STUDIO REPORT: ALESIS 20-BIT ADAT RECORDER

EQ

THE PROJECT RECORDING & SOUND MAGAZINE

DECEMBER • 1997

Exclusive Reviews:
- Opcode VOCODE
- Electro-Voice T221M
- A&H GL4000
- Shure PSM 600
- Sek'd Samplitude
- Sonic Foundry
- Sonorus STUDI/O

Keyboard Recording Tips:
David Bryan, Jack Renner, Al Kooper, Jordan Rudess, and Craig Anderton

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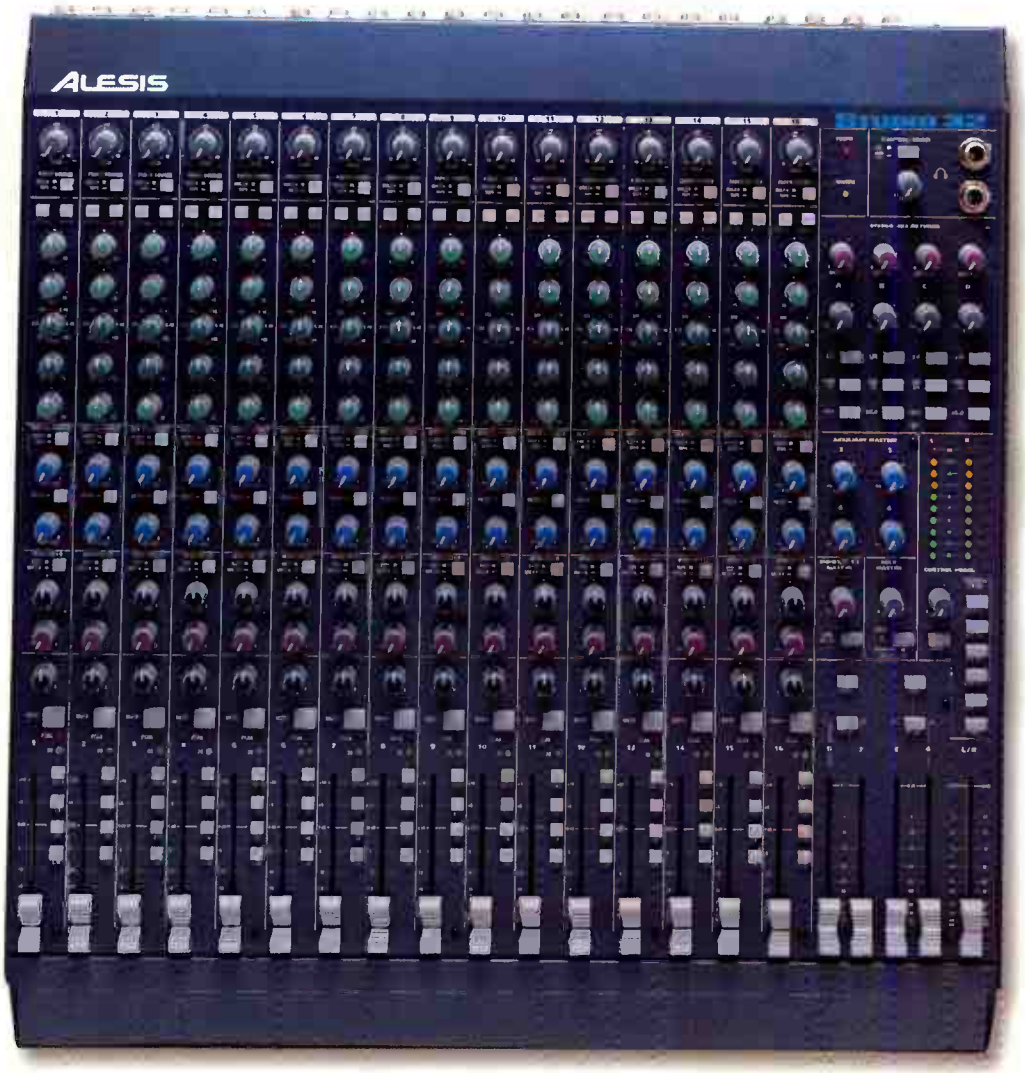
MILLER FREEMAN PUBLICATION

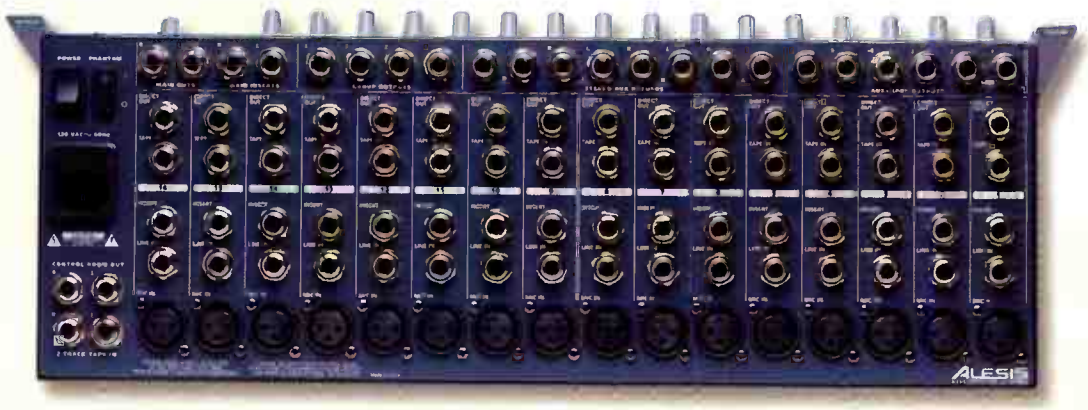
David Bryan of Bon Jovi sits in his project studio.

World Radio History

The Recording Console That



The Studio 32's inline design gives you balanced XLR mic inputs and balanced 1/4" TRS line inputs, channel inserts, tape inputs and direct outputs on each channel. Four group outputs, six aux sends (four pre-fader and two post-fader), phantom power for every channel and separate control room outputs are also provided. And since all of these connections are on the rear panel, your studio stays neat and professional-looking.



World Radio History

Looks Sixteen but Acts Thirty-two

The world of small-format consoles seems to be suffering an identity crisis. After all, most of them look alike...and also act alike.

Where can you turn to get the advantages you need?

Introducing the Alesis Studio 32™ Recording Console with Inline Monitoring

The Studio 32 offers 16 hybrid/discrete mic preamps that combine extremely low-noise performance (-129dB E.I.N.) with a wide 60dB range, making them perfect for driving digital recorders. In fact, the Studio 32 offers a wider dynamic range than all of the currently-available "affordable" digital consoles (and it's a whole lot less expensive).

Audio sources in your studio multiply quickly. Instruments, miked drums, vocals, and stereo signals from synth modules keep adding up. Fortunately, the Studio 32 has twice as many inputs as an average 16-channel mixer, so simultaneous recording or mixdown of multiple sources–live or in the studio– is no problem.

It's the world's most affordable 16-channel console that offers inline monitoring capability. Inline monitoring means that each channel can send signals to a recorder and receive signals coming back from tape...*at the same time.* So, unlike your average mixer, the Studio 32 can hook up with sixteen tracks of ADAT® (or any other recorder), instead of just eight. That's *double* the tracks you can access.

Other stuff that makes the Studio 32 stand out from the crowd: fully-parametric midrange EQ and super high-quality mic preamps that are more comparable with the consoles you see on magazine covers than on other compact mixers. 40 inputs available at mixdown...again, twice as many as most other small consoles. All at a price so low that you can afford to get that second ADAT (now that you can use it).

▲ *Above: a 16-track digital recording studio that can fit into a corner of your living room. Centered around the Studio 32 and a pair of ADATs, this setup is a professional-quality, low-cost solution for serious recording.*

The Studio 32's EQ section provides more than just high- and low-shelving EQ. You'll also find a fully-parametric midrange EQ with individual gain, frequency sweep and bandwidth (Q) controls.

The Alesis Studio 32. The console that acts a lot bigger than it looks. At your Alesis Dealer now.

STUDIO 32™
RECORDING CONSOLE W/INLINE MONITOR

For more information on the Studio 32, see your Authorized Alesis Dealer or call 800-5-ALESIS.

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1633 26th Street Santa Monica CA 90404 800-5-ALESIS alecorp@alesis1.usa.com www.alesis.com

World Radio History

ALESIS
CIRCLE 02 ON FREE INFO CARD

HR824 ACTIVE MONITOR

"Overall frequency was almost hard

Logarithmic wave guide helps accurately propagate high frequencies over a wider area. Result: better dispersion, more precise imaging and a far wider sweet spot.

Edge-damped 25mm high-frequency transducer is directly coupled to its own 100-watt FR Series™ Low Negative Feedback internal power amp.

Alloy dome is free from "break-up" that plagues fabric domes, causing high frequency distortion.

Signal present and overload LEDs.

Instead of a noisy port, a passive honeycomb aluminum transducer on the rear of the HR824 almost doubles the low frequency radiating surface.

"This allows the HR824 to move a large volume of air with minimal low frequency distortion & power compression."
EM Magazine*

Specially-designed 224mm low frequency transducer has a magnet structure so massive that it wouldn't even work properly in a conventional passive loudspeaker. But servo-loop-coupled to a 150-watt FR Series™ amp, it's capable of incredibly fast transient response and extremely low frequency output.

Inside: the HR824 cabinet is 100% filled with adiabatic foam. Result: Unwanted midrange reflections from the low frequency transducer are absorbed inside the enclosure instead of being reflected back out through the cone into your listening space.

"The enclosures — dressed in conventional yet classy black motif — are shielded."
EM Magazine*

Inside. Two separate FR Series power amplifiers with a total of 250 watts rated power — the most of any active monitor in the HR824's class.

On the back. HF Boost/Cut, Acoustic Space, Roll-Off and sensitivity controls, balanced 1/4" and XLR inputs. *"The Mackie HR824 is the only system (in the comparative review) that doesn't require the user to fumble around with tiny tools in order to make adjustments."*
EM Magazine*

Actually this paragraph doesn't have anything to do with the HR824. Mackie is further expanding its R&D/Engineering department and is looking for more analog and digital engineers with experience in pro audio. Log onto our web page for particulars.

* **Electronic Musician, October 1997, All quotes are unedited.**

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World Radio History

response was so flat that it to believe." Electronic Musican Magazine*

Ready to confront reality? The HR824 Active Monitor is now in stock at Mackie Dealers.

Owning a set of HR824 near field studio monitors has the potential of seriously altering your perception of sound.

For the first time, you'll be able to hear **precisely** what's going on all the way through your signal chain — from microphones right through to your mixdown deck. You'll suddenly discern fine nuances of timbre, harmonics, equalization and stereo perspective that were sonically invisible before.

Some tracks you've recorded will amaze you; others may send you back for an immediate remix.

But either way, for the first time, you'll be hearing **exactly** what was recorded — not what a conventional loudspeaker may or may not have been capable of reproducing.

> "In fact, all the sonic details that I can discern on a $45,000 reference system were very well reproduced, although not identically, on the HR824s. That was very impressive."*

> "The precise resolution is a major boon for finicky sound sculptors."*

> "The imaging and high frequency dispersion is brilliant. I was amazed at how far off-axis I could scoot my chair and still clearly hear what was going on in both channels."*

Admittedly, these are pretty brazen claims (which is why we're backing them up with comments from a credible, third-party source).

But all you have to do to become a believer is to visit your nearest Mackie dealer. When you compare HR824s to the competition, you're going to hear some dramatic differences.

First you'll notice far more openness and detail. Critical listeners tell us that it's as if a curtain has been lifted between themselves and the sound source.

Next, you'll notice low frequency output so accurate that you might look around for the hidden subwoofer (some of the world's most experienced recording engineers have done this, so don't be embarrassed). The HR824 really IS capable of flat response to 39Hz. Moreover, it's capable of **accurate, articulated** response that low. Rather than a loudspeaker's "interpretation" of bass, you can finally hear through to the actual instrument's bass quality, texture and nuances.

Each HR824 ships with its own signed Certificate of Calibration attesting to its ±1.5dB 39Hz-22kHz frequency response.

Next, if you can "unlock" yourself from the traditional, narrow "sweet spot" directly between the monitors, you'll discover that the HR824s really DO live up to our claim of wide, dispersion.

> "The low end was robust and present; the electric bass and kick drum thump-ed into my chest the way those huge UREI* monitors did back in the old days."*

Their sweet **zone** is so broad that several people can sit next to each other — or if you work solo, you can move from side to side in front of large consoles — and still hear a coherent, detailed stereo panorama.

> "Overall, the response was so smooth that I wasn't even aware of a crossover point."*

Finally, let the salesperson go wait on somebody else and enjoy an extended session with one of your favorite CDs. When you're through, you'll discover that when distortion and peaky frequency response are minimized, so is ear fatigue: You can listen to HR824s for hours on end.

> "Stereo imaging and depth were fabulous."*

One final point... your monitors are the only part of all your studio equipment that you actually **hear**. Along with good microphones, HR824s are the best investment you can make, no matter what your studio budget. And, like premium mics, HR824 monitors cost more than less accurate transducers.

But if you're committed to hearing **exactly** how your creative product sounds, we know you'll find owning HR824s well worth it.

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CIRCLE 45 ON FREE INFO CARD

World Radio History

EQ
PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 8, ISSUE 12
DECEMBER 1997

ON THE COVER:
David Bryan sits between his boards — both keys and console. Photo by Mark Weiss/Angeles.

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World Radio History

I will play music

Nothing but music

Way back then it was cool
to play the blues
When hip-hop was be-bop
you know, straight ahead.
When a young musician
had visions of Oscar an' McCoy
settin' it out so smoothly-
kind of like Jordan taking flight,
but in the key of B flat.
Dreaming of being a student
in the Miles Davis
"turn my back to you"
original school of funk
Having knowledge of the old
keeps you prepared for the new.
Get ready for the DA-38

TASCAM®
CHANGES EVERYTHING

DA-38 The Digital Multitrack built with the musician in mind

CIRCLE 95 ON FREE INFO CARD

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Pssst! Hey you...

...Wanna buy some great gear for your studio? *really* cheap? I can hook you up...

How many times have you heard that kind of an offer? It's usually proceeded by, "Brand new in the box! Now is your chance to score a great deal." The problem is that the gear may be of "questionable origin." It's no big secret that sale of stolen gear goes on in our industry simply because the toys are expensive and not everybody is willing to cough up the cash. However, the long-term impact of buying stolen gear may not be immediately recognized by those who buy it. Consider some of the ramifications:

- Gear that "falls off a truck" causes manufacturer's insurance rates to go up. You wind up paying for it when they raise their prices and cut their staff to save money.
- You're not likely to receive tech support on a stolen item.
- You have no recourse if it doesn't work properly.
- If it does work properly when you buy it, you still don't get a warranty.
- You'll have to worry about being busted if it goes in for repair.
- You may not be entitled to software updates or hardware upgrades.
- If somehow the police recover the gear from you, they take it and you have nothing.

For those reasons, smart studio owners and engineers stay away from hot gear — it's not worth the risk.

Of course, there's the consideration of stolen gear that's not new. Where do you think it comes from, the audio junk yard? No. It usually comes from somebody else's studio. And you know something — what goes around comes around. If you're buying hot gear from a thief that knows where your studio is located, how long do you think it will be until your studio gets hit?

If someone approaches you with a deal that sounds too good to be true, it probably is. Here are some questions to ask before plunking down your hard-earned cash:

- Does the unit have a power supply and are you getting it with the deal? Let's face it — you'd have to be an ass to buy a vintage tube mic without a PS because (a) you won't know if it works or not and (b) very few legitimate people would ever sell such a mic without a PS. The same could be said for a console.
- Are you getting a user's manual with it? Real equipment owners usually keep the manual, especially if it's a complicated piece of gear.
- Is the serial number intact? Lack of a serial number is a blatant indication of stolen gear.
- Does the unit look well cared for? Although a faceplate may be legitimately scratched, look to see if it appears to have been hastily ripped out of a rack.
- Is the person offering the gear to you someone you'll never see again, or are they part of your circle of friends?
- Is the unit missing a proprietary accessory such as a multipin cable or a unique mounting device?

If you can answer "no" to a few of these questions, then it might be wise to stay away from the gear *and* the person selling it. If you're not sure, you can easily do a little research. Call the manufacturer and find out if the serial number was reported stolen (if the seller won't give you the serial number, tell them to take a hike). Keep your ears open and stay in touch with other local studio owners. If your gear was stolen, get a list of model and serial numbers and get that list out to every engineer, studio, and retailer that you possibly can (you *do* have a listing of model and serial numbers, *don't you*). Most importantly, keep this in mind: If we don't support the audio black market, there's less incentive for people to steal gear in the first place.

—Steve "Woody" La Cerra

World Radio History

The Incredible Impulse™ 200

Hear them at some familiar places.

The Impulse™ 200 can be wall-mounted from the bottom or wall/ceiling mounted from the top with the Peavey Versamount™ 70 bracket. The speaker can be used free-standing with the S-1™ tripod stand.

Addressing the need for a high-performance molded speaker system at a reasonable price, Peavey Electronics presents the Impulse™ 200. Competitors have tried to match us, but they always seem to come up short (under-powered) or past the mark (over-priced).

The 12" Black Widow™ woofer, with specially treated cone and field-replaceable basket, provides superior resistance to outdoor elements, while the 22XT™ titanium compression driver, coupled with a 90° x 45° horn, handles the highs with precision and ease. Add to that our new Sound Guard™ high-frequency driver-protection circuit, which combines the industry-standard light-bulb method and an innovative resistor network. This new method is much more audibly pleasing and transparent.

All these features, plus carefully matched audio and crossover components, conspire to produce the crystal-clear, high-fidelity response that one has come to expect from the Impulse Series.

The Impulse 200... looks great, sounds even better.

Peavey exclusive Sound Guard™ high-frequency driver protection circuit utilizes a much more audibly pleasing and transparent safeguarding method.

Specially coated cone and dust cap help make the Peavey made Black Widow™ woofer even more durable. Field-replaceable baskets reduce down time should the speaker become damaged.

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SURROUND THIS!

I'm sorry to say that I found it frustrating to read your recent issue that was devoted almost entirely to 5.1 surround sound (October '97). I'm a project studio recordist and am still trying to achieve decent mixes within my financial restraints in stereo! It'll be a long while before I think about picking up three more monitors!

David
via Internet

FACT OR FAD

I recently read your Surround Sound feature in the October issue of *EQ*. I'm not a retro man, but I wonder if we're not coming face to face with another audio fad. Not for film obviously, but for audio there are some obvious cons. My eyes and ears — my entire face, in fact — attends to one direction. If someone to my left addresses me, I turn to face them.

My ears, unlike me eyes, can sense what is behind me, but it is natural to focus your senses. We do this by facing the music. The concert stage is not all around us. There can be no real surround video. Even the sense of smell will lead the head to face and focus on a point of perceived origin. It is true that the sound of an acoustic instrument will fill a room, but there is still a focus of origin. When it comes to the mix, I suppose that we will still, eventually, mix the lead vocal, kick, snare, and bass at or near the center point. When stereo first came on scene we heard all sorts of "strange" drum mixes — drums left, bass right, etc. Eventually we standardized an exaggerated mono mix, which in reality is a natural, realistic method.

I realize that the pop album is a work of art unto itself and doesn't have to relate to the environment or physics of live performance. But making the transition from stereo to 5.1 is not the natural evolution that mono to stereo was. Surround alters our sensibility, and, in today's world, where everybody has the chip, people are format weary. Going from LP to CD was easy, but today's format might have the life expectancy of a goldfish. Kids and yuppies will jump on, but the baby boomer might remember quad, or even the Edsell.

What I've seen thus far reads like a hula hoop. Intriguing, fun, adventurous — you bet, but my senses and budget request a harder sell. We've cloned a sheep and possibly have the technology to clone humans, but just because we can doesn't mean we should.

So, as a sound engineer with a small label, I can share your excitement, but let's wait and listen before we create another DAT or MD for the masses — or perhaps a hula hoop.

Mike Walker
Florence, AL

THE WAY IT WAS

As a mastering engineer at Columbia Records from 1971 to 1976 I am compelled to rebut the picture of Columbia Records mastering given by Al Kooper in your October issue. First, we did use "clippers" or compressors as a matter of policy. I had a pair of UREI LA-4A compressors that I only used when the program material needed it, and certainly not for flash peaks. We used compressors to raise the average program level, not to take out flash peaks. Analog cutting heads, particularly the Westrex heads favored by Columbia, were very tolerant of flash peaks.

We used very little in the way of EQ or limiting. I had the LA-4A's, a couple of Pultec MEQ's, a couple of Lang's, and a couple of Pultec filters screwed into a vertical rack and that was it. No console, no A-B switching, no modern conveniences. Just as straight an audio path as we could manage and the highest quality maintenance in the industry.

Phil Brown
N. Hollywood, CA

PERF-ECT WORLD?

In response to Gary Woods' letter in the October '97 issue: For 20 years I've despised the perf-rights societies. Becoming a member is like breaking out of Alcatraz. Obtaining information and establishing a dialogue is much more difficult, stressful, and fruitless than dealing with the CIA, Mafia, and the Ku Klux Klan — I really have dealt with those three, and it was easier.

Gary says: "The societies' interests are those of the composers, lyricists, and publishers." I mean no insult, but is Gary insane? The IRS is warm and friendly compared to the blunt stonewalling the perf-rights societies thrust in our faces. Gary should try being an artist and then see if his views might be a bit more reality-based.

He has no idea at all what most artists express in their music because the societies prevent most artists' music from being heard by anyone at all. Yes, they do a tolerable job of collection and distribution of the funds, but only for artists who bought a backdoor entry into the country club of self-serving perf-rights families.

There's no legitimate reason to provide any society with info about my parents, children, and grandchildren. It's irrelevant, and none of their business. ASCAP require you to "already be published" before you can become a writer-member, and to be a writer-member before you can become a publisher member. Obviously, this is impossible. This Catch-22 game is played by all the societies. How would Gary justify such unjust rules?

If Gary knows a secret password to thrust open the iron doors, he should share it with us. We artists would dearly love to have the freedoms Gary says the societies "care about." We've never had them before — it would be a new experience for us.

As perf-societies' employees pay their rent with our money, we struggle to find money to pay our rent. Let's be sensible and start a healthy, friendly, and productive effort to correct the mistakes, right the wrongs, and make the music business the fair and freedom-filled environment that so many like Gary fantasize it as being. Then we can do something about the U.S. Copyright Office, but that's a different nightmare. Thanks for listening.

J. Johns
via Internet

CORRECTIONS

In the Audio Alchemists story in the October issue's *EQ* Live section, it was erroneously reported that the Alchemists recorded Matchbox 20 at Le Bar Bat in New York City. They did, however, record Wilco and Big Head Todd & The Monsters.

Also, the incorrect address was listed for HHB Communications in the Genex GX8000 review in the November issue. The correct information is 626 Santa Monica Blvd., Suite 110, Santa Monica, CA 90401. Tel: 310-319-1111.

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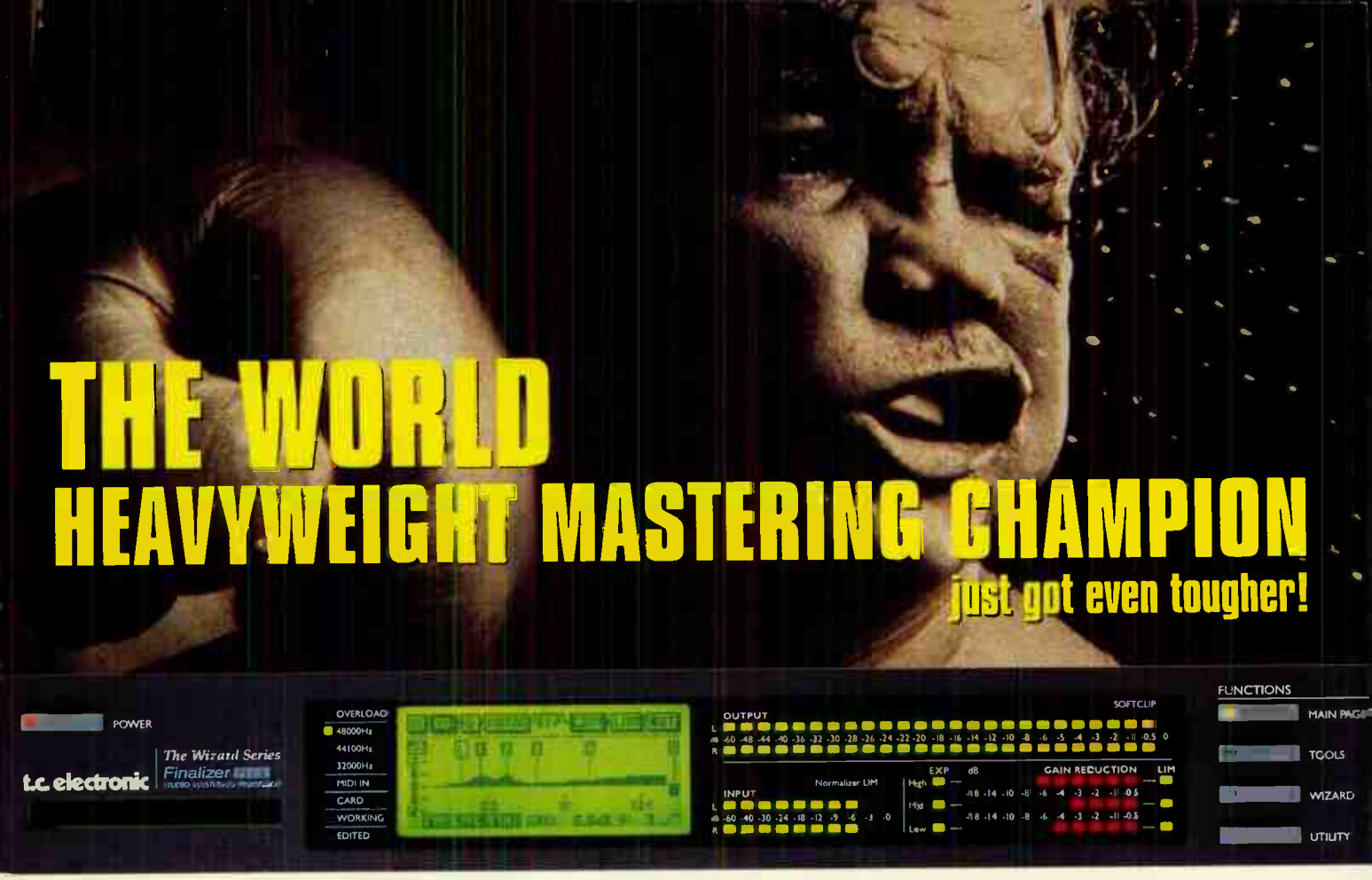

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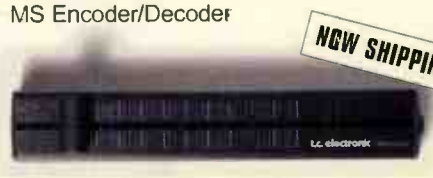

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CACHE CARD

Q *I hear that caching with digital audio programs is not a good idea, yet Windows 95 makes a big deal about how it includes a "dynamically resizable cache." Does this solve the caching problem?*

Bill G.
via Internet

A File caching in Windows 95 assumes that if you read data x recently, you'll probably want to read it or write it again soon; and if you just read data x, you're probably about to read in data x+1 (read-ahead). But this presupposes that the operating system "knows" better than the application which data is going to be referenced next, and that statistically you'll get better average performance by having the OS store this data into VCACHE's memory.

