actually engineered the mix — all the while having to endure my constant inquiries as to why he chose to do something one way as opposed to the way I would have done it. I guess that's why he's a recording engineer and I play. Nonetheless, we both had to learn our way around the D8B in order to keep the project moving when one of us couldn't be there. Much to my surprise, the board was quite easy to learn. We were really using the console within our first day and from there, the discovery process continued at an ever-increasing pace.

From a production standpoint, the song "Blue Touch" was the most challenging for us. This is a "Bluesey" kind of number with a Chicago-type horn section toward the end that involved Mike Palmer and Mike Stern on guitar with Jeff Grossberg on harmonica. All three players had the lead melody and played all the way

through the number. From there, we performed an extensive amount of editing so that each player's part came in at different places throughout the song.

Sometimes they ended up playing solo while other times two or all three musicians were performing together. Even though the three players hadn't rehearsed their parts together, it was really amazing how well they complemented each other by the time all the editing was finished. There was a tremendous amount of cutting and pasting on this song, and we used

you next switch back, you don't have some really loud or too soft levels to contend with. Its snapshot automation remembers just about every position on the board with the exception of the Record Ready switches or mic preamp settings."

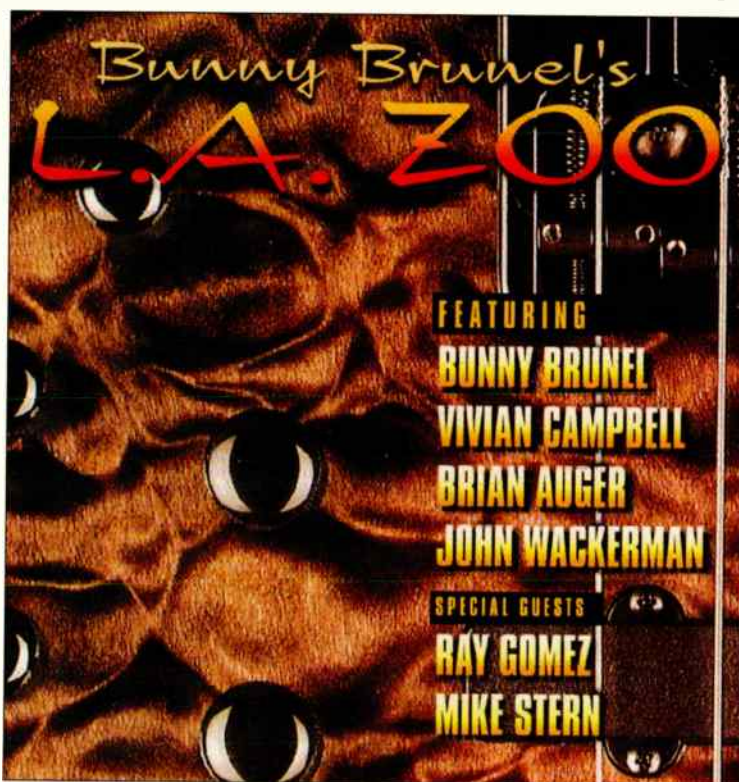
Another aspect of the board that helped us manage all the countless details throughout the mix sessions was its multiple layers of operation. By having separate layers for inputs 1-24, another for inputs 25-48, a layer for effects control and processing, and yet another layer for

MIDI continuous controllers, we were able to rapidly get to any aspect of the mix at the touch of a button. This approach not only saves a tremendous amount of real estate in the studio, but since each layer is remembered, we could get at everything very quickly with each previous setting locked into memory.

All signal processing and dynamics control was handled by the board's internal DSP capability. I currently have two effects cards that provide four stereo effects. Dynamics like compression and gate are independent of these cards. By keeping everything internal, I was able to not only automate every last detail of my effects usage, but we also avoided introducing noise into the mix. Our mixdown deck was a

Sony DT-1000 DAT connected to the board using AES/EBU digital.

In closing, my experience using the D8B was really positive. I had a far more difficult time deciding what I actually needed from a console than I ever did when it came down to actually working with a digital board. If I can offer any advice to those of you who are planning on "taking the plunge," I would encourage you (if at all possible) to sit in on some sessions where the board is in use and observe the way people interact with it. A digital console has to be a good fit for your style of working if it is to really bring out your best efforts. Assuming that the console's design and features make sense to you and you like the way it sounds, I'd say go for it! **EQ**



IT'S ALL HAPPENING....: L.A. Zoo is an instrumental progressive rock album that features many performers.

Opcode's Studio Vision for the job. With the mixer, we also ended up having an incredible number of automated mutes and real-time EQ and effects changes throughout the final edit.

The D8B's automation capability played a huge role in the production of the CD. "This console enables you to automate everything," says Barry. "These days, console automation plays a crucial role in the production of most commercially released projects. Most records simply don't 'fly' unless they're heavily automated. With the D8B, you can even automate your control room monitor volume as you switch from large to small speakers. The board actually remembers the level of each speaker set — so when

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tor, I was able to pan it to the other channel; back it up just for that one spot. Because the splice is at an angle, you can pick up one where the other drops out and vice versa. Nine times out of ten, if one channel has a dropout, the other side won't. I already had it on DAT, so I'd just back it up, cancel the other channel, back it up again, and edit between the pieces."

Sounds easy. And, to an extent, it is, thanks to the state-of-the-art equipment and programs Winner is using.

His *sine qua non* tools are from CEDAR and SADiE, especially when he is recovering masters that predate magnetic tape and were carved live directly into lacquer discs when the performance was going on.

"Essentially what I do is run it through a number of CEDAR boxes I have," he elucidates. "The first one is a phase-corrector (AZ-1), which checks the groove walls' left and right signals 44 times a second, matching them back up. That's because in the early days (and

even to the last of the lacquers that were cut into the '50s and '60s) sometimes the same information that's in both groove walls may be slightly out of phase with respect to one another. The angle of the cutting head when it originally came down determines that — whether it was actually perpendicular to the surface or it may have rocked either way off its axis. That phase-corrector box will correct any sort of distortions. Then it's fed into a declicker (DC-1), which will work on larger-order ticks and pops. Then, the one I love best, is the CR-1, which is called the decrackler. That one works on the smaller order of ticks and pops, fast-running ticks that can be very, very annoying. It's also very good on working on certain stripped grooves. If you have a recording where the grooves are slightly worn and there's a lot of crackle around them, it will remove that fairly well."

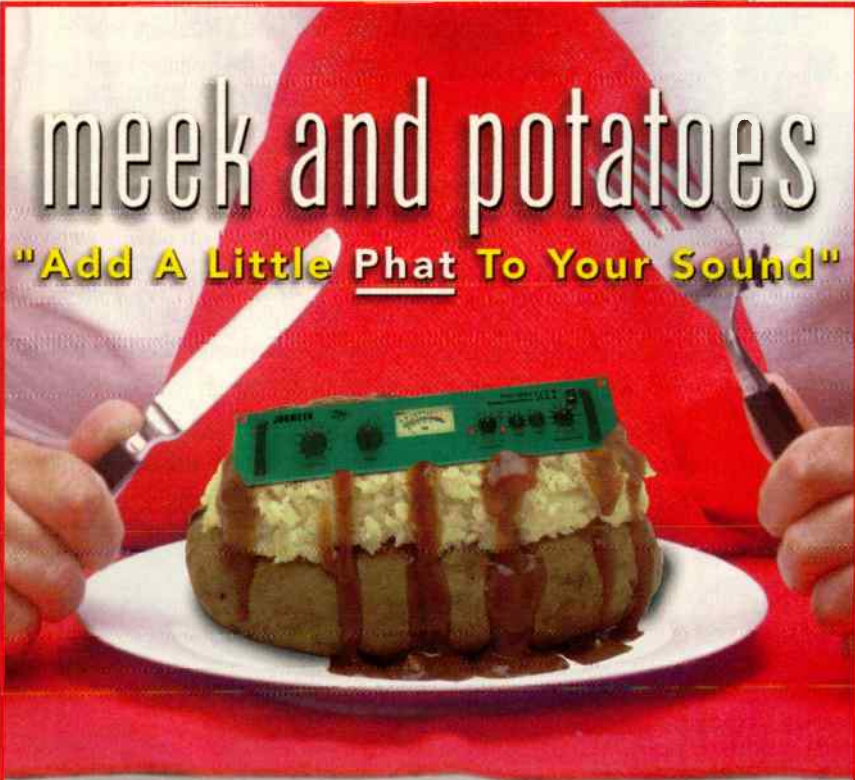
Showing off his equipment further, Winner continues, "Below that is the VH-2, which is the dehisser that works very nicely on reel-to-reel tape noise. At 78 rpm you have to go into something a lot more effective than that, the CEDAR Console NR-3. This is a terrific little piece of software. Here you have a noise-reduction system that takes a fingerprint of the noise in a recording and is able to dehisss it to various levels that you want. It creates an inverse-phase signal, and then you can determine how hard you want to hit it to cancel it out, yet not lose room sound. The beauty of this thing is that after you've done that, if you're still not happy with the EQ you have, you can draw your own curve. And it's pretty much noise-free. The beauty of it is also that you can affect just equalization or just noise reduction. If you want to modify just the noise reduction, you can do it with a pencil, or equalization, or both at the same time. If you like the noise-reduction curve you have and you don't want to change it, you can take that out and when you're doing equalization, it will only affect the equalization curve, not the noise reduction that you've put in. It is something that is quite revolutionary."

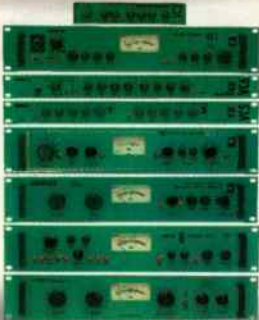
All this on CEDAR alone? "I use quite a bit on CEDAR," Winner says, but "when I want to do fine touching up, once I get it into the editor, SADiE has a whole bunch of equalizations that I can bring up. This is the most powerful

continued on page 144


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World Radio History



PEAVEY

Tracking in the Wild

Gregory Butler goes
on location with
Switchblade Symphony

BY ALAN DI PERNA

"The only real danger was the rattlesnakes," Gregory Butler recalls. "One time, I had a scorpion next to my bed, and another time a black widow spider the size of a truck. But it was neat being out in wildlife. We'd go hiking. A couple of times we slept outside, under the stars."

Butler isn't a naturalist recalling some rainforest expedition, but a record producer talking about his latest project, an album for British "gothic trip hop" duo Switchblade Symphony. The group's third album, *The Three Calamities* (Cleopatra) was tracked in an unfinished rented house high on a Malibu, California cliffside, overlooking the Pacific Ocean. "It was located two-and-a-half miles from the nearest person," Butler elaborates: "No phones. You needed a four-wheel-drive vehicle to get up there. It was glorified camping, really."

But Butler wouldn't have it any other way. An unusual recording location, he finds, can negate the usual studio pressures and bring out performances perhaps unobtainable by any other means. He first caught the location recording bug from friend and associate Mark Howard, who is Daniel Lanois's engineer. "Mark would tell me about all the weird setups they used to do. One time, they were actually going off to record in the side of a mountain out in Mexico. I just thought that was an interesting path to take. That's why Daniel and Mike set up Teatro as well."

Lanois's Teatro studio — built in a reconditioned old movie house in the agricultural community of Oxnard on the outskirts of L.A. — has hosted greats like Bob Dylan and Willie Nelson. The facility served as mothership for the Switchblade Symphony project.

Butler and the band spent a week doing basic tracks for two songs before heading off to their cliffside Malibu retreat. They then returned to Teatro for a few overdubs and mixing after a month of tracking at Malibu.

"I wanted to have something in the can before we went up there," says Butler of the initial session at Teatro. "I don't like starting cold. This way, we had something tangible the moment we turned on our gear at Malibu."

Butler, engineer John Bird, Switchblade Symphony synthesist Susan Wallace, and vocalist Tina Root spent a month living and working at the Malibu house, which Butler had located on the Internet and secured for a monthly rent of \$2100. "The whole house was virtually one room," says Butler. "It was a good couple of thousand square feet, almost like being in a big warehouse, only with an amazing ocean view. There was a loft bedroom, a big kitchen, and a couple of bathrooms, but the house was really unfinished — all cinder block walls and hardwood floors. The main area, where we did the recording, had 20- to 30-foot ceilings with wood beams."

Tracks were recorded onto two Soundscape SSHDR-1+ hard-disk sys-

tems, running on Butler's custom PC Solutions P200 MMX rack-mount computer. "The Soundscape is a stand-alone unit that interfaces with any PC that can run Windows," he explains. "It's a 12-track recorder, and I use two of them; 24 tracks is generally enough. The Soundscape has its own motherboard, so it doesn't use the PC's resources. That meant I could also run two synth/sound design systems — Programmed Reality and Rubber Duck H30 — which is what I use to create my synth sounds."

"Soundscape has an internal 128-channel digital mixer. But to get into that, we just used a little Mackie 1202 and an Alesis 16-channel mixer. The Mackie was mainly used for vocals and some guitar miking. We used an AKG phantom powering unit for mics going into the Mackie, and that seemed to give us a lot cleaner, nice signal. That was the only adaptation we had to make."

For most of the songs, Susan Wallace created MIDI sequences that were then recorded into the Soundscape system. "This way I could do all my manipulations in the digital domain," Butler explains. "So songs would start in the MIDI world, but we didn't ever go back to it. From that



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point on, if we wanted any new keyboards or loops, it all came from us live."

Session players were then brought up the mountain to overdub tracks. "I'd make up a schedule that said, 'Okay, the bass player's coming in for the next three days,'" says Butler. "It would shut us down for a couple of hours to ferry people in and out. Things took a lot of coordination."

Butler took a somewhat unique approach to recording tracks with the musicians involved: "Rather than having the guitarist, drummer, or anyone play to the sequence and say, 'Here's where the verse is, and here's where it goes to the bridge,' I'd just have them play one feel continuously over the whole song. Because Soundscape has all these virtual tracks, I could record many different passes. Afterwards, I could chop it all up and put things where I wanted them. That allowed the players to get a little more creative and also allowed us to work at an unusual pace — almost 24 hours a day. Susan and I both wake up really early. She'd get up and go hiking and I'd get up and turn the equipment on and start doing editing. By 11:00, John and Tina would rise and we'd get into recording again. Tina likes recording vocals at night. So during the day maybe we'd do bass or guitar or more editing. Vocal recording would go on till one in the morning. So it was like shift work. I'd be cooking dinner while they were doing vocals."

Along with conventional drums, guitars, and keyboards, instrumentation for the record included an upright bass and a bowed, one-stringed Southeast Asian instrument called an erhu. Things were generally miked with a CAD Equitek and/or Audio-Technica 4050, often deployed in some close-mic/distant-mic combination.

"For the drums, we used four or five mics all over the place," says Butler. "We had a lot of basic drum mics like AKG D112's and one [Shure SM] 57. We knew that trying to mic it like a normal drum kit would be useless in that room. So we thought, 'Let's make a really huge drum sound then.' We hung Crown PZMs from the ceiling and put mics five feet off, ten feet off, behind the kit...just to try and get the room. And the drums ended up sounding bigger than Led Zeppelin."

"Recording the second song on the record, 'Wicked,' we knew we couldn't put the guitar stacks inside the house. We'd all be dead from the volume. So we said, 'Why don't we put them outside, facing the ocean?' We put one mic right on a speaker, the way you would normally do. But then we put mics out on the cliff, just to see what kind of response we would get. And the main guitar track we used on that song was the one where the mic was 20 or 30 feet away from the amp. When we solo the track, we can hear crickets and the wind blowing through it,



UNFINISHED BUSINESS: The studio was basically one room — and an unfinished room at that, but Butler and the band used the room acoustics to their advantage.

which all works beautifully in the mix.

"Vocals were the only area where we had to try and make the acoustic space of the house a little more reasonable. What we did was put the vocal mic just underneath the loft bedroom, so at least we had a wood ceiling — which was the softest thing in the house — about 10 feet overhead. Then we took a ping pong table, draped a carpet over it, and put it behind Tina, the singer, and then put carpet on the floor. As soon as we did that, the vocals were fine. The only problem was that nobody could use the bathroom or go into the kitchen during a take.

"The weirdest factor was the power," Butler adds. A diesel-powered generator was used in combination with a bank of solar panels to provide electricity to the house. Electricity was needed to pump water into the 3000-gallon holding tank that held the house's water supply, maintaining a fire code minimum of 2000 gallons at all times.

"We had to play off the generator vs. the solar power, vs. our needs, vs. the water pump's needs," Butler says. "We couldn't run the refrigerator at night. Then you've got this thing where the generator puts out a different type of electricity than the solar panels. One's sending sine and the other's sending square. So we couldn't use the solar power on the keyboard and MIDI equipment. We had to use the generator for that or we'd get hum. Needless to say, we had a lot of Furman power conditioners. Also, the house is only 20 amps, as well. So we couldn't have the guitar amps and the MIDI equipment running together. We had to be pretty meticulous. But after a couple of days, you hit a rhythm where you understand what the house needs."

Despite all difficulties, Butler and the group got the tracks they were after. These were transferred to a Studer analog 24-track machine for mixdown by Mark Howard at Teatro. "We found that the analog tape and the Neve board really brought out some nice things in the digital tracks," Butler says. "I didn't print any effects or anything at the house, because I knew Mark would be using his effects during the mix. The only processing I did on the Soundscape was EQ. Mark ended up keeping about 90 percent of that, which is a hell of a compliment for the digi machine, since we were going through the Neve that Phil Spector and John Lennon used to use."

The project served to confirm Butler's faith in going after tracks in wild places. He has plans to record his own band, the Enemy, in the Grand Canyon. And that's one of his more down-to-earth ambitions.

"I want to make a record in a mall," he



ROOM WITH A VIEW: According to Butler, the weirdest part of the setup was the electricity, which was both solar and diesel-powered.

says with a kind of quiet fanaticism. "I want to rent a double store and put Plexiglas along the front of it. Whenever we felt like it, we'd

open up some curtains and look out at people in the mall. But I'd really have to find the right artist for that."

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CIRCLE 51 ON FREE INFO CARD

Burning for Surround

Baking your own CD-R that thinks it's a DVD

BY MIKE SOKOL

EQ magazine is taking a leadership position in bringing you techniques and hardware requirements to get you started doing surround mixes in your own project studio. I'm writing a series of articles as part of the research for my *EQ* 5.1-mixing seminar Road Tour this winter and spring, and you will be seeing them in upcoming issues. But since they won't be in any specific order (other than my deranged mind organizes them), you'll want to save all the issues for reference when you get down to mixing in 5.1 mode. This will be an interesting ride, and I guarantee we'll have fun and learn something in the process.

Mixing music for 5.1 surround is getting a lot of interest from all sectors of the music industry. There are just so many more possibilities for spatial placement of the mixing elements when you have five speakers plus a subwoofer rather than two as in stereo. Of course, all of the heavy-hitters are tooling up to do some cool surround production. And that's fine, but I believe that some of the most innovative

5.1 mixes are going to come from smaller studios. So while many of the "experts" would have us believe that mixing for 5.1 is complicated and expensive and needs to be delegated to dedicated million-dollar rooms, there's nothing to prevent us from starting to experiment with surround mixes in our own more modestly equipped studios.

We're going to skip to the end of the process to what I think is one of the most fun aspects of doing a mix (stereo, 5.1, or otherwise) — showing it off to friends and getting customer approval. One of the problems of doing a 5.1 mix is that it's not readily playable on consumer home-theater systems. Normally you do a discrete mix on the first six tracks of an extra DA-

88 or ADAT deck. That's fine for playing back in your own studio, but how do you check it out on another system? Even if you wanted to drag around a DA-88 deck for playback, most consumer receivers don't have a way to get six discrete channels of information into them. But since there's now in excess of a million home systems that are equipped with a Dolby Digital decoder (also known as AC-3), it's becoming more and more common. I'll bet even your Uncle Floyd has a new home theater that he's using to torment his family.

Dolby Digital is a data compression standard that takes the six channels of 5.1 surround audio and produces a single data file in AC-3 format with about a 12:1



PHOTO ILLUSTRATION BY GREG GENARO

5.1 SURROUND

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Unlike stereo which only has to create an accurate image between and somewhat to the sides of the mix position (usually a small sweet spot), convincing 5.1 surround mixing and scoring demand much more from your monitoring system. The environment must be transformed into a totally 3-dimensional sound stage to be done effectively. This relies on a linear response from the loudspeaker both on and off axis in both the horizontal and vertical planes.

This is simply not possible with conventional multi-driver discrete loudspeakers, which pose a plethora of problems with amplitude linearity, especially off-axis in the vertical dimension. While they might work fine in a fixed position for stereo music production, they just cannot compete with the Tannoy Dual Concentric's ability to reproduce accurate imaging and placement in a 3D stage requiring a linear response on all axis.

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BAKING YOUR OWN CD-AC3 DISC

This will allow you to take a 5.1 mix, encode it as a Dolby Digital AC-3 file with Soft Encode and turn it into a CD-AC3 CD-R on any standard workstation with a CD-R recorder. This CD-AC3 disc should play back on most current-generation home-theater systems with a Dolby Digital Receiver. Each disc can hold up to 74 minutes of 5.1 Dolby Digital (AC-3 format) surround audio.

• **Step 1:** Do a 5.1-surround mix using the console or workstation of your choice. Record it discretely on six-track media (DA-88, ADAT, or open reel) or internally as six separate WAV files in your workstation.

• **Step 2:** If the discrete audio tracks are on external media, transfer or record all channels as separate wave files into your workstation. I've done it using 16/44.1 files, and it should work at bit lengths and rates at up to 24-bit /48 kHz.

• **Step 3:** Open the files in Soft Encode and assign them to the proper channel (L, C, R, Ls, Rs, and LFE).

• **Step 4:** Set the encode parameters for 3/2 Mode, and enable the LFE channel if needed. Set the Data Rate to 448 kbps and the Sample Rate to 44.1 kHz. You can also set the rear channel levels and down-mix levels if desired. Higher data rates with better audio quality will work, and I've tried it at 640 kbps on several different brands of receivers, but I'm not sure all consumer units can utilize higher rates — that remains to be tested. But Dolby says it should work on most current-generation consumer decoders.

• **Step 5:** Go to the File, Save-As pull-down and set it to save as a Dolby Digital WAV (*.WAV).

• **Step 6:** Hit the Record button and name your file. This will make a stereo 16/44.1 file with a WAV extension that has the required padding so that the chosen data rate streams the AC-3 file back at the correct bit rate.

• **Step 7:** Go to the CD-Audio recorder application of your choice and use this stereo 16-bit WAV file to create a standard Red Book audio CD. I've used CD-Architect as well as Adaptec Easy CD Creator. Make sure you mark this as a CD-AC3 disc that's not for playback in an Audio-CD player, as the digital noise will be at full volume level and speaker damage could result.

• **Step 8:** Take the CD-AC3 disc and play it back in any DVD player that's hooked to a 5.1 receiver with a Dolby Digital decoder. Start with the volume turned down low in case the receiver decides you're giving it a PCM file and plays the data "as-is" without decoding, which could damage your speakers. Select the DVD-Digital input on the receiver (optical or wired), and it should detect the Dolby Digital data stream and start decoding it into 5.1 surround.

Challenges

The only problem I've noticed so far is that in some receivers there can be a single digital "click" that occurs the first time the DVD player is started. It appears to happen while the decoder auto-detects and determines if the data is PCM or AC-3 format. Also, I can't get a Pioneer receiver to recognize the AC-3 stream at all; it just mutes. So I'm investigating if there's a way to move an AC-3 identifier to the front of the file or within each audio frame that will grab the converter's attention as quickly as possible. I've also just burned a CD-AC3 disc with mixed modes and data rates on adjacent tracks (2/2 @ 640 kbs followed by 2/3 @ 448 kbs) and the consumer decoder went from track to track without a burp. Therefore, once the receiver knows it's dealing with an AC-3 data stream, it has no problem decoding it.

Further, some early generation DVD players won't recognize CD-R media at all. This has something to do with the color of the dye being incompatible with the laser. Roger Nichols advises me that many of these same DVD players, surprisingly, will read CD-RW media without problems.

Dolby has officially advised me that this CD-AC3 disc should not be used as a master for CD duplication or public distribution since there are no safeguards against someone playing it back in an audio CD player. But it's a great method for making one-off test mixes. I've considered adding a standard audio disclaimer on track 1 that says something like, "This disc contains Dolby Digital data. Do not play in a standard CD player or speaker damage can result."

Please forward any comments or suggestions to jmsokol@intrepid.net.

savings in file size and bandwidth. This AC-3 file is what's encoded on a DVD disc and will eventually be decoded by a Dolby Digital-equipped receiver. Up to a few months ago, you needed to buy a dedicated encoder (such as the Dolby DP569) to make this file. But now Sonic Foundry (and a few others) is selling software versions of the Dolby Digital encoder, and the price has been dropped to less than a \$1000. Still, now that you've got your 5.1 mix encoded as an AC-3 file, what do you do with it?

Up to this point, there were only two ways to hear your AC-3 file back on a consumer system: [1] Have your project mastered onto a DVD disc at great expense and then find out after the deed's been done as to whether you like the mix; [2] Output the AC-3 data stream through an AES/EBU port and record it on a DAT deck. You could then play the DAT back into the digital port on a Dolby Digital-equipped receiver. Right now, a DVD mastering station is about as expensive as CD-R recorders were five

years ago. That is, they cost tens of thousands of dollars for the hardware and software. What this does is put the actual production of DVD masters into the expensive stratosphere of audio projects. You're not likely to get your experimental 5.1 mix on a DVD disc anytime in the near future. And not many home systems have DAT decks to playback the AC-3 data stream. So what's a mother to do?

What I wanted was a way to make my own one-off CD-R discs that would play back in a consumer DVD player and decode as 5.1 surround in a Dolby Digital receiver. All of the industry pundits told me it was impossible (sound familiar?), but while I was visiting Tim Carroll at Dolby Labs in New York, I thought I hit on a way to do it, and he agreed that it should work. EQ magazine's Eddie Ciletti also was there at the moment of inspiration. A few weeks later, Tim e-mailed me to say he had tried it and that indeed it had worked

as envisioned. Since I had just gotten in a copy of Sonic Foundry's Soft Encode, I quickly installed it and made my first AC-3 file. I burned one of these CD-AC3 discs using the recipe in the sidebar, and popped it in my DVD player.

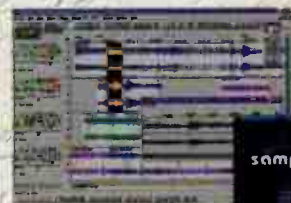
It worked! You could have knocked me over with a feather. Here was a simple solution that would allow a studio to make a 5.1 surround mix and give a copy of it to the producer to take home and compare it to other "DVD" sound tracks. I've played back these CD-AC3 discs

on a half-a-dozen different DVD players and Dolby Digital receivers, and the only decoder that wouldn't digest it was a Panasonic VSX-557. There may be a way to refine the process so it will be totally universal, but that will take some more experimentation. So I'm not proposing this as a mastering process that will be pressed into consumer discs. But it's certainly a great way to hear your mix back on a variety of surround systems, both large and small. And that's the best way to learn what the consumer will actually hear. **EQ**



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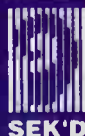
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The EQ *Editing Primer*

OK, you've got it
on tape ... now what?

BY RON STREICHER

You just spent four days in the studio recording your next hit album. All the tracks are ready to go, and you only need to cut it together. This shouldn't be too bad: all you have to do is sort through 223 takes and cut them into 11 songs. It'll be a cinch! Won't it?

Editing is the most critical step in the process of creating a finished album from your original session tracks. You know that all you have to do is pick the best parts of each take and put them together. But where do you begin?

Whether you are working as your own producer or with someone else, the editing session will go much more easily — and consequently be less expensive — if you do your “homework” ahead of time. The key to successful editing is proper and unambiguous identification of each of the musical elements to be used. A carefully prepared Edit Decision List (EDL) and marked music scores are essential to an efficient and productive editing session.

BEFORE THE RECORDING SESSION

The best time to prepare for your editing session is before you even go into the recording studio. Keep good logsheets. There is nothing more frustrating than having hours of session tapes and not knowing where to find that “perfect take” you did at some time

during the early morning hours.

With the common use of DAT recorders as the stereo master format, keeping track of your session has become much easier because a DAT has two built-in locating mechanisms. The first of these are the Start-ID/Program Numbers (PNO's) recorded on the DAT master tapes. On some DAT machines, these are written automatically every time the recorder goes into the Record mode; on others, they can be placed wherever you want at the push of a button. In either case, they should be written at the beginning of each piece of music or take. Therefore, one column on your session log should list each of these ID numbers and the music they represent.

The second DAT reference is the ABS time. This is the “absolute” time, and is essentially a running-time tape counter, referenced to the start of the DAT master tape. It is not exactly “timecode,” but it is quite accurate on most DAT recorders. Also, because it is written directly onto the tape itself, it will read the same on any playback machine, and all direct clones of the DAT Master should have the same ABS time so that your audition reference copy likely will be exactly the same as the DAT master.

[Note: Digital clones of a DAT tape will contain the same ABS and ID codes as the master tape only if they are made via the IEC-958 or S/PDIF “consumer” digital interface. This is because these are written into the subcode data on the tape, which are transferred in this format.

Copying via the AES/EBU digital interface omits this subcode data. Consult the instructions for your DAT recorder for more information on preserving these codes while making copies.]