However, if you're playing long stretches of audio, the OS is constantly filling up the VCACHE memory with data that won't be used again...it'll just get flushed out as more and more audio data moves through the system. Read-ahead caching seems like a good idea, because you probably are going to need "data x+1." But if it's going to VCACHE's memory instead of directly into the DAW program's buffers, the performance gained by reading ahead is likely offset by the time spent writing the data into the cache.

Today most disk drives do their own read-ahead by filling up RAM on the drive itself. This is useful because it requires no host CPU or system memory. If the read caching on the drive matches the requests from your system (when the reads are coming from the same part of the disk), this is a big "win."

Finally, one of the primary functions of the DAW program itself is "read-ahead caching" — the program is constantly trying to fill the application-allocated buffers that are used to pass the audio data between the program and the device-driver for the sound card. The DAW program knows better than the OS or the drive which data needs to be played.

Of course, there's a tradeoff between getting good audio performance and getting good performance with Netscape, Word, or any other program that's a good match for VCACHE's assumptions. You can change the VCACHE size yourself by editing the SYSTEM.INI file so that the VCACHE section specifies MinFileCache=0 and MaxFileCache=2048 (this assumes 16 MB of RAM; for 32 MB systems, MaxFileCache can be 4096). Even better, setting MinFileCache and MaxFileCache to the *same* value will keep Windows from dynamically changing the size of the cache, an operation that can periodically send your hard disk into a frenzy of activity.

Barry Braksick
Frontier Design Group
http://www.FrontierDesign.com

DIY IN THE SHOW-ME STATE

Q *I was wondering if you know of any books or articles that would show me how to build a simple tube mic preamp. I am in a situation where my boss won't spend the money to buy any, but the mic pres on our Neotek Elan console have become just about unusable.*

I sat in on one of Eddie Ciletti's panels at the AES in Los Angeles, and found the info on helical-scan machine maintenance to be very helpful, keep it up!

Bob Beck
Conservatory of Music
Missouri Repertory Theatre
University of Missouri, Kansas City

A Although I suspect you are exaggerating just a wee bit, I'm sorry to hear that your Neotek preamps are "unusable." Call *EQ* magazine at 212-378-0400 for a back copy of the January '97 issue (you do have a subscription, don't you?) or visit my Web site, which features the same Altec mic preamp/direct box do-it-yourself project.

Please keep in mind that there are at least two philosophies concerning preamplification: accuracy or coloration. I believe the Neotek preamps are a transformerless design and are more likely to be sonically transparent than "colorful." Either philosophy is desirable depending on your application.

The cut-and-paste efficiency of modern-day recording console mass production can improve channel-to-channel consistency, but performance may degrade as components age. Electrical noise immunity is also an issue with some consoles, not by design, but via steps taken to reduce production costs.

Coloration is what guitarists are always looking for and why they

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Digital Mixers Hit Earth.

Announcing 02R V2 and 03D mixing consoles. The incredibly affordable Yamaha digital mixers make the world a much more productive place. From the start, the 02R has delivered spectacular sonic quality with 32-bit processing, 20-bit digital/analog conversion and direct digital interface to your digital recorder. It has also allowed you to save and instantly recall all of your mix settings and the movements of 02R's motorized faders, EQ, effects and limiter/compressor/gates. **Now, 02R V2** adds more stellar features including ► DIGITAL AUX SENDS ► 6-channel SURROUND SOUND ► REMOTE MIDI CONTROL of external devices (like multitrack and hard disk recorders) ► INPUT PATCHING so you can assign tracks from a recorder to alternate inputs ► 24-BIT RECORDING on your 16-bit multitrack ► and new automation features including TOUCH SENSITIVE FADER EMULATION. 02R V2 has 44 digital and analog inputs and lots of outputs. For the more down to earth but ambitious 8-track digital studio working with MIDI gear, the **Yamaha 03D** offers the same features in a smaller format, plus brand new 32-bit effects processors. Whether you choose 02R V2 or the new 03D digital mixer, your mixing power will take off and your mixes will sound incredible. To understand why Phil Ramone, Roger Nichols, Tom Jung and Hans Zimmer rave about Yamaha digital mixing, see these products today at a Yamaha Authorized Dealer or call **1-800-937-7171 x 645** now for literature.

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tend to overdrive amps and preamps. This is not how to get more "color" from the Neotek. A good percentage of the magic "color" recording enthusiasts are looking for comes from overdriving class A tube and transistor circuitry.

Eddie Ciletti
Manhattan Sound Technicians
NYC, NY

BUZZ TO GROUND, COME IN PLEASE

Q *I recently switched microphones — from an Audio-Technica 4033 to a Neumann TLM 193 — and am now picking up hum and radio frequencies that were previously never a problem. Any ideas for getting rid of extraneous noises? I use balanced connections from and to all my gear. I did notice that the problem occurs with a Tube Tech MP 1A mic preamp (straight to a TASCAM DA-38) and not with the Mackie 1604 mixer preamps.*

Ken
via Internet

A I suspect it's a ground-related problem, but first try another cable. What happens at Pin-1 of the mic preamp's XLR input is extremely important. It should go directly to the metal chassis, and, along with it, all of the noise that the cable's shield picks up. In many cases, Pin-1 goes to ground via wire or a circuit board trace. The slightest extra bit of resistance undermines the effectiveness of the ground and may also inject noise into the high-gain preamp circuitry.

I have forwarded your question to Neumann and suggest you contact Tube Tech. Rather than attempt a modification, there is one simple approach that may do the trick. Open the male end of the mic cable and connect a wire from Pin-1 to the "fourth" pin, a solder lug that makes a direct chassis connection. Let me know if this works.

One final point. Some XLR connectors have locking screws (Switchcraft), while others (Neutrik) are held together by a plastic strain relief. Hold the metal end in one hand while turning the strain relief counter-clockwise.

Eddie Ciletti
Manhattan Sound Technicians
New York City
edaudio@interport.net

Neumann adds: One of the reasons the problem doesn't occur with the A-T mic is that the TLM-193 may draw quite a bit more current from the phantom power supply. Not only does the capsule require a bias voltage, but also even more current is required by the active transformerless circuitry. The phantom supply should be capable of delivering at least 2.5 mA per mic, but, even so, ground current in the path Pin-1 takes to ground is the likely culprit.

Karl Winkler
Product Manager
Neumann-USA

DA-88 SYNC HELP

Q *I tried — for the first time — sync'ing three TASCAM DA-88's (version 4.0) and controlling them via our RC-848 (upgraded to v.4.0). I followed all the tricks in the manual, but, unfortunately, it didn't work. The three units did sync with each other, and we can activate each track locally, but we can not control any of the three units through our RC-848. Any ideas? (By the way our RC-848 can control a single unit perfectly when one DA-88 unit is disconnected from the other units.)*

Fer de Castro
INC Sound & Video Facilities
via Internet

A There are too many undetailed elements in your question to answer it with any certainty. It's possible that your problem comes simply from not using a quality TASCAM sync cable, but I would not want to steer you wrong. You need to contact TASCAM Customer Service at 213-726-0303 and explain in depth what components your system contains and what it is and isn't doing for you. I'm sure TASCAM will be able to help you.

Roger Maycock
TASCAM

ASK US

Send your questions to:
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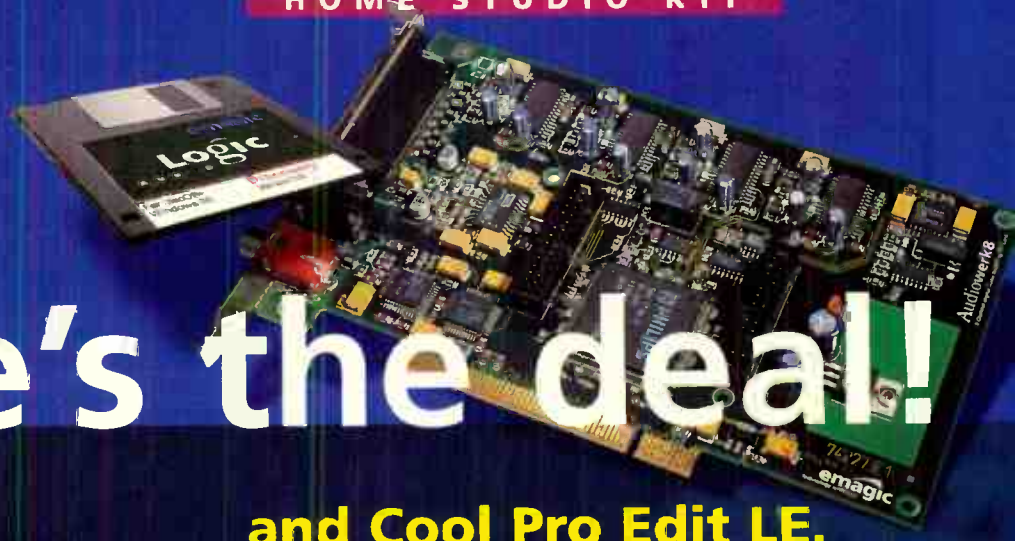

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EQ PRODUCT VIEWS

ACTIVE PLANNING

AXI, the U.S. distributor of Dynaudio, has introduced an active version of the company's passive BM15 speaker. Called the BM15A, it is an active two way near/mid-field system with a 9.5-inch magnesium silicate impregnated polypropylene bass drive unit and a 1-inch Esotech soft-dome treble unit with aluminum voice coil. The bass unit uses a 4-inch voice coil and also features dedicated amplifier electronics that include protection circuitry. Power and "clip on" indicators are mounted on the front baffle. The amplifier section is a discrete MOSFET design, delivering a robust 200 W for LF and 100 W for HF drive units. The BM15A has a suggested retail price of $3599/pair. For more information, contact AXI, Inc., 357 Liberty Street, Rockland, MA 02370. Tel: 617-982-2626. E-mail: info@aximarketing.com. Circle EQ free lit. #101.

GOLDEN OPPORTUNITY

If you are looking to invest $2000 in a studio tool that is sure to increase in value, check out AKG's limited edition golden anniversary C414B/ULS microphone. Sure, you know the AKG C414, but this edition is covered in an 18 karat gold plating and has engraved serial numbers that will range from 001/100 to 100/100. The gold version weighs 11 oz. and comes in a wooden case that includes all accessories and a signed certificate of authenticity. For more information, contact AKG at 1449 Donelson Pike, Nashville, TN 37217. Tel: 615-399-2199. Circle EQ free lit. #102.

TWO PACK

ART's new Tube Pac tube preamplifer/compressor may seem familiar, but that's only because it is a combination of the company's popular Tube MP preamplier and Tube Compressor. The preamp section provides over 70 dB of gain, +48 V phantom power, and phase reversal. This section also features LED level indicators that monitor the output of a 12AX7a tube for harmonic content. The compressor section has a VCA-less, optical design, as well as threshold, compression and limiting ratios, variable release times, bypass and output gain controls, and gain reduction metering. For more details, contact Applied Research and Technology, 215 Tremont St., Rochester, NY 14608. Tel: 716-436-2720. Circle EQ free lit. #103.

MAKE THE SWITCH

DCS, Ltd. has unveiled its dCS 972 DDC digital-to-digital converter. The 972 has input and output frequencies from 11.025 to 96 kHz and 1st, 3rd, and 9th order noise-shaping options. The unit can convert between AES, dual AES, S/PDIF (on RCA, BNC, and Toslink connectors), and SDIF-2 formats. For more details, contact Canorus, 240 Great Circle Rd., Suite 326, Nashville, TN 37228. Tel: 615-252-8778. Web: www.canorus.com. Circle EQ free lit. #104.

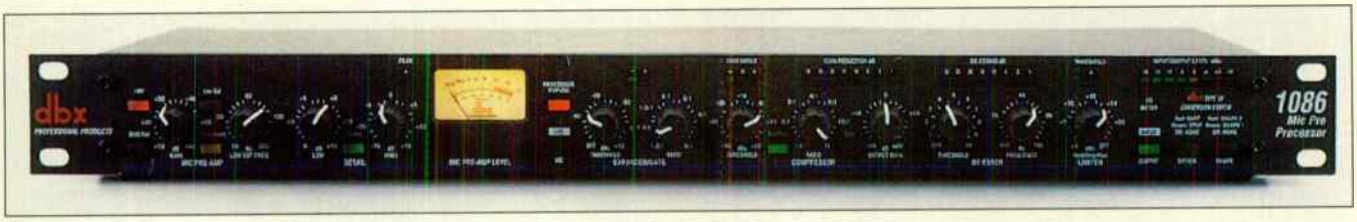
World Radio History

TO SUMMIT UP

Summit Audio's new TMX-420 line-level mixer is a hybrid unit, offering both vacuum tube warmth and solid-state performance. The device has four line-level inputs, A/B pan control, and channel level control, and includes a per channel in/out switch, phase switch, and send level control with a pre or post level switch. Four TMX-420's can be linked together, and each unit has a master section that offers a master level control for two outputs, two VU meters with peak indicators, and separate channel A and B trim controls. The TMX-420 can accommodate combinations of –10 and +4 inputs/outputs. For more details, contact Summit Audio, 2636 South Rodeo Gulch Road, Unit C, Soquel, CA 95073. Tel: 408-464-2448. Web: www.summitaudio.com. Circle EQ free lit. #105.

PROCESS SERVER

New to dbx's line of processors is the 1086 single-channel microphone preamp and dynamics processor. The mic pre section features a variable-frequency low-cut filter and low and high equalization controls, as well as +48 V phantom power, a 20 dB pad, and phase invert switch. The unit's mic pre can be used independently of its dynamic processing section via mic pre outs (1/4-inch and XLR) on the rear panel. The compressor section features selectable hard-knee or OverEasy® characteristics. The de-esser features variable controls for both threshold and frequency settings. The expander/gate has threshold and ratio controls coupled with a two-part meter that shows the signal in relation to the threshold level. Also included in the 1086 is dbx's PeakStopPlus limiter that prevents unwanted transients from blowing drivers, while minimizing sine wave distortion. Suggested retail price of the 1086 is $749.96. For more information, contact dbx, 8760 South Sandy Parkway, Sandy, UT 84070. Tel: 801-568-7660. Circle EQ free lit. #106.

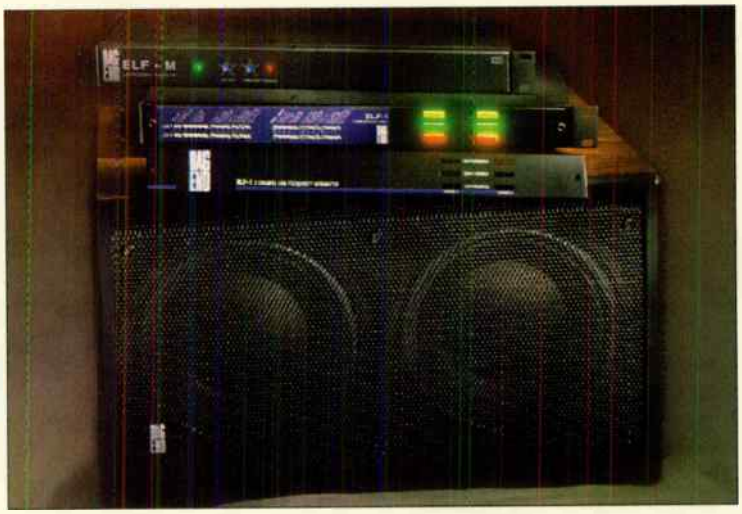


LIGHTEN UP

Samson has introduced a power distribution unit that will let you keep the artist-pleasing mood lighting in your studio and still let you see what you are doing. Samson's PowerBrite is a single-space rackmountable power strip that also features an adjustable pull-out fluorescent light that, when placed at the top of the rack, will illuminate all of the devices. The back-lit inlay incorporated into the pull-out light tray can be individually customized to showcase a studio, band, or company name or logo. The PowerBrite's front panel includes a power on/off switch, a 15-amp circuit breaker, and an unswitched AC receptacle. The rear panel features eight AC receptacles arranged vertically and horizontally to accept both standard plugs and wall-mount power supplies. The suggested retail for the PowerBrite is $139. For more details, contact Samson Technologies Corp., P.O. Box 9031, Syosset, NY 11791-9031. Web: www.samsontech.com. Circle EQ free lit. #107.

A LITTLE LOW

Add a little low end into your studio literally with Bag End's compact D10E-I subwoofer system. The system is designed to be used with Bag End's extended low-frequency dual integrator. When used together, the frequency response of the D10E-I is ±3 dB from 8 to 95 Hz. Power handling capacity of the 4-ohm system is 400 watts continuous sine wave. Specs include two 10-inch-cone drivers, and a sensitivity of 94 dB SPL/1 watt/1 meter @ 80 Hz. The dimensions of the cabinet are 13 inches high x 22 inches wide x 13 inches deep and is available in unfinished or black. Weight is 48 lbs. and suggested list price is $688. For more information, contact Bag End, P.O. Box 488, Barrington, IL 60011. Tel: 847-382-4550. Circle EQ free lit. #108.



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EQ PRODUCT VIEWS

PLEASING PUNCH

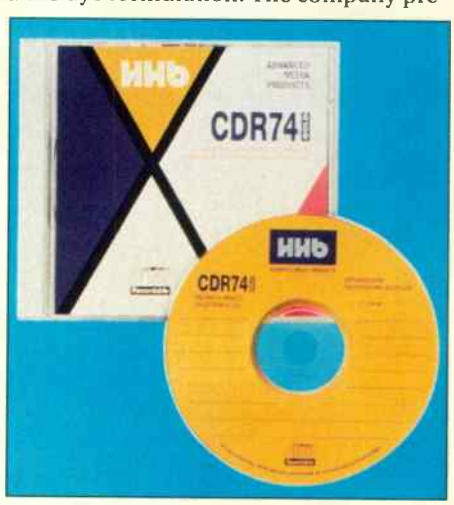
Drawmer's MX40 punch gate has been designed for engineers to apply a gate to a drum quickly and easily. The MX40 has just three operational switches and features Drawmer's new Peak Punch circuitry that accelerates the leading edge of the drum signal, heightening the dynamics. The Trigger Frequency control allows fast set up of frequency conscious gating with Key Listen to enable the engineer to tune-in to the required frequency. Other controls include Threshold, Release, External Key, Filter In/Out, Attenuation Range, and Bypass. Connections are XLR balanced channel input and output and a 1/4-inch key input. Suggested retail price is $499. For more details, contact Drawmer, distributed in the U.S. by Transamerica Audio Group, 2721 Calle Olivo, Thousand Oaks, CA 91360. Tel: 805-241-4443. Circle EQ free lit. #109.

LOOK, UP IN THE AIR...

As a follow up to its Flying Cow digital audio converter, MIDIMAN has introduced the Flying Calf D/A external S/PDIF digital-to-analog converter box. The Flying Calf D/A delivers audio from its 20-bit, delta sigma D/A converter with 128x oversampling and dynamic range of nearly 100 dB (A-weighted). The unit also has a small footprint — only 5.2 inches x 3.2 inches x 1.2 inches. The Flying Calf D/A has an RCA S/PDIF digital input and dual 1/4-inch unbalanced audio outputs. The Calf's D/A circuitry automatically locks to the sample rate of the incoming S/PDIF digital bit stream. Price is $149.95. For more details, contact MIDIMAN, 45 East St. Joseph Street, Arcadia, CA 911006. Tel: 626-445-2842. E-mail: info@midiman.net. Circle EQ free lit. #110.

GOOD AS GOLD

HHB has released the HHB CDR74 Gold — the first CD-R disc developed specifically for professional audio use. The main difference between the 74-minute CDR74 Gold discs and CD-Rs designed for computer use is in the manufacturing process where, according to HHB, all of the critical manufacturing elements are under direct control — the production of the masters, the disc pressing, and the dye formulation. The company predicts that the discs should be able to securely archive for 100 years. For more information, contact HHB Communications, 626 Santa Monica Boulevard, Suite 110, Santa Monica, CA 90401. Tel: 310-319-1111. Circle EQ free lit. #111.



TWIN ENGINE POWER

The new S100 multieffects processor from DigiTech is built on the company's S-DISC processing technology and has two individual processing engines that can be configured in series, parallel, or combined to provide true-stereo effects. The single-rack-space processor uses a 46.875 kHz sampling rate and 20-bit conversion, and also features tools such as stereo reverbs, multi-tap delays, chorus, flange, tremolo, detune, and parametric EQ. Because of the dual-processing engines, two separate effects can be used simultaneously. With 99 factory programs provided, up to 99 combinations of user-defined programs can be modified and saved. The processor responds to MIDI, and carries a suggested retail price of $199.95. For more information, contact DigiTech, 8760 South Sandy Parkway, Sandy, UT 84070. Tel: 801-566-8800. Web: www.digitech.com. Circle EQ free lit. #112.

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Focus On The Most Important Musician On Stage.

Take Control of Your Sound—and Say Goodbye to Wedges—with the New Shure Personal Stereo Monitor

Let's face it. The band needs you. And to sound your best, you need the new, full-featured Shure PSM™ 600 Personal Stereo Monitor. •The PSM 600 uses advanced technology and tiny earpieces to do what large, bulky floor wedge monitors can't: Give you total control of the mix you hear on stage. •You can choose a full, rich stereo mix. Or, to create your own personal mix, use Shure's innovative MixMode™ circuitry. MixMode allows you to raise or lower your mix level at will, relative to the others in the band. •The sound is full, clear and consistent. And the price, in wired or UHF wireless configurations, is thousands less than most competitive systems. •Start taking control of your sound. To learn more about the PSM 600, call 1-800-25-SHURE. In Europe, call 49-7131-72140. Outside Europe and the U.S., call 847-866-2200.

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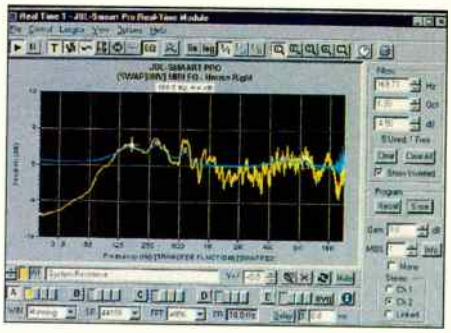

Based on the popularity of its JBL-SMAART acoustical measurement and system optimization program, JBL has introduced JBL-SMAART PRO. The Windows 95/NT-based JBL-SMAART PRO is divided into two modules, one for disk-based signal analysis and the other for real-time measurements. The real-time module includes a 2-channel FFT-based Real Time Spectrum Analyzer and a Delay Locator feature. New features include native 32-bit operation in Windows 95 or NT; an ASCII Export feature; a Fixed Point-Per-Octave Resolution Transfer function; an Automatic Delay Location feature; and a Wave File Save function. For more information, contact JBL Professional, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-894-8850. Circle EQ free lit. #113.

SEE THE LIGHT

Optek gets the creative juices flowing with its SmartLIGHT MIDI Driver. With the software, guitarists will be able to purchase SmartLIGHT Ready MIDI albums from Optek or download standard MIDI files from the Internet, route them into their computer-controlled SmartLIGHT guitars via a MIDI sequencer program, and choose the tracks they want to play. The driver also allows guitarists to see multiple inversions of guitar fingerings so they can modify or customize the sound they want. Existing MIDI features that can be employed while driving the guitar include transposing to another key, looping, soloing, or muting various instruments, and adjusting the speed. It is available for PC and Mac systems. For more information, contact Optek, P.O. Box 90485, Raleigh, NC 27675. Tel: 919-878-7997. Web: www.optekmusic.com. Circle EQ free lit. #114.

BURNING FOR YOU

Steinberg has released WaveLab version 1.6, which now offers an integrated CD burner to create Red Book audio CDs with a majority of the popular CD-ROM or CD-R recorders connected via SCSI. New features in version 1.6 include full-featured waveform editing, six spaces of real-time plug-in effects processing, 24-bit audio processing, support for ActiveX Movie Plug-In architecture, real-time processing of a live input, batch processing, and importing of audio from CDs via CD-ROM or CD-R. Manufacturer's suggested retail price is $499. For more information, contact Steinberg, 9312 Deering Ave., Chatsworth, CA 91311-5857. Tel: 818-993-4161. Web: www.steinberg-na.com. Circle EQ free lit. #115.

POST WITH THE MOST

Digidesign has debuted the latest version of its AudioVision digital audio workstation, which has added editing tools specifically designed to meet the needs of audio post professionals. AudioVision 4.0 has been re-engineered to run on PCI Macintoshes with RISC-based processing for improved performance and now works with third-generation TDM hardware from Digidesign. Additionally AudioVision comes bundled with a full-featured version of Pro Tools III software. Other key features include integrated Avid-format digital picture, Avid Media/FilmComposer compatibility, and task-based tools and windows. For more details, contact Digidesign, 3401-A Hillview Ave., Palo Alto, CA 94304. Tel: 650-842-7900. Web: www.digidesign.com. Circle EQ free lit. #116.

World Radio History

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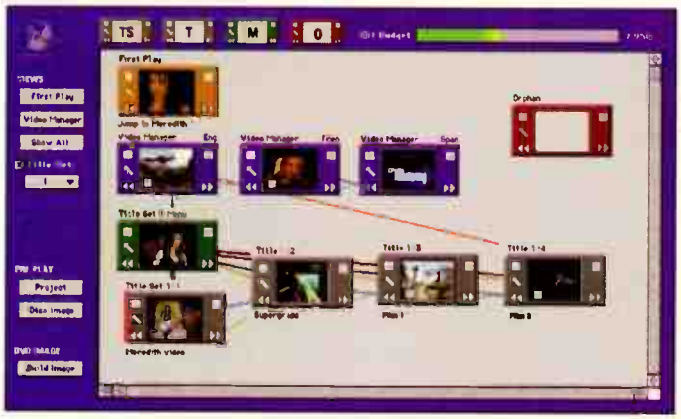
EQ STUDIO WARE

BUNDLE UP

Waves has introduced the Waves Windows DSP Bundle, which will allow D.A.L. V8 owners to run Waves' Q10 Paragraphic Equalizer, L1 Ultramixer, S1 Stereo Imager, C1 Compressor/Gate, TrueVerb room emulator/reverb Plug-Ins in real time and with full automation. The same Plug-Ins are available to all V8 "Gearhead Approved" applications. The Waves Windows DSP Bundle is now available for $2300. For more information, contact Waves, 6716 Central Ave., Suite 8, Knoxville, TN 37912. Tel: 423-689-5395. Web: www. waves.com. Circle EQ free lit. #117.



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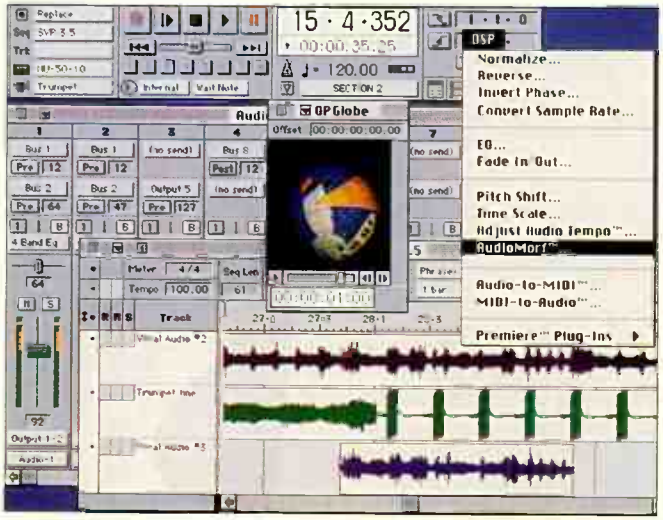
Be the first on your block to author DVD discs with Sonic Solutions Sonic DVD Producer. When combined with the other elements of Sonic's DVD Creator System (DVD Studio for MPEG video and audio encoding and DVD PrePlay for proofing), DVD Producer will allow users to take a project through to the final DVD disc image with real-time WYSIWYG feedback at every step. DVD Producer will first be available for the Macintosh. For more information, contact Sonic Solutions, 101 Rowland Way, Novato, CA 94945. Tel: 415-893-8000. Circle EQ free lit. #118.

BETTER VISION

Opcode has announced an upgrade to Studio Vision Pro. Version 3.5.6 features Power Mac native code, full support for TDM bussing, new DSP features, and enhanced integration with Apple QuickTime. Studio Vision's consoles now provide eight auxiliary busses and address line inserts, sends, and SampleCell TDM. It also increases the number of Audio Instruments from 16 to 64, providing up to 64 channels of I/O. The new version also supports OMS timing, which allows other OMS-compatible applications to control Studio Vision Pro with frame accuracy. Other features include enhanced Sound Manager support and Adobe Plug-In support. The upgrade costs $129.95, Deluxe CD edition is $179.95. For more details, contact Opcode Systems, 3950 Fabian Way, Suite 100, Palo Alto, CA 94303. Tel: 415-856-3333. Circle EQ free lit. #119.



World Radio History

World Radio History

BLUE The Bottle

Hit this Bottle and its many capsules for a range of applications

MICROPHONE NAME: Baltic Latvian Universal Electronics (BLUE) The Bottle
PRICE: Retail $4500 complete with BLUE B7 or B6 capsule, power supply, and A.T.A. flight case; all other capsules are $950 except the B4 ($1500)
TYPE OF MIC: Tube Condenser
TUBE: EF86
YEAR INTRODUCED: 1997
POLAR PATTERN: Depends on capsule (see notes); shown with BLUE B7 cardioid capsule
FRONT-TO-REAR-REJECTION: Better than 20 dB
FREQUENCY RESPONSE: 30 Hz to 20,000 Hz, ±4 dB
SENSITIVITY: 8mV/Pa, ±1 dB
RATED SOURCE IMPEDANCE: 200 ohms
SIGNAL TO NOISE RATIO: 67 dB (related to 1 PA at 1 kHz)
POWER REQUIREMENTS: BLUE 9601 power supply
DIMENSIONS: Diameter 3.75 inches (max. diameter) x 14.75 inches (length including capsule)
WEIGHT: 4 lbs. (including capsule)
MIC NOTES: Baltic Latvian Universal Electronics' (BLUE) The Bottle microphone employs the use of interchangeable hand-built capsules crafted by BLUE, including the B7 cardioid (single back plate, large diaphragm), the B6 cardioid (dual back plate, large diaphragm), B5 pressure omni, B4 perspex sphere pressure omni, B3 cardioid (mid-size diaphragm), B2 figure-eight, and B1 cardioid (small diaphragm). The amplifier design is based on a single vacuum tube pentode EF86 (hand-selected for low noise) operated in a triode mode. The power supply for The Bottle features a regulated circuit design with a unique slow-start feature designed to prolong tube life.
USER TIPS: The B7 and B6 capsules are designed for vocal use, the B5 for orchestral work, and the B1 for percussion and acoustic guitars. For more information, contact BLUE at (tel.) 818-986-BLUE (2583), (fax) 818-784-7564, or (e-mail) bluemic@earthlink.net. EQ

PHOTO BY EDWARD COLVER

World Radio History

"Check's in the mail."

"My dog ate it."

"Use a live board for recording..."

"No such thing as a quality recording console for $1699."

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Don't depend on your salesperson to know, but for every track of your recorder, a live board wastes 1 input (8 tracks = 8 wasted inputs). Not very efficient. A true recording console, like the M1600, has dedicated ins/outs specifically for your multitrack, so all input channels remain available for necessities like guitars, keyboards, mics — whatever you need.

No Patching and Repatching

Another thing a recording console will save you is hassling with cables. That live board has only 4 sub-masters. So, if you want to send multiple signals to any of the 8-tracks, you'll need to patch and repatch. And forget

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The M1600 has the EQ you need. Three bands including a semi-parametric mid sweep with more range than anything in its price class. Plus, the M1600's next-generation mic preamps are optimized for digital recording. Much cleaner and quieter than those on a live board. Check out the specs.

Serious Monitoring. Inputs a Plenty

You'd be hard pressed to find the M1600's monitoring capability on another mixer — let alone a live board. With 6 AUX sends you can create stereo cue mixes and still have plenty of AUX power to spare. Plus, you get 4 fully assignable effects returns. Thanks to its inline design the M1600/16 gives you 32 inputs at mixdown.

You Can Expand It, Too!

Best part is you can buy the M1600 and its optional meter bridge for about the price of a basic live board. How can TASCAM do it? By not making you pay for stuff you'd never use — like mic inputs. When was the last time you used more than 8 microphones simultaneously for recording? Chances are never. But if you ever do, you can easily expand your M1600 with the optional TASCAM MA8 eight channel mic preamp — giving you 8 more killer mic preamps.

You're smart. So buy the right tool for the job. For gigs and sound reinforcement, get the live board. But for recording on a tight budget, get the TASCAM M1600. At only $1699* for 16-inputs; or for more bang get 24-inputs — only $2199. You won't find a better value. Want to know more? Read the M1600 story. Call TASCAM FaxBack today. Document #6610.

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*16 input model gives you 32 mix positions; 24 input model gives you 48. Manufacturers suggested list prices: $1699 for 16 inputs and $2,199 for 24 inputs.

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CIRCLE 96 ON FREE INFO CARD

World Radio History

Microphile "Undressed"

A look inside (literally) the Telefunken U47

BY EDDIE CILETTI

Welcome to Microphile Undressed. Unlike *EQ* photographer Ed Colver's artful technique of capturing classic transducers each month in the Microphile section, this undercover edition chose the sensational approach, using a hidden Hi-8 video camera to expose the secret life of a classic mic. A mere student of microphone technology, I am a very lucky enthusiast, especially when an acquaintance brings two Telefunken U47's in extremely mint condition to my shop for evaluation.

WHAT'S HIS NAME?

At one time, Telefunken distributed microphones made by Georg Neumann as well as those by AKG. Some were customized versions tweaked to Telefunken's specs, while others were completely stock. (In case you've been unsure, the name is pronounced *noy-mahn*, not *newman* like that guy on the *Seinfeld* show.)

PRISTINE

One of my first discoveries was the tampering indicators — aluminum discs embossed with the Neumann "N" covering the access screws. (See the inset on the lower right corner of the picture.) Neither microphone had ever been opened. Even the output connector on the power supply was the original, three-blade Tuchel. Knowing that certain collectors focus on the degree of originality, I was very careful to make only the necessary repairs in order to maintain value. With the exception of switching to an XLR connector (on the power supply), I left the working mic untouched.

The U47 and the U48 are identical microphones, the former offering cardioid and omnidirectional patterns, while the latter's options were cardioid and bidirectional (also known as figure-of-eight). Both utilize the same, large, dual-diaphragm capsule. Early capsules used PVC (polyvinyl chloride) as the diaphragm material, coated with a molecularly thin layer of gold.

Unfortunately, PVC didn't age well. The most common failure was separation of the gold layer from the plastic, resulting in a loss of output. The ripples in the picture indicate that this particular diaphragm came unglued from the capsule. Neumann eventually switched from PVC to Mylar, choosing to clamp the plastic with a retaining ring rather than use glue.

Since the microphone cases were in essentially perfect condition, I couldn't afford to make a single scratch on them. Therefore, needless to say, even my normally skilled hands were a bit more tremble-prone during this operation. Adding to my pre-operative shakes was the fact that, unlike Phillips-head screws, which securely mate with their drivers, all of the U47 screws required a flat bladed screwdriver more likely than not to wander off the head.

TAKE TWO CAPSULES AND CALL ME...

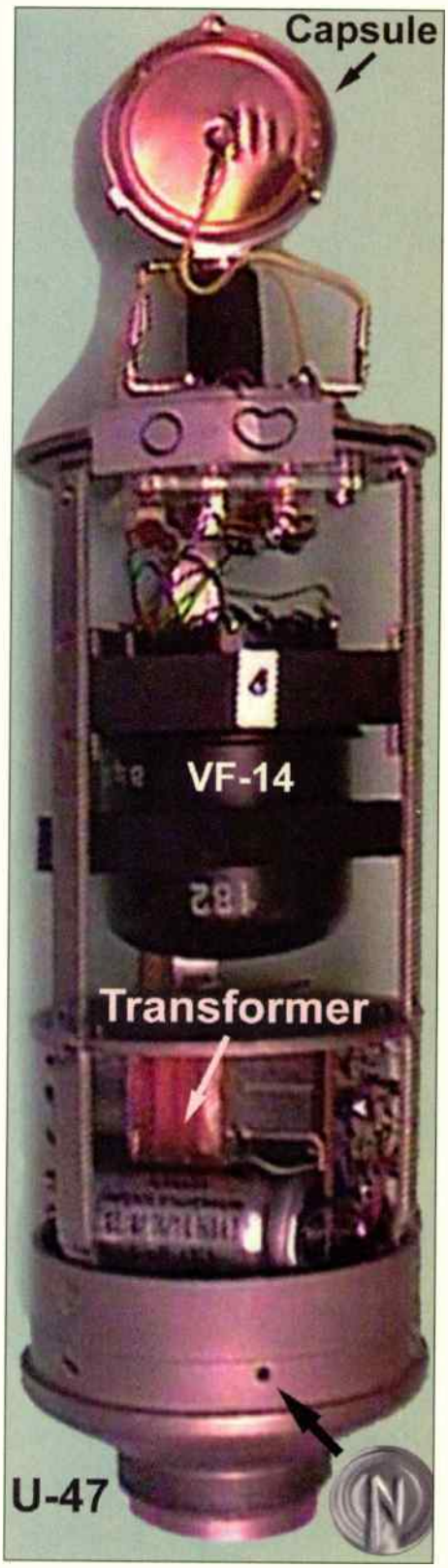
Even though one mic seemed to be in working order, odds are its capsule would fail sooner than later. And so, being a symmetry freak, my first thought was to have both capsules rebuilt. This, however, was not an option until the day before this article went to press. Mark McKenna at Bearsville Studios turned me on to Tracey Korby (412-937-1349) who does capsule rebuilds ($600) as well as microphone repairs.

Neumann (860-434-5220) does sell replacement capsules for about $900, but these are the more modern, mechanically clamped versions. I wanted the mics to remain as close to the original as possible. Another option is Stephen Paul Audio (818-905-9952), where a complete overhaul goes for about $1600.

I eventually found a one-time alternate source for the M7 capsule so that, with parts and labor, the job was completed for about $900. A steady hand is even more crucial when changing the capsule wires. One slip and the capsule would be toast! These are not, in any way, user-serviceable items.

TUBE IN A CAN

Since these mics were rarely, if ever, used, both VF-14 pentode vacuum tubes were in great shape. And, yes (for those



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in the know), each had an "M" stamped on the case, indicating the tube had been factory tested and selected for low noise. A VF-14 is more rare than an honest politician. (None of the former was made after WWII, and none of the latter has ever existed!)

Joe Leung at Gotham Service Labs (212-967-3120) tells me there are similar

continued on page 143

MICROPHONE TOPOLOGY

There are many different types of microphones — dynamic, ribbon, and condenser — each with unique characteristics. These names refer to the technology used to convert acoustical sound waves into electrical waves — some technologies being more suitable than others for specific applications.

A dynamic microphone capsule is essentially a headphone driver in reverse. Picture a loudspeaker. Its cone (diaphragm) is attached to a voice coil, which is then suspended in a magnetically charged air space. Moving the cone generates a voltage in the coil or impressing a voltage on the coil will move the cone.

The Analogy

A speaker in free air radiates sound from both front and back (a figure-of-eight pattern) until placed in a cabinet so that sound radiation can be made directional. This is the same principal used in reverse to make a unidirectional or cardioid microphone. A ribbon microphone is a variation on the dynamic theme. It suspends a metallic foil in a magnetic field. The surface area of the foil also serves as a diaphragm, but with less mass and inertia than a dynamic mic, hence improved transient response. Ribbon mics are also inherently bidirectional and, like dynamics, are naturally low- to medium-impedance devices. Transformers are used to match coil or foil impedance to the 200-ohm standard.

A condenser capsule consists of a metallized plastic diaphragm suspended like a drumhead over a metal back plate. These two conductive surfaces don't electrically touch. The surface area and the air space between them determine the capacitance, which is typically less than 50 picofarads (pF). This highly vulnerable sound source requires a buffer amplifier whose input impedance can be as high as one gig-ohm, about one thousand times that of a guitar amplifier! The built-in amplifier can be a vacuum tube or Field Effect Transistor (FET) followed by a matching transformer or an electronic impedance matching circuit.

A *single* diaphragm condenser capsule can be mechanically designed for omni-, uni-, or bidirectional characteristics (although the last is not common). More common are dual-diaphragm capsules with electronically variable patterns. A fixed polarizing voltage is always sent to the front capsule. Making the voltage on the rear capsule more or less positive changes the patterns. This can be accomplished with a switch or made continuously variable with a pot. Electret microphone capsules are designed to retain their electric charge. External or phantom power is only required for the preamp.

Heart And Soul

As you can imagine, the sonic signature of a microphone primarily originates from its capsule design. The mechanical and electrical methods of achieving the directional characteristics also happen to be great sonic contributors. Omni mics are generally flatter, though some have a rising top end. Both cardioid and bidirectional (figure-of-eight) characteristics exhibit proximity effect — a substantial low-frequency "warmth" — when these mics are used close-up for vocals.

The grille and the microphone body also contribute to the sonic character. So do transformers or their electronic equivalent. Like most things analog, most "flaws" are, at best, often perceived as sonic assets or, at worst, as limiting the microphone's application to specific instruments or situations.

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World Radio History

Mackie Human User Interface

Put that mouse away — Mackie provides familiar hardware controls for Pro Tools users

BY STEVE LA CERRA

One of the more difficult aspects of dealing with a PC-based digital workstation is the lack of a hardware interface for mixing, and anyone who has ever tried to mix with a mouse knows what we're talking about. It should come as a relief to Pro Tools users that Mackie has released the HUI (Human User Interface) Digital Audio Workstation Controller. HUI is designed to allow Pro Tools users to track and mix using a more traditional, hands-on work surface that has been designed to make you feel like you're working on a traditional audio console.

Designed in conjunction with Digidesign as a front-end controller for Pro Tools 4.1, HUI communicates bidirectionally via MIDI and/or RS-422 using the Pro Tools interface. To enhance fader resolution to 512 positions, Mackie has cleverly designed a means for HUI to generate 9-bit fader data while still conforming to the MIDI spec. This is accomplished by using the standard 7-bit byte (which alone would have generated only 128 volume positions) and augmenting it with the first two bits from an additional byte in the MIDI data stream.

Mackie has provided HUI with a good selection of controls to make the mix process more expeditious. Instead of grabbing on-screen faders with a mouse, users can mix using HUI's hardware faders. Eight reassignable, motorized, 100 mm faders are provided on the front panel of HUI. Capped with conductive, metallized fader knobs, these faders react quickly to touch without the need for a switch to enable or disable them. Mackie has designed the fader motors with tightly tuned servo amplifiers to reduce chatter. A conductive-plastic, fader servo track is said to reduce failure and extend fader life — greater than 2,000,000 cycles, according to Mackie.

Each of HUI's eight channels has a 4-character LED "scribble strip" that can be used for channel ID, as well as for displaying groups assignments, phase status, source, and routing. Dedicated controls are provided on each channel for routing, assignment, status, edit, and automation control, and there are illuminated switches for mute, solo, write, and record-ready. Channel parameters are adjusted using Mackie's V-POTs, a "soft" knob design with illuminated LEDs in the knob collar that indicate the knob's current value. One V-POT is provided per channel and they

POINT AND CLICK NO MORE: Like hard-disk recording but hate the computer interace? Mackie's HUI makes it a more familiar experience.

World Radio History

TAPE TALK

JEAN TARDIBUONO
National Sales Manager
Studio and Broadcast Products
JR Pro Sales

ANALOG REALITY CHECK FORUM

Contrary to what many people have heard, the death of analog recording has been greatly exaggerated. Certainly there's no denying the tremendous impact of digital audio technologies, but as I travel around the United States and Canada, I notice that analog recording – especially for music – is thriving.

At the 103rd AES Convention in New York in September, we participated in a forum entitled "Analog Reality Check." Participants included representatives of leading suppliers of analog products and services, including JRF Magnetics, Quantegy, ATR Services, Studer and a representative of BASF brand tape. After the manufacturers spoke about their current and future plans to support analog recording, Bob Ludwig of Gateway Mastering, Allen Sides of Ocean Way Recording and independent producer/engineer Ed Cherney offered their perspectives on the health and longevity of analog. At the end of the conference, it was clear to those in attendance that analog recording continues to play a vital role in today's recording landscape. ■

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Producer David Kahne and Scream Studios Receive BASF Master Award

(R-L) Doug Bernhardt and Jean Tardibuono of JR Pro Sales/BASF present the BASF Master Award to both Producer/Engineer David Kahne, and Scream Studios (pictured: chief engineer Doug Trantow and studio manager Jeanne Moultrie) for their work on Sublime's number one single, "What I Got."

JR Pro Sales Inc., U.S. distributor of BASF-brand recording media, recently presented a BASF Master Award to both Scream Studios and producer David Kahne for their work on Sublime's self-titled platinum album and the band's chart-topping single, "What I Got." The Master Award salutes excellence in recording by honoring number-one albums and singles recorded with BASF-brand tape.

During his career, veteran producer, engineer and mixer Kahne has worked with artists ranging from Tony Bennett to Sheryl Crow. For the Sublime sessions, Kahne mixed the project to BASF Studio Master 911.

Since its founding in 1988 by Randy Alpert, Scream Studios has hosted such multi-platinum artists as Hootie and the Blowfish, Indigo Girls, Ozzy Osbourne, Soul Asylum and Janet Jackson.

JR Pro National Sales Manager Jean Tardibuono said, "It's a pleasure to be associated with a world-class studio like Scream and such a talented producer as David Kahne. We're happy to recognize their achievements."

In addition to the Master Awards, EMTEC Magnetics – manufacturer of BASF-brand media – donated $1,000 in Kahne's name to UNESCO.

The control room at Scream Studios features a 64-input SSL 4000 G console.

For more information on the Master Award, call JR Pro Sales at (888) 295-5551. ■

Analog Recording: Alive and Well in Music City

People have two common perceptions of the Nashville recording scene: It's all country music, and it's all going down on digital tape. Neither could be further from the truth. More than just a hot-spot for county music recording, Nashville is quickly becoming known as a great place to record jazz, rock, alternative and other musical styles. And while digital recording formats may have grown more popular in recent years, analog recording in Nashville is staging a comeback.

Engineer/producer Peter Coleman (center) and assistant Dan Leffler (right), manning Ocean Way Nashville's Neve 8078 console at the BASF listening session.

"We've seen a great increase in analog recording," says Castle Recording's Mike Janas. "The luster of digital has worn off."

Grant Fowler of Love Shack Recording Studios agrees. "There has been a resurgence in analog recording," Fowler says, "especially outside the country genre. In Nashville, there's a fair amount of business coming in from all over the country. It makes more sense for these people to cut to analog, because

Continued on next page

WIN A CASE OF BASF TAPE!

See Back Page for Details!

World Radio History

The Great Room at Ocean Way Nashville provides outstanding acoustics and ambience and easily accommodates the largest sessions. The studio is built in a pre-Civil War stone church, over 140 years old.

Music City, continued from first page

you can go to any town in the universe and find a decent 2-inch machine."

Even Georgetown Masters owner/engineer Denny Purcell says his clients hand him more analog master tapes. "A few years ago, 90% of the masters came in on DAT," Purcell says. "Now I get roughly 30% of the masters in analog format."

BASF recently made the buzz about analog tape even louder by hosting an all-star listening session at Music City's newest world-class facility, Ocean Way-Nashville. BASF brought together some of the area's top engineers, producers and artists to hear how BASF 900 *maxima* tape stacks up against another popular formulation. Among the attendees were Grammy® Award-winning producer Richard Dodd, mastering engineer Denny Purcell, engineer Bill VornDick and alternative producer Doug Easley.

With producer/engineer Peter Coleman at the helm, two identical analog decks captured the performance of a six-piece band, including top session bassist Glen Worf, singer/songwriter Kieran Kane and steel guitar player Fats Kaplin. For the comparison, the two 24-track Studer recorders were loaded with BASF 900 Maxima and Quantegy 499 tape. The decks were biased carefully for their respective tape formulations and synced together for the recordings, which were made at a tape speed of 30 inches per second with no noise reduction. According to Coleman, "It was an incredibly fair shootout – absolutely impartial."

After the recording, attendees were able to compare the performance of the two tape formulations on a track-by-track basis. Most heard an unmistakable difference in the BASF 900 formulation. "There were a lot of people who had not heard our tape before," says BASF Southern Sales Manager Daren Chamblee, "and a few told me they didn't expect to hear such a dramatic difference. Many of them said we have a more open, natural sound."

"Everybody at the console could easily hear the difference," says Coleman, "especially on the bass and drums. The general impression was that the BASF tape just sounded bigger."

Steel player Fats Kaplin added tasty licks to the tracks.

Nashville producers and engineers are no strangers to the depth and power of analog tape. Even those who use digital formats for editing or mixing regularly track to analog. "I use digital recording in conjunction with analog," says Janas. "When Sammy Kershaw, John Anderson and Lionel Richie record at The Castle, they cut analog. It's how we'll track the next BR5-49 album as well."

Ocean Way-Nashville, a joint venture of Gary Belz and engineer/studio owner Allen Sides, co-sponsored the listening event. The studio is a 15,000-square- foot facility boasting three discrete tracking/overdub rooms, the world's largest 8078 Neve console, a vintage API console and the country's only Sony Oxford all-digital mixer. Ocean Way-Nashville has a firm commitment to both analog and digital recording formats.

The nearly 200 engineers, producers and artists who packed into Ocean Way's main control room are further proof that analog recording is important to Nashville's production community.

Grant Fowler says he wasn't "that surprised at the turnout, because of the buzz I hear about BASF. Everybody I talked to was excited about the shootout, and seemed really impressed with what they heard. BASF is really making its presence known."

"Analog recording," concludes Janas, "is alive and well in Nashville." ■

by Loren Alldrin

FROM THE TOP

Welcome to another edition of the BASF Studio Observer – a quarterly update on what's happening with various media for studio and recording.

Although analog is alive and flourishing (see Jean's column on the Analog Reality Check forum at AES), we realize that digital technology is equally important. This fall marked the introduction of an entire family of new digital recording products. Leading the way are BASF ADAT Master and DTRS Master tapes, both of which have been specifically designed to deliver peak performance in modular digital multitrack (MDM) environments. We also have BASF DAT Master and CD-R Master. For critical cassette copies, we've developed BASF Reference Master cassettes with a unique three-piece shell and high-output Type II tape for optimum cassette recordings.

Finding BASF-brand professional recording media is becoming easier as we continue to add more dealers throughout North America. An updated list of those dealers is available on-line at www.jrpro.com.

I hope you enjoy this edition of BASF Studio Observer. Good luck in all your recording endeavors, and keep an eye out for our next edition which will feature some exciting new product news.

Joe Ryan

President · JR Pro Sales
North American Distributors of BASF Recording Media

IN SESSION WITH JOE CHICCARELLI

Talking with Joe Chiccarelli is a real treat – kind of like going to a baseball game with your best buddy. He's a relaxed, friendly person, enthusiastic and cheerful by nature, disarmingly intuitive and intelligent. Given to preferring second person pronouns over first, Joe is someone who makes you feel special when you're with him. Not a bad starter for character traits. Now add to that the fact that for the past two decades he's been recording a virtual Who's Who of rock and roll and pop music superstars and you have the basic ingredients for one of the leading engineer/producers in the music business.

Joe recently finished a recording project with the new group Box Set, one of the last of a string of records that has, over the years, included everyone from the Bee Gees to Beck. Studio Observer asked Joe to share some of his experiences and views on tape and how it affects the recordings he engineers and produces.

Joe Chiccarelli: "Analog and digital tape both have important uses in music recording. For the engineer and producer they are like colors. Analog has its own color, and analog tape saturation and compression tend to make the tracks breathe a little. For rock and roll recording I love analog tape. There's a warmth to it that's just great for most rock and roll! I guess you could say I'm primarily an analog guy.