A second column on the session log should be the ABS time corresponding to the beginning of each DAT-ID. This also can serve as a point of reference for musical events that occur between DAT-IDs, such as during long takes or live performance recordings. (Remember, however, if your audition reference will be a cassette, your machine's time counter numbers will correspond only *approximately* to those you would read on the DAT. Also, because a cassette machine's counter registers only the motion of the tape being played, if you remove the cassette tape, or turn it over, the time reference will be lost. Because cassette timing references do not accurately relate to the master DAT from which you will be editing, they can be used only as loose reference for preparing your Edit Decision List.)

If your original master tape was made during a recording session (as opposed to a concert or “live” performance), a unique take number should be announced at the beginning of each recording throughout the session, and these numbers should be list-



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ed in a Take Number column of the logsheet. Then, during playback, whether you have a DAT or a cassette audition tape, these numbers will be heard at the start of each recording, and serve as a positive identifier for each part of the music you wish to use for editing.

Of course, a concise description of the music being recorded should also be written onto the logsheet. Notate such things as the title of the piece and measure numbers covered if the take is not a complete performance. At the end of each take, while your memory is fresh, it also is a good idea to write down comments about the performance, because these will help you later in choosing only the best takes.

Finally, on the logsheet it is helpful to have a Duration column that notes the durations of the musical selections as they were performed. From these, you can calculate the approximate length of each piece, as well as the entire project. Remember, however, that these will give you only an indication of the duration of each edited segment of the recording; additional time must be allowed for spaces between selections or movements on the finished product. There also may be minor differences between the duration shown and the actual edited duration of the music.

AFTER THE RECORDING SESSION: AUDITIONING YOUR TAPES

Although the final editing session itself probably will take place in the editing suite at the studio, the real process of editing begins when you (and your producer) listen to your audition reference tapes and begin to select the best performances to cut together. This time you spend at home or in your project studio is considered "offline" time, i.e., the clock isn't running at high studio rates! Use this time wisely; it can save you significant money in the final editing process.

It is best to do your listening at a time and place when you will not be distracted so that you can give critical attention to all aspects of the recordings — musical and nonmusical.

Your first listening should be straight through the tapes, as though you were playing a CD you just purchased. This will allow you to develop an overall perspective of the recordings. (If you haven't already done so, number each measure of the score for each piece of music, and use these measure numbers as a positive reference for your editing decisions.) While listening, make notes about anything that catches your attention. Refer these notes to the take and/or DAT-ID

numbers, as well as the measure numbers. During this first listening, begin to think about which takes could be used for the final edited master and which can be discarded right away. At this point, however, do not get bogged down trying to make final editing decisions — unless they are obvious ones.

During subsequent listening sessions, decide which take of each musical passage represents the best performance and which are your second or third choices. Keep good notes, and refer to the musical score by measure number. Continue listening through all the material and make notes for your EDL until you are confident that you have selected and marked the best musical passages for all the pieces in the project. This is the time to be sure that everything is "covered," and that you haven't missed anything.

DECIDING THE ORDER AND DURATION OF THE PROGRAM

If you haven't already done so, determine the order in which the music will appear in the final product and the approximate total duration of the music. If you are producing a compact disc, try to keep the total duration of the disc less than 74 minutes. (Although discs can be made slightly longer, playback may be unreliable in portable or automobile players. There is no rule for the minimum amount of time on a CD, but the buyer may feel cheated if there are less than 50 minutes on the disc.) Don't forget to include the duration of the spaces between the selections. The actual length of each space will depend on the music that precedes and follows it, but figure an average of five seconds for the purpose of these calculations.

If you will be producing cassettes, in addition to total duration of the program (the maximum here is around 90 minutes), there is another significant timing consideration: where to put the side break. Whenever possible, it is preferable for Side One to be longer than Side Two so that listeners won't have to wait through a long pause following the end of the music on Side One until the start of Side Two. Again, when calculating the total duration of the sides, remember to account for the spaces between the selections.

After you make your decisions, prepare a Program Order list, giving the title of each selection and the order in which it is to appear in the finished product. In pieces where there are multiple movements, note these appropriately. Where appropriate, to eliminate any possible ambiguity among similar titles, it is also a good idea to list the

names of composers. If the project will be a cassette, list the selections grouped according to Side One and Side Two.

PREPARING THE EDIT DECISION LIST AND MARKED SCORE

The next step in your homework process is preparing the actual Edit Decision List (EDL) and marked score. These will be the "roadmaps" the editor will use to produce your final edited master tape. Here is where the notes you made while auditioning the tapes will prove their value.

For each piece of music, construct a complete performance using the takes you have marked as your first choice. For example:

Measures 1–5:	Take 3
Measures 6–12, Beat 3:	Take 2
Measures 12, beat 4–Measure 29:	Take 3
Measures 30 to the End:	Take 1

Be sure to also mark the score with these take numbers. If you have alternate choices (always a good idea in case something just doesn't sound right when you make the edit), mark these on your EDL. From the previous example:

Measures 6–12, Beat 3:	Take 2
(Alternate: Take 4)	
Measures 12, Beat 4 – Measure 29:	Take 3
(Alternate: Measures 12, beat 4–Measure 21:	
Take 5	
Then Measures 22–29:	Take 4)

With modern digital editing systems, it is easy to try alternate versions during the editing session, so if you are unsure of your "favorite" choice, mark the alternatives as well. Don't worry too much about the precise note or beat on which to make the edit; this can be determined during the editing session. However, if a particular note of a chosen take is *not* to be included in the final version, be sure this is clearly marked on the score and the EDL.

Mark all the selections to be edited in this same way. If an entire selection is comprised of a single take, just mark it this way on the EDL; you don't need to mark the score. Continue until all selections have been marked on the EDL and the scores. Because you might not be present at the editing sessions, be sure that all your notes are clear and readable. If your notes are ambiguous, at best, your session will be delayed until the editor can contact you; at worst, the edits may be done incorrectly.

GENERAL SUGGESTIONS

"Good editing is creating a performance that could have happened." When deciding where to make the actual edit, the first places to try are entries after a rest or on a

strong beat. Other common edit points are downbeats of measures, beginnings of phrases, abrupt changes of instrumentation or sonority, and any place where something within the music can catch the attention of the listener. If possible, try to avoid editing within long sustained notes — either in the primary voicing or the underlying accompaniment — and rapid runs or repeated notes.

Whenever possible, try not to do an edit inside a musical passage by coming in right from the start of a “dry” take — such as a pickup that comes out of silence. Instead, try to edit from music into music. (This is why you always should record overlaps during the session.)

Listen carefully to your audition tape to determine if there might be problems with tempo or pitch across the edit. If so, be sure to have an alternate version ready, because, even with digital editing, it is not always possible to correct for these problems.

Decide on the *approximate* durations for the spaces between selections, and list these in the EDL. Remember, however, that the final decision need not be made until you and the editor listen to the selections in

sequence and determine what “feels” right with the music.

BEFORE THE EDITING SESSION

Once you have completed your EDL, it's time to schedule the appointment for your editing session. Whether or not you are planning to attend, it is a good idea to send a copy of the EDL and the marked scores in advance so the editor can load the musical material into the computer and setup the format for the project before you arrive. This process can take from two to three times the actual playing time of the tapes, so allow ample lead-time for this.

DURING THE EDITING SESSION

Although you needn't be present during the editing session, if you or your producer can attend, this usually will simplify and expedite review and approval of the editing; you can do this as you go, and you will be able to resolve immediately any questions that might arise. As noted earlier, if you cannot attend, the accuracy and completeness of your EDL and marked score will be all the more critical, and your review and approval will have to be done later.

Editing music by computer is similar to word processing. The original recorded material is never actually altered; rather, markers indicating specific regions are selected, moved around, and placed in sequence. Before you arrive, the various takes you selected will have been transferred from the original session masters into the computer, so that once you begin, the session can proceed without having to spend time shuttling tapes around. Based on your EDL, the editor also will have entered “editing markers” during the transfers into the computer; these denote places where edits are likely to occur, and reduce search time during the actual session. (This is why your EDL and marked scores are so critical to this process, and why the editor needs to receive them in advance of the editing session.)

Most editing is simply a linear assembly of each complete piece from the takes that you have selected. By listening and referring to the marked score, the editor will determine the actual “edit-in” and “edit-out” points for each take and then “capture” these marked regions into an on-screen EDL. Once all the regions have been entered, the computer plays them back in order. Us-

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ing a variety of digital manipulation techniques, all edits can be "fine tuned" until they sound perfectly natural.

The spaces between selections can be comprised of either room tone (the natural "quiet" sound of the room where the recording took place) or pure silence. The choice is a matter of taste. With many types of music, room tone is preferable because pure silence may be too austere — by its very absence of sound it actually can be disturbing. At other times, absolute silence ("digital black") between selections will be more appropriate. The decision as to which will work best is usually left until the editing session.

AFTER THE EDITING SESSION

Once the editing session is completed, you should listen to your edited audition copy as critically as you did the original recordings; this is your last opportunity to determine if everything is satisfactory. While listening, make notes as to anything you feel needs to be corrected. Be as specific as you can with your comments, again referring to measure numbers. If something isn't right and you have an alternate edit to suggest, mark this as you did before.

After you have reviewed this tape, if there are any problems to be corrected, discuss these with the editor. If possible, fax a copy of your notes and comments beforehand so you can review them together. Be sure you are completely satisfied with the final edit. Once you have given written approval of the edited master, this process is done, and the tape is ready for replication. There's no turning back.

ADDITIONAL INFORMATION REQUIRED FOR REPLICATION

In addition to the recording, your album project also includes the packaging: labels, program notes, cover artwork, etc. You (or your producer) should provide the label copy, including the project title, proper title, and composer's name for each piece (and performers if appropriate) listed in program order. *Be as complete and specific as you feel necessary*, but remember that labels have a limited amount of space, so don't try to include too much information here. If your product also will include an insert sheet or booklet, here is where additional information, such as names and biographies of the performers, background information on

the music, text of songs, photographs or artwork, etc., can be printed.

It is very important that you carefully proofread everything you submit for printing. Any errors you let get through probably will be printed, so don't rely on others to catch your mistakes.

THE COMPLETED PROJECT

Once all of the components — the edited master tape, label and insert materials, etc. — are completed, the project is ready for replication. Unless you request a proof copy, the next thing you see will be boxes of finished product. Therefore, it is much better to resolve problems *before* they occur than after they have stalled the process or, worse yet, been repeated in thousands of copies. Again, remember, the better you do your homework, the more easily everything will proceed.

Ron Streicher established Pacific Audio Visual Enterprises in 1972. He has worked with many organizations, including the Bolshoi Theatre Orchestra, L.A. Theater Works, and The Aspen Music Festival, among many others.

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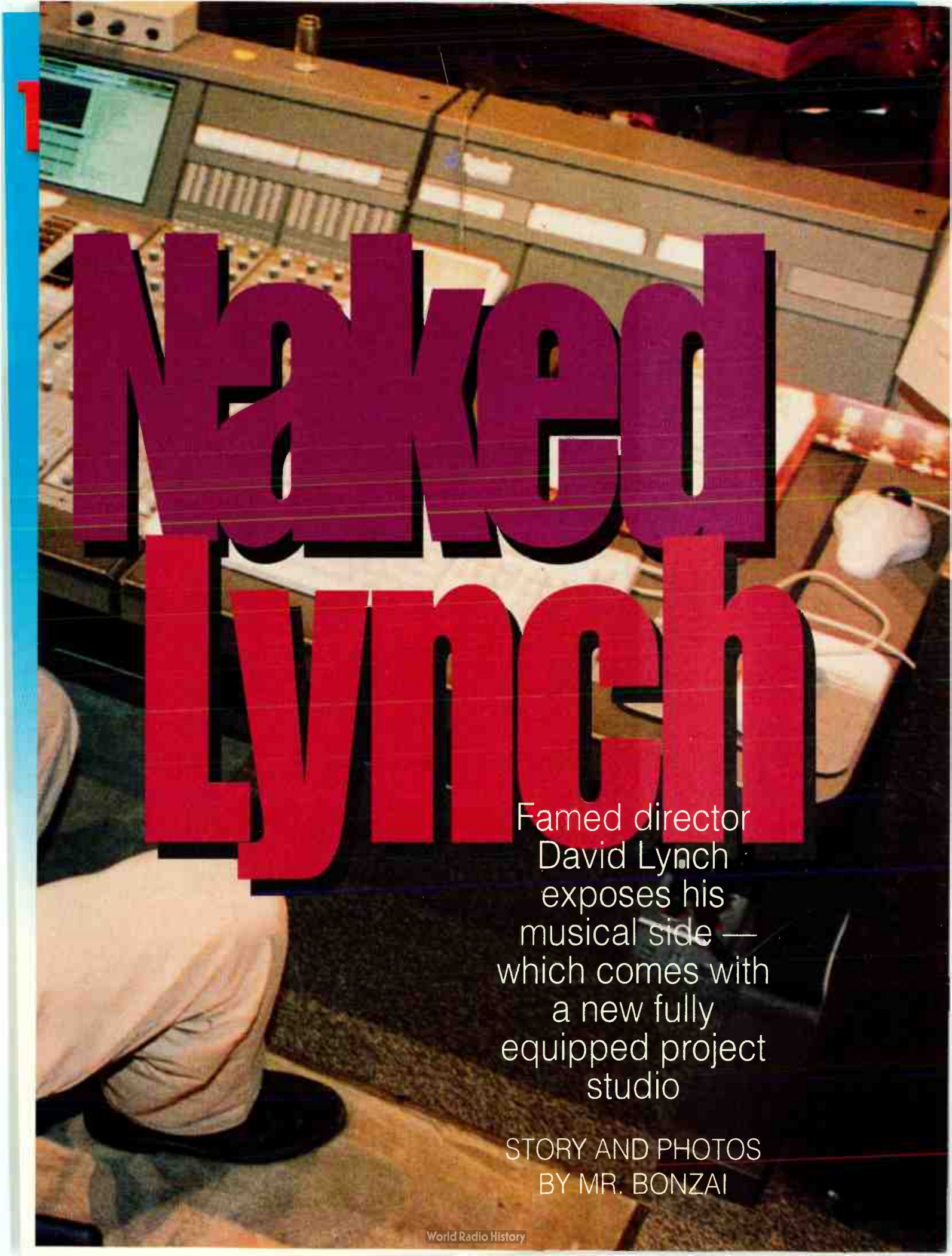
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A photograph of a recording studio control room. In the background, a large, multi-tiered mixing console is visible, featuring numerous sliders, knobs, and a small monitor screen on the left. The room is dimly lit, with some light coming from the console's screens and ambient studio lighting. In the foreground, the lower half of a person is visible, wearing light-colored trousers and dark shoes, sitting on a stool or the floor. The overall atmosphere is professional and technical.

Naked Lynch

Famed director
David Lynch
exposes his
musical side —
which comes with
a new fully
equipped project
studio

STORY AND PHOTOS
BY MR. BONZAI

Naked Lynch

did in this room.

Great sound — the bass just about blew the speakers out of my car. You play the wine glass?

Lynch: Yes, I played a bunch of stuff. Everybody did.

Neff: Jocelyn went into the booth and played a bowl, and David played a glass. We used a guitar tuner to pitch the 24-track to a certain note, and then she played a couple of minutes that we recorded into Pro Tools and VSO'd [varispeed] the 24-track to build a 7-note chord. She sings around that 7-note chord, and we mixed the notes in and out like drawbars.

What is that effect that sounds like a sword coming out of a scabbard?

Lynch: [Laughs.] That's a sword. You just finished filming your new film?

Lynch: Yes, *The Straight Story*. It's about Alvin Straight, a man in his '70s who didn't have a driver's license and was partially blind, and had to walk with two canes. His brother became ill, and he drove a riding lawnmower over 350 miles, taking five weeks to go see him.

Well, you gotta do what you gotta do.

Lynch: Exactly right.

The music will be with your old pal?

Lynch: Yes, Angelo Badalamenti. I'm going out next week to New Jersey to start working on the music. We fly back and forth, and we'll do the final mix here. Angelo likes a couple of studios in New York, particularly Excalibur Sound — Art Pohlemus is the engineer and a great guy. We might use orchestration, and we've gone to Prague twice for that. It's a great orchestra, and I love going there. Angelo actually recorded the very first music done in this room, when we had just finished building it.

Who are the film composers that you look up to?

Lynch: Shostakovich, Nino Rota, Bernard Hermann, and Franz Waxman.

Which directors have given you inspiration?

Lynch: I love Fellini, because I feel a connection with him. And I got to meet him two times. But my biggest influence was the city of Philadelphia. You could love something, but it doesn't really go through you — it has to come from the inside...out. Something goes inside you, is altered, and then

comes out. Philadelphia — a lot of things in life just hit you and might not pop out right away. Later on it does.

Are sound effects musical?

Lynch: There are sound effects and there are sounds that bridge the gap between sound effects and music. And then there is music.



Doesn't the new sampling technology allows us to manipulate sound more?

Lynch: Yes, but you could always manipulate it. My friend Alan and I used to say you could do a symphony with no instruments, nothing — just a tape recorder and a couple of gizmos in a room. There were ways to manipulate sounds, but now it's faster and there are maybe more ways. People are writing unbelievable little programs and there are different boxes, but the only problem is that you lose time by going through the multitude of combos and possibilities.

Are you pleased with the progress of technology?

Lynch: Oh, yeah. [Laughs.]

Are you a religious man?

Lynch: More spiritual than religious. I would be a Hindu if I was going to be anything religious.

Where are your ancestral roots?

Lynch: Well, I'm an American, you know, but I've heard that I've come from every country in North Europe. Ireland, England, France, Germany, Finland, and maybe Sweden. Lynch is an Irish name.

You are also a furniture designer?

Lynch: Yes. I just had a show in Italy. I make a piece of furniture and then Veit Rausch, one of the owners of a Swiss company called Casanostra, and his team build them. They don't have outlets in America.

So, we can't run out...

Lynch: No, you can't run out and snap something up. But
continued on page 144

ASYMMETRICAL VIEWS — EQUIPMENT OVERVIEW

By John Neff, Studio Manager and Chief Engineer

David Lynch's Asymmetrical Studio was conceived as a multipurpose project studio. It had to serve as a film screening room, a dubbing stage (film mixing studio), FX element and ADR recording studio for film and TV, and a top-notch music recording studio.

Peter Grueneisen of studio bau:ton was selected to design the facility, and TEC:ton engineering was selected to specify, procure, and install the various equipment packages and interface systems to complete the studio. At the time, I was the general manager of TEC:ton. We worked with Lee Burton & Associates on the projection and cinema sound systems and with The Desk Doctor on the wiring/interface package. Much of the wiring is Monster Cable.

The centerpiece of the recording system is a Euphonix CS2000 console, consisting of 56 faders with an additional eight groupers, and a Euphonix Cube for Multiformat panning and additional aux sends. Four recording formats are present: an Otari MTR-90/II analog 24-track, TASCAM DA-88 digital, Alesis ADAT digital, and a large Digidesign Pro Tools digital hard-disk system with eight 9-GB Rorke drives. ProTools is the recording system of choice for most projects. The 24-track is most often used as an "instrument" to render a certain sound that only analog recording delivers. Then the material is transferred into Pro Tools for editing and mixing. The 24-track also sees duty as a pitch-shifting device. The ADATs are used for incoming transfers only.

Two-tracks are DATs, including a Sony PCM-7040, and TASCAM DA-60 and DA-30. Analog 2-tracks are available, but not used on a regular basis. A Marantz CDR-620 and PMD-510 dual cassette complete the 2-tracks.

Main monitoring is via the new JBL 5672 three-way cinema sound system for Left, Center, and Right, with eight JBL 8340 surrounds and two JBL 4645-B single 18-inch subwoofers. System controllers are JBL/BSS DSC-280's, and the system is powered by over 7000 watts of Bryston amplification. Mini monitors include Genelec 1031, the ubiquitous Yamaha NS10M, JBL 4208 and 4406, and the obligatory Auratone Super Sound Cube.

Microphones include my collection of over 60, augmented by a pair of Blue-restored Telefunken U47's David just purchased. Mics from Neumann, Sennheiser, AKG, Groove Tubes, Shure, Electro-

Voice, Sony, Countryman, Crown, and others fill the locker.

Outboard equipment contains a large selection of time-domain-based processors, including Lexicon 480-L and PCM-80, many TC Electronic devices (I program factory presets for their new products), including M-2000 and M-3000 reverbs, FireWorx FX, 2290 delay, 1210 Chorus, Eventide DSP-4000 and Instant Flanger, Sony R-7, DigiTech Studio Vocalist, and Ensoniq DP/4.

Preamps include TC Gold Channel and Summit TPA-100, with Dis by Simon Systems, Countryman, and Desk Doctor. Other Summit gear are EQP-200B (Pultec-type) EQ and TLA-100 compressors.

Dynamics are enhanced with a dbx 900 rack containing two 902 de-essers, six 903 compressors (160-type), and a 929 denoiser. Tube Tech LCA-2B stereo tube compressor/limiter, two UREI 1176-LN, JBL M712 compressor/gates, and Orban de-essers complete the picture. A TC Finalizer is the usual mastering dynamic controller. I bring in various vintage pieces and a large MIDI rack for specific applications.

Synchronization is obtained with a Timeline Lynx-II system, consisting of a Keyboard Control Unit (KCU), Film Lynx module, and three Lynx-II synchronizers, under the supervision of a new Euphonix TT-007 master controller. They control the audio recorders and Pro Tools in sync with the Christie/Electrosonic 35-mm dubbing projector and a Sony BVU-950 3/4-inch Umatic-SP video recorder.

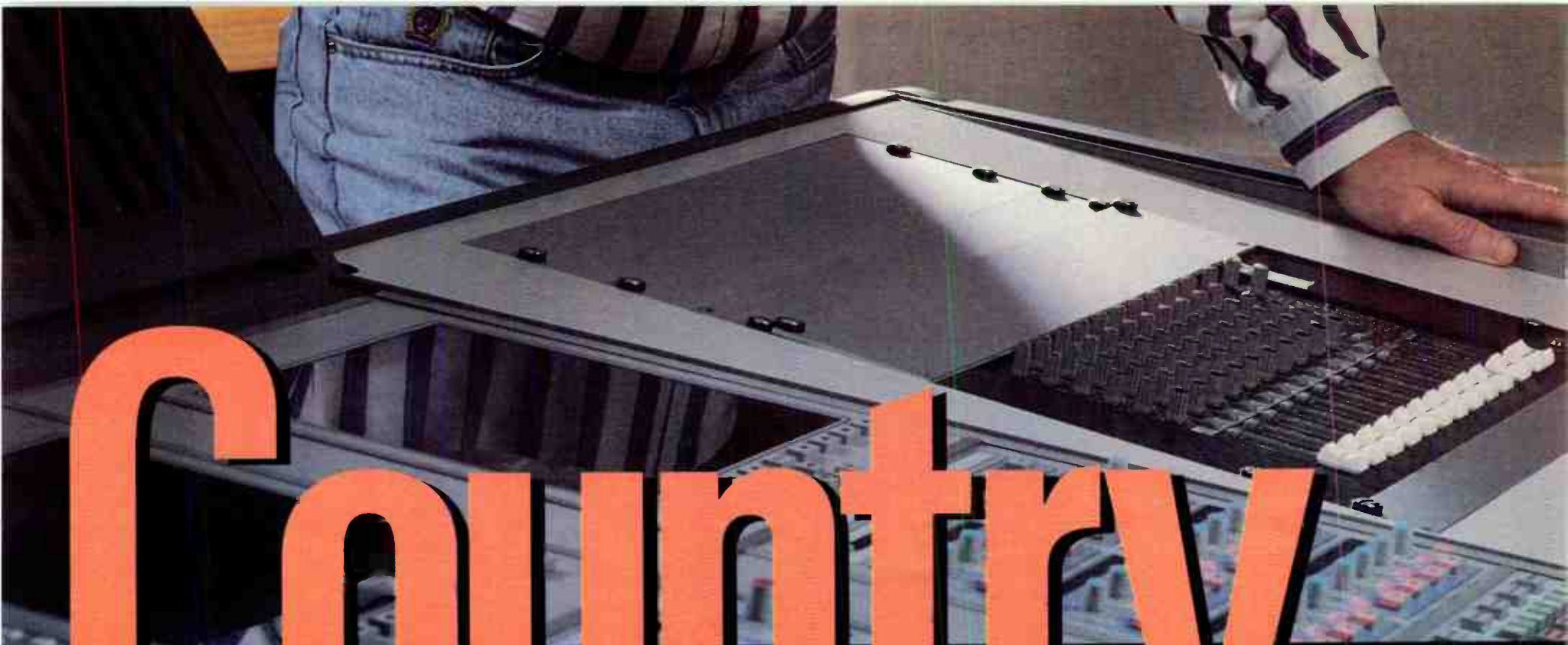
Film projection of both picture and magnetic soundtrack is accomplished with a pair of Strong/Simplex studio-grade 35-mm machines, and video projection with a Sharp LCD projector. Image is put up on a Stewart FilmScreen UltraMatte Cinema Perf 22.5-foot by 11.5-foot screen.

Digital transfers are taken care of by a Z-Systems 32r switcher/router, and a Gefen Systems M&E Pro CD effects library and database organizes and delivers the sound effects.

Computer systems are Apple Macintosh 9600 and G3, running the CD Library, Pro Tools, Sample Cell II, CD Masterlist, Z-Systems, Opcode Studio Vision Pro, and a custom studio administrative software package designed by Andy Wild.

Finally, I have contributed a large collection of vintage guitars, amplifiers, and keyboards. David's personal instruments, including a futuristic guitar he designed, also reside in the studio.





Country in the Key of Seay

BY BOBBY OWSINSKI

Engineer-producer Ed Seay discusses the state of Country music today, as well as his techniques for getting it done

"There's pitch, passion, and pocket. Pocket and pitch can be worked around, but there's no knob for the passion."

Country in the Key of Seay

*Getting his start in Atlanta in the '70s by engineering and producing hits for Paul Davis, Peabo Bryson, and Melissa Manchester, Ed Seay has since become one of the most respected engineers in Nashville, having moved there in 1984. With hit-producing clients such as Pam Tillis, Highway 101, Collin Raye, Martina McBride, Ricky Skaggs, and a host of others, Ed has led the charge in changing the recording approach in Nashville. In this excerpt from my upcoming book, *Mixdown*, Ed describes the evolution of the sound of Country music to what it is today.*

hear guitar, bass, drums, keyboards, a slide or steel, and then a vocal background — that's pretty much the format now...although fiddle is also used. Ironically, a lot of those guys that were making those records have moved here because at this point, this is one of the last bastions of live recording.

So you still do a lot of live recording?

Absolutely. In fact, most of the country records, I'd say 95 percent, are tracked live in some form or fashion. Usually five-piece, with the drums, bass, at least an electric guitar, an acoustic guitar, and a keyboard. Quite often, six-piece with steel going



PHOTOS BY BETH GWINN

How has Country music changed and how does that affect what you do?

Ed Seay: Back when I used to listen to my dad's old Ray Price and Jim Reeves country records, they weren't very far from what pop was in the early '60s — very mellow, big vocals, very subdued band, very little drums, strings, horns, lush. From a mix standpoint, there wasn't really too much difference in an Andy Williams record and one of the old Jim Reeves records.

What happened was that Country got too soft sounding. You'd cut your track and then do some sweetening with some horns and strings. At one time, strings were on all the country records, and then it kind of transformed into where it's at today, with almost no strings on country records except for big ballads. For the most part, horns are completely dead. They're almost taboo. Basically, it's rhythm-track driven and not really very far off from where pop was in the mid-to-later '70s.

The Linda Rondstadt tunes, "It's So Easy To Fall In Love" and "You're No Good," where you

at the same time and occasionally the fiddle, too. So that would be seven pieces, plus the lead vocal. So on at least 95 percent you have at least four to six or seven musicians going down at once.

That must be fun.