"On the other hand, for jazz recording and slick, sophisticated things where you want all the depth of the reverb and the space between the sounds, digital tape can be wonderful! I try to choose the tape that's right for the project I'm recording."

Studio Observer: How did you first come to use BASF tape?

JC: "I was turned on to Agfa 468 in the late seventies. I thought it colored things in the nicest way. It sounded like a truly accurate representation of the signal and had a certain musicality. For years it was all I used. I didn't really change until BASF introduced SM 900. It seems to be an ideal balance of the best characteristics of 468 and the benefits of the new oxide technology. SM 900 has the same clarity I found in 468 while offering the advantages of higher output and lower noise. You still get that cool tape compression thing, and it sounds just like the live music from the console. It doesn't destroy the sounds, it just adds a little more 'oomph' to them."

SO: With these new high output tapes, do you use noise reduction?

JC: "No, not me. I've heard some great recordings made with noise reduction, especially Dolby SR, but for me, I'll live with a little bit of tape noise to avoid that processing step. I've tried all the new high output tapes, and with SM 900, every time I played the tape back it sounded better than what went into the machine! The kick drum sounds a little warmer and the cymbals have a nice sheen.

"But the thing I really appreciate about SM 900 is that after repeated passes it doesn't lose any high end response. Its retentivity is excellent and it really holds up through those long overdub and mix processes."

SO: As a creative engineer or producer, how do you use high output tapes and their analog color characteristics to advantage?

JC: "Not all tapes work this way, but with SM 900 I find that the effect of bouncing tracks is often very pleasing. I've even bounced guitar tracks intentionally with SM 900 tape to warm them a little, or to add a bit of punch. I've definitely not been afraid of dynamic range as much with high output tape, both in terms of mixes and tracking things like acoustic guitar. And I find that I don't compress tracks as much as I would have in the past.

"In general I tend not to align tape too hot. I don't often do the +9 alignments that high output tapes allow, but tend to prefer a +5 or +6 alignment with high output tape. I find that it's a good balance between the tape's compression characteristics and keeping what goes into the machine true."

SO: What format do you mix to, Joe?

JC: "I mix to SM 900 too. I've used BASF SM 911 for mixing because it has a super-clear, almost digital-like sound. SM 900 offers that same kind of clarity, but it punches up the bottom end a little bit. Again, it's a matter of color. I like them both and choose one or the other depending on the kind of music I'm mixing. I also mix to digital formats, including DATs and DA88s. As an engineer or producer I choose the most appropriate tools and materials for the job. But personally, I'm still an analog guy." ■

World Radio History

are globally switchable for addressing either pan or any of Pro Tools' five sends. In the event that Pro Tools expands to additional aux sends, a shift function will allow the V-POTs to access another bank of sends.

One of the really interesting things that Mackie has built into HUI is a dedicated section for the use of software plug-ins — which allows automation control of DSP functions. There are four dedicated V-POTs with associated enable switches underlying a 2x40 VFD (vacuum fluorescent display) panel where precise values of adjustable parameters may be viewed. Assignment and bypass switches round out the controls available in the plug-in section.

To facilitate monitoring in a traditional manner, HUI has an analog control room section. In addition to talkback, this section also includes master mute and dim switches, a mono sum switch, and assignment routing for three stereo audio pairs. Keeping future possibilities of surround audio in mind, Mackie has designed the three stereo pairs of analog I/O jacks to be configurable for either stereo or surround applications. Surround aficionados will also appreciate the fact that there is an expansion port on the rear panel that can accommodate either a joystick or additional V-POTs.

Augmenting HUI's mixing console-type controls are a set of machine transport controls, including play, fast-forward, rewind, stop, and record. Additionally, HUI is capable of arming individual tracks. A jog wheel facilitates scrubbing to exact locate points and the Pro Tools locate points (0 through 99) may be addressed using HUI's numeric keypad.

On the rear panel of HUI are inputs to two patchable mic preamp sections as well as an additional preamp input for the external talkback mic, a headphone output, two sets of Apple Desktop Bus mouse/keyboard thru ports, MIDI In/Out, and an RS-232/422 port for directly connecting HUI to a computer. HUI is now shipping at a suggested retail price of $3499.

For more information, contact Mackie Designs, 16220 Wood-Red Road NE, Woodinville, WA 98072. Tel: 425-487-4333. Web: www.mackie.com. Circle EQ free lit. #120.

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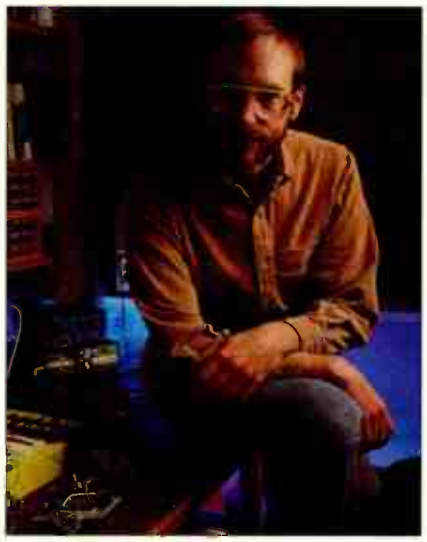
Synthplicity?

And you thought synths were easy to record



BY CRAIG ANDERTON

No one would say, "Recording a piano is simple — just stick a mic in front of it and make sure it doesn't distort." Yet a lot of people seem to think that recording a synth just involves plugging into a console and setting levels. While that's certainly the simplest way to go, it's not necessarily the best if you're looking for a synth sound that really shines. Here are some ways to get that extra ounce of recording performance out of your favorite silicon-based soundmaker.

THE INDIRECT DIRECT BOX

Synths can often plug right into a console input, but consider adding a tube preamp with DI capabilities to subtly warm up the sound. Inserting tubes and/or transformers into the synth's signal path can smooth out excessively "digital-sounding" synths, as well as give more bite when overdriven. Light distortion is particularly useful with bass and percussive sounds.

Another option is to run the synth through a guitar amp (think of it as a very complex signal processor that affects frequency response, phase, and distortion), then mic it. The amp will add a character of its own. To take things one step further, set up stereo overhead mics to integrate the room sound.

THE RIGHT TOOL FOR THE RIGHT JOB

Every synth has a "sonic signature," be it dark, bright, edgy, clean, or whatever. One timbre is not necessarily better than another, but just as you'd choose a Strat over a Les Paul (or vice versa) depending on the musical context, it helps to choose the right synth for the right job.

For example, as a generalization, bright, digital-sounding synths cut well on analog tape and draw lots of attention to themselves on digital tape. Analog synths can sound dull on analog tape, but are captured cleanly on digital. Gritty-sounding synths might work well in a rock project, whereas clean-sounding synths would blend in better with an ensemble of acoustic instruments.

Of course, equalization and other signal processing can alter synth sounds, but all instruments have subtle inherent characteristics.

Of course, equalization and other signal processing can alter synth sounds, but all instruments have subtle inherent characteristics. I know musicians who still swear by the ancient, 8-bit [Ensoniq] Mirage for certain applications because it gives a gritty sound that's unlike any other synth.

ROOM FOR REALITY

One cue that synths aren't acoustic instruments is the lack of room ambience (another argument for miking an amp). Unfortunately, electronic reverb units have a hard time simulating the very complex early reflections present in real acoustic spaces (the processors in reverbs, no matter how fast, can only crunch so many numbers).

A trick used by several hot-shot producer-engineers (such as Bruce Swedien) is to feed a synth track into a relatively live room's monitor speakers, then mic the room at a bit of a distance from the speakers. The room mics pick up those all-important early reflections; mixing this ambience track in with the main synth output can give a more "real," organic sound.

THE HF SHELF

Your console's high-frequency shelving filter can help "debrittle" digital synths. Digital synths not only have an extended high-frequency response, but there can be harmonics that add a harsh, unpleasant timbre.

When you first switch in the HF shelf, the sound will seem dull because you're not used to it. Live with this change for a while and listen to the synth sound in context with the overall mix. After a while, you may prefer it to the brighter, potentially harsher regular sound.

Sometimes a steeper curve gives even better results. Cut the very highest frequencies using the console's onboard EQ (e.g., try –6 dB at 15 to 20 kHz as a starting point).

PROPER GAIN-STAGING

Just like a mixing console, a synthesizer usually has several places for level adjustment: DCA (Digitally-Controlled Amplifier) initial gain, voice output level, level of individual patches used in a "combi" or "multi" patch, master output, and so on. For minimum distortion and the cleanest sound, it is important to properly adjust these levels.

First, set any front-panel master volume slider to the highest level. This usually will be a digital volume control, where lowering the volume gives lower resolution and greater noise. Second, set the gain throughout individual programs as high as you can. Be careful about overloading resonant filters; hopefully there will be some level parameter (such as waveform or oscillator level) so that you can bring down the level prior to the filter.

Finally, in "combi" patches, high individual patch levels can overload the available dynamic range. There will

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usually be a level parameter for each patch in a combi; initially pull them all back to a relatively low level, then increase levels just short of distortion. Reduce the levels an extra 15–20 percent for a little extra margin of safety, and you're set.

RECORDED VERSUS VIRTUAL TRACKS

Thanks to MIDI, synths can be driven from a MIDI sequencer that syncs up to a multitrack recorder (e.g., digital tape or hard disk). The synth outputs then feed a console along with the multitrack outputs, thus extending the track count without having to expand the multitrack recorder. The synth outs are often called "virtual tracks" because they act like tracks from a multitrack machine, and run at the same time.

There are times, however, when it makes more sense to record the virtual tracks. Here are some examples:

• It can be time consuming to recreate the virtual tracks every time you want to do tracking or mixing. Once something's recorded on tape or disk, it's (hopefully!) there to stay.

• If you have only one or two cool signal processors, recording tracks lets you use the same effects box multiple times. With virtual tracks, each track needs its own processing because it plays in real time.

• With "workstation"-type synths, the timing accuracy often deteriorates as you try to drive more and more sounds within the same instrument. For tightest timing, record important rhythm parts (particularly drums) with all other sounds disabled, then use virtual tracks for less timing-dependent parts such as pads. This is also a good trick for expanding polyphony — if a piano part chews up all the available voices, record it, and then drive the other sounds as virtual instruments.

• Recording virtual tracks, plus a little varispeed, provide cool doubling effects. Record one track with the multitrack speed offset by a few percent (faster or slower). Next, restore the multitrack speed and instrument pitch back to normal, rewind the sequencer and multitrack, and record the same part using the same instrument but at normal pitch (or play it back as a virtual track). The pitch offset produces slight timbral and envelope rate changes that can open up and enlarge the sound, especially if the two tracks are both panned oppositely in the stereo field.

• Don't be concerned about recording virtual tracks perfectly, as you can always "undo." For example, if you record the bass and drum parts from a workstation and then decide the mix wasn't right, just erase the track, rerun the sequence, and record the parts again with the proper balance.

In any event, no matter how you record tracks, take the time to experiment. The art of recording synthesizers is young, and much remains to be learned.

Craig Anderton is the author of Home Recording for Musicians and Multieffects for Musicians. He has played on, mixed, or produced 12 major label releases, hosts the "Sound, Studio, and Stage" site on AOL, and lectures around the world on musical electronics.

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Digital Mixer	Yes	No	No	No
Digital Effects & EQ	Yes	No	No	No
Waveform Editing	Yes	No	No	No
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Wendy & Lisa

PHOTO BY ED FREEMAN

The versatile duo come clean on their creative habits

BY MR. BONZAI

Bonzai: What are the key pieces of equipment in your project studio?
Wendy: TASCAM console and one-inch 24-track. For our film work we use a Mackie and DA-88's at our friend's garage.
Any special microphones?
Lisa: We use our AKG C414 for just about everything, and then compress the hell out of it with a dbx 160.
Who does the engineering?
Wendy: We both do, but Lisa's better.
Who is responsible for the lyrics and who is responsible for the music?
Wendy: Depends — sometimes Lisa goes away and comes back with a finished piece; sometimes I'll do the same. She'll put the frame around mine or I'll frame her song. Other times we sit down with a couple of guitars and start from scratch.
Who plays the drums and bass?
Wendy: I do, for the most part.
Who's the best with synthesizers?
Wendy: Lisa.
Why did you choose to work with Tchad Blake?
Lisa: Just lucky. We hate everybody except Tchad.
What is the difference between a blimp and an airplane?
Lisa: Wings.
Wendy: One I can eat, and the other I am afraid of.
If you were a musical instrument, what would you be?
Wendy: I'd be that mixing board at Sound Factory and Tchad would be using it.
Lisa: I would be the first piano I played as a kid, an upright Yamaha, which I still have. It helped raise me, and is responsible for the way I am.
What's wrong with the music industry?
Lisa: It's run by people who aren't musicians — sort of upside down.
Is it getting better or worse?
Wendy: Worse. A horrifying experience.
Which came first: music or the musician?
Lisa: Music. Musicians take sounds and put them where they want them. It's very interesting that with sampling and the more advanced our technology becomes, the more we are able to use the natural sounds of nature.
Who inspired you to be musicians?
Wendy: My parents. My father was a professional, of course, but my mother was the ultimate musical fan — she really loved listening and experiencing music. I loved the idea that someone might appreciate my music as much as my mother enjoyed it.
Lisa: Same here. My father playing the piano inspired me, and my mother would play me records she loved.
Do you two remember the first time you met?
Wendy: I was too young to remember.
Lisa: But I remember. She was just a toddler, in little rubber panties — this was about five years ago.

Suspects: Wendy & Lisa

Occupations: Singers, songwriters, musicians, producers, engineers.

Residence & Birthplace: Los Angeles

Vehicles: 1955 Ford F100 pickup (Wendy); 1964 Mercury Montclair (Lisa).

Diet: Snickers, cottage cheese, Italian, Indian.

Hobbies: Psychology (Wendy), photography (Lisa).

Hair: Short and spiky (Wendy); long and straight (Lisa).

Identifying Marks: Three-inch scar on scalp (Wendy); scar above left eye (Lisa).

Notes: Wendy Melvoin and Lisa Coleman, daughters of prominent session musicians, have known each other since early childhood. Their faces and musicianship became known worldwide in the '80s film *Purple Rain*. Albums blending pop, funk, rock, dance, and jazz include *Wendy and Lisa* (1987), *Fruit at the Bottom* (1989), *Eroica* (1990), and *Re-mix in a Carnation* (1991). Scored the films *Dangerous Minds* and *Soul Food*. Currently working on new material recorded in their project studio and at Sound Factory with coproducer/engineer Tchad Blake.

PHOTOS BY MR. BONZAI

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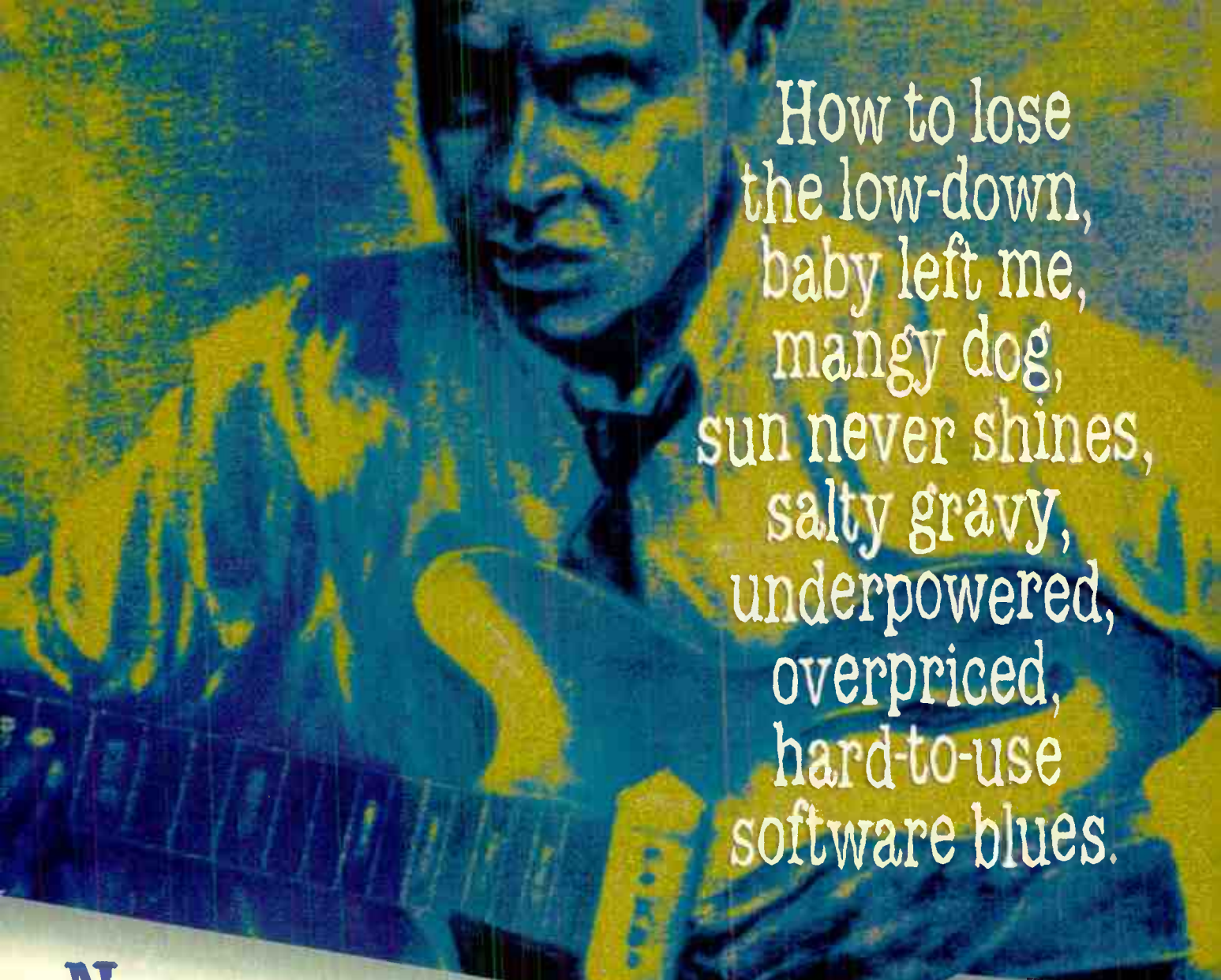

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CIRCLE 20 ON FREE INFO CARD

World Radio History

What music would you like played at your funeral?
Lisa: Carousel music — a circus atmosphere.
If you could go back in time before the birth of recording, what would you like to hear?
Lisa: The birth of jazz.
Wendy: I'd like to be the fly on the wall when Stravinsky was creating the Rites of Spring.
What is the first music you remember hearing?
Lisa: My dad playing the piano.
Wendy: Me, too.
Who were your musical heroes when you were getting started?
Wendy: Joni Mitchell and Stevie Wonder.
Lisa: My first three albums were Joni Mitchell, Stevie Wonder, and Franz Liszt.
Do you have any interesting business tips?
Lisa: Don't trust anybody.
Wendy: Take risks but don't be stupid. Don't let your ego make your decisions.
What were you in a past life?
Lisa: I think I was water.
How long does love last?
Wendy: If it's not ego-based, it lasts forever.
Lisa: But ego may create the need for it.
What old saying do you hate the most?
Wendy: "Not bad for a girl." I hate that.
Lisa: But I think girls should always be bad. As Mae West said, "When I'm good, I'm very good. But when I'm bad, I'm better."
What is the biggest mistake of your life?
Lisa: I wore this really stupid outfit one day, and I felt stupid, but I went out anyway. It happened that Wendy had arranged a surprise party for me and everybody was there — even my parents.
Any advice for getting a good start in the music business?
Wendy: Find a good therapist.
Lisa: Talent would be helpful.

THE CARD WITH CONNECTIONS

The powerful DSP based **ZA2** is the latest in direct hard disk recording for your PC based studio. The **ZA2** records and plays back simultaneously using any Windows based program and has the added convenience of a built–in analog stereo monitor output. All three digital formats are available without switching cables and can be completely SCMS free!

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CIRCLE 80 ON FREE INFO CARD

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NT1 $499 U.S. MSRP

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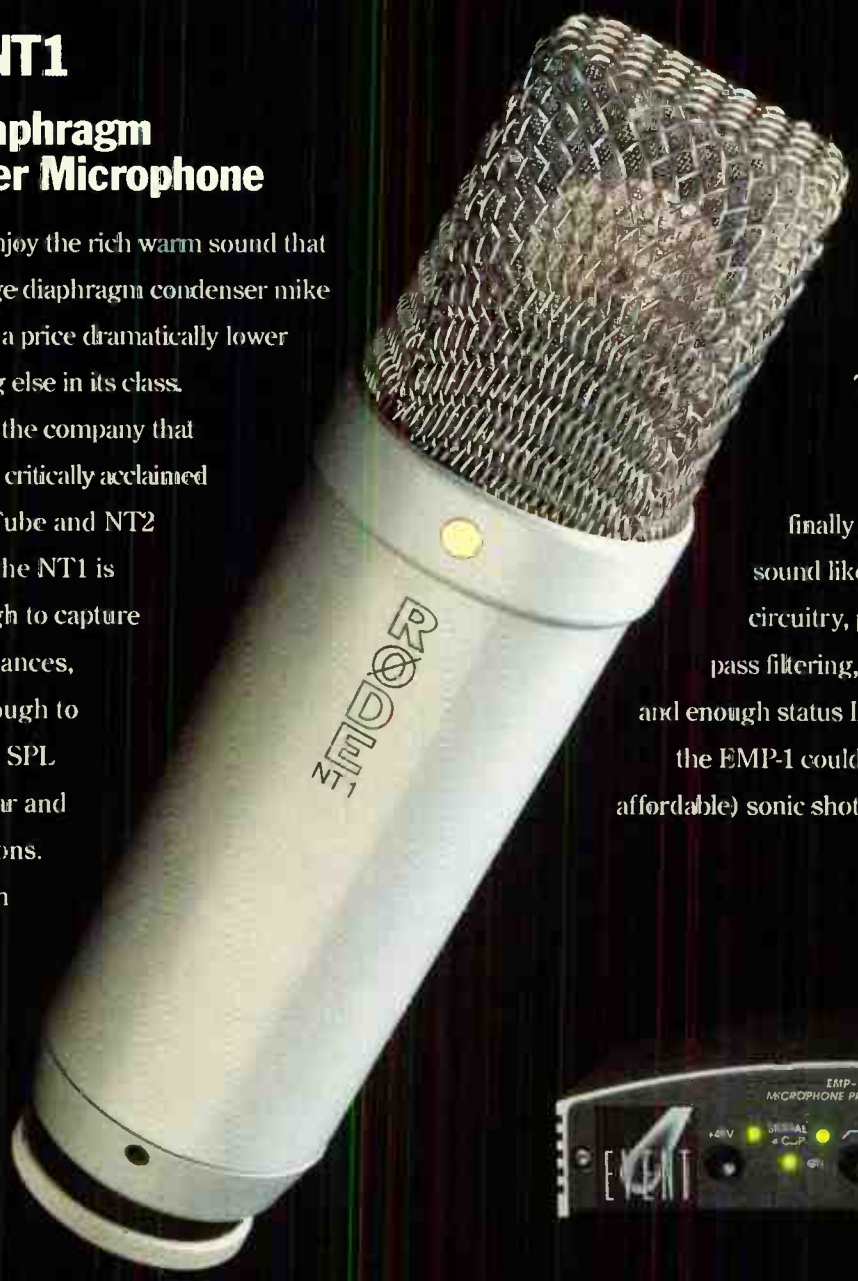

Event EMP-1™

Microphone Preamplifier

Want to spruce up the sound of your current microphone collection (or even your NT1)? Then plug them into the new Event EMP-1—a world class preamp so acoustically transparent that you'll finally hear what your microphones *really* sound like. With features like ultra low noise circuitry, phantom power, phase reverse, low pass filtering, continuously variable gain control, and enough status LEDs to light up your control room, the EMP-1 could be the single most important (and affordable) sonic shot in the arm you give to your studio.

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EVENT ELECTRONICS

CIRCLE 23 ON FREE INFO CARD

World Radio History

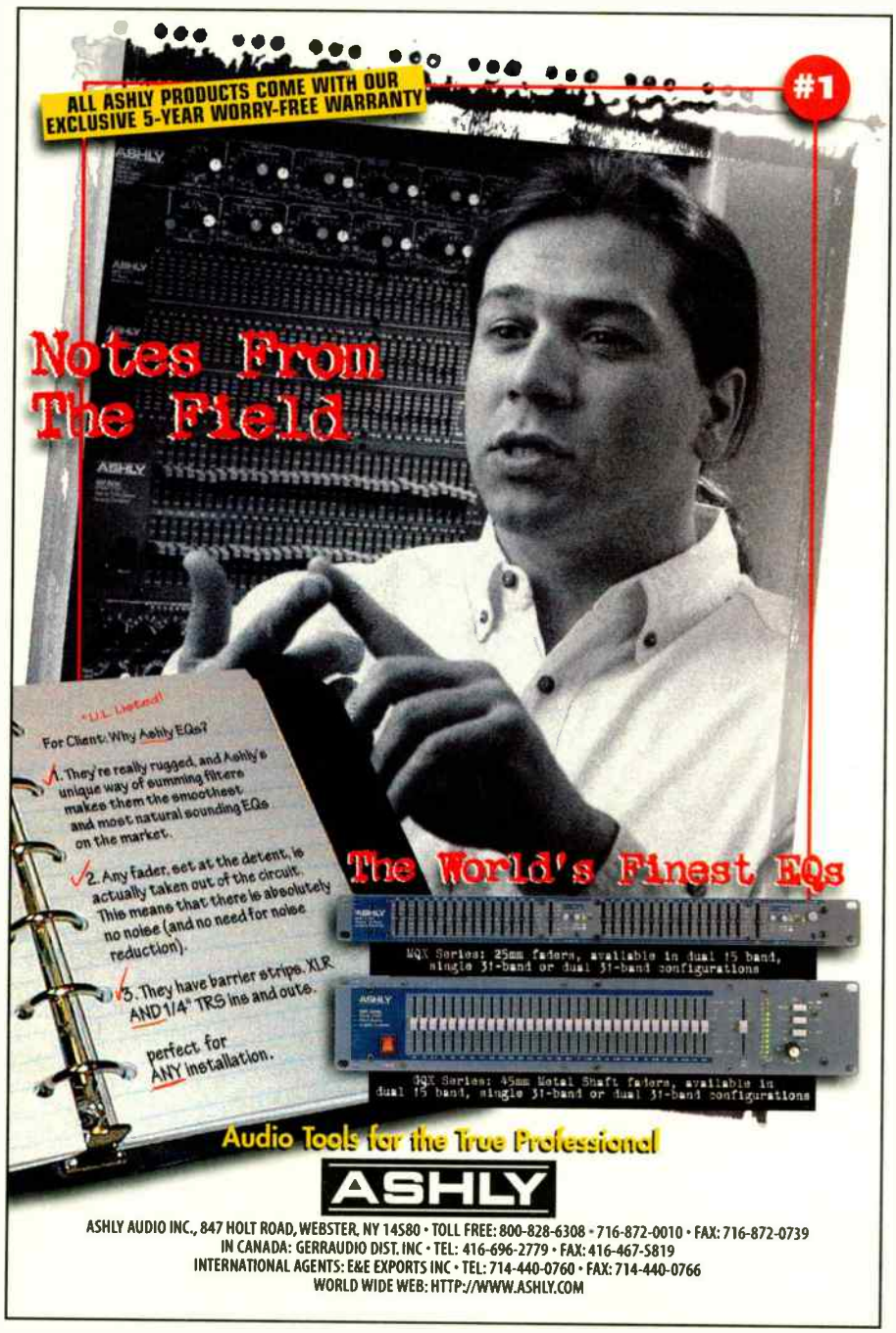
Who is the Great Imposter?
Lisa: He has no name right now.
How has direct access to recording tools changed your music?
Wendy: Huge difference. We had an experience a few years ago with a producer and it was an absolute disaster. Everything was his: the studio, the engineer, the instruments, the time. We felt that our music was completely out of control.

It's very important to learn the gear so that when you want to create something, you can really do it. You're not stuck having to translate the idea to somebody else. Even if it's a 4-track at home, learn it. Don't be afraid of the technology. And this goes for women, especially. Women are afraid of that stuff and you just can't be. Do not be at the mercy of someone else. Be responsible for getting your creative energy out. Do it yourself. It's given me incredible power to know how to patch something in, to turn my machine on, to clean my heads, to know exactly what kind of compressor I want, to learn the microphones, to learn how to anticipate, to troubleshoot.

Lisa: Even if you don't know the exact compressor you want, or the microphone, don't be afraid. By recording yourself, you can also learn about how ideas change during the recording process. You have an idea and you go into the studio. Most of the time it takes its own path. You just take a great idea and start to work with it.

Sometimes when you go into a hired studio — an engineer, the band all waiting for you to tell them what to do — it can get out of your hands and you really feel lost. But you can learn to deal with it by working at home with your own tools. The creative process has a will of its own sometimes, and that's OK. You can learn to work with it wherever you are and still feel that your power and your gift aren't going to go away because the kick drum doesn't sound just as you imagined it in your mind.

I asked Tchad Blake about a certain incredible bass sound on your new material, and he told me he couldn't take credit for it. He said you did it up at your house. Did he have any comments about your engineering ability?
Wendy: He said, "You're too good."
Lisa: We just put up a microphone, and, as long as it sounded clean, we thought that it was OK. But it's hard not to edit yourself. You're hesitant, you're tempted to rework things. With Tchad, I would finish a take and want to correct something. I would say, "Listen to that line — horrible." "No it's not," he'd say. "I totally feel what you said there. It's great, so just keep it."
Wendy: Relatively speaking, working with Tchad has been a religious experience. Absolute freedom within a confined area, which is the project itself. Tchad is the first person we've worked with who actually has allowed the two of us to maintain who we are, completely.
Lisa: I'm Lisa, she's Wendy. Hello, Tchad. That's enough. EQ



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CIRCLE 52 ON FREE INFO CARD

microphones that include Neumann U87, '47, and '67's and a Sony C-800G.

The unique thing about Daddy's House is the custom 18-inch Far-Field Monitor Speaker Towers with TAD components. "Puffy's rooms sound like a dope club at three in the morning," claims Alexander. Most engineers would scoff at 18-inch woofers for mixing. Pushing the envelope of unusual standards makes for an impressive creation. "Those rooms were built extra heavy for low-end response. We went to great lengths to make sure he would be happy with the bass response. Those [custom monitors] are mounted in eight-foot tall, sand-filled columns," says Cumentale. "These monitors have the producers feeding off this loud, crystal clear, club sound. The amazing bottom end aids their creativity," adds Alexander.

Most engineers would scoff at 18-inch woofers for mixing. Pushing the envelope of unusual standards makes for an impressive creation.

POOL OF THOUGHT

With Combs constantly using the facility, Maserati found the need to create a consistency among engineers since working at such a breakneck speed can be detrimental to ones mixes and tracks after a while. Having founded the Allied Pool of Engineers, Maserati was sure that anyone called upon to mix or track something would have a certain level of expertise. "We were interested in upgrading the level of studio personnel from assistants to engineers," states Maserati.

Combs knows that whatever he needs, whether it's someone to mix, track vocals, or re-call something, he can rely on the Allied Pool to provide quality and familiarity. It's that closeness with his engineering team and staff at Daddy's House that helps to formulate his creative desires. "Puffy doesn't like to work with a lot of people that he doesn't know. He finds people that he likes and sticks with them," says Craven.

With Daddy's House as his creative playground, Combs is free to work on any project, at any time. Craven adds: "Puffy believes in tracking [material] as often as possible. He is always building his catalog." Often, Combs and his production team will get a vibe, track something, and not even have an artist in mind for it. "He is a classic type of producer, not really a musician, but focused on how the end user is going to use his product. Puffy is totally clear on the fact that his listeners want to dance and/or make love to his music," says Alexander.

By using Daddy's House as a creative center, Combs has created a "Brill Building" for the '90s. "He likes to throw musicians and producers together in a room and see what happens," admits Alexander. Combs can disassociate what he's created from what might work best for the track. "He knows if the beat is weak, and the track kills to just redo the drums or vice-versa. Puffy has no problem selecting what works for each track and what doesn't," Alexander continues. Whereas some producers would be hindered by their ego before replacing something they've created, Puffy is only strengthened by his drive toward excellence.

"The staff [at Daddy's House] is a tight machine that is able to deal with the chaos of Puffy's world. Without this tight cohesion, the whole thing would derail," says Technical Director of Daddy's House, John Eaton. The pace at the studio is dizzying, though the staff is well trained and has a great knack for communication. Studio director, Felicia Newsome, states: "First and foremost, this is a learning facility. We give a lot of chances, but if you screw up, you'll hopefully never make the same mistake again." Even though they are not a commercial facility, they have to run efficiently. "We are not real good at firing people, we would rather promote them to a new position," admits Eaton. Wanting the engineers and producers who work at Daddy's House to feel comfortable is a high priority for the staff. "We've created a database for the Puffy's clients. For example, what drinks they like, which cigarettes they smoke, anything to make the session more comfortable for them," says Newsome. In addition, that information helps the 2nd engineers to be a step ahead of the engineer.

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CIRCLE 72 ON FREE INFO CARD

"As an engineer, I like my assistants to be in tune with what we're doing; to be a step ahead," says Neihaus. "A good engineer and a good assistant make a great session. A good engineer and a bad assistant can make a session fail, upsetting the creative flow."

GENERATING HEAT

Puffy and his crew of producers are creating and rewriting history. Weeks on end at the top of the charts, numerous multiplatinum records, massive radio play, and a constant creative buzz surround the staff. "[What makes everyone want to be a part of this] is a combination of the creativity and the energy," says Patterson. Puffy has created an atmosphere where today's Hip-Hop and R&B stars are hanging around the studio and vibing with each other. "Everyone from the interns to the artists like to hang out at the studio. That's the reason that it's a hot place to be; you never know what is going to happen," says Maserati. Indeed, most often the 2nd engineers can rise higher than in usual studios. Generally, at a commercial facility, the goal of the assistant is to become an engineer. At Daddy's House, that is not always the case. "Some of the [2nd engineers] want to be producers. Others might want to be artists or songwriters. These guys have the ability to hand a tape to the hottest producer in the world right now; not many people get an opportunity to do that," states Maserati.

The process of building the studio started when Combs asked Maserati how to go about putting a studio together. Knowing that he would need a studio director and a technical director, Puffy brought in Felicia Newsome and John Eaton, respectively. "My involvement with the studio has always been as a consultant. We bought all the gear and built the place from the ground up," says Maserati. Studio designer Frank Cumentale, whose Sound-Vu Associates design firm has created a great number of studios around New York, was brought in to make sure the studio would be of top construction and design. "I came up with this design from a progression of studios I had worked on starting back with the old Hit Factory. The studio is the latest version of that basic design," says Cumentale.

Puffy's production skills are well documented. So is his rise from intern to VP at Uptown Records in the early 1990s. Naturally, what doesn't get that much attention is his support staff. "All the engineers have done a lot of great records with producers other than Puff, but there is something that he adds to the records at the end [that make them special]. He knows exactly what he wants and how to get it; he's very perceptive. He relies on his staff to make his vision come true," says Patterson. The tracks that Puffy and his team produce have a consistency of quality throughout because of the engineering team that he has organized. "This is an interchangeable machine. There is a family vibe and a creative energy that exists between the engineers," states Alexander. "The studio acts almost as a home base of operation for Puffy and his production team," adds Patterson. Surely they feel comfortable. Knowing what they can get out of the equipment, knowing how the room sounds; that good old feeling of home. Appropriately, it's no wonder he named it Daddy's House. EQ

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<< AD # >>
080284

<< TYPE: >>
Teaser

<< MANUFACTURER: >>
Akai Professional

<< BEGIN AD DATA: >>

[PRODUCT NAME]
DPS12

[DESCRIPTIVE DESIGNATION]
Digital Personal Studio

[FUNCTIONAL DESCRIPTION]
Integrated hard-disk recorder/digital mixer

[KEY FEATURES]
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CIRCLE 65 ON FREE INFO CARD

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Rock Those **Socks!**

Cool software (except the last two) stocking stuffers for under $100

BY DAVID MILES HUBER

Need some cool but inexpensive ideas for stocking stuffers for your fellow musician, producer, and engineer friends, significant others, or maybe something for yourself to get you through the holidaze? Well, here are a few innovative, inexpensive, and even powerful toys that are just ripe for the pickin'.

DirectCD CD-Recording software ($69) — This is my first pick of the season (and maybe even 1998). DirectCD from Adaptec uses a whole new way of recording computer data to your Windows 95 CD-R or CD-RW drive. With "packet writing," gone for good are the multisession or buffer underun woes. Since data is written to the disc in small "packets," it's possible to add single or multiple files to a CD-R without creating sessions. Unlike previous methods of writing data to CD (such as Disc-at-Once and multisession), packet writing doesn't waste much time or disc space, and there's no arbitrary limit to the number of packets that can be written to a CD.

When using DirectCD, the disc drive acts just like any other drive in the system. You can drag and drop files, rename files, delete files, and create new directories right on your CD-R disc — without the need for any "Wizards" or mastering programs. By the way, packet writing is the file format that was chosen for DVD technology and is rumored to be fully supported in Windows 98. Trust me on this one, it's already revolutionized the way I use my CD-R. (P.S.: Sorry, it doesn't support audio CD mastering.)

Contact: Adaptec, 800-442-7274 (be patient with the multilevel options menu) or surf www.adaptec.com. Circle EQ free lit. #121.

WaveZIP Soundfile Compression Program ($49.95) — WaveZip from Gadget Labs is the first Windows software program to shrink the size of large digital audio WAV files down to elf-like proportions — without sacrificing sound quality. Before storing soundfiles to your favorite media, you can use WaveZip's Explorer-like file navigator to batch compress your files from 30–60 percent (depending upon the program material). When you want to restore the files for playback, you simply call up WaveZip and expand the files back to their original size. (P.S.: Emagic's Zero/Loss Audio Packer ($99) is a similar package that's available for both the Mac & PC. See the review in the May '97 issue.)

Contact: Gadget Labs, 800-660-5710 or surf www.gadgetlabs.com for the demo. Circle EQ free lit. #122.

Diamond Cut Audio Restoration Tools ($59) — Diamond Cut Audio Restoration Tools (DC-Art) is a high-quality Windows-based program that removes ticks, pops, crackle, buzzes, and surface noise from any recording. It gives the user all the software tools necessary to perform high-quality mono or stereo noise reduction. In addition, its audio wavefile editor can be used for general audio editing applications. All of DC-Art's NR filter controls now work in real time, meaning that you can hear the results as the file is being processed.

Contact: Diamond Cut, 973-316-9111 or surf www.diamondcut.com for the demo. Circle EQ free lit. #123.

Audio Magic Ring ($99)—The AMR from Emerging Technologies is a graphic-oriented audio file format conversion program for Win 95 or NT that can batch convert any number of files between different formats, wordlengths, or sample rates. Some features include: wide range of file format support, a high-quality sample-rate converter (supports all the common sample rates from 8 kHz to 96 kHz), and a wordlength converter (includes dither and advanced noise shaping) that supports up to 24-bit wordlengths.

Contact: Emerging Technologies, 847-

WRITE ON: Adaptec's DirectCD makes writing to CD-Rs easier.

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CIRCLE 94 ON FREE INFO CARD

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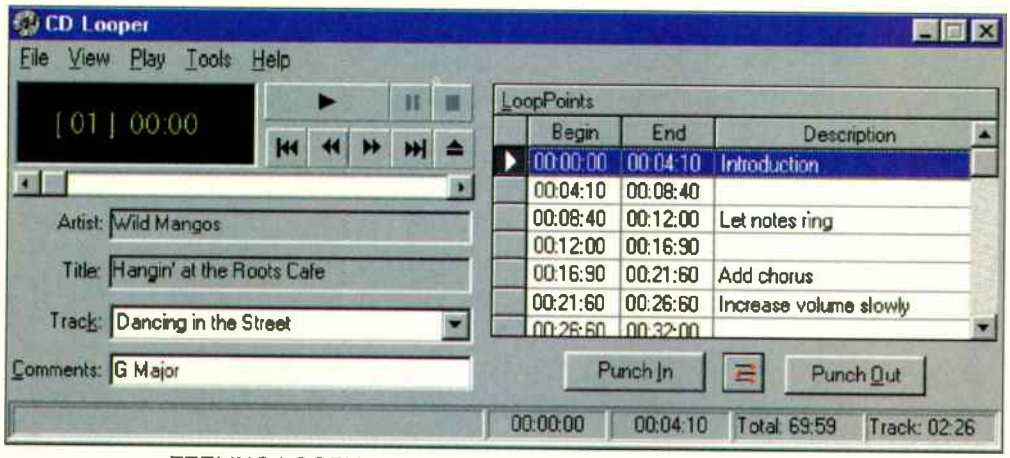
272-0500 or www.merging.com. Circle EQ free lit. #124.

MIDI Software ($99) — For those stockings that are just getting into MIDI, you might want to check out Emagic's MicroLogic ($99) for Mac/PC, or Steinberg's Cubase Lite for the Atari ST or Cubasis for Windows (both at $99). These are lite versions of their bigger brothers and can be easily upgraded at a later date.
Contact: Emagic, Inc., 916-447-1051 or www.emagic.de. Circle EQ free lit. #TK. Steinberg N. America, 818-993-4091 or e-mail: info@steinberg-na.com. Circle EQ free lit. #125.



FEELING LOOPY: Make quick loops with Replay's CD Looper.

KEY INGREDIENT: Play your computer keyboard like a, well, keyboard with Mixman Studio.

Replay's CD Looper ($59.99)—This nifty little Windows program from Replay Technologies can be used to create loops using your PC's CD-ROM. The CD Looper lets you manually capture and cycle through a virtually unlimited number of loop points per track on an audio CD and then play them back from your hard drive at full, half, or quarter speeds without changing the original pitch. Conceived as a compositional tool for studying recorded music, I could easily see the looper as a tool for sampling, live, or studio performance.
Contact: Replay Technologies, 888-3-REPLAY or www.replayinc.com. Circle EQ free lit. #126.

Mixman Studio ($49.95)—This interesting performance and production CD-ROM for Windows 95 provides royalty-free loops that can be assigned to the keys on your PC's keyboard, allowing you to create percussion tracks or mix musical elements. You can use sounds from the library of bundled Mixman tracks, import your own WAV files, and then export your composite mix as a CD-quality digital audio file to use within other programs. Features like real-time control over tempo, volume, pitch and panning let you customize your song or you can use any of the included song templates as a starting point.
Contact: Mixman, 888-4MIXMAN (888-464-9626) or www.mixman.com. Circle EQ free lit. #127.

The *Muzical Wizard ($89.95) — For the techno-sequence, create-your-own-beat track kind of stocking, there's the *Muzical Wizard for Windows 3.1 and 95. This pattern-based music software provides a natural means to capture and develop hooks and riffs, as well as compose songs, jingles, musical styles, and background accompaniments. Using Standard MIDI File exchanges, this tool lets you sequence your own drum-tracks or import from a bank of well over 100 sample patterns. Features include up to 16 independent player-tracks per pattern, simple mouse and pattern window interface, and note entry and editing with full cut and paste (as well as move and transpose) functions. The *DrumZ Wizard Plus ($59.95) provides the same editing features, while offering only one MIDI pattern track.
Contact: Mediatech, 408-267-5464 or surf www.midibrainz.com for the demo. Circle EQ free lit. #128.

PianoscaN music scanning software ($99) — This Windows program allows you to scan piano, solo, and duet music scores (with up to two staves per system) directly into a Standard MIDI File format for entry into your favorite sequencer of choice. You can even choose the newly adopted NIFF notation file format that's soon to be supported by most music software programs and use the built-in image editor to edit vocal lines from piano/vocal sheet music.
Contact: Musitek, 800-676-8055 or surf www.musitek.com for the demo. Circle EQ free lit. #129.

The Musician's Pocket Memo ($99.95) — On the hardware side, the folks at E.W. Bridge offer a solid-state pocket

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16 IN+16 OUT-DIGITALDOMAIN-REALTIME-SYSTEM

And much more: TDAT16 is available - but be forewarned ... you'll have to add your name to the waiting list of recording engineers who were ahead of you! TDAT16's all new, yet mature and stable - we've taken our proven tripleDAT interface and added the powerful capacity of 16 I/O, while keeping all the features that earned tripleDAT a 1997 TEC Award nomination! Why gamble with products that are only on spec sheets. Don't risk your valuable studio time and recording talents with one piece of hardware combined with some "off-the-shelf" software interface. TDAT16 is a finely tuned hardware AND software solution. No installation adventures and no waiting for an update that actually works! Install TDAT16 and your creativity starts flowing. The fastest editing with all the power tools that make tripleDAT so outstanding: integrated CD-Writing and a whole suite of excellent REALTIME effects. You won't find this anywhere else - certainly not at this price! TDAT16 is the HDR soltuion for the digital studio. Now you're digital, stay digital. Link your digital mixing consoles, your tape (like Alesis ADAT or DAT) and your TDAT16 powered PC together without ever turning back to analog.

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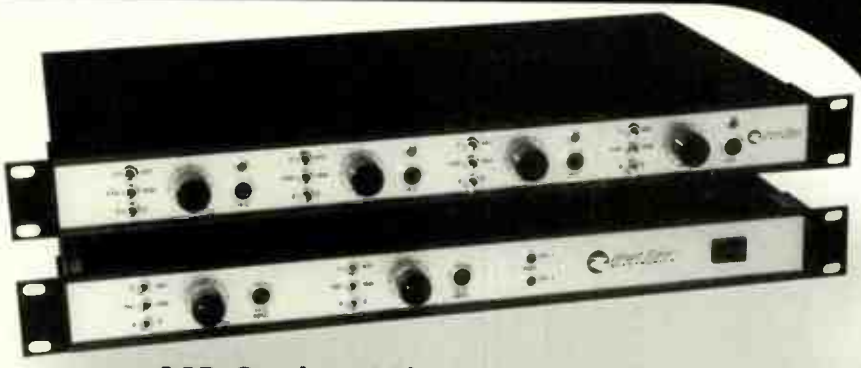

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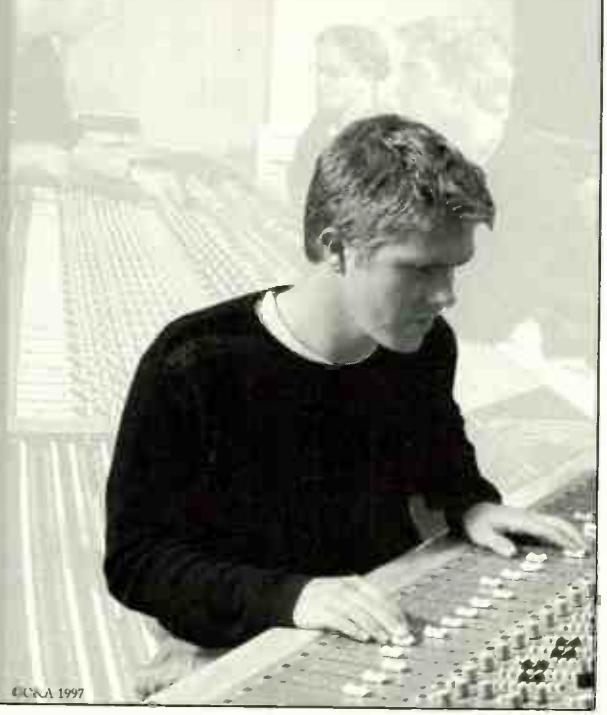

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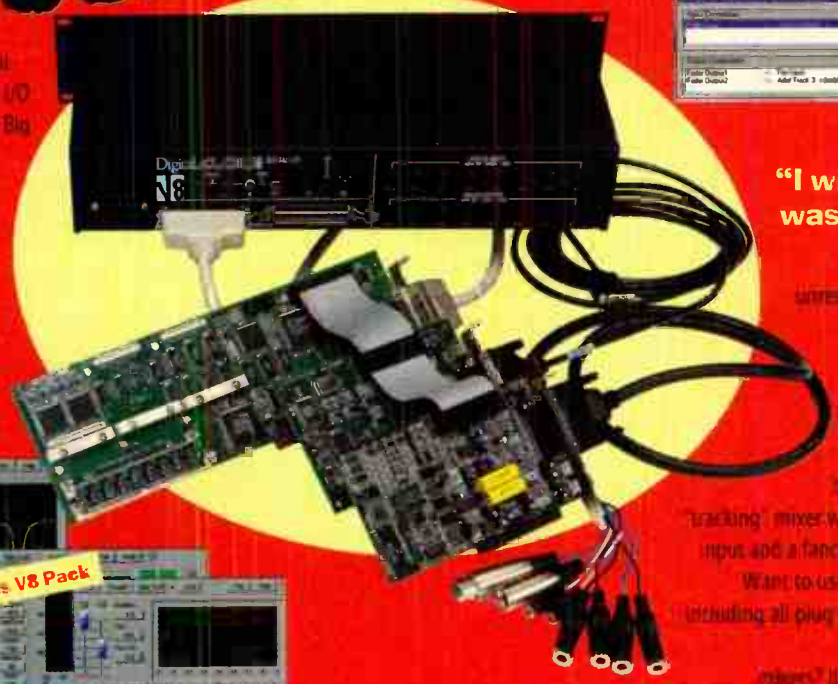

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World Radio History

Stalking the *Celebrity Squeezebox*

The comeback of free reeds in pop and world music spells challenge for engineers

BY JOHN TOWNLEY

If there is one family of instruments the average engineer is ill-prepared to deal with, it is most certainly the squeezebox. Accordion, melodeon, concertina, bandoneon — there are a dozen varieties and incarnations of the redoubtable squawkbox that, after a couple of generations of obscurity in the archives of Lawrence Welk, have come bounding back onto the music scene and now demand the attention of mic and VU meter. And it's no longer like plunking a couple of Neumanns in front of the predictable likes of Myron Floren, bland and forgettable — no technical challenge in that. Now you've got to cope with the wild dynamics of Cajun, Zydeco, and Tex-Mex melodeons, the tenuous pitch of Celtic concertina, and the orchestral breadth of the bandoneon, not to mention the inclination of their players not to stay in one place long enough to maintain a reliable level. And, because of the sudden revival of "free reed" instruments in nearly every style of music — from k.d. lang to the Rolling Stones in the last year alone — you have to figure out how to make them blend with every conceivable type of instrument, acoustic or electric, in the studio or on stage.

Recording a squeezebox is more than just putting the right mic in the right place — it's a concept. In fact, box players (who tend to be on the crazed side) might tell you it's a philosophy, even a way of life. I know — I'm one of them. Fortunately, I was building recording studios well before free reeds came into my life, so I still retain an ounce of sanity and a pound of sympathy for engineers on the receiving end of squeezeboxes. For a successful result handling these often obstreperous objects, you need to know three basic things:

1. the individual instrument you're recording;
2. what you want it to sound like; and
3. the style of the music and the player.

That's good advice for recording anything, but in this case getting your ducks in a row before ever picking up a microphone is more essential than usual.

Number one, the individual instrument. With the exception of the more-or-less similar piano accordions à la Lawrence Welk, most squeezeboxes are radically different from one another, even though they may be called the same name. A Cajun musician's melodeon is not remotely the same as a traditional Irish melodeon — not to mention the melodeons used for Tex-Mex or, say, French Canadian music. Same name, but vastly different sound emission characteristics and very disparate ways in which they physically are

ACT ACCORDIONLY: David Hidalgo of Los Lobos helps kill the "geeky" stereotype of squeezeboxes.

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BIG SQUEEZE: They Might Be Giants

played. For instance, although melodeons (button accordions) are designed to produce sound from both ends, Tex-Mex artists like Los Lobos and Flaco Jiminez don't use the left-hand side at all, except to propel the bellows, so you don't even have to put a mic on it. And the relatively even dynamics of the right hand are not too difficult a challenge to mic or record.

On the other hand, Cajun boxes boom out like thunder from both ends, and the musicians tend to be both peripatetic and noisy — to capture the frantic wonder that is a good Cajun player is a challenge indeed. The squeezebox is the only instrument I can think of that is by nature a moving target — it has to be in continual motion in order to produce sound and you need to know how much motion is going to happen before deciding upon a miking strategy.

Which immediately leads to **number two, the sound.** Squeezeboxes can (and should) sometimes sound very intimate and in-your-face with all the rhythmic clicking of the buttons and pads, creaking of the bellows — even the panting of the player retained as a part of the signature sound. Close-miking is the best way to get that, the same way you would for picking up the squeaking string-fingering sounds of a classical guitar. But, unlike a guitar, you've got a moving object to contend with, which makes tight-miking a problem.