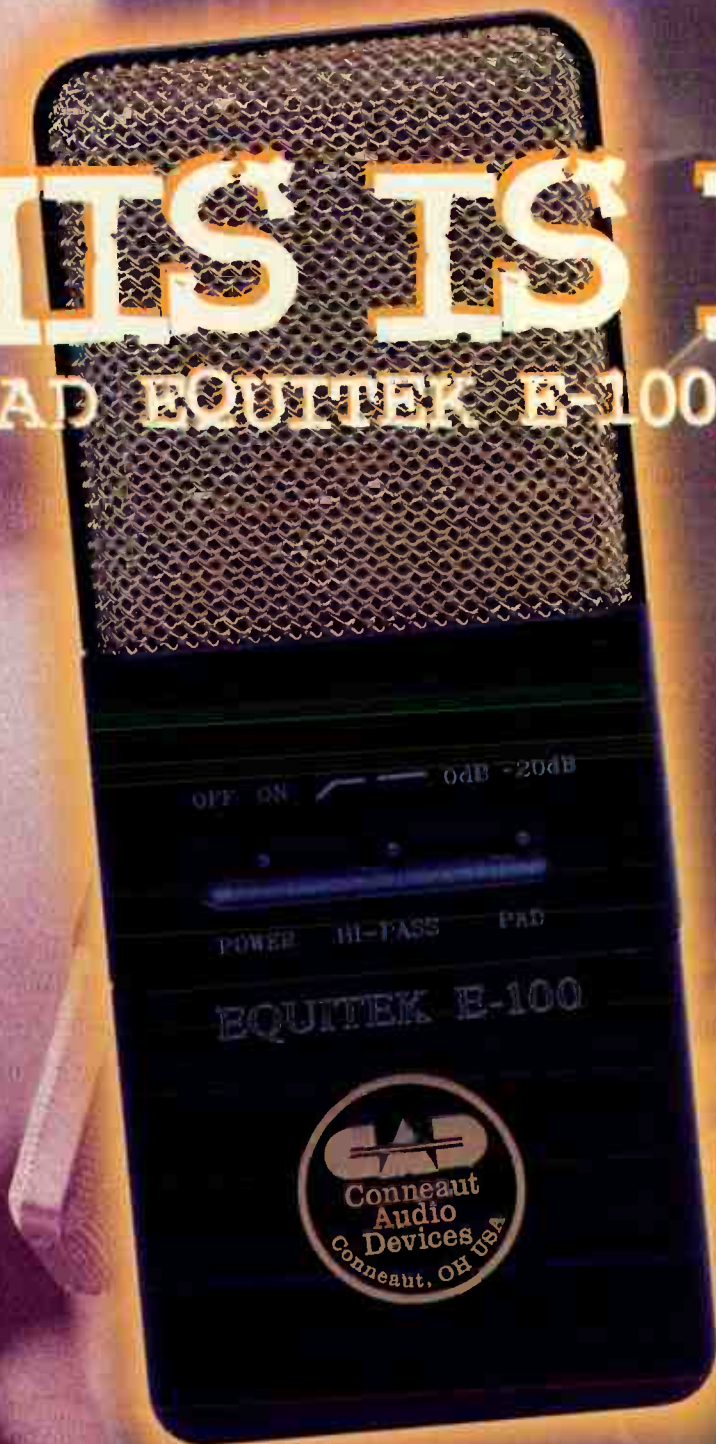
It is. It's exciting and it's a different approach. It's live recording, and what you do on the tracking date is very important. It's not like you start with the drum machine and you add the keyboards and layer-cake up. You catch it all going down at once. You don't have to, but when you have great players and you're prepared and the studio is geared for it, you get some interplay and creativity going between the players. It's fun, and the record has a vibe to it.

It must take a lot less time to cut the records then.

Yeah. Usually you can track your album, provided the songs are in place, in four days, five tops, and sometimes three to four. Then it's usually a mix that takes me about a song a day. So you can figure four days to track, ten days, maybe eleven, to mix. Then all that middle area is for overdubs, and most of the overdubs are vocals. You spend a

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Country in the Key of Seay

edgier sound. I certainly wasn't the only one doing that kind of thing, but the Country music I wanted to make needed to go that way. The younger demographic started paying attention because they didn't want a soft and nice background. They wanted their music to be important and in the foreground, and all of a sudden, it's goodbye strings and see ya on the horn section and the drums got bigger and rawer. Over the stretch of time, I think the public started paying attention and saying, "That's pretty good. I like this."

So I don't know if the technology really did cause that to happen in Country music per se, although the technology was a little behind in Nashville at the time. All of a sudden, though, the budgets got bigger and the equipment got better and people came in with fresh ideas. Right now there are some rooms in Nashville that are as state-of-the-art as probably anywhere on earth.

Do you hear the final mixed songs in your head before you begin to mix?

To some extent. I think one of the things that helps me as a mixer, and one thing that helps all of the ones who have made a mark, is what I call "having the vision." Rather than just randomly pushing up faders, I like to have a vision as far as where we're going and what's the perspective. I try to grasp that early on.

Is there a difference between mixing Country music and other types of music?

Country music is definitely lyric driven. One of the mistakes that some people make when they try to work on Country is that they tend to downplay the lyric or downplay the lead vocal. In Pop and in Rock, you don't always hear every word, and it's kind of okay if the vocal's buried just a little bit. Country is usually not that way. The vocal rules. But at the same time, it's pretty boring if it's all vocals. There's an art to keeping the vocal on top without making it dominate.

When you start to mix, how do you build it?

Well, I'll usually go through and push up instruments to see if there are any trouble spots. I'll work through my mix and try to get it up into the acceptable range, or the exceptional range, or at least somewhere that can be worked with. It takes a cou-

ple of hours to get good sounds on everything, and then another couple of hours to get real good balances. Then I'll do some frequency juggling so that everybody is out of everybody else's way.

The tough part, and the last stage of the mix, is the several hours it takes for me to make it sound emotional and urgent and exciting so that it's just not a song, it's a record. It's not making it just sound good, it's making it sound like an event. Sometimes that means juggling the instruments or the balances, or adding some dynamics. That's the last stage of when I mix, and that's the part that makes it different or special.

So how do you go about doing that?

I try to find what's important in the mix, then make sure that the spotlight shines on that. Sometimes that means playing with compression on the acoustics or auditioning different kinds of compression to make it sound like, "Boy this guy was into it." Sometimes hearing the guy breathe, like on the old Steve Miller records, might make you say, "Man, he's working. I believe it." It's just basically playing with it and trying to put into it that indefinable thing that makes it exciting.

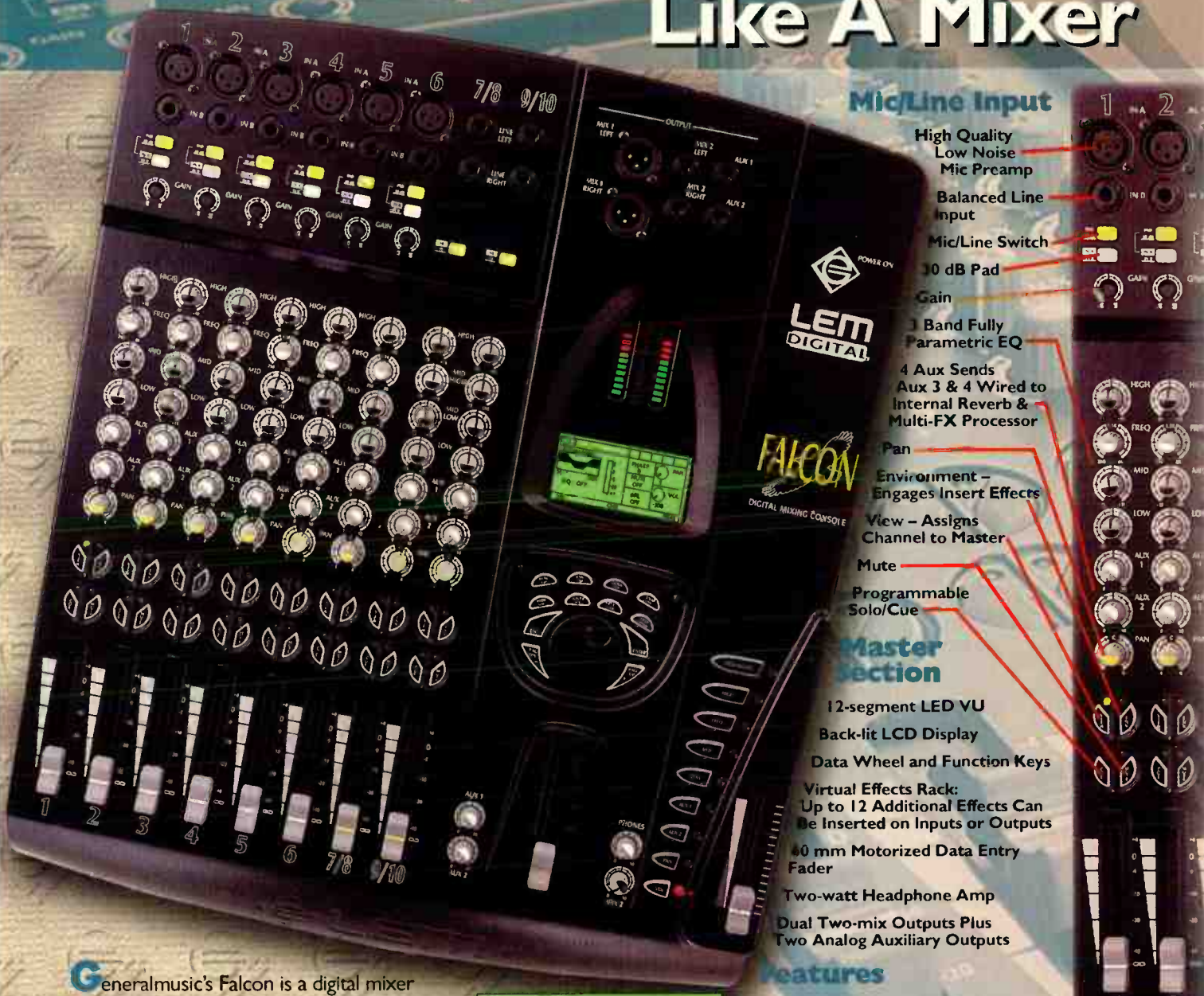
Do you have a special approach to EQ?

I just try to get stuff to sound natural, but be very vivid at the same time. I break it down into roughly three areas: mids, top, and bottom. Except for a very few instruments or a few microphones, cutting flat doesn't sound good to most people's ears. So I'll ask, "Well if this is a state-of-the-art preamp and a great mic and it doesn't sound that great to me, why?" Well, the midrange is not quite vivid enough. Okay, we'll look at the 3k, 4k range, maybe 2500. Why don't we make it kind of come to life — like a shot of cappuccino — and open it up a little bit? But then I'm not hearing the air around things, so let's go up to 10k or 15k and see if we can kind of perk it up. Now all that sounds good, but our bottom is kind of undefined. We don't have any meat down there. Let's sweep through and see what helps the low end.

Sometimes, depending on different instruments, a hundred cycles can do wonders for some instruments. Sometimes you need to dip out at 400 cycles, because that's the area that sometimes just



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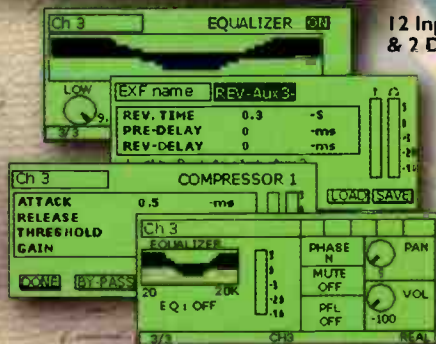
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Country in the Key of Seay

clouds up and takes the clarity away. But, a lot of times, adding a little 400 can fatten things up.

Also, frequency juggling is important. You don't EQ 3k on the vocal and the guitar and the bass and the synth and the piano, because then you have such a buildup there that you have a frequency war going on. So sometimes you can say, "Well, the piano doesn't need 3k, so let's go lower, or, let's go higher." Or, "This vocal will pop through if we shine the light not in his nose, but maybe towards his forehead." In so doing, you can make things more audible and everybody can get some camera time.

Do you have a specific approach to panning?

Yeah, I do. The most significant approach is I pan as if I were sitting in the audience. I try to make stereo records, and I'm not afraid to pan something extremely wide. I like my mixes to have a few things that stick out and get some attention and not just blend in with the crowd. That way, there can be all kinds of contrast, not only volume dynamics, but panning dynamics as well.

One of the things I don't like is what I call "big mono," where there's no difference in the left and the right other than a little warble. If you pan an instrument wide left and right, and then here comes another keyboard and you pan that left and right wide... and then there's the two guitars and you pan them left and right wide.... By the time you get all this stuff left and right wide, there's really no stereo in the sound. It's like having a big mono record, and it's just not really aurally gratifying. So, to me, it's better to have some segregation, and that's one of the ways I try to make everything heard in the mixes.

Give everybody a place on the stage.

How about compression? Do you use it as an effect, just to even things out, or both?

Both. To me, the key to compression is that it makes the instrument sound like it's being turned up, not being turned down. If you choose the wrong compressor or you use it the wrong way, then your stuff can sound like it's always going away from you. If you use the correct compressor for the job, you can make it sound like, "Man, these guys are coming at you." It's very active and aggressive.

But if you remove all dynamics or if you really lean on it in an improper way during mixing, by the time it gets on the radio there's nothing left that'll pump the radio [station] compressors, so then it just kind of lays there. It's loud, but nothing ever really jumps out of your mix.

Do you add effects as you go along, or do you get the balance up and then add the effects?

What I'll do is try to make things sound as good as I can dry. If I hear something that just sounds too isolated and too unrelated to the mix, then I'll add some effects as I go. But I don't go too crazy with it until I get the whole picture. Then, once it's all sitting there, you can easily tell if it's just not gluing together.

My general set up for a mix is I'll have one send set up for long 'verb and another set up for a short — kind of a room simulation. Then

I'll usually have a delay send with something, whether it's 8th note or 16th note or dotted 8th triplets, that kind of works with the music. Then sometimes I'll have a little pitch change, perhaps with a Publison [Infernal Machine, manufactured in the '80s by a French company], or an AMS

"One of the
things I
don't like is
what I call
"big mono,"
where
there's no
difference
in the left
and the
right other
than a little
warble."

harmonized kind of sound. I may have a gated reverb or something that can kind of pull sounds together.

I've done records where I didn't use any effects or any 'verb, but quite often just a little can make a difference. You don't even have to hear it, but you can sense it when it goes away. It's just not quite as friendly sounding.

How loud do you usually listen when you're mixing?

I mix at different levels. I try not to mix too loud because it'll wear you down and fool your perspective. I don't find it extremely valuable to listen loud on big wall monitors very often. The only reason I'll listen to big monitors is to check bottom end. In fact, what I like to do is use the studio's big monitors 1 percent of the time, my nearfields 70 percent of the time, and then use a third reference that's not straight on me, but off to the side in a different place.

My philosophy is that most people don't sit right in-between the speakers when they listen to music. They're in the kitchen and the music's in the living room. Even in the car, you're off to one side a little bit. So to me, that's a valid place to arrive at kind of an average.

Do you ever go out and listen in the car or go into the lounge and listen through the door or anything like that?

Yeah, although I don't go to the car as much as I used to. What I'll do is prop open the control room door and walk down the hall or into the lounge where the music has to wind its way out the door. What you get is like a true acoustic mono. It's real valuable to know if you hear all the parts, and it's real easy to be objective when you're not staring at the speakers and looking at the meters.

How many versions of a mix do you do?

I generally like to put down the mix and then put down a safety of the mix — in case there was a dropout or something went goofy that no one caught. Once I get the mix, then I'll put the lead vocal up half a dB or 8/10 of a dB and this becomes the vocal-up mix. Then I'll do a mix with all vocals up. Sometimes I'll recall the mix and just do backgrounds up and leave the lead vocals alone. Then I'll do one with no lead vocal and just the backgrounds. Then I'll do one with track only and no vocals. That's usually all the versions I'll need to do. **EQ**

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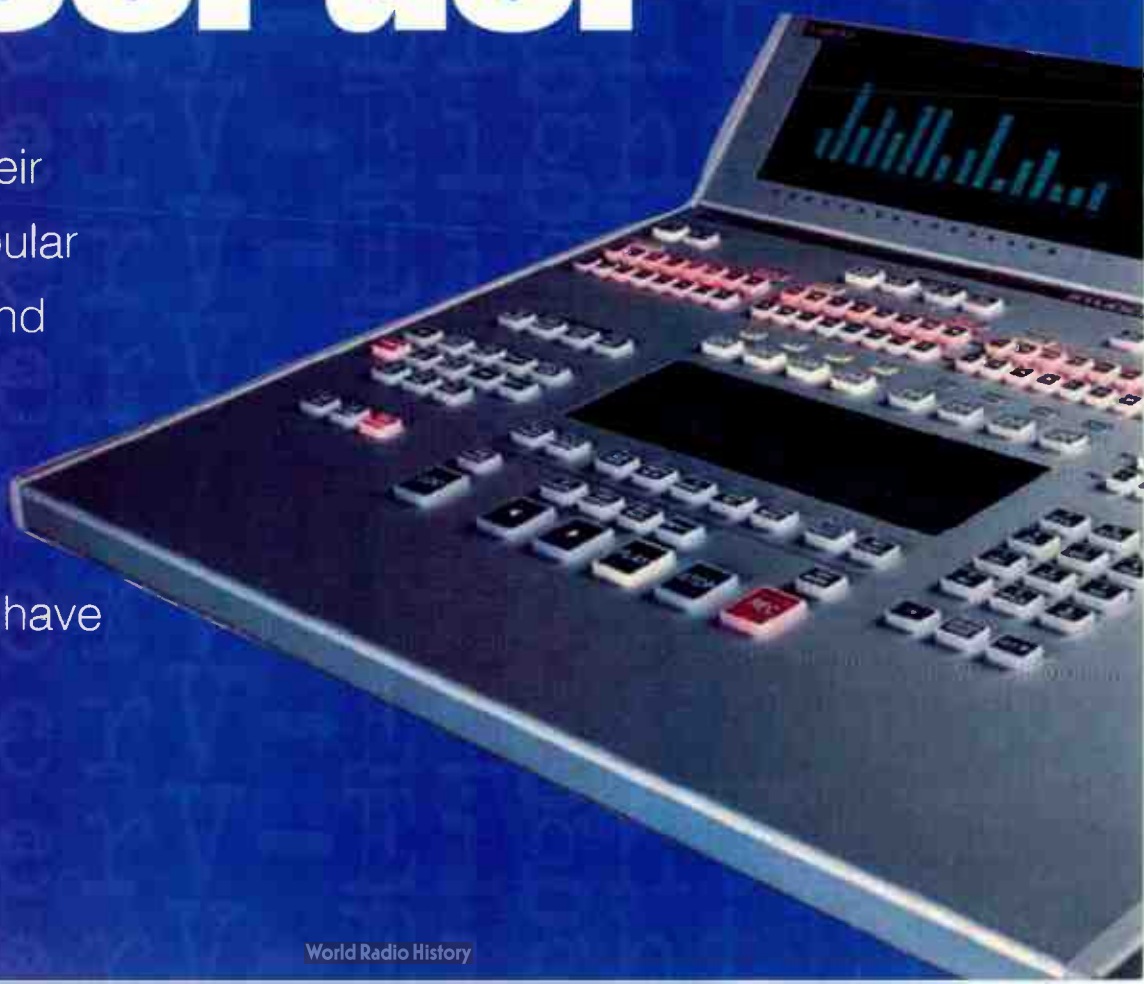
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Zénon Schoepe, EQ Magazine August 1998

Studer V-Eight Digital 8-Track Recorder

Studer offers their take on the popular ADAT format, and makes many improvements to the digital multitracks that have come before

By Eddie Ciletti





Studer V-Eight Digital 8-Track Recorder

I'm a lucky person: tape machines just appear at my door! Take the new Studer V-Eight. For a list price of \$8495 you get a robust 20-bit digital 8-track (S-VHS) tape recorder that's ADAT compatible all the way back to the ancient 16-bit era. In terms of features alone, the V-Eight is seriously deep — capable of full synchronization even without the (extremely desirable) "Cockpit" remote-controller. In fact, there are so many details that all of them couldn't appear in this published review. (Visit my Web site at www.tangible-technology.com for the long version.) The V-Eight should provide a degree of reliability that the ADAT format has long needed; yet this is not quite your father's Studer. For a closer look at the transport, check out the sidebar entitled "About the Guts" on page 100.

TEST DRIVE

After confirming basic operation, the first test drive was to make the V-Eight master to a pair of vintage slaves: a 16-bit XT, as well as a Fostex RD-8, equivalent to a "black-face" ADAT with built-in timecode. The Cockpit can control any combination of ADAT compatibles — up to eight machines — but only the Studer V-Eight or Alesis M-20 can take advantage of the full feature set. Each can be toggled on- and offline via a dedicated button. My ancient machines chased perfectly well, even though both the V-Eight and the Cockpit claimed the second slave was "Unresponsive." This would have been a drag if I wanted to overdub on the RD-8. Swapping cables offered no improvement. Conversations with Studer (so far) confirmed my hunch, that this is a software thang.

IT'S ALWAYS THE QUIET ONE!

In all of my noise tests, the V-Eight is clearly a winner. I don't have test equipment capable of measuring the 102 dB/105 dB A-weighted dynamic range (A-to-D/D-to-A, respectively). Instead, I chose to compare three generations of machines by connecting their analog outputs to a 24-input mixer, listening to the low-level noise floor while adding a small amount of a 40-Hz sine wave. For more details on this test, see the sidebar entitled "Noisy Neighbors," or travel through time and check out table 1, "ADAT Specs Through History."

MANHATTAN TRANSFER

With the Studer as master, I used the three-machine configuration to load multitrack source material into my Soundscape workstation. The V-Eight has a pair of linear analog

tracks, one for Timecode track and another, labeled Aux, for non-critical audio. Setting the TC generator to Internal and the TC track to Input converts the ADAT Absolute (ABS) timecode to SMPTE. In Repro, the linear track timecode is output, if recorded. Using the Input/Repro button as a TC source selector is a bit confusing. I would have preferred this to be a Menu option. Your choice can be confirmed if selected via one the many display pages. The manual is well written and updated along with software changes.

Changing some parameters while the V-Eight is in Play will have no effect. The unit must be stopped before changes are implemented. (I've seen this "bug" on other machines.) At the very least, the display should flash the message, "Please stop the machine for changes to take effect." One

machine flashes ILLEGAL OPERATION messages with little provocation. These are about as useless as a Microsoft HELP menu. Fortunately the V-Eight doesn't do this, but it should do something.

After tangling with clocks, playing "who's the daddy" (master or slave) and tasting SMPTE flavors by ear (to confirm whether legitimate code was being output), I could have gathered my notes and started this review. Instead, the holiday season provided an opportunity to take full advantage of the V-Eight.

NERVE ANNA

A friend in Philadelphia, Joe Hanning of Weston Sound, received a last-minute call to record a holiday concert — in a church with full orchestra, male and female chorus, and pipe organ! Despite the short notice, Joe was immediately inspired to capture the event on multitrack. His well-timed call to me was mutually beneficial. The improved resolution of the 20-bit ADAT format is a perfect match for the spatial detail captured by a pair of B&K 6000 series mics (omni-directional, closely spaced).

The tracks were transferred to a workstation for a quick-trial remix in 5.1 surround. Like making a sauce, each ingredient added to the flavor. Starting with the B&K's in front, the stereo ambience tracks in the rear, then spot mics (on tympani and soloists) were added to the center. The main stereo pair and the tympani were also routed via aux send to the subwoofer. You couldn't help but get goose bumps.

MANUFACTURER: Studer North America, 1308 Borregas Avenue, Sunnyvale, CA 94089. Tel: 408-542-8880. E-mail: studer.sales@harman.com. Web: www.studer.ch.

APPLICATION: Digital 8-track S-VHS audio tape recorder.

SUMMARY: Twenty-bit compatibility with Alesis M-20 and XT-20, 16-bit compatible with XT and "Blackface" models.

STRENGTHS: Reliable, proven medical-grade transport; includes RS-422 interface, Timecode and Aux (linear analog) tracks, and built-in 9 x 1 mixer; excellent shuttle and jog control; "quality" indicator light and easy-access error rate display; recessed side-panel for optional glide rails allow a rack mounted unit to slide out for routine service (head cleaning).

WEAKNESSES: Unit could be more serviceable.

PRICE: \$8495. Options: V-Twenty-Four "package" includes three V-Eight recorders, "Cockpit" remote controller, remote meter display, roll-around rack, and all cables, \$31,400.

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Studer V-Eight Digital 8-Track Recorder

PAT ON THE BACK

Consuming seven inches of rack height, the V-Eight has plenty of front- and rear-panel real estate. The front panel has 81 dedicated buttons — plus a Jog/Shuttle knob. With the exception of the high-current Power switch, all buttons are illuminated and provide cushy-soft access to Inputs, Outputs, Presets, and Preferences of the User Kind. (Lotsa milk, no sugar, please!) There are two large fluorescent displays for metering and interface. The Fluorescent Level display represents 72 dB of dynamic range — enough resolution to “see” noise (from a mic pre or room ambience, for example).

The Interface display has dedicated Status windows, as well as a Text window that is capable of the full range of alphanumeric characters. Finally, a machine that can display status and error messages in plain, unabbreviated, and unencrypted English! There is a Quality Light (note the psychology here) that is a bit hypersensitive — certain tapes make

NOISY NEIGHBORS

Using a low-frequency sine wave can reveal a remarkable number of anomalies in both analog parts (scratchy pots and switches) and digital conversion (nonlinearities). A 40-Hz tone was digitized via an Aardvark converter, recorded on a Soundscape workstation, then played back and routed to all eight channels of its TDIF (TASCAM compatible) port. Soundscape's SS81/O translated TDIF to ADAT optical, feeding first the V-Eight, then the two slaves via optical daisy chain.

I made sure that each track of each machine produced the same level on the mix bus, then connected the mixer output to a Crane Song STC-8 compressor to add enough gain (and protection) to make the noise floor recordable. (I will post Real Audio samples in the near future.) The V-Eight is so quiet and its noise spectrum so sweet (in an analog way) and devoid of artifacts that I had to raise four faders to make it obvious. The other machines were compared in the same way, even though, with one fader up, they made their presence known!

The level of the 40-Hz tone was lowered until it created obvious artifacts on the Fostex RD-8. This lit the last segment of the V-Eight's meters, -72 dBFS. (No segments were lit on the XT or the RD-8. The meters can't display that low!) The V-Eight's digital output can be toggled from 20-bit to 16-bit dithered (noise shaping) to 16-bit truncated. Changing the bit depth and dithering smoothed the XT's low-level chirping into “snow.” The RD-8's converters were quite inconsistent from track to track, making it hard to choose between the aggressive snowfall of noise (with chirps) or the resulting hash-n-fuzz that dither normally cleans up.

Relative to the Studer, the ADAT-XT was about 10 dB noisier, while the RD-8 was quite the chatterbox with nearly 20 dB more noise! (Each machine was tested with all eight tracks up.) That's generational progress for ya!

it blink too often even though the error rate does not exceed two digits. If only the Quality light doubled as button that directly led to the Error Rate display...

Note: Studer has issued a service bulletin for a mod that desensitizes the Quality indicator.

The rear panel is equally populated. Two rows of nine XLRs access the eight (primary) analog I/Os, plus a dedicated Linear Aux track. (Each includes a recessed level trim pot.) Another row includes ADAT optical, Word, Video, Timecode MIDI, RS-422 (edit controller), DB-9 (ADAT sync), and RJ-45 (meter bridge). Like previous ADATs, the ELCO/EDAC connector makes for a quick getaway, at least for eight channels of analog I/O. (There were no spare pins to squeeze in the Aux and TC tracks.)

OPTIONS

The Cockpit remote control and Remote Metering Panel are pure sex. That and the fact that this review was written between two major holidays saved me the hassle of decorating a tree. What a light show!

Note that the Cockpit includes the same wonderful interface screen, illuminated buttons, and Jog/Shuttle knob as the V-Eight mothership. There is more real estate, thus allowing the buttons to be more logically laid out than those on the transport — grouped according to function. The Cockpit is surprisingly user-friendly even without a manual (not available until after I had finished the review). As mentioned, older machines will slave, but may not be able to take full advantage of the Cockpit's feature set. There can only be one master, but the eight buttons labeled Online are used to select any machine for individual control or for enabling any or all of the slaves. Above each are button-like indicators that are illuminated when the slaves are LOCKED.

The meter-bridge can display up to 32 tracks at once and can toggle between two groups of four machines. (Up to 64 tracks can be accessed.) Unlike the metering on the tape machine, no level-legend is provided. There isn't even a reference mark. User parameters include Peak Hold, Fine (for calibrating levels), Headroom, and Decay Time.

SUMMARY

The V-Eight alone is a qualitative leap up for the ADAT format. Though reflected in the price, as an ensemble, the V-Twenty-Four is still more affordable than a 2-inch analog machine. This arguably makes the V-Eight the most affordable, finest-sounding digital multitrack tape recorder to date.

I wish Studer luck with this machine. No ADAT clone up to this point has successfully been marketed or sold by a third party. With the exception of the time limit imposed by S-VHS tape (60 minutes, max) and a few serviceability issues, the three reasons to buy the Studer V-Eight over the Alesis M-20 are: the converters, the remote, and the support. Studer's digital converters are the cleanest I've tested. There is nothing about them that “sounds digital.” The only better converters that I know of are made by Prism.

With over 30 years of experience interfacing with world-class studios — their clients and technicians — having ac-

cess to the Studer support team has got to be a plus.

As of early January '99, a new version of software is on the verge of being released. Included are some new features, some feature enhancements, and some bug fixes. Software

can be downloaded, but this upgrade requires hardware changes to be made as well. Studer will either be recalling units or sending technicians out to perform a complete update, including the Quality Light fix. **EQ**

TABLE 1: ADAT SPECIFICATIONS THROUGHOUT THE PRODUCT'S HISTORY

(Compiled from Alesis and Studer online documentation)

Product	ADAT	XT	LX-20	XT-20	M-20	Studer V-Eight	24-bit Prism (for ref. only)
Record (A/D)	16-bit, 64x	18-bit	20-bit, 64x	20-bit linear, 128x	24-bit, 64x	24-bit, 128x	24-bit
Delta-Sigma		128x		128x			
Play (D/A)	18-bit,	20-bit,	20-bit, 128x	20-bit linear, 128x	20-bit, 128x	24-bit, 128x	24-bit
Delta-Sigma	oversampling not specified	8x					
Dynamic Range "A" weighted (20 Hz-20 kHz)	92 dB	92 dB	97 dB	102 dB	A/D: 115 dB; D/A: 105 dB (see Note #1)	A/D: 105 dB; D/A: 102 dB (see Note #2)	130 dB unweighted
Crosstalk	-90 dB @ 1 kHz	-90 dB @ 1 kHz	-90 dB @ 1 kHz	-90 dB @ 1 kHz	-90 dB @ 1 kHz	100 dB @ 1 kHz	For Ref Only

Note #1: Alesis specs are not verified. (I invite Alesis to send an M-20 so a direct comparison can be made.)