In the case of big piano accordions, sometimes the instruments already have mics inside them, a helpful option, or even MIDI outputs. For funkier boxes, however, you may be best off with actually attaching small clip-on mics on stands to each end of the instrument, so consistent distance and level is maintained however the player moves, especially if you are doing a live stage recording (see more on this in the accompanying "Squeezin' On Stage").

To retain intimate sound and also separation, try to add the squeezebox in the overdub stage and not the basic track, if possible — they leak into everything. On the other hand, a more distant, amorphous, enveloping sound may be what you want to go for. These boxes can sound as big as an orchestra and make great continuo — being, after all, just portable reed organs. In that case you can room-mic them or even play with the signal for special effects. Best for that sort of game is the concertina, since it has a purer, single-reed tone and is much easier to manipulate with, say, flange, phasing, and the like.

Finally, number three, music and player style. By and large, you will find most concertina and melodeon players rather set in their ways, coming from traditional folk and blues backgrounds.

SQUEEZIN' ON STAGE

Like on-stage recording and amplification of any instrument, squeezeboxes present their own challenges to musician and soundperson alike. Your options are obvious — either stick mics in front of it or pickups on it. But which way you go with is very stage and performer dependent. Until recently, most pickups were terrible — they sounded harsh, had bad feedback problems, and picked up a lot of mechanical sounds. Definitely not the way to go, despite that they give the player more freedom of motion.

A new solution, pioneered by physicist Griff Jones at Accusound Electronics in England, has been to mount small, directional lapel-type microphones on goosenecks on either end of the instrument tied to a stereo preamp worn on the belt. Similar designs are also offered by Microvox, another English company. They provide relatively feedback-resistant sound that is quite adequate, though not always as good as really high-quality PA mics. However, by maintaining a fixed miking distance from the instrument that is not subject to the player's moment-to-moment control, this approach limits the musician's ability to "play the mic" and get various types of proximity-derived volume and tone color. It's a trade off of level convenience vs. artistic control, and personally I prefer control and I don't like my instrument tied to wires that interfere with stage movement, switching instruments, or interacting with the audience. If I were the sound mixer, however, I am sure I'd have just the opposite opinion! If you want good pickups/mics for almost any kind of squeezebox, some (but not many) music stores in the U.S. have them, or contact the companies directly:

- Microvox, 19c Thorp Heys, Back Lane, Holmfirth, West Yorks, U.K. HD7 1HG. E-mail: alan@microvox.demon.co.uk. Tel/Fax +44 01484 684049.
- Accusound, 19 Bitteswelle Rd., Lutterworth, LE1 74EL, Great Britain.

Both companies offer a wide variety of pickups and microphones for every kind of squeezebox, as well as for many other acoustic instruments, at prices ranging between $100–$200.

And for further tips on squeezebox playing, facts on hundreds of artists and recordings, details on the free reed revival, and more than you will probably ever want to know about this family of instruments, check out these Web sites:

Phoebe Senger's Accordiana Page, at **http://www.cs.cmu.edu/afs/cs/user/phoebe/mosaic/accordion.html** and *RootsWorld's* Free Reed Page at **http://www.rootsworld.com/freereed/**.

Both have links to dozens of other related pages, magazines, dealers, recording companies, and constantly updated reviews and discographies. Well worth the visit! —*John Townley*

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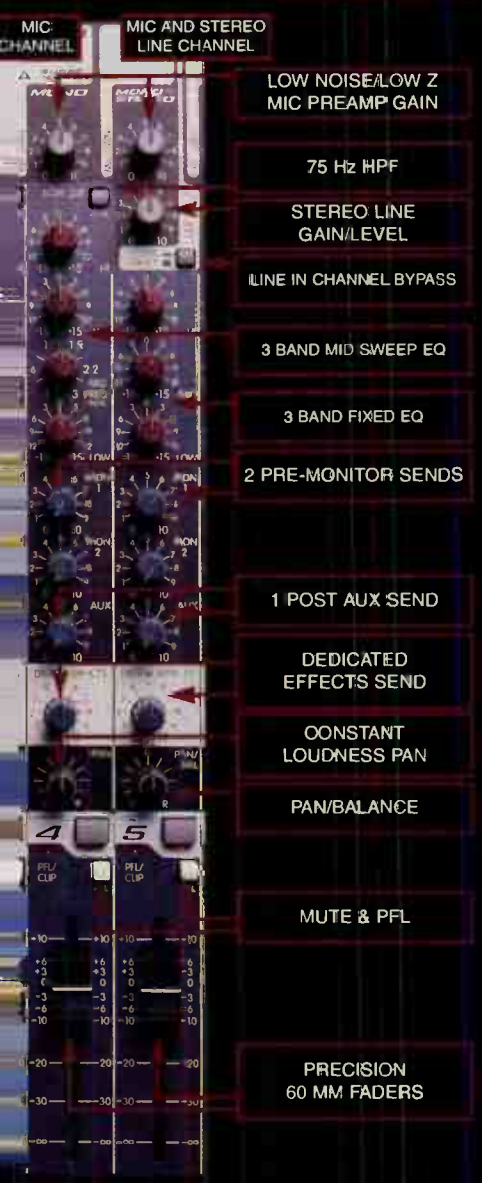

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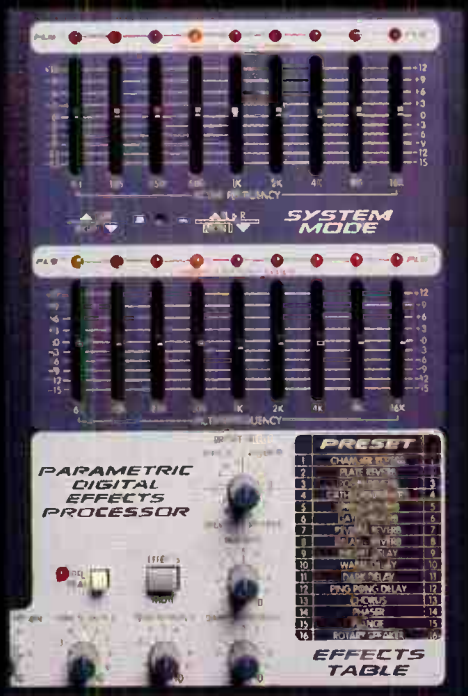

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AND-A-ONE, AND-A-TWO: Buckwheat Zydeco shows the strength of accordion rhythms.

In order for them to give a convincing performance, it has to be a live set, with the recording part unobtrusively in the background. It is thus not a surprise that judiciously accomplished 2-track recordings are among the best made of this kind of music.

Not so for piano accordion players, who tend to be more flexible and studio-friendly. They're used to abuse — as evidenced by the last unglamorous 40 years or so — and are better adaptable to the vagaries of getting the perfect sound. In a band setting, player placement may be critical, particularly if you are space-miking. Free reed instruments can either wonderfully unify or completely destroy an ensemble sound, depending on their proximity to other instruments. For example, keep them away from pipers of any sort, whereas up close and personal with a flute, surprisingly, works wonders.

So, having reconnoitered instrument, player, and intended sound, it's time to pick out the mics — and the recorder. Starting with the latter, digital is the only way to go; take if from an old analog fan. Especially if you're recording concertina, which can seek out and find wow and flutter problems you never knew you had. But, because free reeds tend to sound cold to begin with, you'll want to use 24-bit processing if possible, and avoid 16-bit DAT.

My fave studio for this at the moment is Monitor Radio's Studio Two in Boston, manned by veteran engineer Jeff Whitehead. There the Sony 3324 mixes straight down to Sonic Solutions 24-bit, giving the warmest sound digital can produce. And, just as important, Jeff is well experienced with squeezeboxes. His favorite mic setup is a pair of Schoeps with the CM-5 capsule about 3–4 feet away from each end of the instrument, to give some room for movement while still keeping a relatively close sound. Sometimes an AKG C414 for the left hand may give a better bass, but the idea is to use a mic that gives little coloration on its own. Lately, Jeff has been doing a lot of traditional Irish recording where that's most favorable, though he says he's also had good results with Milab DM4's for more pop uses in the past.

But to each his own. One of the all-time great recordings of concertina (Bertram Levy's "Sageflower Suite") was done live 2-track with crossed Sennheisers eight feet above the performers in a really great room whose presence itself helped make the recording outstanding. Similarly, New England producer, concertina-player, and fiddler extraordinaire Frank Farrel finds great results with a pair of Sony MS5's, cross-phased, and a third mic down the middle, all on separate tracks.

Although left-right stereo miking is more or less standard (and obvious), be adventurous and play with the potentials of the instrument. Try miking the top and bottom of the right side of an accordion or melodeon on separate

continued on page 136

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E-mu E4XT: The Sampler That Grew

Recent updates to the popular sampler turn it into a powerful, easy-to-use studio tool

BY TIM TULLY

A little over two years ago, E-mu introduced the EIV, the latest in E-mu's legendary line of samplers. Like its forebears, the EIV's excellent sound quality, intuitive and powerful sampling capabilities, and enormous library of sounds made it one of the most popular project-studio instruments, and the EIV's expanded features and functions made it a hit in postproduction facilities as well.

Since its birth, the EIV has experienced some significant growth spurts, most recently including an updated operation system version (EOS 2.8), a new bank of 256 ROM sounds, and other memory enhancements. All together, its improvements and upgrades have made today's version of the EIV—the E4X Turbo—virtually a new instrument that's worth another look.

BASICS

The E4X Turbo is built around 16 MB of sound RAM, a 1 GB internal hard drive holding over 400 MB of sounds, and eight balanced analog outputs, as well as an AES/EBU digital I/O, ASCII keyboard input, four expansion ports, and a SCSI port. A 16-track "scratch pad" sequencer plays back Standard MIDI files and there are 128 6th-order Z-Plane filters (including 21 types of filters). The unit uses 128X oversampling and sigma/delta conversion, offers graphic editing of sound waveforms, and digital resynthesis.

Perhaps most impressive is the 128-voice polyphony. This not only gives you lots of individual sounds, but provides the freedom to layer sounds with impunity. And while these are impressive specs, two options take the E4X Turbo over the top. The first is a 32 MIDI channel expansion card. A second card adds eight balanced 1/4-inch analog audio outputs, for a total of 16 analog outs. All together, the polyphony, MIDI channels, and extra outputs make it possible to create completely orchestrated compositions with the E4XT alone. It's the closest thing to a studio in a box I've seen.

The E4XT also incorporates two 24-bit, stereo effects processors that were originally available for the EIV as an optional expansion card. These add over 40 studio-quality reverbs and 30 chorus, flanging, and delay algorithms.

ROM AND FLASH RAM

One of the great strengths of E-mu samplers generally has been their ability to load sounds from a hard disk or an ever-growing CD-ROM sound library developed by many sources. The downside is that each time you turned the sampler on, you had to load every sound from disk, and this can get hard to manage. For every project you do, you have to keep track of the hard disk or CD-ROM, folder, and bank in which each of your sounds and its associated preset was stored, and then locate and load each one whenever you turned the machine on, and then make sure it was assigned to the MIDI channel the sequencer expected.

Two new memory options — a 16 MB sound ROM and a new CPU Flash RAM SIMM — go a long way towards simplifying these operations. They give the E4XT user 256 new presets that use 16 MB of samples (classic as well as brand new) on the new sound ROM. To play these sounds, just turn on the E4XT and dial in one of the presets. Not only is the sound instantly playable, but you can set its bank and program number in your sequencer and forget it. The E4XT will always play that sound when the se-

FIGURE 1: The E-mu E4X Turbo is the latest in the line of E-mu samplers.

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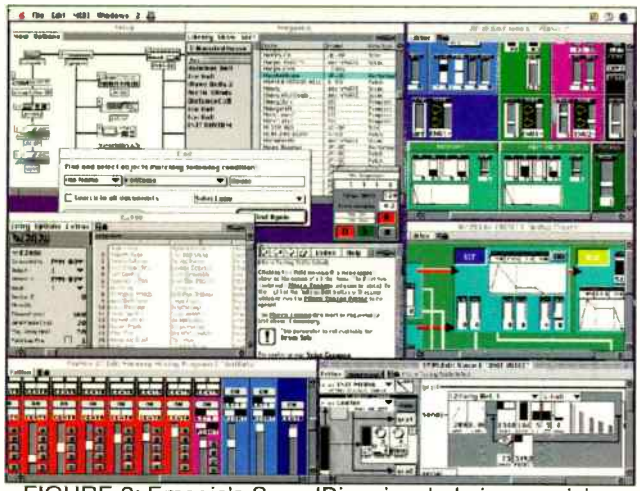

FIGURE 2: Emagic's SoundDiver is a help in organizing and locating a large collection of samples and presets.

quencer calls that number.

You can also create new presets (which contain the keyboard mappings and synthesizer-style programming that turn raw samples into useful patches) that can generate a lot of new sounds from the ROM samples. Although you have to save these presets to disk and load them to ordinary, volatile sound RAM at start-up, they load much more quickly than samples. Since they can have different bank and program numbers from the factory presets, your sequencer settings will work for them as well as the factory presets. This convenience, combined with the traditional E-mu extensibility, makes the instrument much more able to fit nearly anyone's working style.

The second part of the upgrade, the CPU flash RAM, contains both the new EOS and the sound ROM presets. Flash RAM is also known as nonvolatile RAM because it retains its data when the power is turned off. Since it's also rewritable, you will be able to upload future operating system versions from floppy, as well as save new presets for the ROM sounds in flash RAM. The flash RAM SIMM only holds 256 presets, however, so you would normally want to save the factory presets to disk first.

SOUND FLASH RAM

E-mu has also announced 8 MB and 16 MB sound flash RAM SIMMs that will store both presets and samples. Like the CPU flash RAM, this memory is both rewritable and nonvolatile, combining the best features of ROM and hard disk for storing sounds and presets. Sound flash RAM is a very high-cost item, however, and is not expected to be sold through ordinary retail outlets. Contact E-mu if you have a burning need for the very highest level of technological performance in your sampler, and lots of money. (You can install both the ROM SIMM and the Flash RAM SIMM into the E4X, E4K, and e6400, but only one or the other into the EIV and e64.)

To manage the new flash RAM and ROM upgrades, the latest EOS 2.8 includes a number of new utilities: erase the entire contents of the flash RAM, defragment the flash RAM (that is, rearrange its contents in neatly contiguous locations to let it work as efficiently as possible), and copy presets from flash to ordinary RAM and vice versa. The last function is important because you can't copy presets directly between flash and a disk. You have to get them to preset RAM first.

One problem with the memory upgrade is that, regardless of how much RAM you've installed in the E4X (up to 128 MB), adding the ROM sounds will limit the instrument's sound RAM to 64 MB. The tradeoff is not immutable, however, as an EOS utility can disable the ROM bank to allow using all the RAM in the machine. Trading 64 MB of

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Chris Fogel *(Engineer - Alanis Morissette) "I was amazed at what the C-1 did for the track. The bottom end was warm and solid and the high end was clear and open."*

Andy Jackson - Pink Floyd *(Sound engineer) - "All the lead vocals on the "Division Bell" album mix were run through the EQ-1 - I certainly prefer the EQ-1 to other Tube Equalizers for vocals. The new EQ-2 is probably the best all-round EQ I've ever used."*

Alex Marcou - Abbey Road Studios *(House recording engineer) - "The VI-1 makes hard sounding digital sound like cosy , rounded analogue - a joy to listen to. The control that the EQs, Pre Amps & Compressors give is excellent."*

Omar Hakim *(Top Session Drummer with Madonna and Sting) - "The VI-1 is the absolute best hardware solution for warming up the digital signal path - it's wonderful on drums, bass and vocals as well."*

Tom Lord Alge *- (Dual Grammy award winning engineer) - "The Indigo 2011 has given me the ability to EQ with clarity, rather than just tone. I find it to be very musical."*

Stephen Croes *-(Producer-Engineer: Fleetwood Mac, Kenny Loggins, Stevie Wonder) - "The Indigo 2021 is fast and friendly, great on drums, percussion and guitar. These are real tools for any level of production."*

was ~~$1795~~
$1375

C-1 Dual Tube Compressor / Mic Pre

Stereo tube compressor; balanced & unbalanced mic & line inputs; +48v phantom power' 2 AUX inputs; variable "soft knee" compression; sidechain insert points; continuously variable attack, release, ratio & gain make-up; stereo link mode.

was ~~$1595~~
$ 975

EQ-1 Dual Tube EQ / Mic Pre

2 channels x 4 band tube EQ; balanced & unbalanced mic & line inputs & outputs; +48v phantom power; front panel AUX nput; bypass switch; mono 8 band mode, pre EQ insert on each channel.

was ~~$2395~~
$1775

EQ-2 Stereo Tube Parametric EQ / Mic Pre

4 band parametric; variable filters; mic-amps; +48v phantom power; dual mono or stereo linked modes; balanced & unbalanced mic & line nputs; EQ bypass on each channel; insert point on each channel; 20 Hz to 40 kHz frequency response; front panel AUX inputs.

was ~~$1695~~
$1250

PA-1 Dual Pentode Tube Pre-amp

Transformer coupled mic input; +48v phantom power; input/output gain controls; front panel instrument input, phase reverse switch; balanced & unbalanced mic & line inputs; switchable high & low pass filters; rotary faders control output level; phase reverse; 30 Hz to 40 kHz frequency response.

was ~~$595~~
$ 475

PA-2 Dual Tube Mic Pre-amp/DI

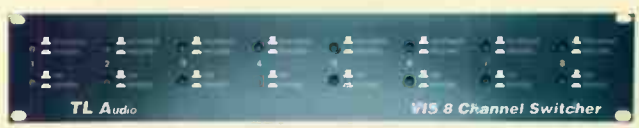
Mic & Instrument inputs, peak LED, +48v phantom power; switchable sensitivity; variab e gain control; rack ears included; balanced & unbalanced mic & line inputs; loop-through output; ground lift; 30 Hz to 40 kHz frequency response; peak LED's with variable brightness; -127dBu E.I.N.

was ~~$795~~
$ 575

VI-1 8 Channel Tube Interface

Line amp; balanced & unbalanced mic & line inputs; unbalanced compatible; level matching for -10dB & +4dB equipment; 108dB dynamic range; 10 Hz to 40 kHz frequency response; 12 AX7 tubes run from stabilized 250v DC supply.

was ~~$595~~
$ 425



VI-S 8 Channel Switching Unit

8 channel switching unit for use with VI-1 Tube Interface. Offers switching between record and replay modes plus bypass.

SASCOM DIRECT

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TL Audio DIRECT

The Reviews

STUDIO SOUND 7/94 "A joy to use... as quiet as one would expect, while giving that indefinable musical valve warmth"

MIX 1/95 "I would characterize the EQ sound as warm and sweet. On the bench, both units met spec - THD+N measured 0.025% which is excellent"

STUDIO SOUND 3/95 "The result impressed everyone in the room, one person saying it was the best vocal sound he had heard"

EQ 4/95 "Characteristic tube sound, wonderful broad EQ bands, instantly satisfying to use and incredibly quiet"

THE MIX 5/95 "The sound is absolutely wonderful, and the units are extremely quiet"

RADIO WORLD 6/95 "It was easy to use, well built and affordable. Highly recommended"

STUDIO SOUND 12/95 "Excellent technical specs - frequency response reaching 40kHz EIN of -127dBu - an open, musical sound"

PRO SOUND 1/96 "Ideally suited to the professional or the project studio with a need for great sounding, easy to use and well thought out signal processing"

EQ 5/96 "An excellent tracking EQ, very easy to get results with and, because it has tubes, it's a little more forgiving and interesting to use"

MUSICIAN 6/96 "The effect of the VI1 is subtle but perceptible. The VI1 can prove to be your secrete weapon in the digital recording wars - a weapon that requires no technical know-how to operate"

EQ 11/96 "If the Classic processors were great value for money, then the Indigos are obscene"

MIX 3/97 "Fast, flexible - and best of all - musical. A bit of tube warmth seems the perfect compliment to digital tracking"

ELECTRONIC MUSICIAN 7/96 "TL Audio's Valve Compressor is silky smooth, even at brutal threshold and ratio settings"

PRO AUDIO REVIEW 1/97 "These units are easy to call. Pound for pound, I don't think they can be beaten"

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was ~~$1295~~

$ 650

2001 4 Channel Tube Mic Pre Amp

- Continuously variable input gain control (+10dB to +60dB)
- Continuously variable output gain control
- 48v phantom power switch
- 90Hz low cut filter (12dB / octave)
- Phase reverse switch
- Peak LED - indicates degree to which tubes are being driven
- Balanced XLR mic input
- Balanced XLR line output (+4dB) duplicated on unbalanced jack connector (-10dB)
- Frequency response 20Hz to 40kHz +0 / -1dB

was ~~$1295~~

$ 650

2011 2 Channel 4 band Tube Equalizer

- LF band: ±12dB shelving at 80Hz or 120Hz (12dB/oct)
- LM band: ±12dB peaking at 250Hz, 500Hz, 1kHz or 2.2kHz (Q=0.5)
- HM band: ±12dB peaking at 1.5kHz, 2.2kHz, 3.6kHz or 5kHz (Q=0.5)
- HF band: ±12dB shelving at 8kHz or 12kHz (12dB/oct)
- Continuously variable input gain (-20dB to +20dB)
- Dual sensitivity auxiliary input (for guitar / keyb etc)
- Balanced XLR line inputs and outputs (+4dB)
- Line inputs and outputs duplicated on unbalanced jack connectors (-10dB)
- EQ bypass switch with status LED
- Peak LED indicates amount of valve effect
- Frequency response 20Hz to 40kHz +0 / -1dB

was ~~$1395~~

$ 650

2012 2 Channel Parametric Tube Equalizer

- Channel A features two bands: Band 1 continuously variable between 30Hz and 1.2kHz. Band 2 continuously variable between 1kHz and 18kHz
- Band 2 has "divide by ten switch" switch giving a frequency range of 100Hz to 1.8kHz
- Channel B features two bands: Band 3 continuously variable between 30Hz and 1.2kHz. Band 4 continuously variable between 1kHz and 18kHz
- Band 3 has "multiply by ten" switch giving a frequency range of 300Hz to 12kHz
- Each band offers +/-15dB of gain and variable Q between 0.5 and 5
- EQ bypass switch with status LED
- Peak LED indicates amount of valve effect
- Mono mode allows mono 4 band operation
- Front panel dual sensitivity auxiliary input (for guitar / keyboards etc)
- Balanced XLR line inputs and outputs (+4dB)
- Line inputs and outputs duplicated on unbalanced jack connectors (-10dB)
- Frequency response 20Hz to 40kHz +0 / -1dB
- Continuously variable input gain (-20dB to +20dB)

was ~~$1395~~

$ 775

2021 2 Channel Tube Compressor

- Continuously variable control of input gain, threshold, ratio and gain make-up
- "Fast" or "Slow" Attack modes (0.5mS or 20mS)
- "Fast" or "Slow" Release modes (40mS or 2S)
- Dual mono or stereo linked modes
- Compressor bypass switches with status LEDs
- Dual sensitivity auxiliary input (for guitar, keyboards etc)
- 8 segment LED metering to read output level or gain reduction
- Side chain insert point for frequency conscious compression
- Balanced XLR line inputs and outputs (+4dB)
- Line inputs and outputs duplicated on unbalanced connectors (-10dB)
- Program dependent attack and release time constants
- Frequency response 20Hz to 40kHz +0 / -1dB

was ~~$1395~~

$ 775

2051 Mono Tube Voice Processor

- Combines the functions of the 2001, 2011 and 2021 units into a single package
- Mic Pre section with control of input gain, 48v, phase reverse and 90Hz low cut filter
- Compressor section identical to 2021 Compressor
- 4 band EQ section identical to 2011 Equalizer
- 'EQ Pre' switch allows EQ to be positioned ahead of Compressor section
- Master section featuring 8 segment metering (indicating output level or gain reduction), and overall output level control
- 'Link' facility allows two 2051s to be used in stereo
- Side chain insert point for frequency conscious compression
- Mic, Line and auxiliary inputs
- Balanced XLR / unbalanced jack line outputs
- Frequency response 20Hz to 40kHz +0 / -1dB

*** All prices quoted in U.S.$; shipping, handling & insurance, extra.**

World Radio History

sample RAM for just a 16 MB ROM may sound like a lopsided deal, but consider that the ROM gives you a gob of instant presets and enough raw samples to create a lot more on your own. To do a lot of sampling or use sound libraries, just turn the ROM off and use all the RAM you have. But if you like instant access to sounds, the ones on this ROM are outstanding and still leave you 64 MB of space for loading samples anyway.

SYSTEM 2.8

In addition to supporting the memory upgrades, version 2.8 also has a new numberlock feature for faster preset searching, supports Silicon Graphics computers that use SMDI, and has an expanded MIDI sysex implementation that lets it use new Macintosh applications like Emagic SoundDiver and SoundSurfer, which help archiving, organizing, and editing your sounds.

The E4X Turbo is an impressive instrument all across the board. Its sound quality, ease of use, flexibility, and sheer power make it one of the most useful studio additions I've encountered. **EQ**

FIND OUT MORE

MANUFACTURER: E-mu Systems, Inc., 1600 Green Hills Road, Suite 101, Scotts Valley, CA 95067. Tel: 408-438-1921. E-mail: mail@emu.com. Web: www.emu.com. Circle EQ free lit. #130.

PRODUCTS: E4XT, $4895; EOS v. 2.8 (with bundled SoundDiver), $199; Sound ROM, $495; CPU Flash RAM, $249; Sound Flash RAM, 8 MB, $895; 16 MB, $1498; 32-channel MIDI card, $199; eight-output expansion card, $795; FX board option (for EIV and e-6400), $345.

MANUFACTURER: Emagic, Inc., 916-477-1051. Web: http://www.emagic.de/. Circle EQ free lit. #131.

PRODUCTS: SoundDiver version 2.0 Windows 95 and Mac, separate from EOS 2.8, $199.