Note #2: Studer specs are measured and therefore traceable. Note #3: Single converter per channel.

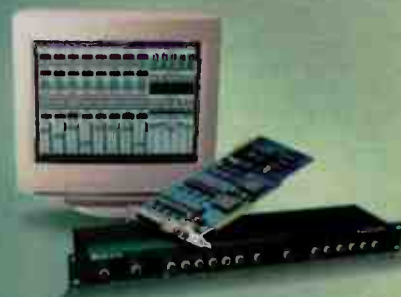
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ABOUT THE GUTS

The Studer V-Eight is a variation of the Alesis M-20. The main chassis and circuit boards are supplied by Alesis. Assembly is by Studer in Switzerland, where the raw parts are augmented with front-panel electronics and their tasty A/D/A converters. The tape mechanism, from Panasonic, is built from a rigid, cast-metal deck plate that is machined to tolerances hitherto unseen in previous versions of ADAT. Studer has added a 9 x 1 mixer with headphone jack (for local monitoring). The power supply is housed in a ventilated steel case with its own fan.

With separate direct-drive reel motors (no tires to wear out), the Panasonic transport is super fast. It can "Locate Zero" from 44 minutes in 43 seconds with no overshoot. (An XT takes 75 seconds to complete the same task). A front-panel knob has two positions: in/jog and out/shuttle.

Shuttle works like you'd expect, from the center detente position, the machine moves in either forward (cw) or reverse (ccw) mode under capstan control. The further away from detente the faster it goes, rotation being limited to about 135 degrees rotation on either side of center. Jog allows a remarkable degree of control for precise scrubbing. In Jog mode, the knob moves continuously throughout 360 degrees and behaves as if it were the capstan motor — like an Ampex ATR-100 or an Otari MTR-90 — in either direction.

Before popping the cover I did get an error message, "cal PG," an ailment that also has plagued XT users. There is no answer — yet — as to the cause of this problem. It is not life threatening, only frustrating. After removing the cover, I noticed one former support brace (now being used to secure a bunch of cables) leaning

on a large, brass "impedance roller" on the transport. (I removed the offending device.)

Note: Studer reported two other instances of the PG delay value needing to be restored. Once reset, the value stayed in memory and neither machine lost any other info (such as head hours). At this time, there is no explanation of what could cause this to happen besides a battery problem. (Even though the problem has existed since the XT.)

I knew the perfect tape path test would be to jog the tape in both directions under capstan control. Indeed, it did reveal a problem. On the opposite side of the head is a fixed guide (just before the capstan motor) that supports the lower edge of the tape. In the forward direction (Play, Shuttle, or Jog), the tape bottomed out and began to curl. In reverse, the tape skewed up toward the top flange, revealing that the motor's ever-so-slight deviance from "square" was the culprit. See fig. 1.

I was not going to put master tapes in the V-Eight until the tape path problem was gone. Exerting pressure on the top of the capstan housing either exaggerated or resolved the problem. So, unlike most reviewers, I shimmed the capstan motor. It has behaved ever since.

In the month since Studer was alerted to the tape path problem, only one other machine was found to skew the tape when jogging back and forth. The unit was held back from shipping until an expedient method of adjust-

ing the capstan angle can be devised.

While the V-Eight should be very reliable, I wish that Studer had been involved with Alesis from the very inception. I found several obstacles that clearly could have been more technician-friendly. Technicians are inspired to do their best when equipment is designed to be serviced.

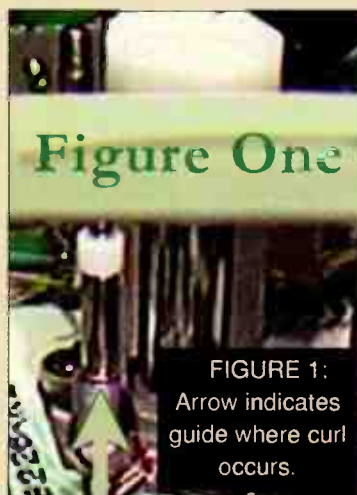
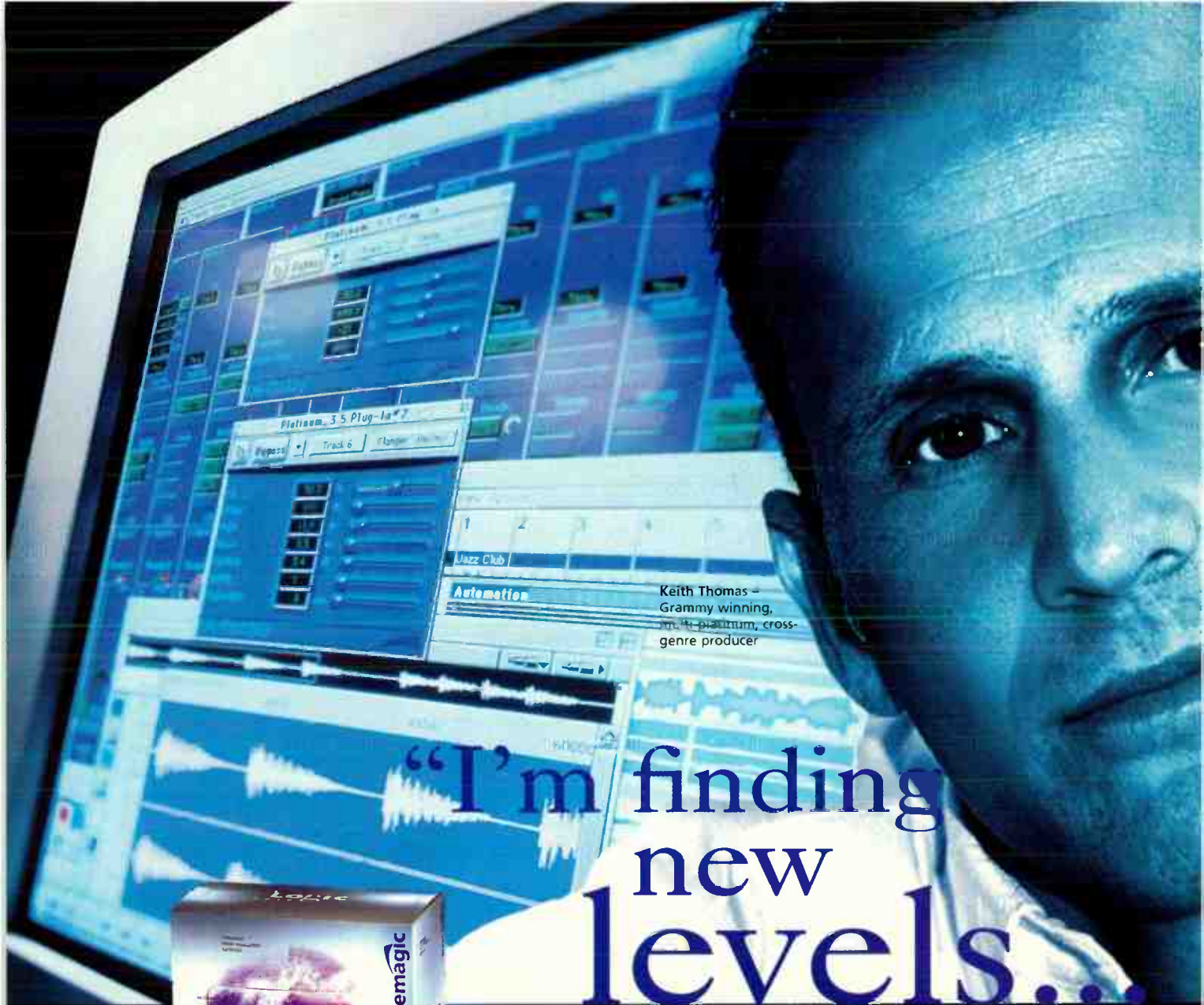


FIGURE 1:
Arrow indicates
guide where curl
occurs.



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CIRCLE 11 ON FREE INFO CARD



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CAN ADD A LOT
TO THAT BOARD
TAPE RECORDING
YOU'RE MAKING

**By Rich
Tozzoli**

.....
Your band has a great live show. It's exciting, energetic, and emotional. You've always wanted that killer live recording, but those board tapes just don't capture the spirit. Here's a way to go beyond that using just a single digital 8-track and some good omni mics.

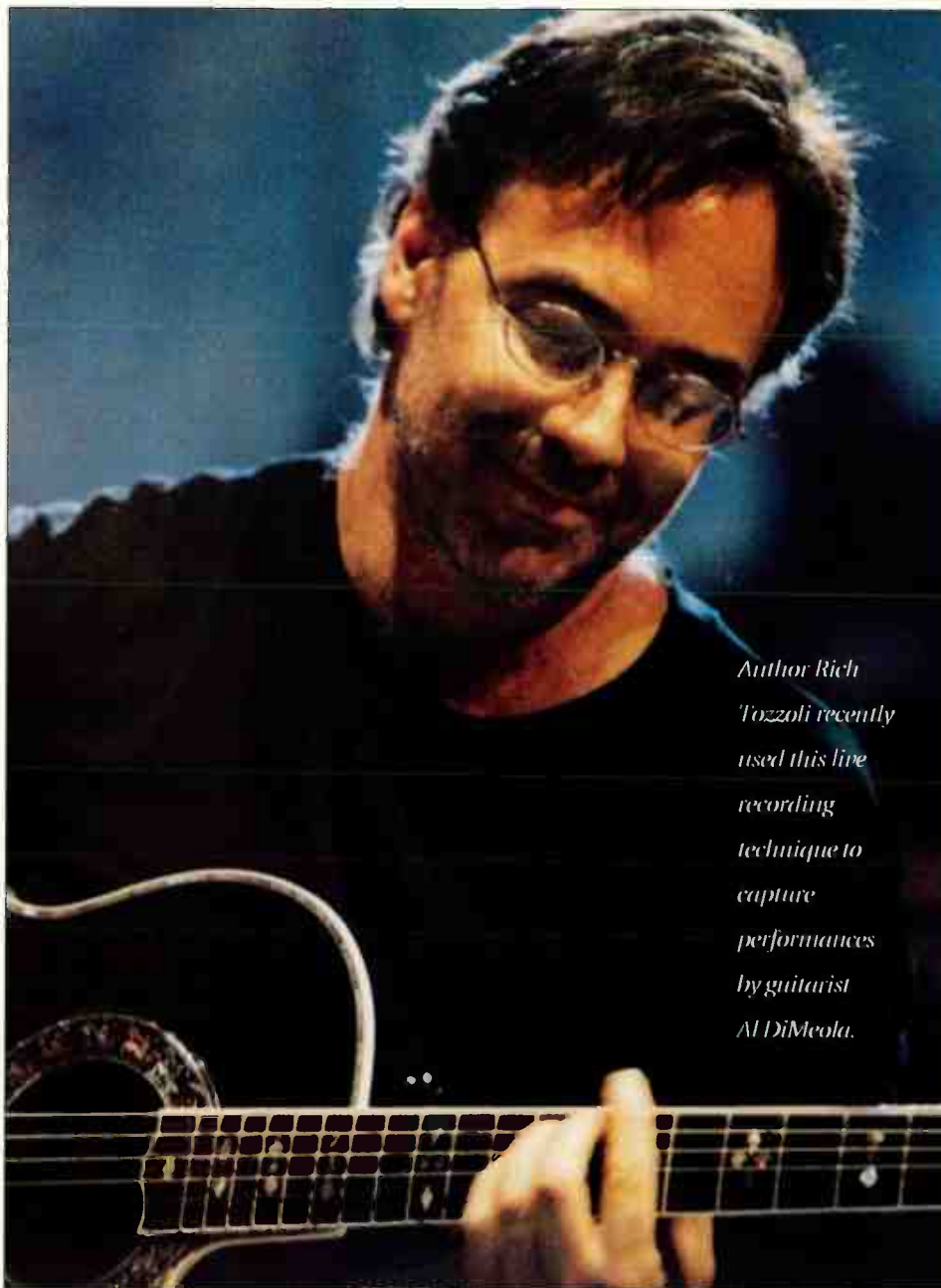
To get a great live recording (besides the obvious factor of the band doing a good show), you need to capture the "sound" of the room. You should pick a venue with a good tight PA, and one that has the best acoustics you can find. One approach, which I call "classical plus," uses just four channels of stereo room mics and a stereo board mix. The classical aspect comes from accurately recording the sound of the group in the hall, and then adding in the board mix for tightness.

I've been using this method recently to record Al DiMeola, and also Ricky Byrd (former guitarist for Joan Jett and the Blackhearts, Roger Daltrey). I prefer using the new Alesis M-20, so I can record at 20 bits and 48k, printing very hot to get the most out of the 24-bit converters.

However, whatever digital multitrack you have will work. I ride the levels during the show, so I don't have to record with compression.

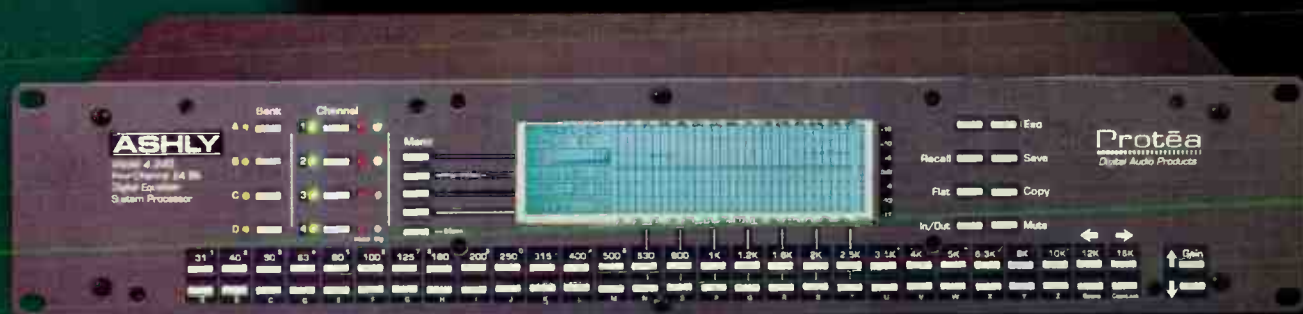
For room mics, I use two Groove Tubes AM62's set to omnidirectional, or Earthworks (TC-30's) mics, spread out about the width of the PA. The size of

the venue affects the positioning, but go for about 20–30 feet from the speakers if you can. These mics will capture the sound of the band in the room, as well as the "feel" of the show. Run the mics through a good preamp, and then straight to channels 1 and 2 of the recorder. Now take the stereo mix off the front-of-house con-



Author Rich Tozzoli recently used this live recording technique to capture performances by guitarist Al DiMeola.

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CIRCLE 07 ON FREE INFO CARD

World Radio History

sole (FOH), route it to another preamp, then to channels 3 and 4. I then run the overall mix into my Mackie 1604 for monitoring purposes. I use all Monster mic cables and snakes to ensure a good signal path. You don't want a bad cable ruining a great live recording!

Make sure to work with the soundman during soundcheck to set levels and discuss the mix for the recording. I'm lucky to do most of my work with experienced FOH man Neal Scott (Annie Lennox, Chaka Kahn, etc.), who gets great live sounds. The mix in the room becomes very important, because that essentially is the "sound" of

o'clock for L and R, and the room mics hard L and R. The live mics give the recording a wide ambient sound, with the board mix keeping the middle tight. You will need to experiment with different pans and levels, as that becomes a personal taste issue. When mixing finals, I will send the tracks into Pro Tools digitally, using the M-20's AES/EBU card. From there, I will set levels and add any additional EQ or reverb. I like to run the mix analog out through an ART PRO VLA for some "invisible" tube compression, and back to the M-20 for a 20-bit master. The 20-bit machines have more "air" on the top of the mix, and more punch on the

these tracks for an upcoming CD release.

Al DiMeola will be using his live tracks to do a special Internet release for his fans. Neal and I did a slightly different live recording for Dion, playing with his Little Kings band. We made a gig recording of his band using five channels of a board feed (two guitars, bass, drum, vocals). Dion then took that mix and "built" a studio record on top of the live tracks, capturing the excitement of a live show with the control of the studio.

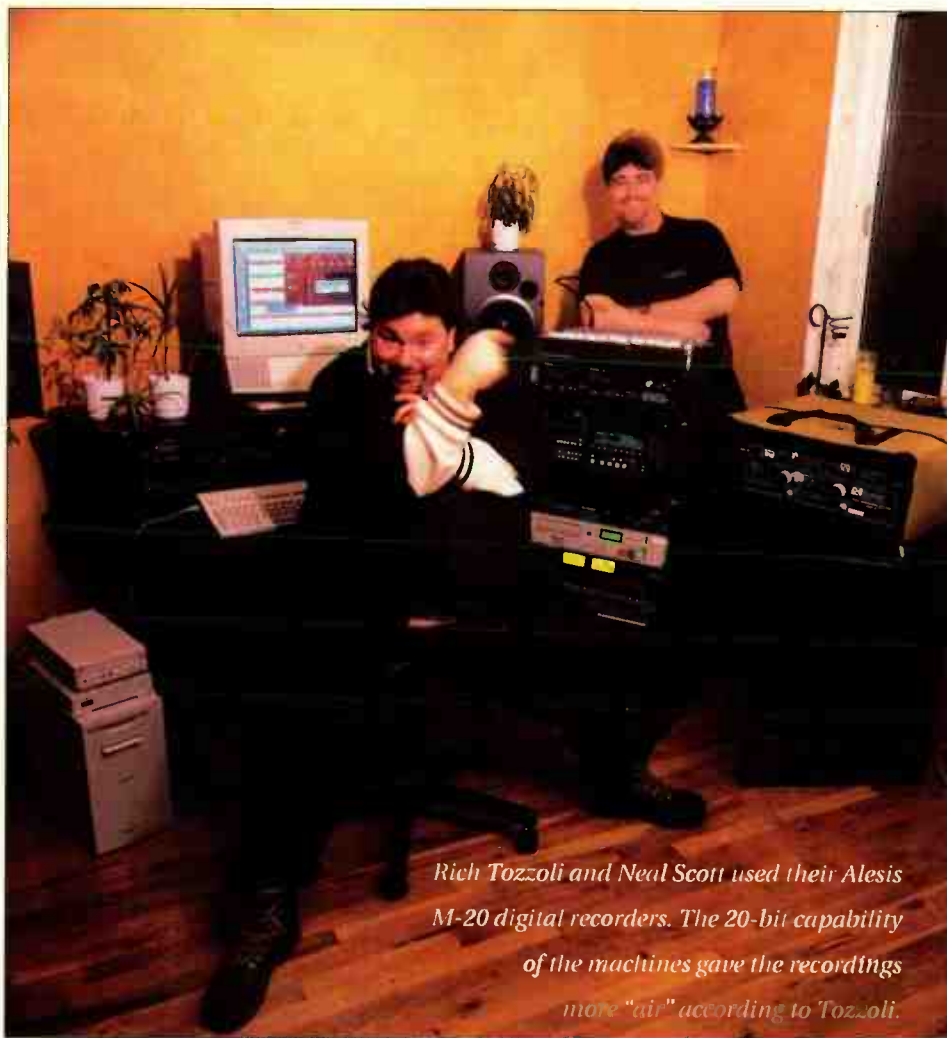
I have recently been experimenting with the use of additional mics for surround purposes. As surround becomes more mainstream, you may wish that great gig you recorded had those extra room mics in the middle of the crowd. Place them in the rear speakers, and your fans are right in the middle of your show. Taking the time to do a little extra work now may be well worth it in the near future.

With a single digital multitrack and some care, you can get some serious results. Bands can take this product and load it on their Web sites for the fans. You

could print up CDs and sell it at your shows, or find a label to distribute it. Or, best of all, just sit back, relax, and enjoy your own hard work.

Rich Tozzoli has been known to have 15 people in the hot tub at his parties.

We made a gig recording of Dion's band using five channels of a board feed. Dion then took that mix and "built" a studio record on top of the live tracks, capturing the excitement of a live show with the control of the studio.



Rich Tozzoli and Neal Scott used their Alesis M-20 digital recorders. The 20-bit capability of the machines gave the recordings more "air" according to Tozzoli.

the recording. Monitoring my mix through headphones, I communicate with him during the show, requesting certain level changes if needed (such as more kick or bass). You may need to track delay the board mix against the room mics depending on your particular distance from the PA.

On the returns from my M-20, I usually pan the board mix at 9 and 3

bottom than their 16-bit counterparts.

Ricky Byrd has been performing a "No Band, No Headaches" acoustic tour, featuring Simon Kirke (Bad Company) on drums, and either Kasim Sulton (Meat Loaf) or Tom Petersson (Cheap Trick) on bass. Playing intimate New York venues, we have been capturing some great-sounding live gigs this way. He will be using some of



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CIRCLE 13 ON FREE INFO CARD

POSITIVE FEEDBACK

TAKING ON A
CHALLENGING GIG
USING SPIRIT'S DIGITAL
328 CONSOLE

By Mike
Sokol

I've done my share of engineering really loud bands with big sound systems, and that in itself is a mixing art that's pretty well defined. You just get yourself a big console (preferably a Yamaha PM4000), hang on eight or more Drawmer gates, plus maybe eight or ten channels of BSS compressors, put a 1/3-octave Klark-Teknik equalizer for every output, and jam a separate monitor console on stage (maybe a Ramsa or another Yamaha). You cram as many cabinets as you can set on the speaker wings or fly in the air, power it with as much amplification as the incoming AC power will handle, and turn it up as loud as it will go. Then you listen to the band complain that they can't hear anything, fight feedback problems all night long, and try to stop the ringing in your ears the next morning. Can you say 110 decibels at the console? Any questions?

While it's not really quite that bad, it is the basic *modus operandi* in many large Country and Rock concerts around the country. But I get to do some fun stuff at least once a month that's not loud, there's no feedback, and the musicians actually thank you after the performance.

I have the pleasure of being the house engineer for the Mountain Green Concert Series, which is now in its ninth season. And, no, I didn't have to make a deal with the devil for this gig. I actually



The Spirit Digital 328 was brought in to handle the myriad tasks needed to make the Cambodian Dance troupe's show a success.

helped start the concert series out of nothing, along with David Fitzwater, who's now its director.

The current room is the Kepler Theater at Hagerstown Community College in Hagerstown, Maryland. Some of the top acoustic artists and acts in the country have appeared there, including Robin & Linda Williams, Tom Chapin, Beau Soliel, and Robin Bullock with Greenfire. But I recently did one act that was both fun and a bit of an engineering challenge as well. How about trying your hand at

doing the sound for a Cambodian Dance troupe with 40 performers, 8 musicians, and a whole lot of costume changes? It was sure to be interesting, but in order to keep myself totally amused, I brought along the Spirit 328 console that I was reviewing for this magazine (see last issue). I wanted to see if I was up to the task of doing a live show with a multi-layer digital console.

Let the dance begin....

For shows of this type, I don't bring a lot of horsepower for the FOH sound

PHOTOS BY PETE SO

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When was the last time one of your gigs looked like this? Forty performers, eight musicians, and many costume changes were only part of the challenges in doing this unusual show.



since I'll be mixing at a comfortable 90 decibels for around 450 people. I've experimented with a lot of different speaker types over the years, but finally settled on a set of Community XLT46's (a 3-way cabinet with a 15-inch bass driver, 6-inch midrange, and 1-inch horn) with the XLT55 bottoms (with two 15-inch drivers). This makes for a nice narrow column width that doesn't distract from the view of the stage, which has a semi-thrust lip. And the stacked cabinets keep the midrange and high-frequency drivers up above the ears of the crowd.

I normally triamp the speakers with a pair of Hill TX-1000 3-channel amplifiers that are rated at 600/300/300 watts per channel. This gives me about 2400 watts for the FOH speakers, which is more than enough for any show I've ever done in this room and has never come close to clipping. I also took a pair of Crown Micro-

Tec 1200 amplifiers and four Peavey 112 DLM wedges, which gives me four channels of monitors with more than adequate volume for acoustic acts. I run these from the FOH console most of the time, since there's rarely the room or budget for a separate monitor world and engineer.

Generally I use White 1/3-octave equalizers, but I did have a Rane Mojo, so I hung it in the rack along with a Behringer Ultra-Curve. I normally use the UltraCurve for its RTA function, but it also can be used as a very serviceable 1/3-octave EQ with final limiters. The Behringer box sounds fine as long as you don't have to get to

XLR inputs with phantom power (which was more than enough for this act), it really doesn't have all the I/O's one would hope for in a big console. The aux outputs are 1/4-inch TRS rather than XLR, so I threw a few extra adapters into my case to hook it up to my snake. The other challenge is there's no way to visually monitor the aux levels feeding the monitors, so you have to keep an eye on the amp rack. But the sound levels were so low on stage that there was never any equipment put in jeopardy.

For the musicians, I hung a pair of Sennheiser Evolution E-604 mics over the gongs and wooden xylophones, put an EV RE-20 down behind the log drum, used a Crown CM-700 for the Cambodian fiddle, and put a pair of Shure Beta 58's on the singers. I ended up using short stands since I didn't realize that the singers would be kneeling, which put their mics about two feet off the ground. Luckily, I had extra short stands and booms with me or it could have been a problem. I used a pair of wedges on either side of the musician's stage, which was covered with Persian rugs, and did a little cross-mixing with the monitors so that each wedge got the feed from the instruments on the other side of the music stage. Since these were pretty loud instruments to begin with, and the musicians are used to using no monitors at all, they didn't need to have their own instruments in their wedge, only the instruments that were physically separated from them. This helped keep the overall monitor levels very low, and the feedback potential down as well.

See, I told you this was going to be fun.

I put two more cabinets on the front edge of the stage as a fold-back mix for the dancers, but it was mostly confidence monitoring, since the musicians were very close to the stage and certainly loud enough. I did put a good bit of vocals in this mix since there was some narration that the dancers would cue from.

The act had specifically requested a recording of the show, so I brought along an Alesis ADAT and hooked it into the Spirit console with the ADAT optical connectors. Since the act fit in the first eight inputs, I simply routed each channel strip to a separate track on the ADAT and kept the level out of the red for recording. The 328 would easily accommodate a second ADAT for 16-channel

anything in a hurry (too many darn levels of menus). So I'll put it on FOH if I need more channels of EQ since these shows have so much extra gain headroom that I rarely get into a feedback problem situation once the basic EQ is set.

Let's talk compression.

I try not to use compressors at all for these shows! Yes, you heard me. I don't like compressors (or gates) for acoustic concerts. I know and love all the various flavors of dynamic controllers, and I'll be glad to patch them in when needed. But remember, I'm trying to augment (not replace) the sound of the acoustic instruments themselves. So I want the dynamic range, and trust the musicians not to do anything silly such as shout, "HELLO HAGERSTOWN, ARE YOU READY TO ROCK?"

Now, as I previously mentioned, I took along the Spirit 328 console just for grins, and while it does have 16 balanced



recording if needed, but 8 channels were sufficient for what I was doing.

At the last minute, the video people requested a mic-level audio feed, and since it wasn't on the tech rider, I hadn't brought along any of my Press Mults. So I improvised and used a pair of passive DI boxes on the extra 1/4-inch TRS outputs of the board, which gave me a balanced, mic-level signal to feed the cameras. I was able to ground-lift them as well, which averted a nasty little hum from one of the camera's leaky power supplies. It's not often that a pair of cheap DOD 265 boxes makes you a hero, but they sure saved the day. That's why I always throw in a few extra goodies in my gig box for just such problems.

What about problems? Well, of course there's always something going wrong during a live show, that's what makes it all so interesting. First off, there was a big communication problem. And no, not the type when the guitar player is yelling at you since you missed putting up the first note of his solo. I mean real communications...such as nobody spoke English with the exception of the manager and a few of the dancers. Plus they didn't understand the concept of a soundcheck. I had no real mic plot, so I told them to get in position so I could figure out where to place the mics. They wanted to keep rehearsing, so I was stepping around the middle of all these strange instruments on the floor and trying to place the stands and mics without getting poked in the eye with a fiddle bow or fall over a singer kneeling on the floor. (I did get a bow poked in my eye by a beautiful Russian violinist named Katerina at the Meyerhoff Symphony Hall the following week, but that's another story.)

This act had a strange but beautiful before-show ceremony with lots of incense where the spirits of your ancestors are invoked to assist you in your performance. And there was a roast duck with its head on and a roast pig head involved, but I've seen stranger things in the green room at rock concerts. (Trent Reznor and Nine Inch Nails comes to mind.)

So how did I like live-mixing on a multi-layer digital board? I was a little worried about it at first, but got into the groove pretty quickly. Since the console was used in the studio for a few weeks prior to the show, I was familiar with all the routing, but there's nothing like a sonic emergency to test your mettle. I did goof up one monitor cue by simply going to the wrong layer. This screwed up everything very quickly, so thank heaven for an "Undo" button on the board. Yes, you can get to your last mixer settings at the touch

of a button. It can be a real lifesaver when you have brain freeze.

For those of you not familiar with them, consoles of this ilk don't have a lot of knobs. In fact, some consoles like the Ramsa DA7 don't have any channel-strip knobs at all. You select a channel that needs something adjusted and go to a central section where you adjust the equalization or set the aux send levels. It can be a little crazy if you're used to a big analog console where every function has a separate knob. Luckily for me, the Spirit 328 has a full row of knobs that can be assigned to any input channel and

they have lights to show their positions. So while you still have to hit the select switches to see a channel, you can see all the parameters of that channel at a glance. But you do give up having a full-sized screen to see the routing. This seems to be a pretty good compromise for a console that might do a live gig now and then. I guess I'm still too old to totally adapt to a digital work surface for live performance, but I sure like them a lot in the studio, especially for mixing. Maybe as I acclimate to them over the next few years I'll feel more comfortable and risk using one on a large complicated act with feedback potential. I'll keep you posted. **EQ**

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BEYERDYNAMIC MCE 82 STEREO MICROPHONE

By **STEVE LA CERRA**

The MCE 82 from beyerdynamic is a stereo condenser microphone employing two capsules, each with a fixed cardioid pattern. Since the capsules are oriented at 90 degrees to each other, the resultant pickup pattern of the MCE 82 is X-Y stereo. Beyerdynamic designed the MCE 82 for stereo field recording, ENG (Electronic News Gathering), reporting, film, video, project recording, and live sound applications.

Included with the MCE 82 are several accessories: a zippered and padded carrying pouch, MVK 82 connecting cable, and a clip-type stand holder (more about these later). *EQ* took the MCE 82 into a variety of locations — including a rather extensive tour with Blue Öyster Cult of venues ranging from 500-seat clubs to outdoor festivals of more than 20,000.

The MCE 82 has two switches: one is a low-cut switch labeled "lin" (linear) and "lo"; the other is a three-position switch with stops for Off, B.C. (battery check), and On. This second switch pertains only to battery operation; it does not affect phantom powering. An adjacent red LED lights full-strength to indicate battery condition when the switch is in the B.C. position. A single, standard AA battery is used for operation — easily obtained on location in a pinch. The MCE 82 will also operate with phantom power from 12 to 48 volts, facilitating use with portable mixers and DAT machines. Interestingly, both audio channels operate even when only one is fed phantom voltage.

The cable supplied for connection of the MCE 82 has a 5-pin, female XLR at the mic end and two, 3-pin male

XLRs at the other — each carrying one channel. Beyerdynamic has chosen to cryptically ID these XLRs with yellow and red tags labeled "2" and "4." A look at the spec sheet reveals that the numbers refer to the hot pin at the other end of the cable. Pin 2 is the + leg of the left channel and pin 4 is the + leg of the right channel. If you're out in the field and

cation. We'd have preferred a simple "L" and "R." White markings on the mic itself clearly indicate the axis of the capsules as well as which side of the mic is left or right. These markings (as well as the switch labels) were easily seen even on stages with poor lighting.

Our first task was a live-to-2-track recording of an acoustic guitarist/vocalist. The mic was connected to a Yamaha 02R and stand-mounted on the stage about four feet in front of the artist, slightly below the level of his mouth. The results were both sonically and spatially very good: the voice was rendered dead center and stable. The guitar exhibited some panoramic spread without sounding unnaturally wide — very realistic. The top end was crisp and generally natural sounding, though we thought we heard a very small peak somewhere in the vicinity of about 5 kHz. Low frequencies were extended, and occasionally the MCE 82 picked up some foot tap-



don't have this data handy, you could end up reversing left for right, which may or may not be serious depending upon your appli-

ROAD TEST

MANUFACTURER: beyerdynamic, 56 Central Avenue, Farmingdale, NY 11735. Tel: 800-293-4463. E-mail: sales USA@beyerdynamic.com. Web: www.beyerdynamic.com

APPLICATION: Remote recording, ENG, sound reinforcement, studio recording.

SUMMARY: A good sounding, versatile microphone useful in many applications.

STRENGTHS: Excellent stereo imaging and good sound reproduction; uses a standard AA battery.

WEAKNESSES: Pickup pattern is not variable, sensitive to stand-transmitted noises.


PRICE: \$799

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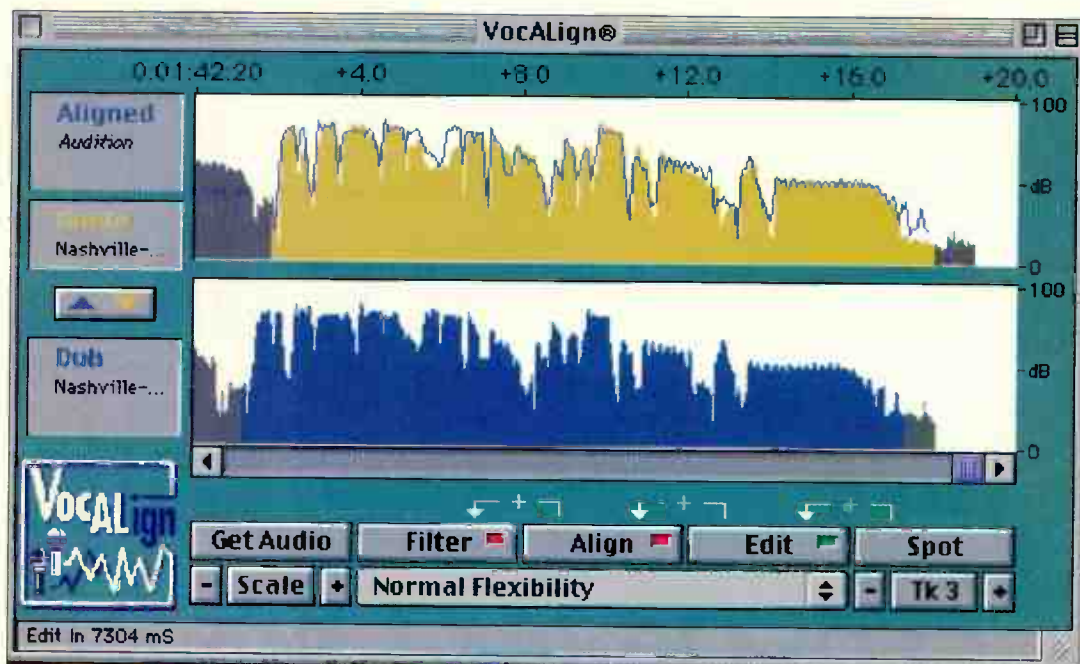


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Synchro Arts *Limited* VocAlign



Double your vocals
with Synchro Arts'
latest Pro Tools
plug-in

BY ROGER NICHOLS

If you knew how many hours I have spent in the studio trying to record the perfect vocal double, you would think I was crazy. Well, you might think I am crazy anyway, but my sanity level improved by a quantum leap after discovering VocAlign from Synchro Arts.

Before VocAlign, there were two ways of obtaining the elusive vocal double. The first method was to record the lead vocal, and then have the artist sing along with the original track. You would keep a log sheet of which lines were good doubles and which lines weren't good enough for doubles. You then continue to record on the double track, punching in and out to keep the good lines while trying to get better performances on the not so good lines. As

you accumulate additional lines that are good, you keep them while continuing to record over the bad ones.

The second method was to record many vocal tracks, say six or more, and then listen back to them and transfer the best lines to a compilation, or "comp," track. After you assembled the comp track for the single performance, you would re-listen to the tracks you did

not use and see if any of them made good doubles of the master single track. Any lines that sounded good as doubles were transferred to a second, or "double comp," track. Someday, if you were lucky, you would end up with a whole song (or chorus, or bridge, or whatever you wanted doubled) that had a master single track and a master double track.

You are not done yet! Usually the artists want to play "beat the comp," where they will go out and sing some more vocal passes to see if they can get any lines that are better than the ones currently residing on the master comp tracks. After a few (hundred) passes, you listen to what you recorded and pick the best lines. You then substitute the new lines for the ones on the single or double comp tracks to see if there is any improvement in quality or tightness of the double. Sometimes this process continues right into the mixing of the album when the artists are sure that, if given the chance, they could produce an even better vocal performance.



LAB REPORT

MANUFACTURER: Synchro Arts Limited, 13 Links Road, Epsom, Surrey KT17 3PP, UK. Mac version sold through the Digidesign retail network, directly from Synchro Arts and through Digidesign. PC version now available; contact Synchro Arts. Tel: +44 - (0) 1372-811934 [omit (0) if outside UK]. E-mail: Sales@SynchroArts.co.uk. Web: www.SynchroArts.co.uk. Digidesign: 650-842-7900. Web: www.digidesign.com.

APPLICATION: Line up vocals and background vocals easily. Also used to align other instrument tracks.

SUMMARY: VocAlign analyzes spectral content of audio files in order to synchronize them.

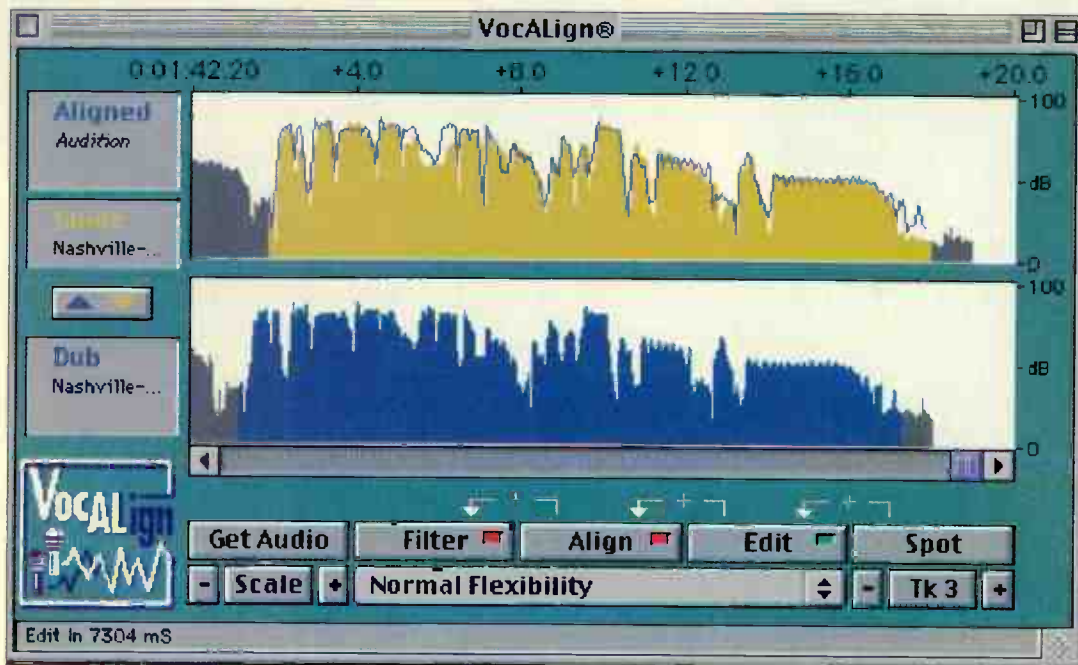
STRENGTHS: Very easy to use; no perceptible artifacts after the alignment process.

WEAKNESSES: Well, I was going to say that a weakness is actually a Digidesign weakness, where you must listen to VocAlign playback through Mac sound driver. Digidesign no longer allows external programs to access Digidesign hardware for playback. Synchro Arts, however, informs me that: "There is now a Digidesign Output Driver that allows audio to be auditioned from VocAlign through the Digidesign hardware, or it can be auditioned through the Mac audio output." So, there you have it...

PRICE: \$999

EQ FREE LIT. #: 103

Synchro Arts *Limited* VocAlign



Double your vocals
with Synchro Arts'
latest Pro Tools
plug-in

BY ROGER NICHOLS

If you knew how many hours I have spent in the studio trying to record the perfect vocal double, you would think I was crazy. Well, you might think I am crazy anyway, but my sanity level improved by a quantum leap after discovering VocAlign from Synchro Arts.

Before VocAlign, there were two ways of obtaining the elusive vocal double. The first method was to record the lead vocal, and then have the artist sing along with the original track. You would keep a log sheet of which lines were good doubles and which lines weren't good enough for doubles. You then continue to record on the double track, punching in and out to keep the good lines while trying to get better performances on the not so good lines. As

you accumulate additional lines that are good, you keep them while continuing to record over the bad ones.

The second method was to record many vocal tracks, say six or more, and then listen back to them and transfer the best lines to a compilation, or "comp," track. After you assembled the comp track for the single performance, you would re-listen to the tracks you did

not use and see if any of them made good doubles of the master single track. Any lines that sounded good as doubles were transferred to a second, or "double comp," track. Someday, if you were lucky, you would end up with a whole song (or chorus, or bridge, or whatever you wanted doubled) that had a master single track and a master double track.

You are not done yet! Usually the artists want to play "beat the comp," where they will go out and sing some more vocal passes to see if they can get any lines that are better than the ones currently residing on the master comp tracks. After a few (hundred) passes, you listen to what you recorded and pick the best lines. You then substitute the new lines for the ones on the single or double comp tracks to see if there is any improvement in quality or tightness of the double. Sometimes this process continues right into the mixing of the album when the artists are sure that, if given the chance, they could produce an even better vocal performance.



LAB REPORT

MANUFACTURER: Synchro Arts Limited, 13 Links Road, Epsom, Surrey KT17 3PP, UK. Mac version sold through the Digidesign retail network, directly from Synchro Arts and through Digidesign. PC version now available; contact Synchro Arts. Tel: +44 - (0) 1372-811934 [omit (0) if outside UK]. E-mail: Sales@SynchroArts.co.uk. Web: www.SynchroArts.co.uk. Digidesign: 650-842-7900. Web: www.digidesign.com.

APPLICATION: Line up vocals and background vocals easily. Also used to align other instrument tracks.

SUMMARY: VocAlign analyzes spectral content of audio files in order to synchronize them.

STRENGTHS: Very easy to use; no perceptible artifacts after the alignment process.

WEAKNESSES: Well, I was going to say that a weakness is actually a Digidesign weakness, where you must listen to VocAlign playback through Mac sound driver. Digidesign no longer allows external programs to access Digidesign hardware for playback. Synchro Arts, however, informs me that: "There is now a Digidesign Output Driver that allows audio to be auditioned from VocAlign through the Digidesign hardware, or it can be auditioned through the Mac audio output." So, there you have it....

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EQ FREE LIT. #: 103



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CIRCLE 02 ON FREE INFO CARD

ping on the stage. The latter could not be eliminated, even when using the low-cut switch.

We really put the MCE 82 through its paces while out on the road with Blue Öyster Cult. On the first show, we used it overhead Bobby Rondinelli's (huge) GMS drum kit. It picked up the cymbals clearly and crisply, with excellent left-to-right representation. The MCE 82 also picked up a lot of vibration from the stage, which (again) we were unable to filter out using the low-cut switch (a shock mount would have been handy here). A bit of low-frequency rolloff on the console cured this. On one drum check, we raised

the mic up to about 7 feet over the kit, turned all the other mics off and cranked up the MCE 82.

The result was great, though the kick was thin (due to the LF rolloff). Adding in the kick drum mic put the punch back in the bottom end.

One of the plusses of using the MCE 82 in this application was convenience of placement. It was very easy to get accurate X-Y pick-up anywhere over the kit with a single mic stand (thus saving precious space on Bobby's riser). Since the two capsules were in one mic body, we never had to worry about stands moving around. Also, it was simple to make fine adjustments in the position of the mic without having to spend all day rearranging the angle between the two capsules. In a live situation, this is invaluable, especially at festivals where gear gets moved around and there isn't a lot of time for tweaking. It'd be nice if the stand adapter held the mic more tightly, because at one show the mic slipped out of the adapter and fell to the floor from about 5 feet up. It was not functionally or

cosmetically harmed, and a piece of tape over the adapter prevented future problems.

Using the MCE 82 to mic Donald "Buck Dharma" Roeser's stereo guitar rig produced a double-edged sword. In order to capture the stereo image from the single stereo cabinet, we had to move the mic about 1.5 feet away from the speakers. Tonally it was excellent, but on such a loud stage, moving the mic away from the cabinet also allowed a lot more leakage from other instruments.

We also used the MCE 82 for location recording of bird sounds and various noises such as passing cars and trucks. In particular, the bird recording was stunning, offering great depth as well as right-to-left width. Again, the convenience factor was high — all we needed was a portable DAT recorder and the mic. It didn't matter whether or not the DAT machine had on-board phantom because the MCE 82 could run on the battery. During these recordings, we found the LF rolloff to be effective at reducing mild to moderate wind noise.

continued on page 159

SPECIFICATIONS

Frequency Response: 50 Hz to 18,000 kHz

Polar Pattern: Stereo X-Y

Nominal Output Impedance: 190 ohms

Maximum SPL: 138 dB

Sensitivity: 3.2 millivolts/Pa

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** 0 dB = 1 mW/Pascal

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In the above scenarios, you would often record an excellent vocal piece, but one not close enough to make a good double. Many times great performances were flushed down the digital toilet just because they weren't tight enough to be used with the vocal that you were trying to match.

ENTER VOCALIGN

Now, I look for the best performance of a line, and don't even care if it lines up as a double. I build two tracks full of great stuff, and pick which track I want to call the master. I then listen to the master and the double track together and mark the lines that aren't tight enough to be good doubles. I then dump the vocal tracks into Pro Tools and fire up VocAlign.

The VocAlign process is very straightforward. First you launch VocAlign. Next, you drag over the region that you want to use as the guide. Usually this is the line in the master vocal track. On the keyboard, hold Ctrl+Shift+7. This enters the region you have selected into VocAlign. Now you select the area that you want to line up with the master. On the keyboard, hold Ctrl+Shift+8. This loads the DUB region (the vocal track that will be processed) into VocAlign.

There are two views in the VocAlign window. The top view shows the master, and the lower view shows the DUB audio. You will see the waveforms of both tracks in their respective views. When you click on the Align button, you will see an outline of the DUB audio superimposed on the Master audio region. This shows the relative position of the audio in both views. If the line-up is not quite correct, (i.e., one region had more audio selected than the other did), you can drag the lower view to roughly line up the two regions.

Press the Edit button to process the audio. This is non-destructive. A new audio file is created to contain the processed audio, so you don't have to worry. Press the Spot button, and the newly created audio file will be placed in Pro Tools in the track of your choice.

At any time during the process you can listen to the master track, the dub track, or both together to see how things are going. VocAlign works so well that I don't even listen to the intermediate steps any more. I just process all of the regions and listen to the results in Pro Tools. There are plenty of parameters to change for special situations, but I have found that the default setting has worked for me every time.

VocAlign worked so well on lead vocals that I decided to try it on the vocal harmonies in the choruses. The results were

just as amazing. Using the lead vocal as a guide, I easily lined up all of the harmony vocals. It didn't matter whether they were higher or lower than the lead vocal. It also didn't matter whether it was a different singer, male or female. Everything lined up perfectly.

SOUND QUALITY

VocAlign does a great job of covering up any artifacts created by the processing it has to do. If you listen to the processed double track in solo, it doesn't sound any different from the original track you recorded.

How does VocAlign work? Well this is what it says in the manual:

"VocAlign first analyses the two signals' spectral energy content through a pair of Filterbanks. The output from this Spectral Analysis process is then passed to a pattern recognition process that generates a Time Alignment Path. This Path describes how to best modify the time scale of the replacement audio to align its modulations to those of the Guide."

Sounds about right to me. VocAlign works in a non-linear fashion. That is, it picks spots to lengthen or shorten the audio track that will be masked so that you won't hear it work.

TIMEMOD

TimeMod is another operation that can be performed with the VocAlign program. TimeMod works in a linear fashion. It microcredits the entire audio region equally to stretch or compress the time frame. TimeMod is used much the same way as VocAlign. You select the audio region you want to modify, select the new length, and process the audio. If you process a stereo pair of tracks, they will remain phase coherent after the process.

TimeMod works well for problems like copying a guitar rhythm track from the first chorus to the second chorus, only to find the tempo a little different. You can stretch or compress the guitar part to fit the tempo change.

If you have Pro Tools and use it for recording or editing (I guess that includes everyone), then you must own VocAlign. It does everything it says, better than I expected. You can download a demo from their Web site at www.synchroarts.co.uk, or check it out at your local music retailer. You will be glad you did.

Roger Nichols is currently VocAligning his brains out on the new Steely Dan album due for release in the summer of '99.

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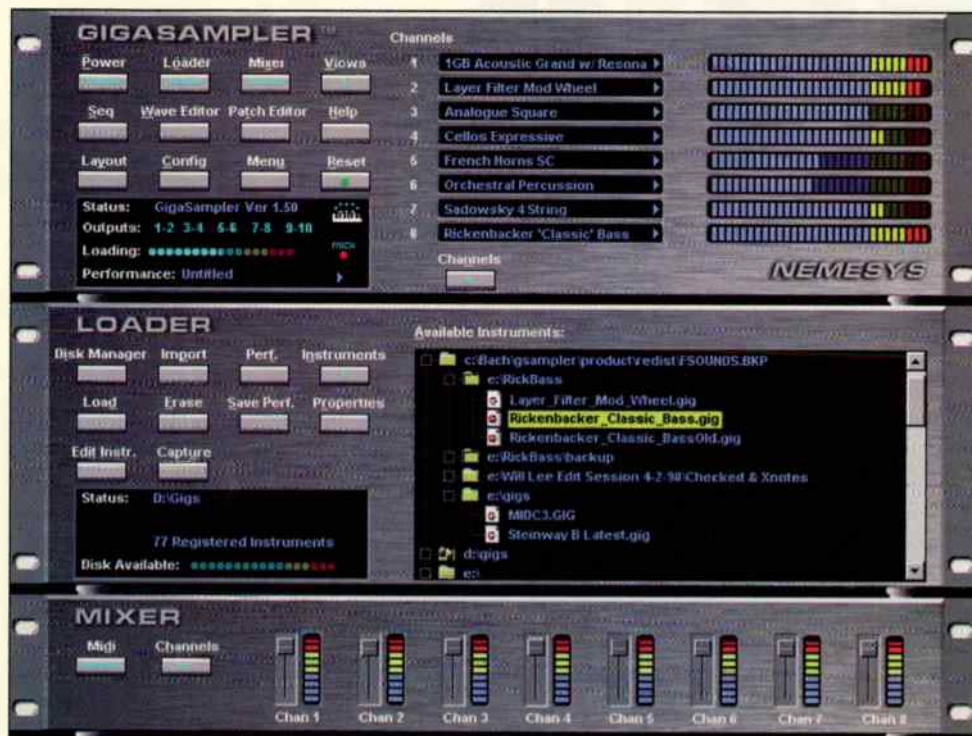
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NemeSys Gigasampler



If you've got the RAM, Nemesys' GigaSampler is a powerful tool for sampling and editing

BY FRANCIS PREVE

More memory — what musician doesn't crave a sampling arsenal with more memory? Sure, many samplers come with 8 MB or more RAM, but at 44.1 kHz, that's only about 90 seconds of mono sampling — enough for a few loops and an instrument or two, but hardly luxurious. So many musicians end up investing a few hundred dollars to max out their sampler's memory, and hope that will be enough.

NemeSys has come tantalizingly close to finally solving this sampling limitation. Their debut product, GigaSampler, is a program that runs on Windows computers and doesn't even use memory in the traditional sense. The software streams audio from the hard drive itself,

effectively making it a real-time, MIDI-controlled, hard-disk recorder that behaves like a wonderfully flexible — and unusually responsive — sampler. (You do need a hefty amount of system RAM, but this is mostly to maximize

polyphony and minimize latency. More RAM allows more voices and loading more samples; for example, 128 MB of RAM provides 64 voices and "slots" for over 1200 samples.)

HARDWARE REQUIREMENTS

While running GigaSampler on the minimum recommended system (Pentium 166 MMX with 32 MB of RAM) will work, this reduces polyphony to about 20 notes and compromises integrated audio/MIDI sequencing options. Getting the most out of GigaSampler requires a far more powerful computer (see System Requirements in the EQ Lab Report section); current PCs in the \$1500–\$2000 range will generally do the job. Up-to-the-minute configuration information — like which sound cards and hard drives are 'certified' and which ones to avoid — are posted on the NemeSys Web site.

GETTING STARTED

Loading GigaSampler onto a PC is fairly straightforward — the installer even scans your system to help determine the best configuration. Also included is an AVI-based, animated help system that visually walks you through each function.

One of the nicest aspects of this app is its synergy with various other audio and

EQ LAB REPORT

MANUFACTURER: NemeSys Music Technology, Inc. 13625 Pond Springs Rd., #202 Austin, TX 78729. Tel: 512-219-9181. E-mail: info@nemesysmusic.com. Web: www.nemesysmusic.com

APPLICATION: PC-based sampling and interactive digital audio tool.

SUMMARY: Radical new sampling technology relies on real-time playback of samples from hard drive instead of RAM, to great effect.

STRENGTHS: Sample sizes limited only by hard drive space; incredible piano sound; sequencer/sample editor integration; extensive real-time control via MIDI; solid editing tools; Akai sample-conversion utility; AVI-based help features; terrific bang for the buck.

WEAKNESSES: Not available for MacOS or Windows NT; requires a high-powered desktop system (marginal laptop support); no advanced synthesis resources.

SYSTEM REQUIREMENTS: Pentium II 266 MHz, Windows 95/98, 64 MB RAM, 6.4 GB Ultra DMA, IDE or SCSI hard drive with 512k cache, SVGA display, CD-ROM or DVD drive, MIDI interface, GIGA or DirectSound compatible sound card.

PRICE: \$795, full version; \$199, LE version.

EQ FREE LIT. #: 136

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Minnetonka Software's MX51

Surround Sound Digital Audio Editor

Edit your surround
sound mixes in your PC

BY DAVID MILES HUBER

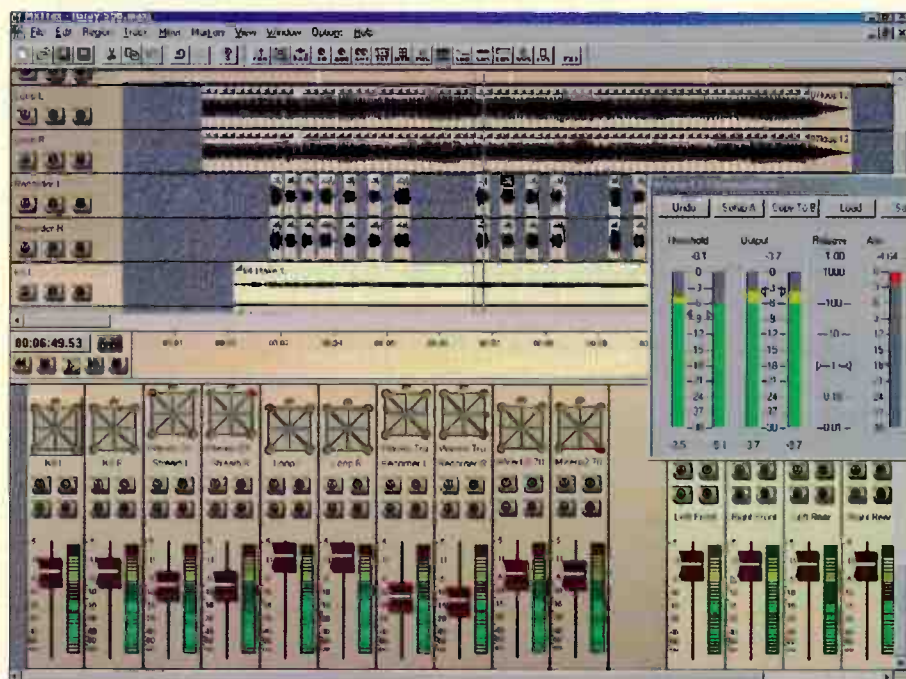
Some readers may have never heard of Minnetonka Audio Software. But (as far as I'm concerned) they were the first to create a serious editor for the PC (in the form of Fast EdDit for the Digital Audio Labs CardD sys-

tem). Now, almost a decade later, they've done it again with the introduction of an affordable surround-sound editor for a PC (loaded with a Digital Audio Labs V8 or Yamaha DSP Factory sound card system). This powerful, yet easy-to-use, editor operates using several linked building blocks: the Track Window, the Mixer Window, integrated signal routing structure, and the Remote Transport Control.

THE TRACK WINDOW

The Track Window is where all track placement and editing takes place. At the left-most side is the Track Control box, which contains the track name and buttons that relate to basic mute, solo, and record enable functions. Mono or stereo wavefiles can be easily dropped into this window (at the current cursor position) by selecting "add" from the Track menu and calling up a 44.1 K or 48 K soundfile from the traditional "Open File" dialog box.

Once a soundfile is placed, it can be non-destructively edited and auditioned using several basic control commands. For example, left-clicking on the bottom half of a soundfile will



EQ LAB REPORT

MANUFACTURER: Minnetonka Audio Software, Inc., 17113 Minnetonka Blvd, Suite 300, Minnetonka, MN 55345. Tel: 612-449-6481. Web: www.minnetonkaaudio.com

APPLICATIONS: Allows analog, digital, and hard-disk tracks to be edited and mixed in a fully-automated, real-time processing environment that can be user-configured to fit the needs and demands of music and media post-production environments.

SUMMARY: Sold as an upgrade to MxTrax (a stereo software version, must be on the system for Mx51 to install), this software system is a surround sound-based editor and automated digital mixer system for use with the Digital Audio Labs V8 or Yamaha DSP Factory sound card system.

STRENGTHS: Working in discrete surround sound is a true joy! The ability to run real-time effects plug-ins (using the power of the V8 or DSP Factory cards) lets you have access to tons of automated processing power. Easily syncs and interlinks with Alesis ADAT and TASCAM DTRS digital 8-tracks and software devices (like your sequencer). Makes sys-

tem-wide integration a behind-the-scenes breeze. The ability to create custom mixer setups that can be designed and recalled to fit the needs of each song or project is way beyond cool.