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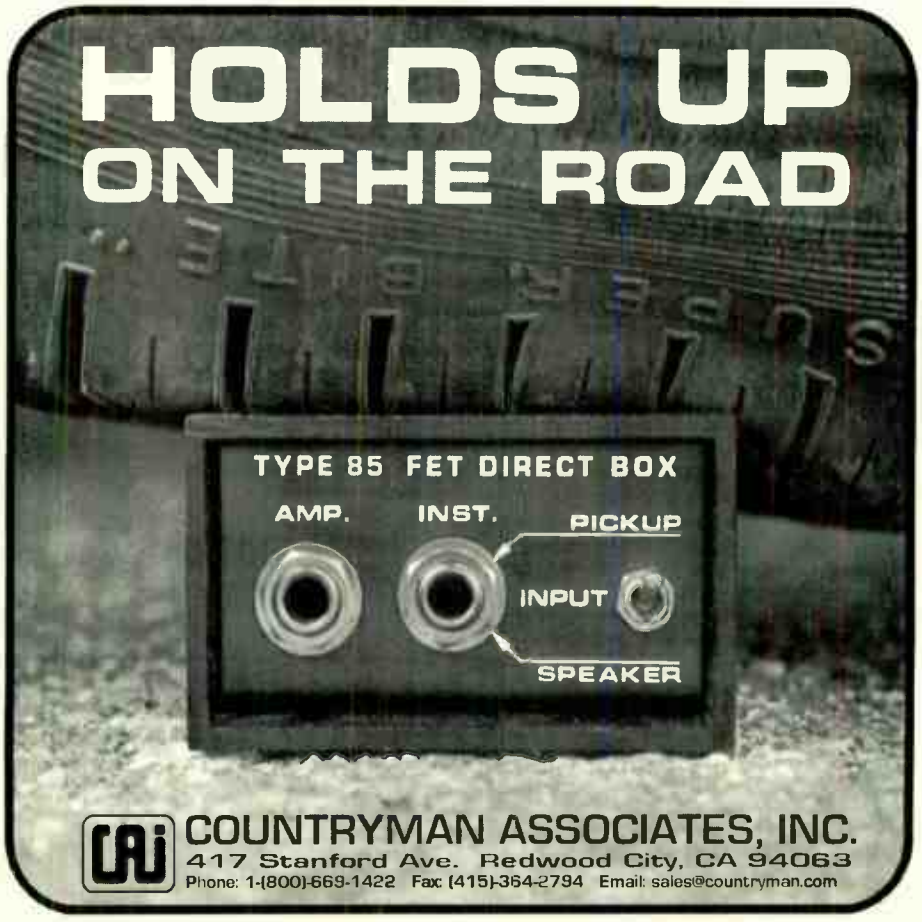

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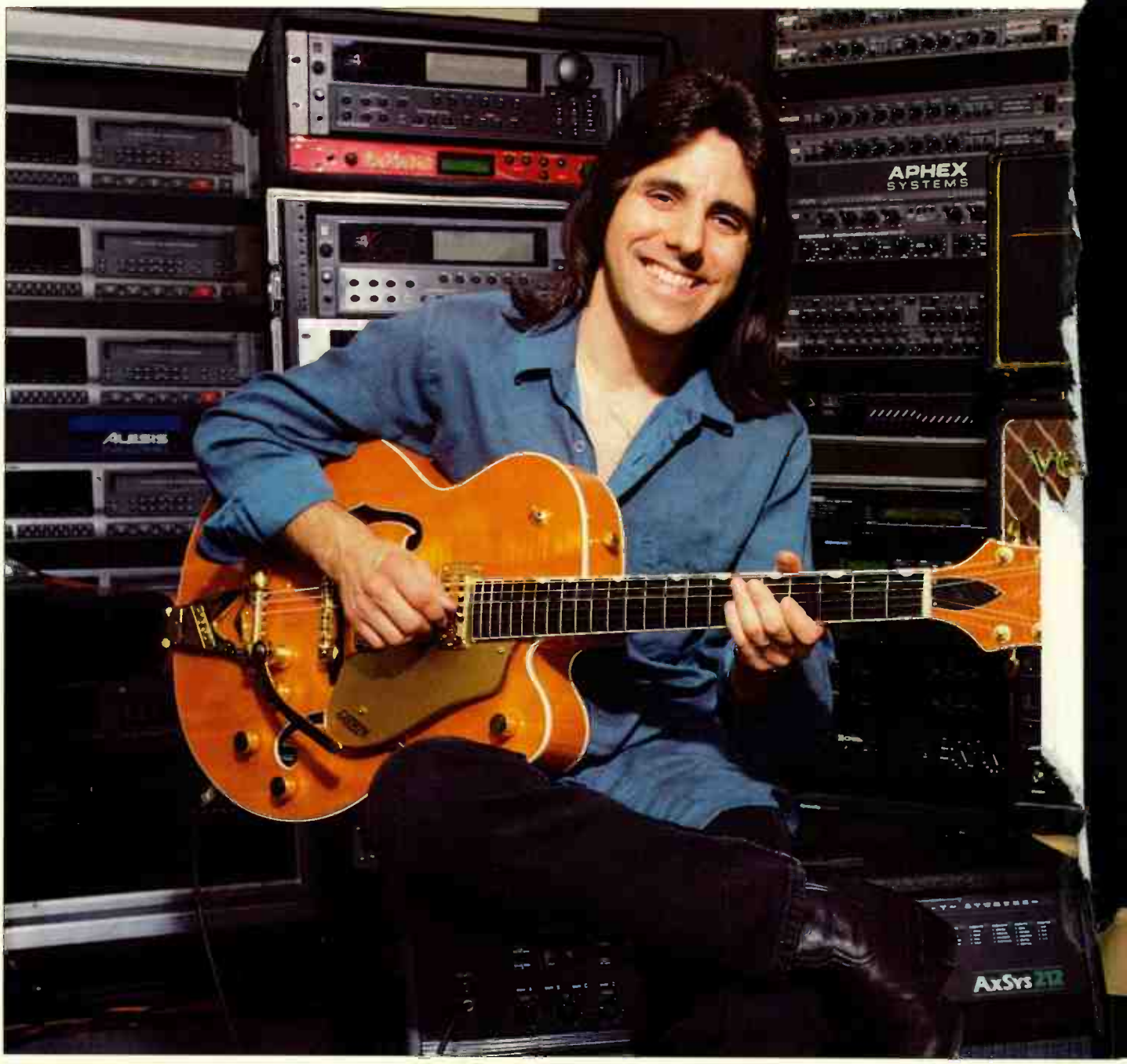
Saving Space

Teddy Castellucci saves some space with guitar emulators

BY K.D. LEWISSON

Teddy Castellucci has experienced the project studio revolution from an unusual vantage point: from the guitarist's chair of innumerable L.A. record, movie, and TV sessions, and in the increasingly elaborate studio he shares with writing/producing partner Tom Mgrdichian (see *EQ* June '92 and November '96).

In both environments, Castellucci is well armed to deliver a wide palette of styles and guitar tones. Such musical and tonal diversity, Castellucci believes, is key both to staying busy as a player on others' sessions and keeping one's own music from becoming predictable. But amassing the tools to achieve that tonal diversity hasn't come cheap — between



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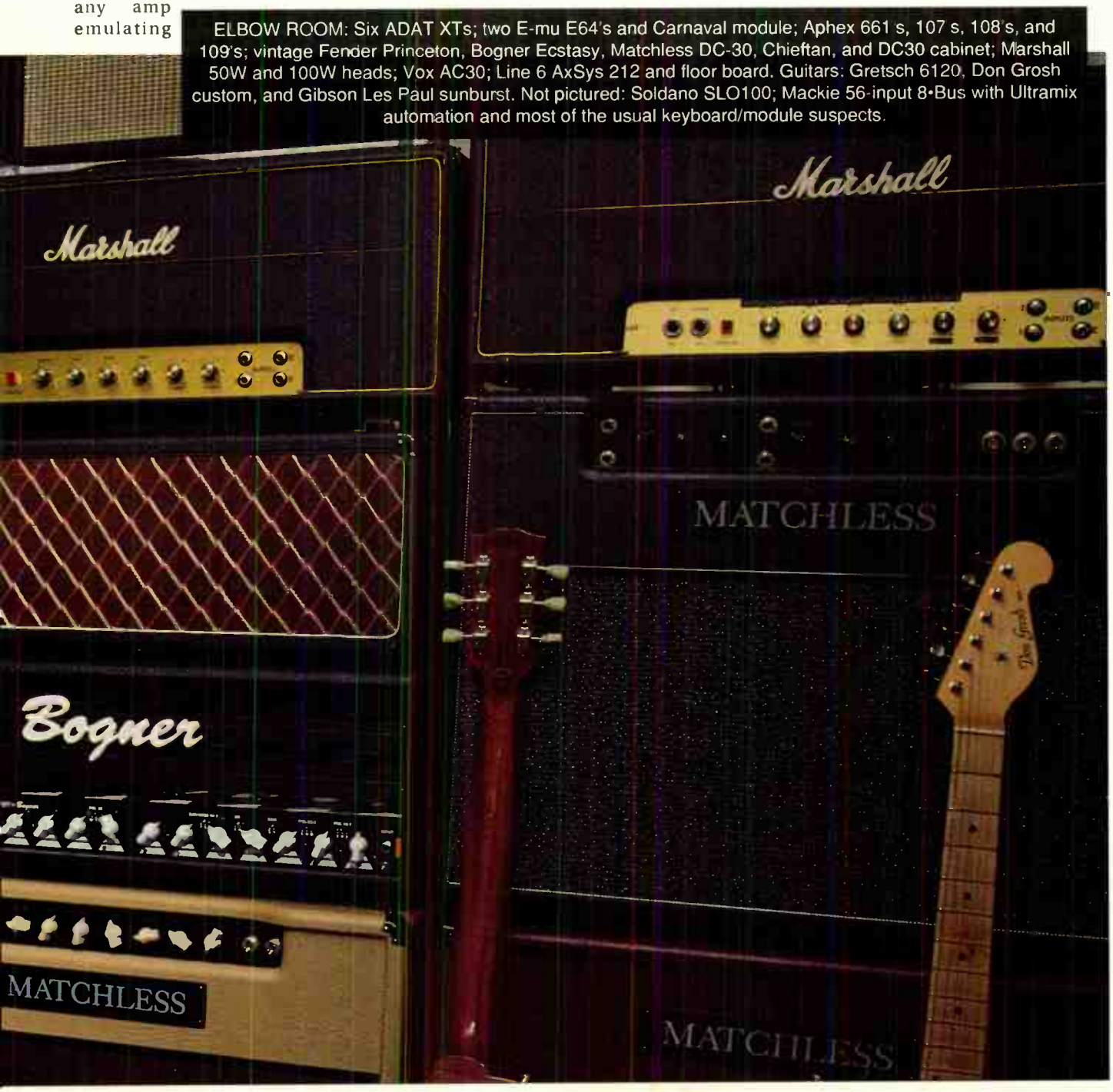
24 guitars and 10 connoisseur amps, and a 20-space effects rack, Castellucci's investment has been substantial.

After selecting the right axe for the part, Teddy moves between amp and speaker combinations in two ways: physically plugging amp heads into different cabinets when necessary (including using two Marshal 4x12's not shown), or dialing up amp/speaker combinations using a Line 6 AxSys 212 guitar amp. Says Castellucci of the Line 6: "I heard about the Line 6 from a great engineer named Francis Buckley, who's ears I definitely respect." Even so, Castellucci says he was initially dubious about any amp emulating the many connoisseur-quality amps and cabinets he owns. "I figured it might pull off a couple of amps pretty well, and the rest would sound one dimensional — like all the other 'emulation' stuff out there.

Though clients pay for his amp cartage around L.A., a recent opportunity in Europe made the AxSys 212's multiple personality very handy indeed. "Shipping all my amps to Europe for a few weeks of work would have been a little extreme," avers Castellucci. Instead, he bought a $300 flight case, did the gig, and returned in time for a juicy career opportunity: moving from the guitarist's chair to the composer's. You can see and hear the results in the Adam Sandler/Drew Barrymore movie *The Wedding Singer*, due for February '98 release.

Doing the movie provided yet another example of how project studios and the music business have evolved since Mgrdichian and Castellucci put their first studio together.

"Our studio was invaluable for being able to have the director and the powers that be come over and hear very close approximations of what the live orchestral sessions would sound like. It takes the guesswork out of the process and makes everyone more comfortable." EQ



ELBOW ROOM: Six ADAT XTs; two E-mu E64's and Carnaval module; Aphex 661's, 107's, 108's, and 109's; vintage Fender Princeton, Bogner Ecstasy, Matchless DC-30, Chieftan, and DC30 cabinet; Marshall 50W and 100W heads; Vox AC30; Line 6 AxSys 212 and floor board. Guitars: Gretsch 6120, Don Grosh custom, and Gibson Les Paul sunburst. Not pictured: Soldano SLO100; Mackie 56-input 8•Bus with Ultramix automation and most of the usual keyboard/module suspects.

PHOTO BY EDWARD COLVER

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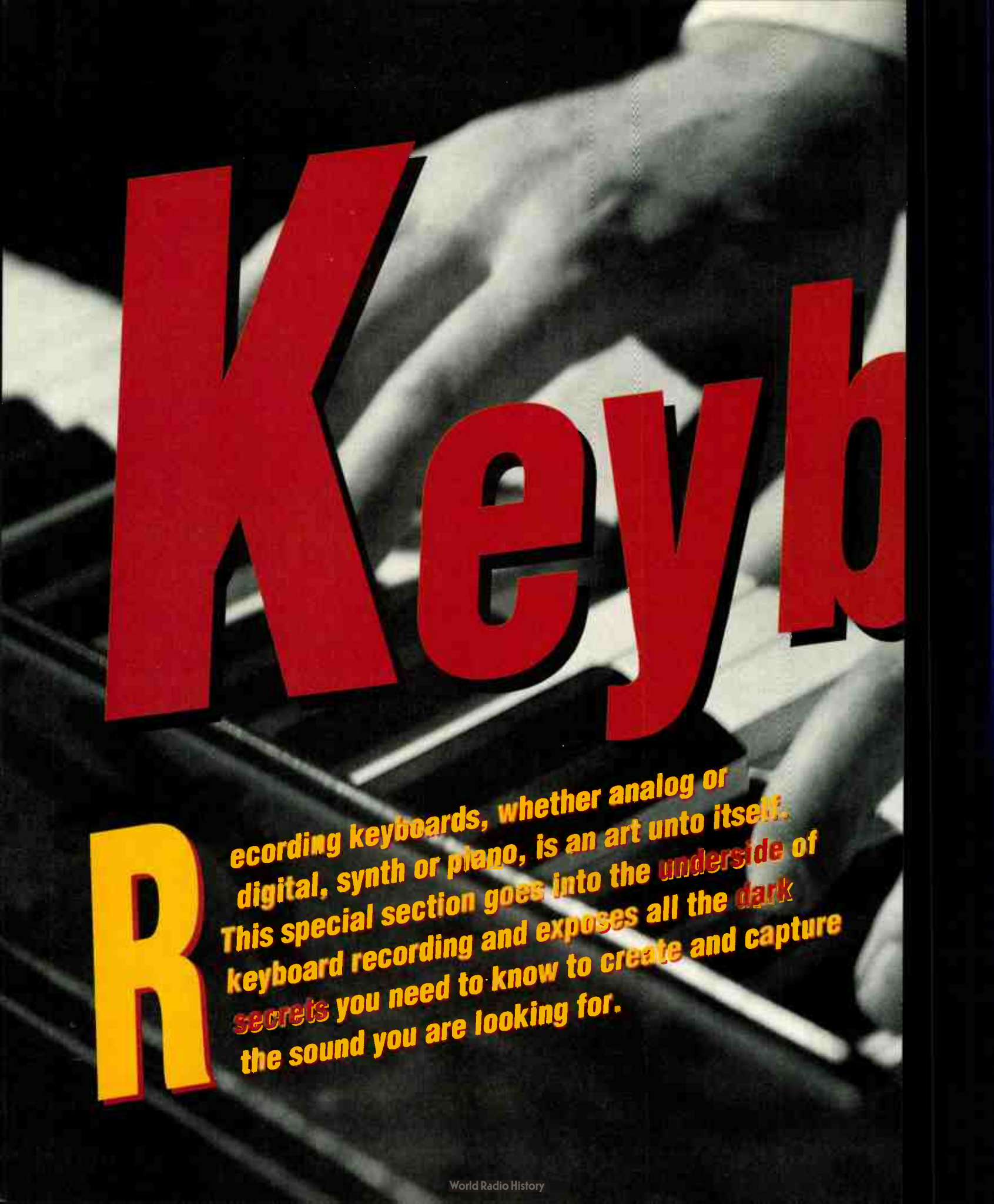

Keyb

Recording keyboards, whether analog or digital, synth or piano, is an art unto itself. This special section goes into the underside of keyboard recording and exposes all the dark secrets you need to know to create and capture the sound you are looking for.

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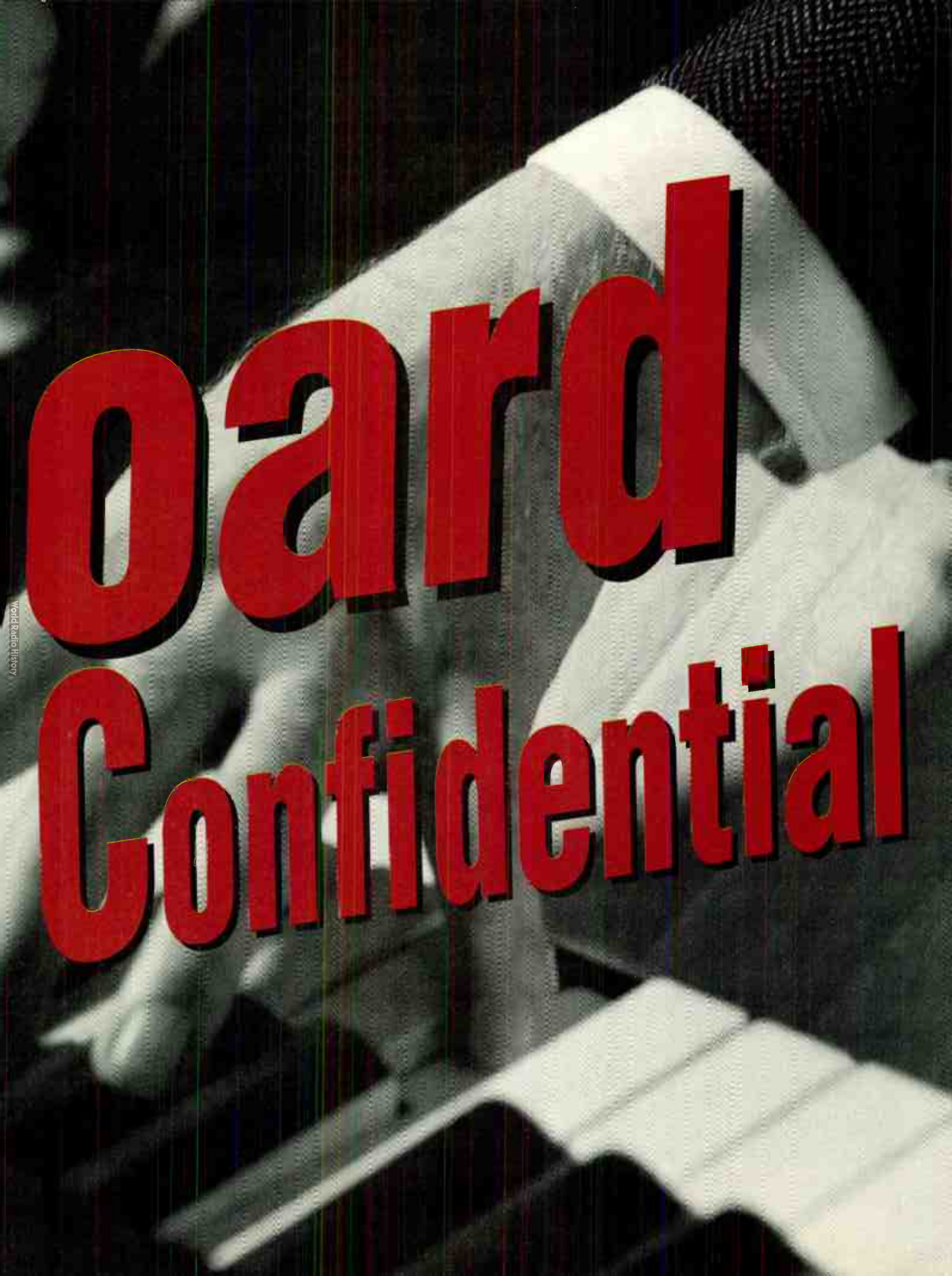

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MIDI IS THE DEVIL'S CODE...

AND OTHER PRACTICAL TIPS FROM KEYBOARDIST AND STUDIO OWNER DAVID BRYAN

BY STEVE LA CERRA

One look around David Bryan's studio and it's clear that the room is home to a keyboard player. Instead of the usual keyboard "peanut gallery" separated from the mixing console area, the keyboardsmith best known for his work with Bon Jovi has clearly arranged his gear so that he can access the equipment he needs, when he needs it. The centerpiece of the room is David's Yamaha 02R, which (along with a Yamaha ProMix 01) forms a tight L-shaped pocket with his Yamaha P500 digital piano. Perched directly on top of the P500 is a Yamaha W5 synth, and right next to that is the Macintosh PowerBook, which performs sequencing duties running Master Tracks Pro 5. A careful look around reveals a Yamaha VL1, CX1, and PSR510, as well as a Wurlitzer electric piano and a Hammond XB-2 organ. No doubt — this is a keyboard *player's* domain.

David explains the genesis of his studio: "I started out playing piano and organ. On our first record (*Bon Jovi*, Polygram) I had a Korg PolySix and used that all over the record. Then it seemed you had to become a computer nut and couldn't just be a piano player if you wanted to keep up. So I had to learn how to program all these machines, the computer, and the sequencer. The natural progression is that if you can make the sounds, then why not record them? And mix them? You wind up getting all the gear, and that's where I'm at now. It's hard to juggle being a piano player with all of this technology, because I still practice — I have to play.

"For me, the only way to learn is by doing. So when we were making records, I'd sit with Bruce Fairbairn, Bob Rock, or Randy Staub and ask them what they were doing. Instead of just coming to the studio for my time slot to do keys, I'd go in early and ask questions. They'd explain to me what they were doing, and I learned how to get sounds using compression, EQ, and other effects. It really helps when we go in to make a Bon Jovi record because I

PHOTO BY MARK WEISS/ANGELES

FROM BON JOVI TO DR. JOHN: David Bryan has an extensive keyboard collection — which led to his extensive studio setup.

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can talk in terms that an engineer understands."

ROLL CALL

Interfaced with the Yamaha 02R is a rack of four Akai DR4d hard disk recorders with onboard 270 MB drives. Interfacing between the machines and the console is AES/EBU digital, and Bryan has an interesting arrangement to accommodate DR4d backup: "I wanted the path in here to be totally digital, but in order to back up the DR4d's, I needed access between the console and the recorders. So my tech, Marty Gelhaar — who wired this entire room — built a digital patchbay into my rack. The AES/EBU outputs of the DR4d's are normalled to the AES/EBU input cards in the 02R via a TT patchbay, and vice versa. The digital in and out from the DAT machine (a Panasonic SV-3700) also comes up to this bay. So when I want to backup the Akai's to DAT, all I have to do is patch a cable from the DR4d out to the DAT in and I can do a digital transfer. For loading audio back into the DR4d's, I can patch the DAT out to DR4d input."

Set into a small alcove at one end of the room, the DR4d's are run by David from a DL4d remote controller. "Without the remote, I'd have to put the mic right next to the machines to punch, and the noise of the hard drives would get picked up by the microphone (of late, David has been recording vocals with a Neumann M149 tube mic). But by putting the machines in that little alcove and using the remote, I don't have to worry. When I do vocals here by myself, I set up the track, set the in and out points, and sing away. It's real quick for vocals, and comping is really easy. If I get one chorus of background vocals that I really like, I can copy and fly it into the other choruses."

DISCOVERING THE TRUTH

The DR4d's serve as the master to the entire system, running MIDI timecode to the PowerBook and 02R via a MOTU MIDI Timepiece interface. David's future plans include "beefing up the computer so that I can run a program with digital audio. But for now, I'm happy with Pro 5 because it's very intuitive and works really well." David generally runs the keyboards virtual but drums are always recorded to the DR4d's. "There is a little bit of a delay in the MIDI chain, so by recording the drums, I have 'The Truth.' Sometimes you might come into the studio to do a vocal track, and things don't sync up. Maybe when you play the tracks back, the keys are slightly out of time. By recording the drums, I'll know right away if there is a problem."

David has experienced an occasional MIDI glitch and says that "Every once in a while, the system loses its mind so I have to shut it down and open it up again. At one point early on, the system was driving me nuts. I had Yamaha, Akai, and MOTU on the phone in a conference call with a really bizarre problem. I could not get the 02R to read MIDI timecode. I know that the interface was putting timecode out because I have what I call the 'Blame Eliminator' — a Studiomaster MIDI test box that shows exactly what MIDI information is coming down a line.

> ***For a record, I want to drag out the instrument for the idiosyncrasies and the variations that you can't get out of a sampler. For demo purposes and live shows, the samples are fine.***

"MTC was being generated by the DR4d's and reaching the interface, but the 02R couldn't see it. It went so far that Yamaha actually sent me a new console, but I still had the same problem. This went on for almost three months. All this time, I was running a MIDI cable from the #8, rear-panel output of the MTP to the MIDI input of the 02R. One day I didn't feel like climbing around the back of the rack, so I decided to use the front-panel MIDI out of the MTP and it worked. Everybody was scratching their heads, so if anybody is out there wondering why their 02R doesn't see the MTP, try the front-panel jack. MIDI is the devil's code."

Many of David's songwriting ideas begin on a Yamaha PSR510 (home) keyboard. "I use the PSR510 all the time for songwriting and I also take it on the road. It has built-in grooves, piano, and organ sounds, and I can split a bass sound to the lower part of the keyboard. Going into the world of the '02R takes a while to set up, but with the '510, I can turn it on and write (the unit has built-in speakers — Ed.). I have a Sony tape recorder and I can get the idea down very easily."

Once David has a sketch of the song, he'll use the '510's MIDI out to play a basic groove into Master Tracks and the building process begins. "I like to build the track starting with just the rhythm section. After I have added keys and bass, I'll edit the drums to move with the bass. I'll try to be a drummer for a day and do the fills on a KitKat or the keyboard, and then edit the drums in Master Tracks. After I have finished the drums, I re-record them to the DR4d's." Drum sounds come from a Boss DR660, the Yamaha W5, and occasionally Bryan's Akai S3000 (loaded with 32 MB RAM) or the Yamaha PSR510.