WEAKNESSES: While the system's mixer is fully automated (by remembering manual fader and DSP moves), I'd really like to have the versatility of drawing waveform volume changes using rubberband handles. A simple, integrated notepad/track sheet app. would go a long way in helping to keep track of notes. I also wish that the digital 8-track transport control would let me program and name an unlimited number of locate points, instead of just one, that could be saved with each project. (Isn't that what computer control is all about?)

SYSTEM REQUIREMENTS: IBM compatible PC with an installed Digital Audio Labs V8 or Yamaha DSP Factory sound card system.

PRICE: Digital Audio Labs V8, \$1500

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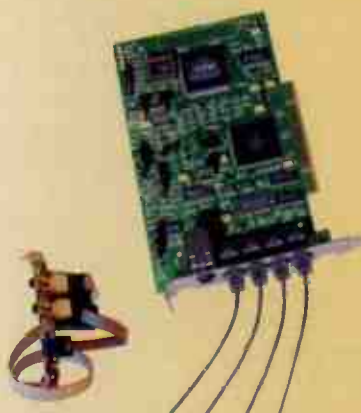
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AES / 8

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STUDI/O



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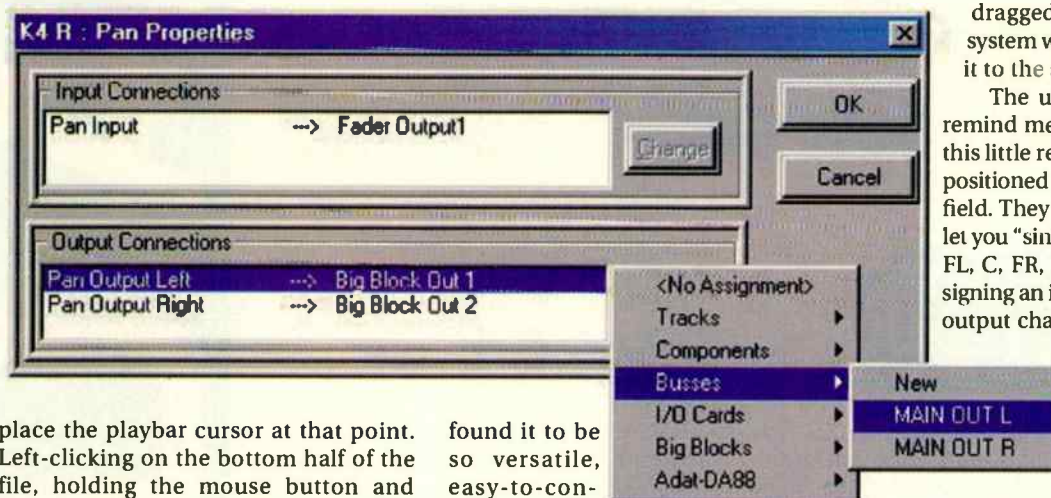
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CIRCLE 151 ON FREE INFO CARD

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place the playbar cursor at that point. Left-clicking on the bottom half of the file, holding the mouse button and dragging it to the left or right will highlight a selected region. Left clicking on a file's top half and dragging it into position moves a track.

Sections of unwanted audio can easily be removed at a soundfile's beginning or end-point by placing the cursor at the boundary and dragging it to its new in/out point. You can also split a track (or selected range of tracks) and delete unwanted sections in a similar fashion. In addition, left clicking on a boundary's top half lets you draw an in/out fade of any length that will be performed by the V8 or DSP Factory in real time. Overlapping faded sections will create a non-destructive crossfade, which is also calculated in real time by the sound card — as are the normalization and gain offset commands.

In addition, any number of tracks or defined regions can be easily grouped together, allowing you to move, copy, or paste linked selections. When you combine this with the fact that Mx51 has a virtually unlimited number of undo levels, anyone using this editor will quickly get the idea that the process is straightforward and simple.

THE MIXER WINDOW

When used in conjunction with the inputs and outputs of either the V8 or DSP Factory, the Mx51's Mixer Window acts as a fully-configurable, fully-automated, digital mixer. This section isn't just another software mixing toy. Working in conjunction with my V8 Big Block, CardD+ and ADAT analog inputs, Mx51's mixer interface is a simple, killer sounding, totally automated, real-time digital mixer. This is no joke! Shortly after I installed my first Mx-based system (over two years ago), I

found it to be so versatile, easy-to-configure, and great sounding that I took my main mixer out of the system and used Mx as my main console. I haven't looked back since.

The main building block of Mx51's mixer is the Component Toolbox. The term "building-block" is quite accurate: it lets you assemble and configure the mixer any ol' way your heart desires simply by dragging traditional components into the mixer. These components include a large fader/meter section, label strip, stereo pan pots, surround panner, surround output faders, solo/mute/record/automation selection buttons, 3-band parametric EQ, sub-bass routing and single- or dual-channel Aux sends.

If you want to create a channel strip, all you do is drop a component (such as an input fader) into the mixer screen and then continue dropping other components into the input strip. As you might expect, the components will automatically connect to each other, while output and auxiliary bus routings will often need to be manually "patched" to a destination.

Outputs can be configured in any number of ways (depending upon the number of inputs and outputs available to the sound card system). For example, to create a stereo output bus, all you need to do is drag two faders into the mixer and then define them as L & R main outs. To create a stereo mixer, you simply assign the outputs of each stereo pan pot to these busses. Creating a set of surround-sound output busses is even easier. All you do is select the surround bus button from the component toolbox and drag its 5.1 master outs into the mixer. Whenever a surround panner is

dragged into a channel strip, the system will automatically connect it to the surround outputs.

The unique surround panners remind me of pool tables that have this little red pool ball, which can be positioned anywhere in the surround field. They even have "pockets" that let you "sink" the sound squarely into FL, C, FR, RL, and RR position. Assigning an input to the sixth sub-bass output channel is done by dragging the sub-bass button from the Component Toolbox to each of the desired source channels. Double-clicking on a track's sub-bass

box (try saying that five times) will pop up a crossover frequency dialog box that lets you tailor the big boom.

Incidentally, one of the coolest aspects of the whole system is the ability to invoke plug-ins that have been programmed to work with the V8 in real-time, such as: the entire Waves Power-Pack series, Autotune shifter from Antares, and the Aural Exciter/Big Bottom plug-ins from Aphex. To assign an effect to a mono or stereo set of channels, you simply select the plug-in (from the rather long drop-down list) and drag it into the desired channels. Double clicking on the effect's title bar will call up its control interface. Again, it should be pointed out that these processing functions aren't handled by the computer's main CPU, but, instead, are handled in real-time by dedicated processors on the V8 card itself.

The ability to throw TruVerb reverbs onto several tracks and drop an L1 Ultramaximizer onto my main outs is simply heaven. All of the DSP parameters can even be automated to change in real-time. Recalling the saved project will automatically invoke the effects and their automation parameter settings. Saying that this is amazing is a bit of an understatement. I only wish that more plug-ins were available for the V8 (with the TC Electronic Native Essentials pack heading my list).

SIGNAL ROUTING

Mx51 deals with signal routing in two distinct ways. Assigning a soundfile track to a mixer channel is done by simply clicking within the Track Control box and dragging the patch plug icon to the destination channel. Assigning an analog input source or output routing bus to a mixer channel component is often

done through the use of the component's property's dialog box, which visually prompts you as to a component's source and destination.

Now, we get to the beauty of it all. Once a mixer has been configured to your liking, it can be saved to disk as a "template" for recall at any time, and/or saved with a particular project for automatic recall upon opening.


REMOTE TRANSPORT CONTROL

If you have a V8 that's equipped with an MDM Custom Card (which provides eight digital I/O and sync connections to either an ADAT or TASCAM), an MDM can be synchronously integrated into Mx51 in a simple and seamless fashion. Remote control buttons can be called up giving access to basic transport functions, individual track record arming, location points, and SMPTE offset/start times. When the "Sync to V8" button is selected, Mx51 will automatically chase and sync all connected digital 8-tracks to the current cursor position, as will any device that is locked to the V8's internal SMPTE sync driver (such as your MIDI sequencer).

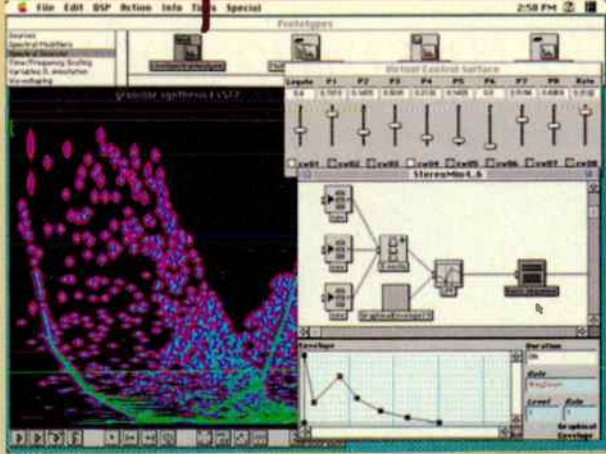
MY TWO CENTS

On certain levels, I've always found Minnetonka Software to be a bit ahead of their time, offering reliable, powerful, and simple to operate products. Mx51 is no exception. The ability to assign any number of hard-disk tracks and a combination of up to 16 V8 inputs (from various analog and ADAT sources) and route them to the best-sounding and easiest-to-use digital mixer that I've ever used (software or not) is a dream come true!

From a stability standpoint front, it's a workhorse. I've only had a few crashes over almost a two-year period, and they were probably Win 95 & 98's fault. Plus, let's not forget the most important feature, the ability to work in discrete surround. I've totally gotten used to it. It's equally easy to use, whether working in stereo or surround. You'll probably want to use Mx51 in conjunction with a good 2-channel editor for finessing stereo tracks, but once you leave the 2-channel environment, you'll invariably find yourself jumping right back to MX51 for everything else. I've definitely found my "Swiss Army editing, production and mixing system," and it'll take some pretty fancy design work to make me even think about switching to another system. **EQ**



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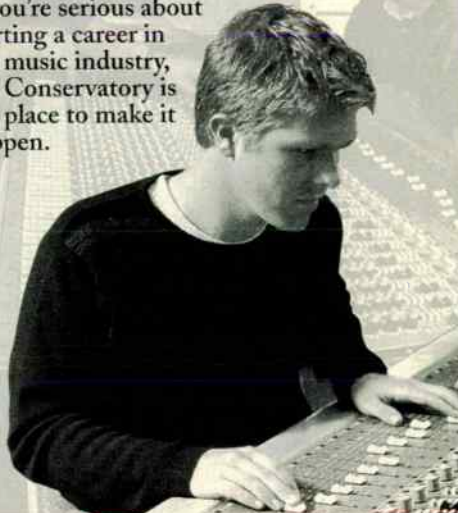
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CIRCLE 77 ON FREE INFO CARD

Clean! *CD Burning Software*



Clean! from Steinberg offers more than your average CD burning software

BY DAVID MILES HUBER

One of the latest entries into the realm of CD burning software is Steinberg's Clean!. Clean! is slightly different from most burners in that once you've imported audio into the program, you can process the tracks using a number of real-time processing tools for removing noise or sonic enhancement before being burned to CD.

YES, IT EVEN DOES WINDOWS!

Clean!'s program window is divided into four functional areas: Tracklist, Volume Controls, Effects Section, and Waveform Display.

The Tracklist is essentially a playlist

into which up to 99 recorded or imported soundfiles can be entered in sequential order. Once entered, you can play a highlighted track using traditional transport buttons and change its order by

nudging the track up/down icon buttons.

The Volume controls let you set the record signal level that's present at the soundcard's input, as well as the monitor output level being sent to your soundcard's output. It should be noted that the output fader doesn't affect the signal levels being burned to disc, it's strictly a monitor function. I/O metering bars visually represent the incoming signal levels, as well as the track's actual recorded levels.

The Effects section is Clean!'s biggest selling point. It includes dedlicker, decrackler, and denoiser algorithms for cleaning up your LPs, cassettes, noisy tapes, etc., while a set of bass boost, stereo spread, and brilliance are also included for enhancing your recordings before they're burned to disc. A separate function also lets you normalize each or all of the tracks in a project.

As its name implies, the Waveform display graphically shows a highlighted track's waveform. In- and out-markers let you to trim the track's begin and end-points (by moving the lower marker boxes into position) or draw fade-ins and -outs of various lengths (by clicking and dragging either of the upper marker boxes). Fade times are shown in their respective time indicators, along with a



LAB REPORT

MANUFACTURER: Steinberg N. America, 21354 Nordhoff St., Suite 110, Chatsworth, CA 91311. Tel: 818-993-4091. Web: www.us.steinberg.net.

APPLICATION: A Windows-based CD recording and sound restoration program for producing custom audio CDs.

SUMMARY: Lets you import audio files into an editable tracklist, edit, and then process them (using real- and non-real-time noise and effects processing techniques). Once completed, the playlist can be burned to CD using either an EIDE or SCSI CD recorder.

STRENGTHS: This straightforward program lets you denoise and sonically enhance soundfiles using high-quality, real-time algorithms at a mere fraction of what an equivalent hard-disk editor/CD burning system would cost.

WEAKNESSES: There's no way to "undo" an effects process that's been written to disk. I couldn't find a way to audition portions of (or the entire) tracklist to hear how the finished CD would sound.

SYSTEM REQUIREMENTS: Pentium MMX 200 MHz; 32 MB RAM minimum (Pentium II 300 MHz; 64 MB RAM recommended) CD-ROM drive/16-bit MME-compatible sound card CD-R burner (SCSI required for importing audio from disc), 16-bit graphics capability with 800x600 pixel resolution

PRICE: \$99

EQ FREE LIT. #: 105

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total CD time readout, zoom-in and -out buttons and a bar for navigating around waveforms that are zoomed-in.

THE 25-CENT TOUR

Working with Clean! is pretty easy. Once audio is recorded from the soundcard's input, imported from hard disk, or directly from a CD (you'll need a SCSI CD-R to do this), the soundfile will appear in the Waveform window. At this point, a set of marker boxes can be moved to change the begin, end, and fade times for each selected track. Once done, you'll probably be tempted to begin playing with the Effects section. Using any of these real-time effects is simple and downright fun. Just turn on the master effects button, select the effect or effects that you want, and turn up the faders. Since all of the tracks can be independently processed and edited, reviewing track effects settings is easy: simply highlight any track in a project and the originally selected processor settings will be automatically recalled.

On the CPU power front, I found that my 350 MHz PII could run up to four effects in real-time, while another studio's

233 PII could only run two before it would begin to stutter. Running out of CPU steam isn't really a problem, as Clean! will let you write a series of effects to hard disk as a temp file and then allow you to continue adding other effects into the selected track until you're done. You'll need to keep in mind that once a file has been processed, you can't fade the track or change any of the file's in- & out-edit points, so make sure that all marker edits are done during the first processing pass.

Once the tracks have been processed, you'll probably want to enter in the index gap times. Since this program doesn't let you crossfade between tracks, the minimum gap time that can be entered is 0 seconds, with the max being 4 seconds (unfortunately, you can't enter fractions). For those special projects that require more than a 4-second gap, you're plumb outta luck.

Before the finished product can be burned as a CD, you'll need to write all the track edits and effects to hard disk. Once this process is done, simply call up the "Create CD-R" window (which contains the usual simulate, speed selection, status readouts and write button) and start burning!

MY TWO CENTS

On the minus side, the manual says that you can put more than 64 minutes into a project, for dumping processed tracks onto a DAT tape. However, since I couldn't get Clean! to play an entire Tracklist in one pass, I don't have a clue as to how this can be done. It's also a bummer that there isn't a "Play" or Audition button in the "Import File" box. The only way to audition a file is to import and play it. Finally, in keeping with the general European obsession with software piracy, Clean! will now & then request that you insert the original CD-ROM into the drive. Although they've programmed it so you can override several "Please insert CD" requests, you'll still have to have the original disc handy.

On the plus side, Clean! is really easy to operate and the signal processors work a lot better than I thought they would. The ability to process files on-the-fly is really handy and could be big money saver for folks that don't already have outboard or PC-based processing gear. Burning CDs was also straightforward and, best of all, Clean! didn't make a single coaster.

continued on page 144

What do these recordings have in common besides 2 Grammy nominations?

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CIRCLE 83 ON FREE INFO CARD

Graham-Patten Systems

DFADE-2 SoundPals



Digitally fade with
this simple add on

BY EDDIE CILETTI

Don't laugh. I am about to tell you about a surprising product, one you may never have classified as "outboard." In this *à la carte* age, the DFADE-2 from Graham-Patten Systems is a piece of hardware that accepts a control voltage from a real fader to control the level of a digitized signal. Graham-Patten is a seriously high-tech company from Grass Valley, CA with a slant towards audio-for-video products. You don't even have to buy their remote fader package. Specs for rolling your own are in the manual.

ALL I WANTED TO DO WAS...

...Apply an early fade to a few mixes that were simply too long for their own good. I didn't want to dump them into a workstation — yet — nor was I ready to exit the digital to mein. In the analog world, we take faders for granted. But in the digital domain, close scrutiny of some "real-time" faders might leave you feeling a bit like a zipper on a very new pair of Levi's. (See the sidebar, entitled

"D.I.Y. Tests," for an explanation of "zipper noise.")

Before going artistic, it was first necessary to calibrate the DFADE-2. It has two multi-turn gain-trim pots with a range of -18 dB to +30 dB. That's 30 dB of GAIN! The DFADE-2 truly does take advantage of the 24-bit internal processing (and 56-bit accumulator). The published dynamic range specs are 138 dB (24-bit) and 120 dB (20-bit). Specs like this make the DFADE-2 the perfect choice for purists. Just connect between two DAT decks, for example, and go.

Neither software nor mind-altering

substance, the "acid test" for any digital audio product is a fade-to-infinity, a.k.a. "black." With a 40-Hz reference tone — from a home-made CD-R — I routed the digital out of a CD player — via Z-Systems patchbay — to the DFADE-2 and then to a Sony PCM-R500 DAT machine. Monitoring the Sony's analog outputs, a strange, harmonic fuzz slowly emerged from the background just before the fade to black. The same signal routed to an Aardvark 16-bit D-to-A converter was perfectly clean. Only the faintest fuzz was noticed as I wildly wiggled the fader in a way that could only be useful as a tremelo effect! (See the "Troubleshooting" section of the sidebar.)

The DFADE-2 can be used in two ways: as two mono faders with PAN pots or a single stereo fader with a BALANCE control, selected via DIP switch. There are four recessed DIP switches to select Unity Gain (L and R), Local or Remote operation, and Stereo Mode. The input is either 110 ohms AES via XLR or 75 ohms AES3ID via BNC. AES3ID is similar to S/PDIF in that it is unbalanced. Instead, though, of S/PDIF's half-volt signal, AES3ID is 1 volt (think video) and capable of traveling 1000 feet! Thank you, Graham-Patten! (The BNC input will accept a standard S/PDIF signal. All flags, especially start IDs, are passed through unchanged.)

A pair of LEDs indicates Stereo and a Remote mode, another pair indicates whether or not the incoming signal is valid. A DB-9 connector provides interface to external faders and pan pots. The 6-volt DC "wall-wart" power connector includes threads so the plug

EQ LAB REPORT

MANUFACTURER: Graham-Patten Systems, Inc., P.O. Box 1960, Grass Valley, CA 95945. Tel: 800-422-6662/530-273-8412. E-mail: soundpals@gpsys.com. Web: www.gpsys.com.

APPLICATION: Digital audio fader.

SUMMARY: The DFADE-2 is one of several in the SoundPals product line, which includes an A-to-D (ADC-20), D-to-A (DAC-20), a four-input AES mixer (DMIX-41), and a dual-channel mic pre/AD converter (DMIC-20). Up to three modules will fit in a 1-U single rack space adapter.

STRENGTHS: High-resolution audio-taper fader feels like the real thing; it can take the wildest, most radical moves, has no zipper noise, plus 20- and 24-bit operation (via internal jumper); specs include details for a remote interface; two faders and two balance/pan pots can be connected.

WEAKNESSES: The unit outputs what you give it; no consumer/pro conversion; no dither.

PRICE: \$899

EQ FREE LIT. #: 106

We think our customers say it best...

...."I've now used the A-51s on almost everything including vocals, guitars, and drums. They remind me of very expensive German mics I have tracked with before..."

Adam Kasper, Producer/Engineer,
(REM, Pearl Jam, Soundgarden, Ozzy Osborn)

...."We tracked all the acoustic guitars on the new Victoria Shaw album with a stereo pair of A-51s because of the way the ADK microphone gave a true representation of the guitar: a well defined high end, and an accurate low end. This is a mic we will be reaching for a lot!..."

Mick Conley (Engineer for Kathy Mattea) and Buzz Leffler,
Wright Studios, Nashville

...."Imagine my surprise when I plugged the ADK A-51s into a TL Audio tube valve preamp and instantly got a more vibrant and alive sound..."

Eliot Bates, M/IQ Productions, Santa Barbara / San Francisco

...."So far I have used this mic on every project I have done since I received it ... I suspect it will become the work horse of my mic closet..."

John P. Sexton, Owner, Pegasus Productions, Louisville, KY

...."These are truly professional microphones that sound comparable to mics costing considerably more..."

Joe Hadlock, Owner, BearCreek Studios, Woodinville, WA

...."I am not inherently generous with praises, but this mic really deserves it. I'm looking forward to using this mic on my current and future CD projects..."

Zoran Todorovic, Fearless Music, Beverly Hills, CA

...."I just wanted to tell you that the more we use them, the better we like them. They're great! We find ourselves reaching for them for most every session we do..."

Ken Lee, Masterpiece Sound, Lecanto, FL

...."We love 'em. These are truly world class..."

Aaron Blackford and Randy Bradbery,
D'Coda Blue Studios, Longview, TX

...."On the recent Pop Concerts I used them on the concert grand and the harp with very favorable results. I found it especially easy to get the full sound of the harp, which is something I don't find with other mics..."

Michael Johnson, House Soundmixer
Arlene Schnitzer Concert Hall, Oregon Symphony



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D.I.Y. TEST (ZIPPER NOISE)

"Zipper noise" is not a recent artifact of the digital process. Way back in the analog daze, automation systems translated motion — from a linear fader or rotary pot — into a digital value. A fader generates an infinite number of values from max to min, but when only 256 steps are available — via MIDI, for example — the transitions turn into steps, hence the term "zipper noise." Under normal "small move" conditions, you might not notice the lack of resolution. But really fast fader moves will reveal the steps.

You could argue that no one really moves a fader as radically as people looking for zipper noise. The point here is that an analog fader shouldn't make any noise when moved. Ones that do are either serviced or replaced. Finding a "weakness" such as zipper noise makes one wonder what other shortcuts were taken. I don't mind a compromise so long as an option is provided to toggle it on or off. If, for example, I had to sacrifice an effect for the sake of getting one perfectly executed fade, so be it.

Troubleshooting

That I was looking for zipper noise and found none was great! But that an idiosyncrasy popped up was no surprise. Feeding a 40-Hz sine wave into any audio product — analog or digital — can reveal a remarkable array of "limitations." This did not happen when I reviewed the Sony PCM-R500 DAT some time ago. Then, I applied 40 Hz to its analog inputs, gradually lowering the level while doing an analog fade with no artifacts from Sony's D-to-A. I suspect Sony is using some kind of dither even without the Super Bit Mapping switched in.

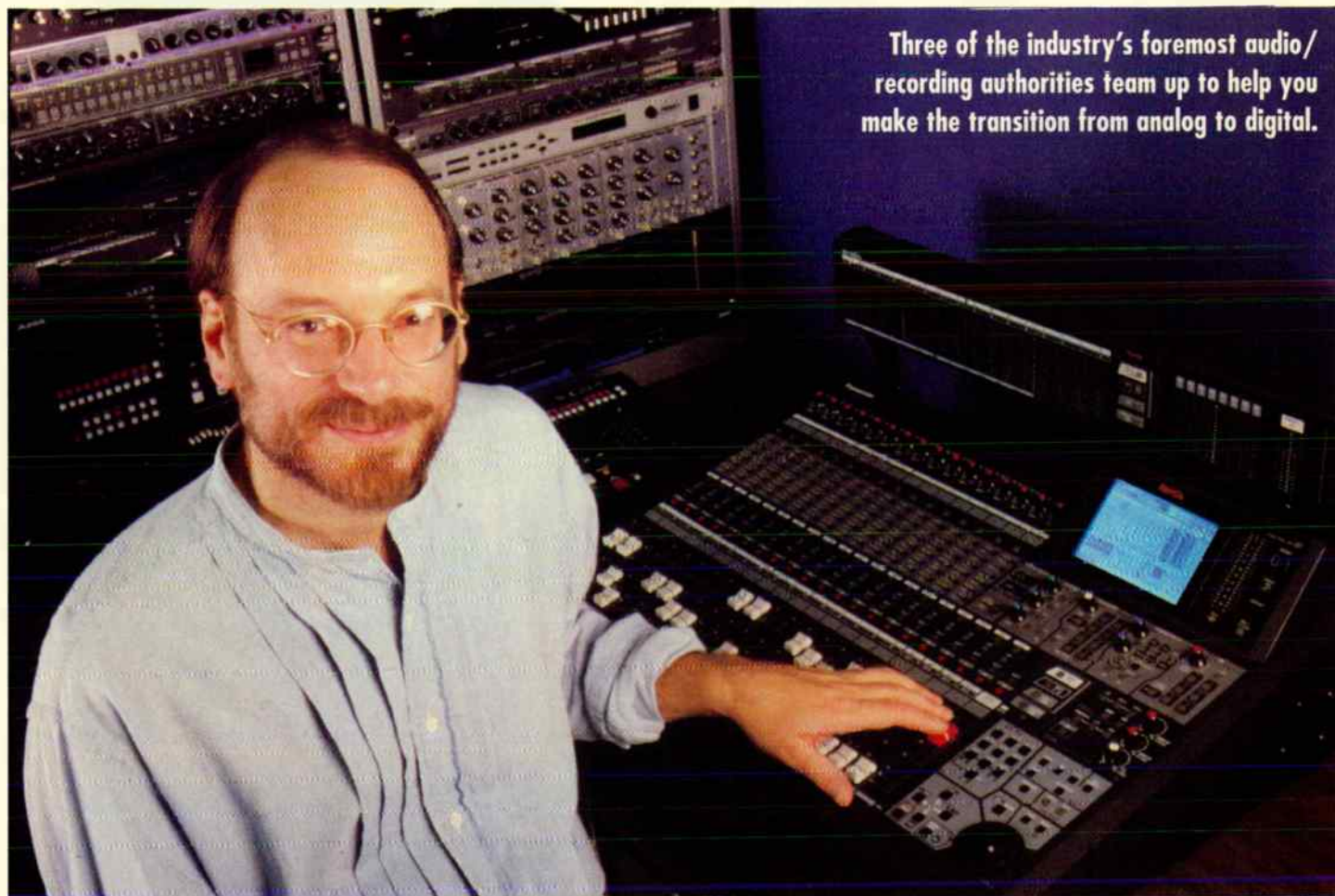
The lesson here is to always attempt to troubleshoot and isolate a problem, especially before calling customer support. Further investigation will require the PRISM digital signal analyzer. (Sounds like future article food, doesn't it...?)

won't fall out. The unit draws 160 mA of power. Like all the SoundPals, you can run the DFADE-2 from a battery. The operator's manual includes all models with detailed specs, internal jumpers (if applicable), and many operating suggestions.

I know it's hard to imagine buying "just" a fader. But when you need to put some real live soul into a digital fade, the DFADE-2 will translate your every motion into infinite bliss.

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Clean Machines

Four ADAT tips,
all-thumbs on a
Panasonic deck, plus a
strip tease...



BY EDDIE CILETTI

I got several calls from a potential customer a few months before actually seeing the patient in question — an ADAT XT that was quite run into the ground. In fact, it took over an hour just to clean it. Those of you familiar with the transition from the “black-face” ADAT to the ADAT XT know that the tire between the reel tables changed from black to a translucent-beige synthetic rubber. So, why would the machine be filled with gummy black bits of debris?

During the cleaning expedition I discovered that something had a grip on the supply reel. After removing the mess and grilling the customer, I found a completely new reason for a stuck-up reel table. The customer had used a “rubber” cleaner to keep the tire fresh and tacky. This may or may not have helped the tire, but the reel tables are made of a plastic that becomes a bit soft and goeey when touched by a rubber cleaner.

Yellow arrows point to the “drag brake” and pressure spring on the supply-side reel table as shown in photo 1. I swear someone at Alesis had told me to disable

this “feature” on the XT (by disconnecting the spring), but when I did, the pad was stuck to the reel table! I guess the felt absorbed enough of the cleaner and, having attacked the plastic, decided not to let go. After a thorough cleaning, I opted to reconnect the spring because it made the machine less sloppy when threading.

Both reel tables are press-fit assemblies that include the lower drum (it makes contact with the tire), a spring (to support the white locating ring), and a black cap (to hold the whole thing together). It is not uncommon for the cap to come loose and cause any of the following three problems: [1] the friction will overheat the reel motor during fast winds; [2] the enormous supply-side tension may cause early head failure or at least require frequent head cleanings; [3] in Play mode there will not be enough power to move the take-up reel, resulting in spilled tape.

If you suspect trouble, check the reel tables for vertical “play.” (See photo 2.) If none, press down on the cap until it pops into place. Now notice the generous amount of room for movement in the vertical plane. (The reel table should ultimately be replaced.)

While you’re under the hood, take note of the length of tape between the right precision guide and the linear head. In photo 3, the red arrow points to the tape represented by the red line. For years I have noticed that, during Play, the tape on some machines looks scalloped on the upper edge and taut on the lower edge. This is a sign that one of the precision guides in the tape path is not square. If any one section of tape is played over and over again under these conditions, the tape may eventually become damaged, raising the error rate.

This “scalloped syndrome” has always bothered me, yet experiments to resolve the

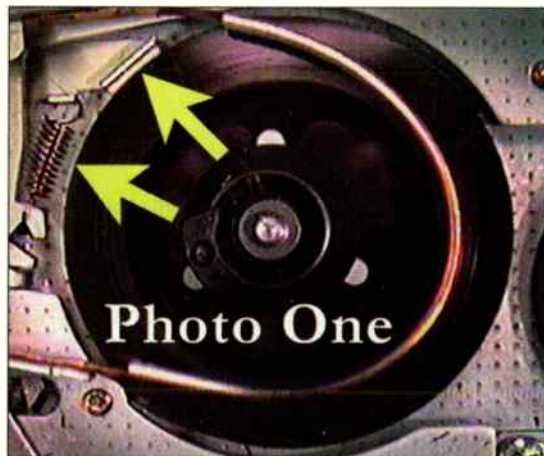


PHOTO 1: Supply-side drag brake and spring.

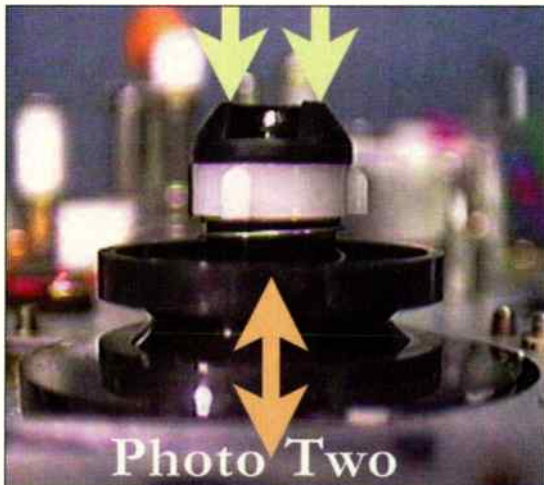


PHOTO 2: Check for vertical play.

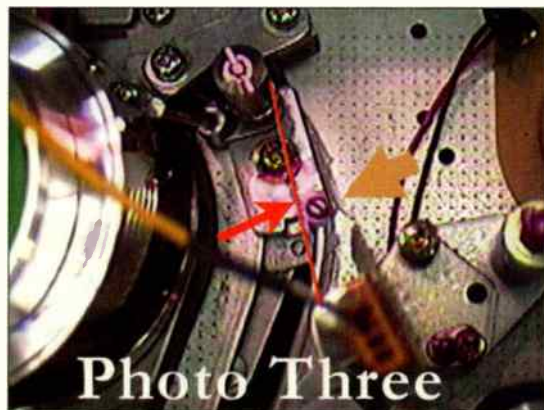


PHOTO 3: Tape path fix.

problem hadn’t yet yielded the *Eureka!* solution, until now. I borrowed an adjustment idea from professional video recorders. By drilling a hole in the slant-block base and tapping it for a #4-40 thread, the added

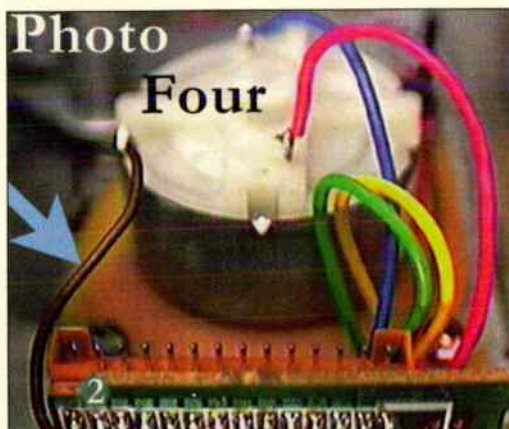


PHOTO 4: Capstan motor ground mod.

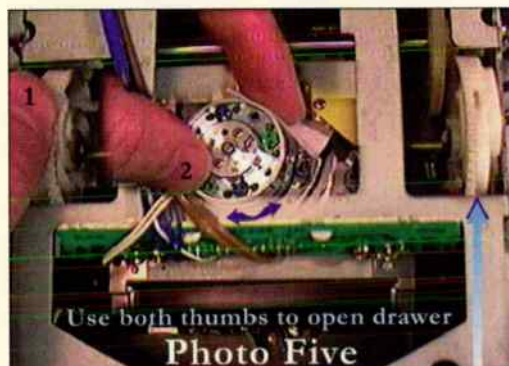


PHOTO 5: How to get to the head.



PHOTO 6: Waber power strip leaves space for wall warts.

screw now adjusts the "zenith" of the guide. (The amber arrow in photo 3.) This is not something you can do at home, kids, but it does reduce tape abuse.

In all but the Alesis M-20, the capstan motor is insulated from the chassis and the flywheel (the base of the capstan shaft) is grounded. When the motor spins and the humidity is low, the rubber belt will generate enough static electricity to discharge through the motor, where it can trick the system logic into stopping the machine. If this happens to your machine, the blue arrow in photo 4 points to a ground wire that you can solder between the capstan motor shell and pin-2 on the interconnecting cable.

We all know that manual head cleaning is safer and more effective than using a cleaning tape. But some machines are not designed for human hands, unless those

hands are skilled enough to remove the loading mechanism. Machines that come to mind are the ancient Sony DAT decks (DTC-500, DTC-1000, and PCM-2500) and the Panasonic SV-3500. Contrary to what you might think, the more popular Panasonic decks (SV-3200, SV-3700, SV-3800, SV-3900, and SV-4100) are accessible, albeit a bit difficult.

Photo 5 reveals the mystery for the first time in print. After removing the cover (as well as the power), place both thumbs on the large white gears of the loading mechanism and push to the rear (light blue arrow) until the drawer opens and exposes the head drum (step 1). There barely is enough room for two fingers, one to apply the lint-free cloth to the side of the head — dampened with 99 percent alcohol — and the other to rotate by touching only the top of the head (step 2).

Please note that this image is highly doctored; I don't really have two left thumbs. You can use two index fingers for the task. (I had to have one hand on the machine and another to capture the image.)

After years of service, the power strips in my equipment racks are getting tired. Some of the outlets are dead or intermittent, causing occasional clicks and pops. Yeah, I bought the cheapest things available. I've never felt the urge to spend money on surge and spike protectors, the only real path to power conditioning IMHO (in my humble opinion) is an uninterruptible power

supply (UPS), which I don't have, yet!

I found the ultimate replacement while thumbing through the Hosfelt Electronics surplus catalog (Tel: 800-264-6464). They carry several models of SL Waber Trimline-Series outlet strips. Part #UL7415-6 is a particular favorite. At four feet long, it features 15 snug-fitting grounded outlets on 2-7/8-inch centers. That's right, there's enough space to plug in a wall-wart without sacrificing a neighboring outlet. Photo 6 shows a road-ready wart secured to the strip with a tie-wrap. The quality is infinitely better than the typical \$10 or \$15 strip and, at \$58.95, is only slightly more expensive.

Note: If you need more information on the subjects covered in this month's column, please visit www.tangible-technology.com

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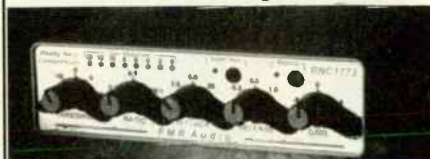
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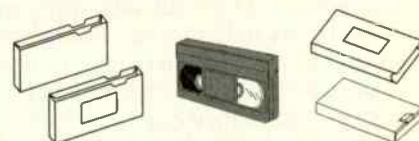
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Another helping
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questions

**BY JON LUINI
AND ALLEN WHITMAN**

It's time we responded to the wise and wonderful queries of you, our readers. The mail piles up and this month, we dig in. It's encouraging to find that we're an active community. The radically different workarounds and fixits that everyone reports on are continually inspiring. But what makes our people so exciting is their willingness, indeed, their eagerness, to share what they've learned through the Threaded Discussion Areas and the Audio Resource Gallery (both available over at www.fezguys.com). But we've just touched the tip of the iceberg. Never a dull moment! Let's get to the questions:

Q: Hello FezGuys! I'm Daniel from Barcelona, Spain. I'm thinking about developing a pay-per-download system where people will be able to download my songs as MPEG files after paying for it. I guess it should work with passwords. I need to find a way that every time the client

clicks on a song, it gets added to the shopping basket. How can I achieve this? What type of CGI's should I use? Do you know of any URLs that already do this? — My gratitude, Daniel

A: Daniel — Your questions are not uncommon, yet they are also ones that require very in-depth information to answer completely. We've got limited space here, but we'll do our best. CGI programming for your Web site requires a fair understanding of programming, and when you add in the complexity of shopping carts and securely processing payment (probably via credit card), it gets more complex! If you're at the level of wondering where to start, your best bet is to find one of the many sites that specialize in providing customers with shopping cart and payment transaction services. To start, try typing "shopping cart and credit card transactions" into www.yahoo.com. You also might find our Column #8 from June 1997 (www.fezguys.com) useful as well.

Q: What Macintosh software do I need to put MPEG files on my Web site for people to download and play (not stream)? How does Iomega's RecordIt fit into the picture? —Paris

A: Paris — Ah, a Mac man after our own hearts! We have been keeping our eyes and ears open for yet more MPEG-based audio compression applications for the Macintosh, now gaining marketshare after being mostly ignored for consumer-level products (like RealAudio and MP3). Today, your best bet is going to be using Macromedia's SoundEdit16 and its SWA (ShockWave Audio) exporter plug-in. You can buy SoundEdit16 for \$419 from www.macromall.com. For a cheaper (free!) solution, look at www.dtek.chalmers.se/~d2linjo/mp3/mp3enc.html. Iomega's "RecordIt" is intended for recording directly to Zip/Jaz/etc. drives, but does fine recording straight to your hard drive. It com-

presses using QDesign's MPEG II stereo compression technology, but does not provide very flexible parameters. RecordIt can be downloaded at apps.iomega.com/software/recordit.shtml. Finally, as we mentioned elsewhere in this column, keep an eye out for Xing's Mac version of AudioCatalyst www.xingtech.com. This is a good product by a good company and reasonably priced.

Q: Hi, I'm looking for the Mac MP3 encoder that produces the truest files compared to the original. I've been using SE16 to convert to

SWA files that are supposed to be MP3 compatible. Will I run into any problems with some players not recognizing the SWA files? Is there a conversion necessary?? Thanks, Heywood J.

A: Heywood — See the above question's answer for some pointers to other encoders for the Macintosh. As for SWA files' compatibility, you shouldn't run into any problems with the majority of MP3 players out there. The only difference between a raw MP3 and an SWA file is an extra bit of header data in the SWA file that the player should ignore just fine (just as some MP3 files have extra ID information at the end).

Q: Hello! I have a Web site that includes RealAudio (5-min. clips, 16-bit, 44.1 kHz stereo). When I try to play it from my site, it interrupts every 20-30 sec. for "congestion." I hired my Web host to set the site, and they said it's normal for such a large file, but for me it seems to be unacceptable. Is it really normal and, if so, is there any way

to play these 5-min. clips in (at least) 16-bit, 44.1 kHz without delays and interruptions? I would be very grateful if someone could answer it here. Thank you in advance. —Emilian

A: Emilian — The first, and most important, issue is what *bitrate* you have compressed your RealAudio files into. The second issue is what speed you are connected

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to the Internet. For example, if you compressed to 128 kbps, most people will not be able to stream that over a modem without *extreme* rebuffering. If you are working with a 16 kbps RealAudio file over 28.8k modems, it should stream just fine. One way problems can be introduced is if the listener's ISP has to travel through other overloaded connections on the Internet to get to your server, or your server is overloaded with other work. The quality of a 16 kbps file is considerably less than 128 kbps ("near-CD quality"), but that's the price

you pay to stream over 28.8k modems. One last issue may be related to how you are streaming the RealAudio file — sometimes you can get a little better quality when streaming through an actual RealAudio server versus using HTTP streaming through a Web server.

A FEZGUYS CORRECTION!

Greetings: In your most recent EQ column, you described the Digital Millennium Copyright Act as an amendment to the Constitution. Tsk, tsk guys. You should remember

that an amendment must be passed by both houses of Congress and must then be ratified by two-thirds of the states. There hasn't been an amendment in a couple of generations. DMCA is just a law. It may seem to be fussy and minor, but if you're talking about matters of law, you might as well be accurate.

Michael Carnes

Dear Michael: You're right — we blew it! Thanks for keeping us on our (legal) toes!

IN OTHER TECHNOLOGY NEWS

In the course of day-to-day life, browsing the Web and receiving loads of e-mail, one is barraged with a never-ending stream of information to process. We FezGuys thought we'd save you the trouble and point out a few interesting and useful ones we've come across.

- In an about-face, WebTV announced that it will likely support Java and RealAudio in future versions of their low-cost set-top Internet boxes. Good idea gang... www.news.com/News/Item/0,4,29845,00.html

- Xing Technologies has announced the Macintosh version of their AudioCatalyst MP3 maker. This is a good product. The FezGuys say check it out. MP3.com has a good article about it at www.mp3.com/news/153.html.

- www.shoutcast.com — From Nullsoft, the folks who bring you Winamp (the most popular MP3 player for Windows), ShoutCast lets anyone broadcast MP3 streaming audio. Free for noncommercial use. We're waiting on some answers to our technical questions and will keep you informed. Windows-only encoder, Windows/Unix servers. Another MP3.com commentary and explanation is located at www.mp3.com/news/152.html.

- www.free-music.com — Index of free music (MP3, MIDI, Mod, etc.).

- www.mp3now.com — "The Ultimate MP3 Resource" (according to them)...music download links, players, etc.

- www.studios.com — List your project (or huge) recording studio in a free contact database being put together.

And, in closing, MP3.com impressed us when they sent out free t-shirts to all the bands who submitted music to their DAM program (which doesn't cost to join). Whether or not you feel comfortable wearing a shirt which reads, "My music is on MP3.com and all I got was this DAM shirt" or not, the gesture was a fine example of keeping their community happy, and involved. Never underestimate the power of marketing via free t-shirts!

The FezGuys welcome all participation.



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DAVID LYNCH

continued from page 83

Casanostra is on the Web, with all their lines and my stuff — www.casanostra.com.

What do you drive?

Lynch: I had a Toyota pickup, but now I've got a 1971 2-door Mercedes.

People know that you have some peculiar eating habits, like you had a Bob's Big Boy milkshake every afternoon at 2:30 for seven years.

Lynch: Yes, I go for a long time on one thing. [Laughs.] Now, I have a choice of two different things for breakfast: a sausage patty, four strips of bacon, and scrambled eggs, or a banana with peanut butter. At lunch, I have a salad of tomatoes, goat cheese, half a can of tuna fish and olive oil, a little bit of vinegar, and some salt. And then at dinner I have cashew nuts and parmesan cheese, and sometimes little strips of chicken.

And that's it?

Lynch: That's it.

Do you have any identifying marks, scars, birthmarks?

Lynch: [Laughs softly.] Well, I just had two marks added. I had back surgery last year, so I got two good scars on my back. Do you get a lot of your ideas from your dreams?

Lynch: No. Hardly ever. Couple of times. Have you heard this rumor going around that you make large donations to the Red Cross in return for a chilled glass of fresh human blood every morning?

Lynch: [Laughs heartily.] No, I haven't heard that one.

Do computers like you?

Lynch: I don't ever work with 'em. I dictate to my assistant, Gaye, and she puts it in a computer.

Boy, what a life!

Lynch: Yeah. You see, I don't type. On Pro Tools, I know how to do a few things, but John is much more knowledgeable and John also understands the musical ramifications. It's much better for John to be on the Pro Tools. If I get on there, I do things very abstractly, just to throw a monkey wrench in. Sometimes it works and sometimes it doesn't, but it's a great tool because you can really jam it and force it — a great thing to experiment with, but if you are building things it's important to know all the things it can do, and have a musical background.

Can you recall the first music you heard as a child.

Lynch: I heard a lot of music, because my parents both loved classical music.

How about songs?

Lynch: "Three Coins In A Fountain." That song has stuck with me. I was in Durham, North Carolina, in the second grade.

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

Lynch: Hmm. What would it be for you, John?

Neff: Beethoven playing after he was deaf.

What do you listen to while you are driving?

Lynch: Lately, I've been listening to John Lee Hooker and George Thorogood.

Do you have any interesting business tips for people in the music business?

Lynch: Keep your eye on the donut and not on the hole.

Who is the most amazing artist you've met?

Lynch: I've met many amazing artists, but the most amazing was Fellini.

Did you ever lose anything?

Lynch: That reminds me of a story. I was in London, working on *The Elephant Man*. It was a five-day-a-week shoot. So I would be home on the weekends. This was a Sunday, and my wife, at the time, was going into town on the train. I was home alone. Somewhere in the morning I get a call from her and she's gotten off the train. She's sobbing. She's lost her ring and I said, "Well, I know where it is." I walked upstairs, went into the bedroom, put my hand between the mattress and box springs. Went in up to my shoulder, got the ring, came back down and said, "I've got it right here." And that's a true story.

No explanation?

Lynch: No explanation at all.

Do you believe in magic?

Lynch: Sure.

Do you believe in Rock 'n' Roll?

Lynch: Yeah!

EQ

ings from all across the 20th century, all the way back into the teens and twenties, from the heights of classical performances to the byways of burlesque, Broadway comic pop, blues, and Tex-Mex. What's most impressive is that it all sounds better than it ever did at the time, because recording technology was always better than the consumer rigs sold to reproduce the recordings. And the miracles are not all wrought by sparkling technology the likes of CEDAR and SADiE. Much of the reclamation effort is clever editing and second-guessing the original engineers who rode gain on the performances like human limiters, albeit it sometimes a bit behind the beat. Winner's ear is faultless, and it seems like he's at the original performance hall when he sets to work.

He left us with a surrealistically life-like window into history. "It was a 1940s recording of an NBC Toscanini rehearsal, in which the genius conductor relentlessly drove the orchestra through the tight and twisting dynamics of a Schubert symphony. Recorded totally without limiters, it revealed every creak of the podium, every remark, cough, and breath of some of the most brilliant musicians ever to play together and now long-perished from the earth. Everything was as it was...and we were there. What a way to make a living!"

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CLEAN! REVIEW

continued from page 132

EXTRA STUFF

In the "added features" category, Steinberg threw a bunch of extras onto the program CD. For starters, a working copy of WaveLab Lite (a stripped-down version of WaveLab) is included to help with additional processing and editing functions. Several front cover and inside sleeve templates were also thrown in (in bitmap and several Microsoft Word versions) for those who would like to do their own artwork layouts. A handy test tone directory includes 1 kHz, 10 kHz, 80 Hz, and 100 Hz wave files that have been recorded at an exact digital reference level of 0 dB (for accurately setting levels throughout your digital system). And lastly, for those who lose manuals, they put the entire thing on the CD as an Acrobat file. Way to go, Steinberg.

This program could be summed up as being simple, straightforward, and perfect for those who want inexpensive access to real-time signal processing for cleaning up older or newer recordings, before burning them to CD.

EQ

SETH WINNER

continued from page 60

IBM-platform-based editor out. It also gives you some other wonderful plugins, for example, a processing board, a sample-rate converter, a manual declicker."

His most impressive machine may well be his least high-tech and most physical: a Keith Monks RCM Mark II disc cleaner. It's sort of an automatic car wash for 16-inch lacquer discs that washes, cleans, and dries the precious originals which are the source of the music. After all, in this business, the beginning is more than half of everything.

Seth Winner has salvaged record-

record guitar...?



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CIRCLE 47 ON FREE INFO CARD

NEMESYS REVIEW

continued from page 124

of the ideal are over: NemeSys spent months toiling over what is undoubtedly the finest sampled piano ever bundled with a program, the aptly named "GigaPiano."

This baby contains 408 samples, taken every two or so keys, with a total of seven different velocity switches depending on the pedal position. The result is awe-inspiring. Every nuance shines, from the undampened top octave, to sympathetic resonances when the sustain pedal is held. It's all there — in stereo — totaling one glorious gigabyte and worth every bit.

In addition to this gem, NemeSys has included a generous selection of sounds, ranging from various drum and groove loops to gorgeous symphonic excerpts from the East-West sample libraries.

While the quality and assortment of bundled instruments and snippets cover a wide range of musical styles, most users will probably purchase additional sample volumes. Fortunately, NemeSys has converted a sizable portion of the East-West catalog for the aftermarket crowd. Add to this the Akai collections, and almost every sonic base is covered —

no small feat for a brand new musical instrument.

CONCLUSIONS

NemeSys could have a huge hit on their hands, what with nearly unlimited memory, squeaky-clean audio, powerful editing tools, solid software integration, and a piano that truly kicks. This is a remarkable new tool for musicians and studios alike.

In fact, while experimenting with GigaSampler, I couldn't help but come up with alternate applications for this type of interactive audio playback. For example, Foley sound effects compositing (with entire sound effects libraries available instantly), interactive DJing and groove remixing (a different song under each key), and real-time post-production dialog and music transfers.

At \$795 (PC sold separately), GigaSampler seems poised to give hardware samplers a run for their money — especially since when your session is done, you also have a computer. For tighter budgets, NemeSys now offers individual GigaSampler components a la carte, with the sampling application (GigaSampler LE v1.5) listing at \$199, and the GigaPiano and other elements available separately. If you run a PC-based studio or use samplers, this is a program that demands your attention. **EQ**

AL KOOPER

continued from page 46

the moment that record hits the charts, you *must* seek legal counsel. Then it is your decision, based on your bank account and your lawyer's advice, to seek legal recourse. Don't do it after the album is named album of the year. You look greedy and like a bandwagon-jumper. Don't do it if the song never makes the charts (it's obviously not worth it then).

I have produced records where I have changed lyrics or melodies and not received credit. If I had asked for credit on that particular project, it would have upset the producer-artist chemistry and cost me the entire project. Some acts, like the late Ronnie Van Zant of Lynyrd Skynyrd, recognized when I was truly involved in the songwriting and rightfully put my name on a song. Other acts I produced, feeding at the bottom of the pond, had years to go before attaining the status of human being that Van Zant was born with. Some never have attained it to this day.

So, before you feel that you are wronged, define your terms carefully. Are you acting as a producer, arranger, musician, or *really* a songwriter? Amen. **EQ**

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Malcolm Toft, a former recording engineer and founder of Trident Audio, has developed one of the most unique mixing systems to date.

The beauty of this system is that each Module can be used as a stand alone device, or to enhance an existing Console.

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DIGITAL MIXERS

MACKIE

Digital 8 Bus Mixing Console

New

Everything you've been waiting for and more!! The new digital 8 bus from Mackie features great sound quality, full recording and mixdown capabilities, motorized faders and an array of digital features geared to take you flying into the next century. See for yourself what the entire industry is raving about.

FEATURES-

- 48 channels of automated compression, gating, EQ and delay
- Built in 3-way meter display keeps you on top of your mix.
- Built-in meter bridge,
- Ultramix II automation for complete control, hook up an S-VGA monitor and you'll feel like you spent a lot more money.
- All functions can be automated, not just levels and mutes. Store EQ, reverb, compression, gating and even Aux send information.
- Fast SCENE automation allows you to change parameter snapshots on every beat.
- Reads Standard MIDI tempo maps, displaying clock info on the built-in position counter.
- Truly the cutting edge of mixing technology.



* monitor, mouse & keyboard sold separately

Panasonic

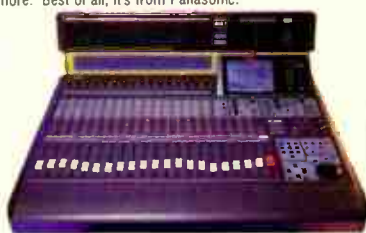
WR-DA7 Digital Mixing Console

New

Stop dreaming about your digital future, it's here! The Panasonic WR-DA7 digital mixer features 32-bit internal processing combined with 24-bit A/D and D/A converters as well as moving faders, instant recall, surround sound capabilities, and much more. Best of all, it's from Panasonic.

FEATURES-

- 32 Inputs/6 AUX send/returns
- 24-bit converters
- Large backlit LCD screen displays EQ, bus and aux assignments, and dynamic/delay settings.
- 4-band parametric EQ
- Choice of Gate/Compressor/Limiter or Expander on each channel
- 5.1 channel surround sound in three modes on the bus outputs
- Output MMC
- Optional MIDI joystick



* meter bridge optional

TASCAM

TMD1000 Digital Mixing Console

You want to see what all the digital mixing buzz is about? The NEW TMD100 from Tascam will have you smilin' & automatin' in no time. It features fully automated EQ, levels, muting, panning and more in an attractive digital board with an analog 'feel'. Your digital future never looked, or sounded, so clear.

FEATURES-

- 4 XLR mic inputs, 8 1/4" balanced TRS inputs.
- 20-bit A/D D/A conversion, 64x oversampling on input, 128x on output.
- Store all settings, fully MIDI compatible.
- Optional IF-TD1000 adds another 8 channels of TDIF and a 2-channel sample rate converter.
- Optional FX-1000 Fx board adds another 4 dynamic processors and another pair of stereo effects.



New

DIGITAL RECORDING

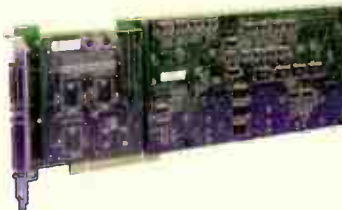
Lexicon

Lexicon Studio Recording System

The Lexicon Studio System interfaces with your favorite digital audio software for a complete hard disk recording package. Supporting both PC and Mac, Lexicon Studio can be expanded up to 32 voices from a variety of I/O options. For recording, editing, mixing and DSP, Lexicon Studio is here.

FEATURES-

- The Core-32 System PCI-Card is capable of supporting 32 audio streams simultaneously. It can also be used as a time code or clock master or slave.
- The PC-90 Digital Reverb daughterboard attaches to the Core-32 providing 2 discrete stereo reverbs.
- The LDI-12T delivers up to 12 channels of simultaneous I/O supporting analog (+4 XLR and -10 RCA), s/pdif, and ADAT.
- Direct support of Steinberg Cubase VST and many other software programs.



OPTIONS-

- The LDI-16S provides 8 channels of +4 XLR balanced analog I/O, and 8 channels digitally through TDIF. 3 option packages are:
- AES-8, 8 channels of AES/EBU digital I/O
- ADT-8, 8 channels of ADAT digital I/O and sync
- STC-1, Post option including read and write of LTC, read and generate of VITC, Window-burn, House Sync and a General Purpose Interface for triggering external devices from the system).

EFFECTS PROCESSING

t.c. electronic

ULTIMATE SOUND MACHINES

Finalizer Express

New



The Finalizer Express is a fast and efficient way to turn your mix into a Professional Master! Based upon TC's Multi-Award winning Finalizer Mastering Technology, it delivers the finishing touches of clarity, warmth and punch to your mixes, putting the world of professional mastering within your reach..

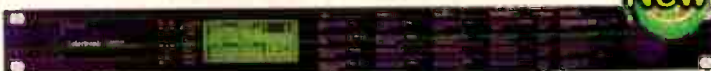
FEATURES-

- 24-bit resolution A/D & D/A converters
- 16 & 20 bit dithering
- TC's unique Multiband Comp & Limiter Algorithms
- Boost and cut over three bands with the Spectral Balance Controls
- Soft Clipping and Look Ahead Delay.
- Finalize Matrix for 25 variations in style and rate

- Optimize overall level with the Automatic Make-Up Gain
- Extra compression in each band using Emphasis keys
- Record fades from the built-in Digital Fader or the optional TC Master Fader via MIDI.
- Connections include AES/EBU, S/PDIF, Optical Toslink & MIDI I/O's.
- High Res LED Metering of I/D & multi-band gain reduction

M3000 Professional Reverb

New



Incorporating TC Electronic's new VSS-3 technology, the M3000 is a great sounding, versatile reverb that is easy to use. Combining ultimate control of early reflections with a transparent rever tail, the art of reverberation is brought to a new level. Whether it's a phone booth, cave or concert hall, the M3000 delivers high-quality ambience.

FEATURES-

- VSS-3, VSS-3 Gate, C.O.R.E. & REV-3 reverbs as well as Delay, Pitch, EQ, Chorus, Flanger, Tremolo, Phaser, Expander/Gate, Compressor and De-Esser
- 300 high-grade factory presets including Halls, Rooms, Plates, Ambience, Gated Reverbs, and more

- Up to 300 user presets in internal RAM and 300 more using an optional PCMCIA card.
- Dual engine configuration featuring 24-bit A/D/D/A's.
- Connections include AES/EBU, Coaxial S/PDIF, Optical Tos-Link/ADAT & analog XLR I/O's, MIDI IN/OUT/THRU, Clock Sync and External Control.

Lexicon

MPX1 Multi-Effects Processor



The MPX-1 is truly an outstanding multi-effects device. Using Lexicon's Lexchip, it offers outstanding reverb or ambience as well as a separate processor for effects for awesome power in the studio or on the road.

FEATURES-

- Intuitive user interface for easy editing, built-in help.
- Balanced Analog I/O (1/4" & XLR)
- 56 effect algorithms
- Digital Inputs & Outputs (S/PDIF @ 44.1KHz)
- 18 Bit A/D; 20 Bit D/A Conversion, 32-bit processing
- >90dB of Dynamic Range
- Intelligent Sorting by Name, Number, Application, etc.
- Parameter Morphing
- Dynamic MIDI/patching & MIDI automation

COMPRESSORS

PreSonus

ACP88 8 Channel Compressor

Stemming from their popular ACP88, the ACP88 comprises eight channels of compression, limiting and noise gating for a variety of studio applications. It features individual side chain for each channel and it's attractive blue anodized finished lets you show your true sonic colors.

FEATURES-

- 8 separate compressors/gates with individual controls
- Servo balanced or unbalanced inputs & floating balanced or unbalanced outputs.
- Individual side chain jacks for spectral compression and a separate sidechain jack for gate processing.

- Each channel boasts full gain reduction metering, compression threshold indication & gate open/close.
- Front panel buttons include hard/soft knee compression, peak/auto compression, bypass, gate range and link.
- Link feature uses a unique summing bus for multiple combinations of master/slave link setups.

dbx

Model 566 "Silver Series" Compressor

The new Silver Series introduces a 2 vacuum tube circuit design making the 566 no ordinary compressor. Loaded with features including custom designed analog VU meters that monitor tube level, gain reduction, or output levels. Full sidechain functionality, including sidechain monitor, Contour function allows low frequency material to pass through the threshold without triggering un-musical compression effects.

FEATURES-

- Hand selected Premium 12AU7 vacuum tubes
- +4/-10 operation
- Drive control for a wide variety of great tube effects

- PeakPlus limiter on each channel
- Complete sidechain, OverEasy, and Auto function
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Roland

VS1680 Digital Production Studio

New

The new VS-1680 Digital Studio Workstation is a complete 16 track, 24-bit recording, editing, mixing and effects processing system in a compact tabletop workstation. With its advanced features, amazing sound quality and intuitive new user interface, the VS-1680 can satisfy your wanderlust.

FEATURES-

- 16 tracks of hard disk recording, 256 virtual tracks.
- 24-bit MT Pro Recording Mode for massive headroom and dynamic range.
- Large 320 x 240 dot graphic LCD provides simultaneous level meters, playlist, EQ curves, EFX settings, waveforms and more.
- 20-bit A/D D/A converters
- 2 optional 24-bit stereo effects processors (VS8F-2) provide up to 8 channels of independent effects processing.



- New EZ routing function allows users to create and save various recording, mixing, track bouncing, and other comprehensive mixer templates for instant recall.
- 10 audio inputs: 2 balanced XLR-type inputs w/ phantom power, 6 balanced 1/4" inputs, and 1 stereo digital input (optical/coaxial)
- 12 audio outs: 8x RCA, 2x stereo digital & phones.
- Direct audio CD recording and data backup using optional VS-CDR-16 CD recorder.

DIGITAL MULTI-TRACK RECORDERS

TASCAM

DA-88 Modular Digital Multitrack

The 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.

FEATURES-

- 1:48 minutes record time on a single 120 min tape
- Expandable up to 128 Tracks using 16 machines
- User-definable track delay & crossfade
- Shuttle & Jog capability
- Auto punch with rehearsal



- SMPTE, MIDI and Sony 9-Pin sync capability
- Options include RC-808/848 Remote Controllers, IF-88AE/IF-885D digital interfaces, MU-Series meter bridge, MMC-88 MIDI machine control interface, SY-88 Sync Card

DA-38 Digital Multitrack for Musicians

Designed especially for musicians, the DA-38 is an 8 track digital recorder that puts performance at an affordable price. It features an extremely fast transport, Hi-8 compatibility, rugged construction, ergonomic design and sync compatibility with DA-00a.



ALESIS

ADAT M20 20-bit Digital Audio Recorder

The M20 represents Alesis commitment to meeting the high standards of world-class audio engineers, producers, studio owners and high-end video and film post production studios. A new professional digital multi-track, the M20 records 20-bit for outstanding sound quality. Combined with a host of production features like SMPTE/E8U, the M20 is a powerful tool.

FEATURES-

- SVHS Recording format - up to 67 minutes recording.
- 18-XLR connections (9 in and 9 out) as well as a 56-pin ELCO connection.



- 24-bit, 64x oversampling recording, 20-bit, 128X oversampling playback
- Digital I/O
- Includes LRC remote and a digital cable.

ADAT XT20 Digital Audio Recorder

The New ADAT-XT20 provides a new standard in audio quality for affordable professional recorders while remaining completely compatible with over 100,000 ADATs in use worldwide. The XT20 uses the latest ultra-high fidelity 20 bit oversampling digital converters for sonic excellence, it could change the world.

FEATURES-

- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.



- Remote control
- Servo-balanced 56-pin ELCO connector
- Built-in electronic patchbay
- Copy/paste digital edits between machines.

ADAT LX20 Digital Audio Recorder

The most affordable ADAT ever made, the new LX20 features true 20-bit recording at a price you won't believe. Compatibility with all other ADATs and digital consoles, the LX20 provides the same sync options and digital inputs as the big brother XT20 at a lower price point.

CD RECORDERS

Fostex

CR200 Professional CD Recorder

The Fostex name is not all this CD Recorder has to offer. The CR200 features S/PDIF I/Os, balanced XLR analog input, 5 record modes as well as a full function remote. A great choice for burning CDs in any studio or home recording environment.

FEATURES-

- Converts any input signal to CD 44.1kHz standard
- Uses both Professional and Consumer CD formats
- S/PDIF Inputs and Outputs for versatile interfacing.
- AES/EBU In, XLR Balanced Ins, Unbalanced Ins & Outs
- 5 Record Modes, Records To Red-Book Standards



- IDs Recorded Automatically
- Durable Platter Mechanism Resists vibrations
- Full-function Remote Included

STUDIO DAT-RECORDERS

TASCAM

DA-45HR Master DAT Recorder

The new DA-45HR master DAT recorder provides true 24-bit resolution plus standard 16-bit recording capability for backward compatibility-making this the most versatile and great sounding DAT recorder available. With support for both major digital I/O protocols plus the ability to integrate the machine into virtually any analog environment, the DA-45HR is the ideal production tool for the audio professional.

FEATURES-

- Word Clock
- 24-bit A/D and 20-bit D/A with dither
- XLR balanced and RCA unbalanced analog I/O
- AES/EBU and S/PDIF digital I/O
- Word Sync In/Thru
- Alphabetic data entry for naming programs
- Independent input level adjustment capability
- Output trim for XLR balanced analog output
- Optional RC D45 Remote Controller



Panasonic SV-3800

The SV-3800 & SV-4100 feature highly accurate and reliable transport mechanisms with search speeds of up to 400X normal. Both use 20-bit D/A converters to satisfy even the highest professional expectations. The SV-4100 adds features such as instant start, program & cue assignment, enhanced system diagnostics, multiple digital interfaces and more. Panasonic DATs are found in studios throughout the world and are widely recognized as the most reliable DAT machines available on the market today.

FEATURES-

- 64x Oversampling A/D converter for outstanding phase characteristics
- Search by start ID or program number
- Single program play, handy for post.



- Adjustable analog input attenuation, +4/-10dBu
- L/R independent record levels
- Front panel hour meter display
- 8-pin parallel remote terminal
- 250x normal speed search

Fostex

D-15 Pro Studio DAT Recorder

The new Fostex D-15 feature 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



- 8MB recording for improved S/N (Sounds like 20bit)
- Independent L/R recording levels
- Equipped with auto head cleaning for improved sound quality.

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SOLIDTUBE TUBE MICROPHONE

The SOLIDTUBE combines the best of solid state and tube technology to provide a "warm" sounding microphone suitable for professional recording applications.

FEATURES—

- Large diaphragm condenser
- Integrated pop screen surrounds the capsule, reducing excessive pop noise
- ECC 83 (12AX7) vacuum tube which provides perfect transfer characteristics
- Includes elastic shock mount
- Low-cut switch, Ground lift switch



audio-technica AT4060

Combining premium 40 series engineering and vintage tube technology, the AT4060 delivers a versatile and competent studio microphone. Low-noise and high SPL capabilities make the AT4060 a premier vocal mic as well as strings, guitars and other demanding applications.

FEATURES—

- 20 - 20,000 Hz freq response
- Dual gold-vaporized large diaphragm elements
- Includes the AT8560 power supply, AT8447 shock mount, rack mount adapters and case.



MICROPHONES

SHURE KSM-32

The new KSM32 side-address microphone features an extended frequency response for open, natural sound reproduction. Suitable for critical studio recording and live sound production, Shure steps up to the plate with another classic.

FEATURES—

- Class A, transformerless preamplifier circuitry for improved linearity across the full frequency range.
- Exceptionally low self-noise and increased dynamic range necessary for highly critical studio recording.
- 15 dB attenuation switch for handling high SPLs.
- Switchable low-frequency filter to reduce vibration noise or to counteract proximity effect.
- Great for vocals, acoustic instruments, ensembles and overhead miking of drums and percussion.
- SL model also features an elastic shock mount which greatly reduces external vibrations.



BPM CR10

Hand-crafted in East Berlin, the BPM CR10 Studio Condenser Mic features a full frequency response for competition against the best of the best.

FEATURES—

- 1" Gold diaphragm
- Suitable for most guitar and vocal recording applications.
- Includes Custom Aluminum Road Case, XLR-cable, wind screen and elastic suspension.



SAMPLING

AKAI



\$5000 & \$6000 Studio Samplers

Akai is proud to announce its next generation of samplers with the introduction of the S6000 and the S5000. Building upon Akai's legendary strengths, both machines feature up-to 128-voice polyphony and up-to 256 MB of RAM. They use the OOS disk format and .WAV files as the native sample format allowing standard PC .WAV files to be loaded directly for instant playback - even samples downloaded from the Internet into your PC may be used. And of course, both the S6000 and S5000 will read sounds from the S3000 library.

FEATURES—

- OS runs on easily upgradeable flash ROM.
- 2x MIDI In/Out/Thru ports for 32 MIDI channels
- Stereo digital I/O and up to 16 analog outputs.
- 2x SCSI ports standard
- Wordclock connection
- Optional ADAT interface provides 16 digital outs
- .WAV files as native sample format



\$6000 ONLY FEATURES—

- Removable front panel display
- User Keys
- Audio inputs on both the front and rear panel allow you to wire the S6000 directly into a patchbay from the back and override this connection simply by plugging into the front.



E-mu Systems, Inc.

E6400 Professional Sampler

The e-6400 from EMU features an easy interface that makes sampling easy. Automated features like looping, normalizing and more allow you to flexibly create your own sound palettes or access any of the 400 sounds provided on 2 CDs for unlimited sound creation. It is upgradeable to 128MB of RAM (4MB standard) and features 64 voice polyphony, 8 balanced analog outputs, SCSI stereo phase-locked time compression, digital re-sampling and more. A dream machine.



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—

- +48V Phantom power, phase reverse, and a 75Hz high-pass filter.
- Mute control and a true-VU response LED bargraph are also provided.
- Includes a Mid-Parametric band with controls especially designed to enhance vocal characteristics.
- Single balanced Class A VCA delivers low distortion and a S/N ratio as low as -96dBu.
- Dynamics section offers important voice processing functions such as compression and de-essing combined with a noise reducing expander.

dbx 586 Vacuum Tube Mic Pre

The DBX 586 Vacuum Tube Dual Mic Preamp

uses hand selected and matched premium 12AU7 vacuum tubes ensure ideal characteristics for a warm, distortion free signal path. Custom designed analog VU meters monitor tube level insert path or output levels well. Line/Instrument and mic inputs make the 586 versatile enough to use with virtually any input source.

FEATURES—

- Mic or line/instrument inputs on each channel.
- 4+/10 operation.
- Drive control for a wide variety of great tube effects
- 3-Band EQ with sweepable frequency
- Optional TYPE IV Conversion System outputs
- Separate 1/4" insert send/return on each channel



JOE MEEK VC1 Studio Channel

The Joe Meek Studio Channel

offers three pieces of studio gear in one. It features a transformer coupled mic pre, compression and a professional enhancer together in a sleek 2U rackmount design!

FEATURES—

- 48V phantom power. Fully balanced operation
- Mic/Line input switch
- High pass filter for use with large diaphragm mics
- Extra XLR input on front inakes for easy patching
- Compression In/Out & VU/Compression meter
- Enhancer In/Out switch and enhance indicator
- Internal power supply 115/230V AC



MONITORS



M6000/S Studio Monitors

The KRK M6000/S are designed for close field monitoring. A smooth frequency response in a compact size make these units portable and efficient.

FEATURES—

- High power handling
- 62Hz - 20kHz, ±3dB
- Compact and portable
- Low distortion
- Smooth frequency response
- Custom Gray finish.



Hafler TRM-8

Powered Studio Monitors

Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Transnova power amp circuitry.

FEATURES—

- 45Hz - 21kHz, ±2dB
- 75W HF 150W LF
- Electronically & Acoustically matched



MACKIE

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
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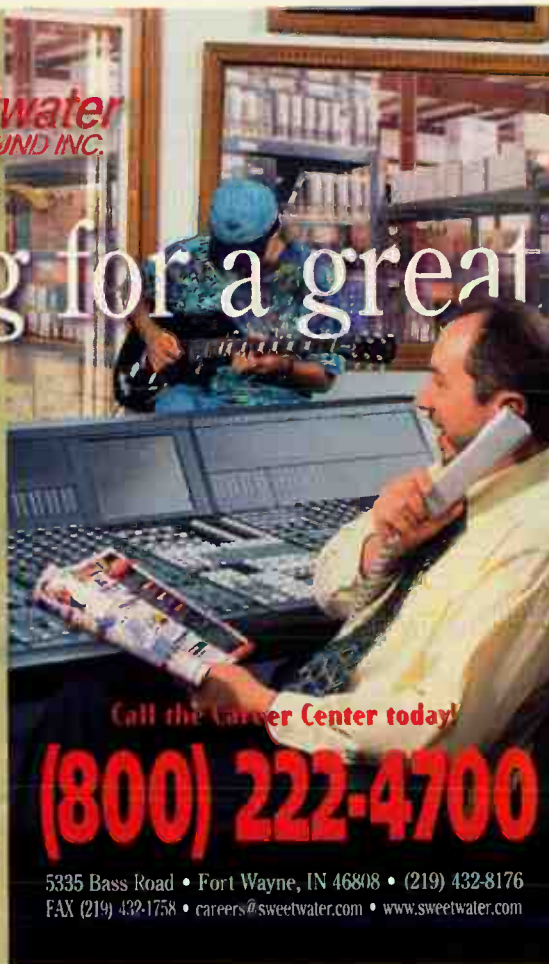
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ACROSS THE BOARD


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an idea of how much louder you want the mix to be. The mastering engineer knows how to use his equipment and can easily make mix 6 to 10 dB louder without hurting the mix much at all. It is much easier if he has the original to work with.

MORE MASTERING POINTERS

There are three key points for successful mastering. Documentation, documentation, and documentation. Each cut on your master DAT (or whatever format you send to mastering) should be labeled with its ID number and time on the tape where it is located. This avoids problems with skipped or erased start IDs. Do not label "1) TUNE ONE 3x. 2) TUNE TWO 4x." This was supposed to mean that the first thing on the tape was TUNE ONE, and it was on there three times. Then came TUNE TWO, which was on the tape four times. Were they exact copies of one mix? Were they different mixes of the same tune? Which one was supposed to be the master? The client sent additional DATs of the mixes, but the labels showed what he was planning on putting on the DAT, not what was actually on the DAT. The compiled tape was a DAT to DAT copy, two of the songs had lots of digital error noises, but the error lights didn't flash. He said that he copied the bad tape so that the error lights would go away, and then I could just fix the digital noises. I had the 75 original mixes of each song, but he couldn't remember which mix version was used as the master. No documentation. Some DATs had no labels, so nobody knew what was on them. To top it all off, all of the tunes were instrumentals, so I couldn't figure out which tune went with which name.

THAT'S ENOUGH


Tools like limiters, compressors, EQs, plug-ins, and whatever else you use can add to your recordings and mixes. I use this stuff every day. Just be careful. Listen with fresh ears. Take your mixes to someone else for input. Print versions with less effects in case later on you wish you had. Always print a version of your mix without overall limiting in case the mastering house can do a better job. Make backup copies of your mixes either by printing the mix again on another DAT tape, or by digitally copying the mix to a computer or another DAT tape. And spend some time documenting what is what. It will be a lot easier and I guarantee you it will be a lot cheaper. 

ROOM WITH A VU

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EQUIPMENT NOTES: Hirschfelder states: My favorite gear would have to be the big beast at the heart of my audio-visual workstation — the Macintosh PowerPC 9500/200 hardware and peripherals used in conjunction with the Emagic's Logic Audio software. Two 17-inch screens are positioned strategically on either side of a central 21-inch screen, forming one wide, composite virtual screen — enabling me to simultaneously display music notation, various MIDI graphic or event list windows, and audio waveforms — all in sync with full frame-rate video playing off hard disk and viewed through a Sony Trinitron monitor. This powerful technology is making the technical side of film scoring a lot less boring and so much more elegant. For example, I love the way you can "touch" a note in your score and see the video automatically jump to the frame that is in sync with that note. Then, if you want to, you can move your note to the frame where you want it to hit. That stuff never ceases to amaze me.

PRODUCTION NOTES: Hirschfelder continues: Compatibility is a key issue in today's individualistic and ectoplasmic world of virtual studios. When it comes to scoring and music desktop publishing, I work closely with Sam Schwarz, who also has a Logic Audio/Pro Tools/Macintosh PPC workstation with three screens, so that when I send files upstairs to him for note editing and fine tuning, we're literally on the same page. Likewise, engineer Chris Scallan's 64-track Pro Tools rig around the corner has two huge 21-inch screens for our viewing pleasure, so when it's time for detailed digital audio editing and processing, I usually pop things over to him on a freshly toasted CD, or a Jaz drive. We have also come up with shared sets of key-command short-cuts in both Logic Audio and Pro Tools, so we all jump on each other's rigs at any time to hack away or help each other out when the sausage factory is in full swing.

Having admitted to being your average professional composing equipment junkie, I have to say that I still get my biggest studio high when I'm pounding away on the black-and-white keys of a roaring 9-foot, acoustic monster — it may only be 20th century enhancements of 18th century technology, but it still really gets me where I live. 

CRITICAL LISTENING

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energy, sound energy should be treated in a similar fashion where force is used appropriately. It all comes down to balance. Balance determines the state of just about all aspects of our universe. When things are in balance, optimum energy is achieved.

The listening space is equally sensitive to balance. It is subject to chain reactions if precision in balance is not considered. An anechoic chamber will give the most accurate representation of a speaker, but be horribly uncomfortable to be in with the worst case of efficiency. An echo chamber will be amazingly efficient, but equally as uncomfortable and extremely confusing. *Balance.* Carefully creating a space where reverb times across the spectrum are similar and interference is minimized. Tight controlled low frequency at the expense of a bit of efficiency is a trade well worth making. If it comes to a choice, give up some efficiency for accuracy. A clever balance of reflection, absorption, and diffusion will result in excellent resolution with the least amount of efficiency sacrificed. When all things are in balance, optimum energy is achieved and focus on the intricacies becomes much more effortless.

In this situation, true critical listening can be achieved.

Chris Pelonis is an acoustician/studio designer with over 200 facilities to his credit. He is also the inventor and manufacturer of several acoustical devices.

BEYERDYNAMIC MIC

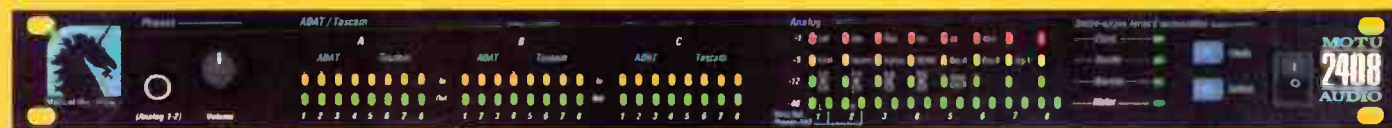
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Beyerdynamic's MCE 82 is a very cool microphone that is useful in many applications. It sounds really good, doesn't cost a bundle, and (like a good tool should) really can help make life easier. The MCE 82 is also very rugged. We stashed it in its pouch, placed it in the back of a small rack filled with cables and a small tool kit where it bounced around for miles without a problem (though heavy-duty road warriors may want some kind of hard case). Its dark gray finish makes it unobtrusive in live performances, and you'll never have to worry about tracking down an oddball battery to power it. A very useful microphone! 

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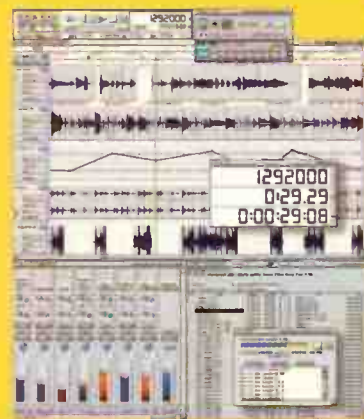


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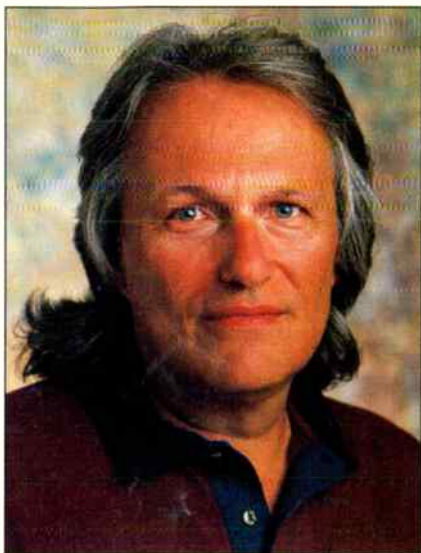
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Plug It In and Turn It OFF!



Tools are cool,
but only when used in
moderation

BY ROGER NICHOLS

Here we are, wandering around the NAMM show, looking for all of the new guitars, keyboards, and recording gear to make our songs into hits. When I classify musicians, I usually split them into two categories. The players and the owners. In the keyboard department, my wife and daughter are players, and I am just an owner. I can still make some music, but I just need lots of time (not real time) and lots of computer power.

When it comes time to do the actual recording and mixing, I thankfully can cross the boundary into playerdom. There are many great musicians, players, who crossover to owner status when it comes time to record or mix. There is also a lot of "friend of the band who owns all of the sound gear" who should also be grouped

into the owner category. Just because you own a Ferrari, doesn't mean you are qualified to race in the *Mia Miglia*.

Why do I bring this up? Well, it seems that as more and more digital audio workstations and digital recorders and digital outboard gear pop up in garages, the audio quality of mastering projects is getting worse and worse. One guitar player told me how much time he spent trying different guitars and how much time he spent making sure that each section was exactly in tune...and then he compressed and EQ'd it so much it sounded like a leaf blower more than a guitar. He was disappointed that I couldn't fix it in mastering.

PLUG IN THIS

Plug-ins are great inventions. I think they started with Adobe Photoshop. Prior to plug-ins, you had to import your drawing into another program that had the effect you wanted, then import it back into Photoshop. Sometimes the secondary program didn't directly support Photoshop files, so you would have to export your work in some common denominator format that both programs would understand. On top of all the hassles, you had to pay full price for all of the secondary programs just for one or two features.

Before Pro Tools and VST plug-ins, it was the same way. You had to save your files in some other format, import them into another audio program, do whatever it is you wanted to do, and then get your audio back intact. Or maybe you had to run your audio out to an external piece of hardware that did what you wanted, and then record the audio back into the original program on a new set of tracks.

FOR BETTER OR WORSE

Plug-ins are good. Each plug-in emulates a piece of hardware that costs two to four times as much as just one piece of gear. Copies of a plug-in can be used in many different places at the same time. You can buy one compressor module and then limit every single instrument to make your mix louder. And then you can use another copy on the final mix to make it even louder. I've seen mixes that are compressed so much I could use them for test tones.

When you only had two hardware limiters, you were pretty picky about which instrument got processed. "Yeah, we don't need it on the guitar, let's save it

for the vocal." If you had to spend hours exporting your audio to another program for noise reduction, maybe you didn't need to process 11 tracks.

With plug-ins, you no longer have to make those decisions. The flip side of the coin is that you now have to make better decisions about how to use each of those limiters. I can always tell when someone buys a new reverb, because everything they do for the next six months has too much reverb on everything. The same thing seems to happen with plug-ins. "Wow, that's great, let's AutoTune everything! Run the vocal through the Amp-Farm! Now put the Aphex on the whole mix and run it through the multiband compressor!" No, I wasn't recording your conversations, but I know you have said the same thing at one time or another.

ALL THINGS IN MODERATION

What the hell does that mean? It means, "After you turn it up for awhile and get your jollies, then turn it down." Most effects don't need to be used to excess. Less is more. Sometimes a separate compressor on each background vocal helps to smooth out the balance, but they start to sound bad real fast if you overcompress.

The worst offenses I have seen (I have been in contact with the limiter police) are the ones where a multiband compressor/limiter is used on the final mix. The mix is pushed up higher and higher until it sounds louder than any other CD. The person doing the mixing doesn't have any idea about the correct settings for the limiter or the compressor. Sometimes they are mixing while listening through the compressor. They can't understand why the whole mix goes up and down in level when they turn up the guitar solo, or why the rest of the track disappears during a drum fill. This mix is then sent to the mastering facility after it is too late. There is not much that can be done to a mix that has been abused.

The best way to approach a mix that you want to limit to death is to first get a good mix without the limiter. Then run the mix through the limiter/compressor to hear the effect that you are trying to achieve. When it is time to send your final mixes to the mastering facility, send them the original mixes without the death limiter, and send the mix you made with the limiter as a guide so the mastering engineer can get

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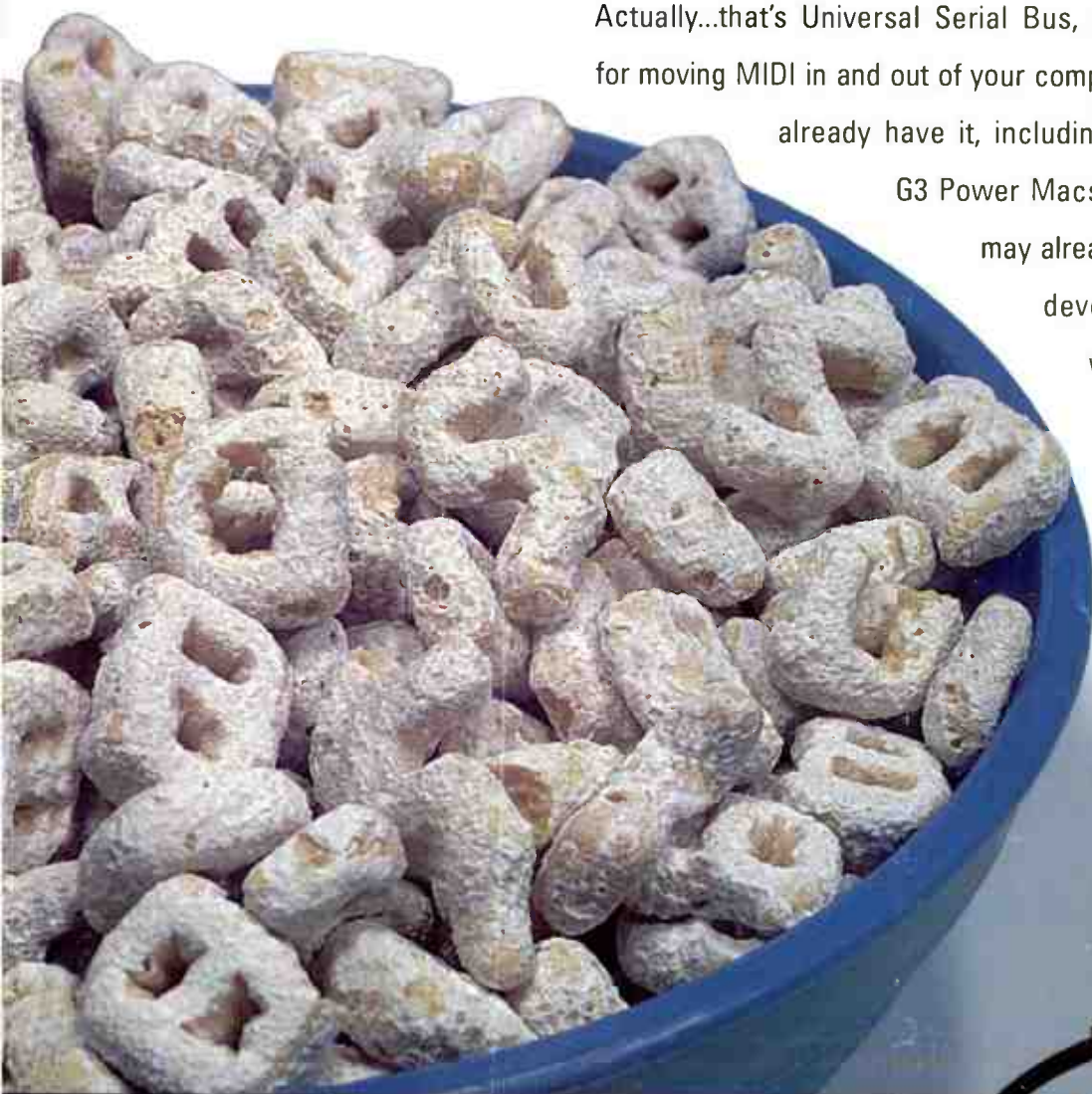
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