ZOUNDS OF SOUNDS

A Yamaha P500 serves as David's controller and acoustic piano sound, which — according to David — is "the best stereo sampled piano there is. It has a full sample per note. When you press the pedal, it thumps, and it doesn't go out of tune." A self-professed "vintage gear nut," he also has a Roland Super Jupiter ("I searched years for that thing..."), a Juno-60 with MD8 MIDI interface, Oberheim OB-8, a Mellotron with the original tapes, and even a Chamberlain. (The Chamberlain was an instrument similar to a Mellotron that played analog tapes of acoustic instruments —Ed.) "I probably have about 100 keyboards, most of which are in storage," reveals David. "But some of them are in my garage, so when I want to have fun I can pull them out to play." In addition to the aforementioned units, the studio is also home to a Roland D-550, Yamaha TG77, and E-mu Morpheus.

Atop David's MIDI rack is an Eltekon removable drive used to store and

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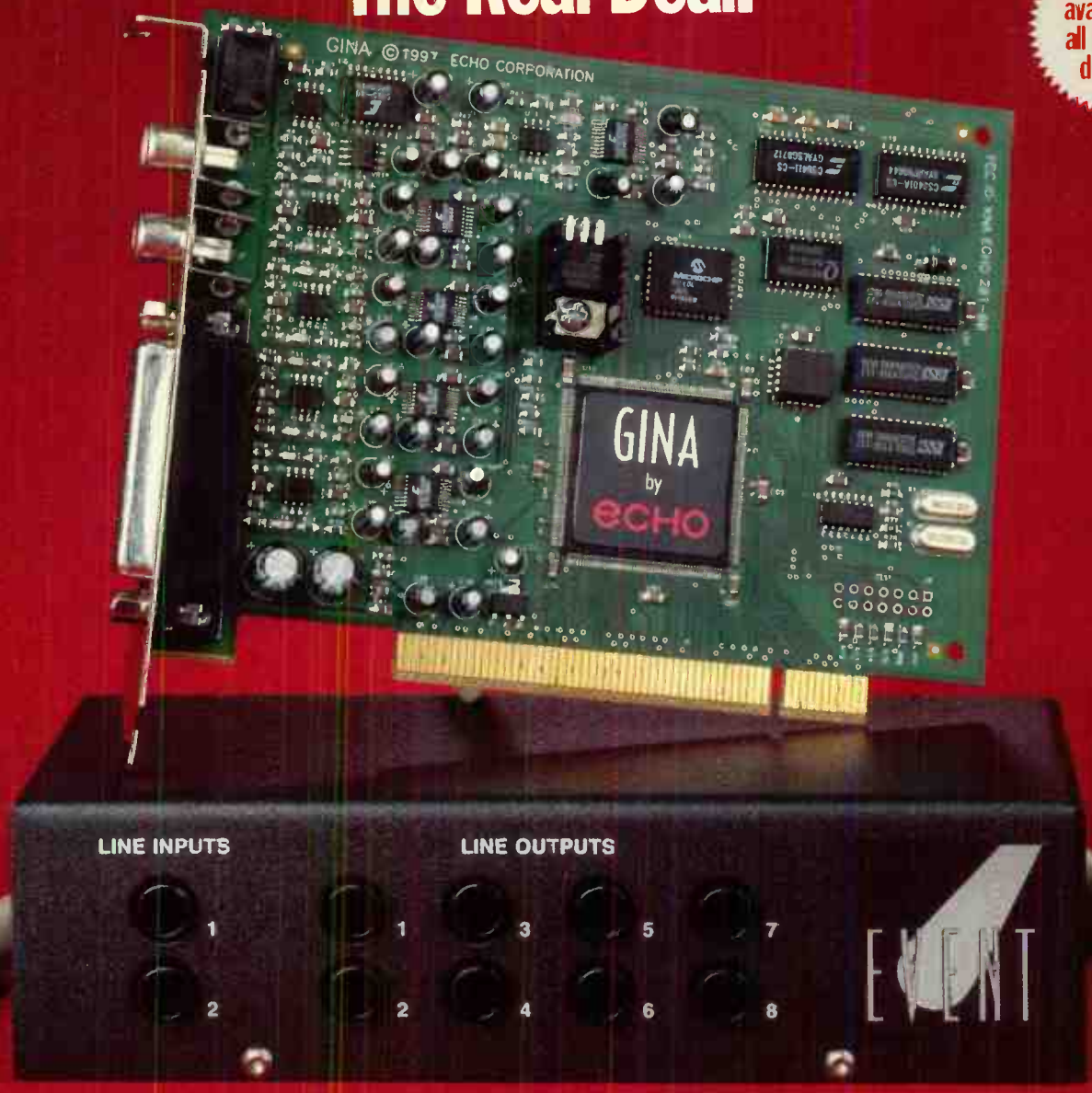

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load samples of David's vintage keyboards. "Marty has sampled all of my vintage gear so that I don't have to drag it out for the demos. Records are a different story: For a record, I *want* to drag out the instrument for the idiosyncrasies and the variations that you can't get out of a sampler. For demo purposes and live shows, the samples are fine.

"It's almost like having different guitars. A guitarist picks up a Strat or a Les Paul because they have distinct sounds. For example, the Super Jupiter makes this unbelievably warm, beautiful pad that is great underneath the P500 piano. A lot of instruments do pads, but that one works particularly well." For organ sounds, David plays a Hammond XB-2 that he runs to a closet containing a Motion Sound Pro 3 Leslie simulator.

Upstairs in his living room, David has a Yamaha seven-foot concert grand piano that was used on "In These Arms" from David's first solo album *On A Full Moon* (available from Music Marketing Network, tel: 800-483-4392). He and Marty recorded the instrument by placing two AKG C414's in a coincident pair and running cables downstairs to the studio (the duo took photographs of the mic placement so they could duplicate it later on). David describes the 25- x 40-foot room as "unbelievable-sounding." You just have to watch for the UPS guy knocking on the door while you're recording. You might hear "BANG BANG BANG" in the middle of a great take."

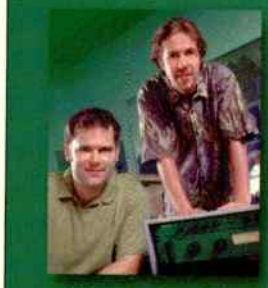
NOW HEAR THIS!

For monitors, David is using the ubiquitous Yamaha NS10M's, Alesis Monitor One's, and a pair of Pinnacle hi-fi speakers. Situated directly front and center to the console is a single Auratone speaker that David uses to check his mixes. "It's a trick I learned way back when we recorded in the Power Station. They always had Auratones and NS10M's. The Auratone was in the middle for mono. They'd switch the mix over to that one speaker and turn the volume way down. Although you can't hear the position of a sound in the stereo field, you can tell if the vocals are loud enough and where everything was sitting in terms of volume."

COMING UP...

Certainly not one to sit still, David is in the process of writing and demoing songs for his upcoming (second) solo album, as well as writing songs with guitarist Richie Sambora for Sambora's upcoming solo record. He also has been writing songs with Dr. John and will be working with the Dr. on *his* next record. David explains that, to him, "songwriting is extremely important. I think in terms of songs and always work on that craft.

"Now I don't need a demo guy because I have a studio. All I need is a guitar player, and, while I work with several players, lately that's been Snake (Sabo of Skid Row). During the day, I can almost feel the heartbeat of the earth — I have to take care of the family and business. But when the world shuts down at night, that's my most creative time. I can come into the studio, light my candles and lava lamp, and feel like I'm a kid again." EQ



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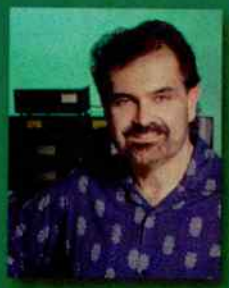

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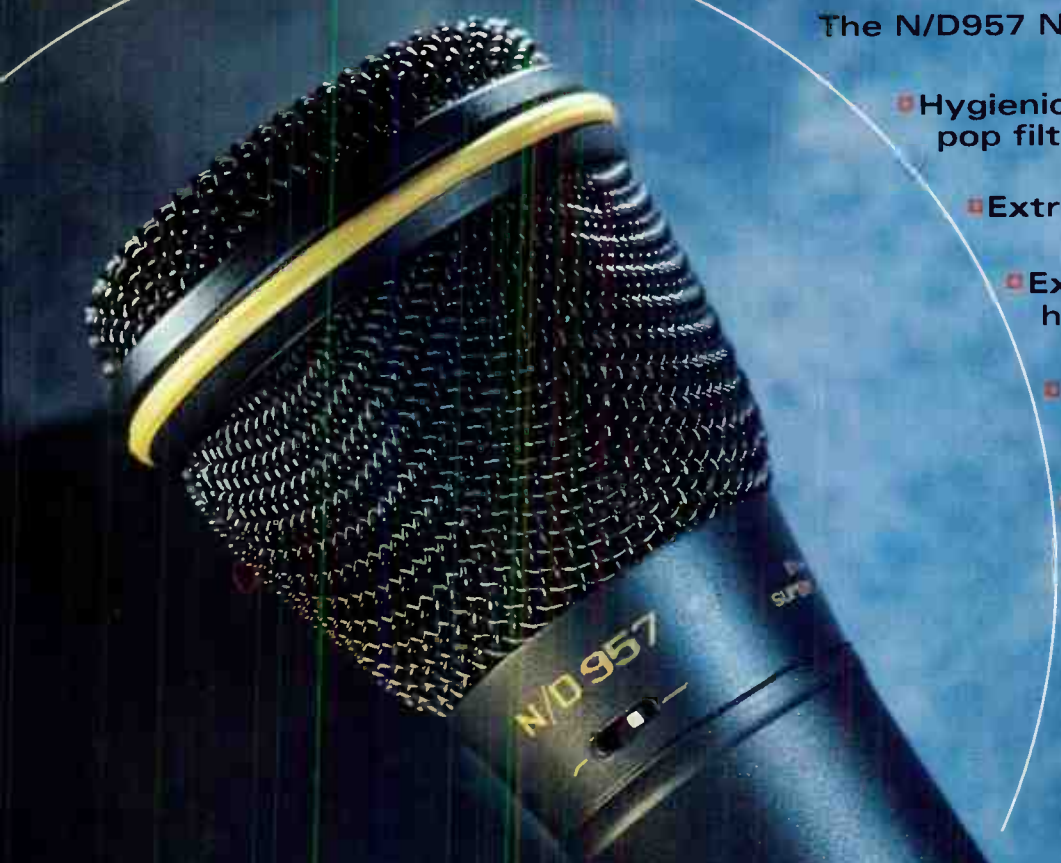

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MIKING ORGANS: THE B3-RATED VERSION

THE RECIPE FOR GETTING SUPERIOR ORGAN SOUNDS

BY AL KOOPER

We're trying to get the organ jokes dispensed with early in this piece, but you never can tell. I've recorded with a Leslie speaker since 1965 and watched all kinds of nonsense go on with various miking techniques and ad-libbing. In 1993, while working with engineer Steve Rosenthal at his Magic Shop studio in New York City, I finally got the organ sound, stereo image, and ambience I always dreamed of. I asked Steve after the first playback, "How the hell did you do that?" He smiled at me and said, "It's so simple, you won't believe it." And you know, dear readers, it's so simple that I don't know how I'm gonna be able stretch a whole column out of it, but this sentence sure does it's part in helping to defray said deficit.

INGREDIENTS

One Hammond B3 organ
One Leslie 122 or 145 rotary speaker
One AKG D12 (or D112 mic if a D12 can't be gotten)
Two AKG C414 mics (God bless 'em)
One nicely balanced stereo compressor (If Al Kooper is playing, cause he plays extremely loud)
One Neumann U47 tube mic (in case you don't like stereo)

RECIPE

Take the B3 and put it in the studio anywhere you want. Good. Now find an unencumbered spot for the Leslie speaker. Turn the speaker so the back faces away from the main sources of sound from other instruments. Place a C414 at the bottom left side of the cut-out area at the top of the cabinet, where the twirling horn resides. Place the other C414 on the bottom right side of that top cut-out area. Be careful how far inside the cabinet you place the mics because:

1. The twirling speakers will smash into them.

2. You'll pick up wind or machinery clicks from those twirling suckers.

This takes a few moments of experimentation. Also make sure everything is in phase to ensure the best possible stereo field. Place the D12 at the bottom of the cabinet in roughly the center of the cut-out area down there. Again, check the positioning of the mic while the organ is playing for the ideal "sweet spot." At this point, it's wise to put blankets on frames and gobos all around and on top of your setup to dampen the sound and to keep other sound sources from leaking in for separation purposes.

LAST ORGAN JOKE, WE PROMISE: The author with tulips on his organ.

PHOTO BY STEVE EICHNER

World Radio History

Apply the stereo compressor to tuck down the peak moments of volume in the performance. With sensitive application, this device should not be an audible "effect," but a governor against distortion from any adrenaline residing in said organist's veins. Add the appropriate EQ and mix the three mics to taste.

If you don't need a tight-miked stereo sound, place the Neumann U47 six to eight feet from the back of the Leslie cabinet (best for overdubs) and add a compressor and your favorite EQ. This is a fat, ambient sound and while primitive on paper, will definitely get the job done.

If you're a project studio pauper and are scratching your head about what to do in that arena, the Audio-Technica 4033 and 4050 can adequately replace the comparatively expensive mics listed above. I imagine there are very few project studios with a B3 and a Leslie in them. I don't even have them in mine, unfortunately.

ROUNDING OUT

When writing a column like this, it's nice to have photos of the mics in place so that they will take up the space, negating having to write this part of the column. But if you live in Boston, and there are no studios on every corner in the town of Somerville where you can photograph the back of a Leslie speaker, you must resort to the time-honored profession of "rounding out" your article. So here goes:

B3's get very shrill in the top octave. If you're recording a part that has a screaming solo or harsh comp in it, it's a good idea to subtract a dollop of high-mids on the 414's to compensate for that. If it's merely a sweet accompaniment for some other instrument soloing, this may not be necessary. In addition, there is a volume control in the bottom right of the Leslie cabinet. For screaming stuff, put it on 11. For warmer sounds, peak at 7.5. If you're really anal, you can remove the back of the B3 itself and find a tone control in most models. There is also a jack for playing another electric instrument through the Leslie in there as well.

Well, dear reader, we have actually come to the end of our road, and not only discovered how to mic your organ, but thrown in a couple of other handy tips for you B3 owners or novices. Hope this helps you in or out of any potential jams. EQ

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EXPLORING THE SONIC PALATE

HOW I CREATED INTERESTING MUSICAL SOUNDS WITH MY SYNTH FOR MY LATEST INSTRUMENTAL PROJECT

BY JORDAN RUDESS

In 1994 the Dixie Dregs were doing a show in Fort Lauderdale when a power failure shut down the guitar, bass, and violin rigs. Mysteriously, Jordan Rudess's keyboard rig remained unaffected. To keep the crowd happy while technical problems were resolved, Rudess and drummer Rod Morgenstein jammed spontaneously. That drum/keyboard jam inspired the two musicians to record a studio CD, Rudess Morgenstein Project *(Domo Records). Here, Jordan Rudess discusses some of the synthesis and sampling techniques used on this CD.*

Rod and I started the *Rudess Morgenstein Project* CD by putting together all of the arrangements in my project studio. We even went so far as putting down MIDI drums so that we had a groove to play along with. All of the parts were played into an Apple Macintosh Quadra 650 running MOTU Performer. Using a MOTU MIDI TimePiece II, we interfaced the Quadra 650 with the keyboards and modules used for the project — which were exclusively Kurzweil units. I used a K2500XS as my master controller, and also had a K2000 rack, a 2500 rack, and one K2000 and one K2000EX.

The '2500XS has eight sliders and two ribbons, all of which can be mapped to any parameter for real-time control, which came in very handy for a few things I'll talk about later. Our plan was to write the arrangements, and after my parts were in the Quadra, they'd be submixed in groups down to a TASCAM DA-88. The DA-88 tapes would then be brought over to Kip Winger's Rising Sun Studio in New Mexico, where Rod would overdub his drum parts.

There are actually a few tunes on the CD that were recorded to tape exactly the way they are performed live, with just my performance and no sequencing. Those tunes have a lot of intense keyboard splits and velocity layering. Both "Over The Edge" and "Don't Look Down" are just Rod and I jamming, except for a 30-second bass sequence in the middle of "Don't Look Down" where my synth lead breaks in. What happens there, is that I run a long sample by hitting a key and then holding a pedal. Then I change patches and play my lead over it. I can do the whole lead using the mod wheel, ribbon, or pressure control, and none of that affects the sample that I am holding.

ALL NATURAL

In regards to sounds, I never try to emulate another instrument because I don't believe in that as a concept, and a keyboard player can never really imitate what a live bass player (for example) will sound like. Instead I look for what I would consider to be a great sound. When writing the actual composition, I might use a factory patch from one of the Kurzweil instruments just to get started. Once the composition is complete, I start tweaking.

I'm a big tweaker, and have trouble keeping my hands off the buttons. The factory sounds inspire my composition and then I usually modify them for the specific song. The finished bass sounds on this record were stacks. "Over The Edge" and "Don't Look Down" both use a large, layered bass sound. Sometimes I start with a sampled bass guitar sound and mix that with some sort of large analog texture, or maybe a bunch of sawtooth waves. Blending in a bit of that analog texture makes the bass breathe.

I CAN'T BELIEVE IT'S A SYNTH: On his new disc, Jordan Rudess gets some interesting synth sounds that will make you listen twice.

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MiniDisc MD DATA

SONY

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Between the sample library that I have collected and the Kurzweil instruments, there's a lot of flexibility in what I can do to a sound once I get it inside one of the instruments because they all combine sampling and synthesis. I can shape sounds into anything I want. In the beginning of "Tailspin," it almost sounds like Eddie Van Halen's guitar screeching. But that sound is really something quite different: it was a sample of a dentist's drill that I morphed into another waveform.

Changing the attack of a sound can completely disguise it because if you don't hear the attack, you generally don't know what the sound is. So a lot of times I'll go in and modify the attack. For the drill sound, I edited at the sample level, deleting and crossfading certain elements. The original sound had little amplitude "bumps" in it, which I didn't want. So I deleted the bumps and then crossfaded the remaining waveforms to mend the gap. I did that several times to get rid of the unwanted parts and really smooth it out after the attack.

Often, a bandpass filter is a great tool to use because it focuses on a particular frequency range within a sound. One of the sounds used in a lot of places on this record is a factory Kurzweil sound called "Cymbal Things." I'll take that crash cymbal sample and put a bandpass filter on it, which makes the cymbal sound almost like an ethereal voice texture. (You've got to hear this to believe it! — Ed.) If you opened up the bandpass filter, you'd start to hear the crash cymbal.

As a matter of fact, I used a similar trick at the beginning of the song "Masada." There's a rain stick sample and I mapped the mod wheel to control the width of the bandpass filter. If you listen to the sound, it's almost playing a melody. The whole sound is actually the same rain stick, but it's tracking the keyboard so you hear different pitches. When the band is thinned out, it has this haunting kind of sound. I'm just playing one patch and moving the mod wheel to expand the band. You hear this "wheeeechoooo," which is the full rain stick sample tuned down really low.

UNWRAPPING THE RIBBON

A ribbon controller is an interesting MIDI controller. By mapping MIDI panning on the ribbon, I can sit in the middle of the speakers and move a sound from left to right just by moving my finger along the ribbon. One of the strange things about the ribbon is that you can put notes on it because it simply puts out MIDI data — you determine what data that will be. By assigning key notes to the ribbon, as I'm running my finger up and down the ribbon, I can actually cycle through various scalular patterns that I have set up. At the same time it can also be controlling other parameters such as parametric EQ.

Using the ribbon, I've developed a slightly different lead style, with these sort of quarter-step trills. You couldn't do that kind of trill on a keyboard because usually when you are playing a lead on the keyboard, it's tuned to half steps. I put one finger down on the ribbon and tap with the other to create a tremolo that is really unique. You can hear that in the song "Masada" — a lot of what I was doing was really low ribbon bends. For solos, I find that using a guitar-type tone helps a sound cut through the mix. A good combination is a guitar waveform mixed in with a very bright sawtooth waveform that has the filter opened up completely.

I have this one particular lead sound that's an odd combination of components. It starts with a sampled guitar waveform but also uses an oboe sound that I put through some gain-staging to dirty it up. Then I've got a flute sample mixed in with a pure sine wave and a sawtooth wave, which creates harmonics. By using pressure control to play the harmonic sound, I can bring in what sounds like feedback. It's a layer of about ten different elements in different proportions to create the thickness and cutting quality that I like. This sound resides in my K2500XS as a multilayered performance, so I can easily access it and record the MIDI data.

Although I do have some processing units in my studio such as the Lexicon PCM 80 and LXP-15, much of my audio processing is done in the Kurzweil. "Tailspin" has an example of how I might process a vocal sample. There's an intense sort of groan, which is actually a stack of vocal sounds. I recorded my voice, layered it several times, panned the parts and EQ'd them. In a situation like that I might run one layer through a parametric EQ to bring out a particular range, and then run another layer into a separate parametric EQ to bring out a different element. Then a third layer could go through some kind of ring modulation. If I'm hearing the sound in my head with an effect (like maybe a really long reverb), I will put the effect on the sound and then resample the completed sound so that I don't have to ever worry about re-creating it.

AUTO KEYBOARD MECHANIC

Some of the sounds I used for *Rudess Morgenstein Project* were from a recording session I did at an auto shop. I brought in a Sony TCD-D8 DAT machine and an Audio-Technica AT822 microphone and captured all sorts of clangs and engine noises that I use both percussively and melodically. In particular, there was a set of wrenches that ranged from very small to very large. When struck quickly in succession, they sounded like a bell tree. When struck individually, they produced a very definite pitch, which gave me another source for bell-type sounds. In the case where the pitch of a wrench does not land exactly on a note, I can easily tune it. Or, if a specific harmonic is sticking out, I can use a notch filter to remove it (I do a lot of tweaking — I should have been a guitarist).

It's interesting creating an instrumental album using synthesizers because, when I'm playing melodies, I don't want it to sound like an imitation guitar or sax sound, or even a typical synth sound. I'd rather just have an original, effective sound, but you do have to be careful about letting a sound get too thick — especially when you start to layer a lot of elements together. As a result, there's a lot of sonic balancing going on between the elements of a sound.

Many of the sounds on this record are not what they appear to be. One of the guitar-type lead tones is actually a combination of a guitar waveform and a flute. I'll take just the attack of a guitar waveform and use an envelope filter to make the sound die quickly. Then I'll take a flute waveform and crossfade it, so that as the guitar wave dies, the flute fades in. When it's timed and crossfaded correctly, it sounds like one continuous sound.

Fortunately, Rod is very patient and encourages me to take the time necessary to get my sounds right. A record is a statement, and you have to live with it, so it's worth the effort to make it right. EQ

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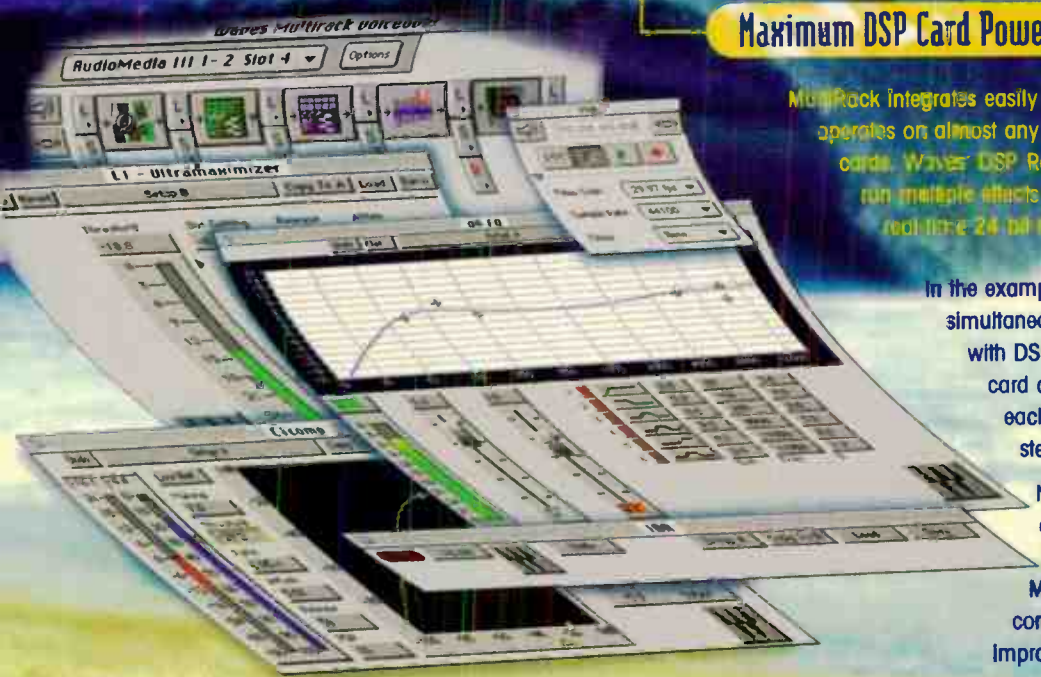

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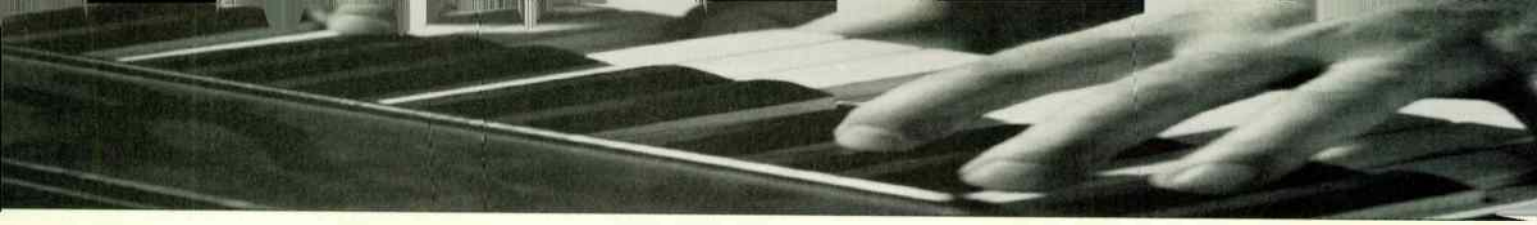

DIGITAL SYNTHS = ANALOG SMOOTHNESS

SOME TIPS ON RE-CREATING SOME ANALOG-LIKE CHARACTERISTICS IN YOUR DIGITAL SYNTH

BY CRAIG ANDERTON

Ten years ago, you could hardly give analog synthesizers away. Now the analog revival has reversed that trend, as fashion continues to veer away from bright, edgy digital sounds toward "warmth" and smoothness.

However, vintage analog synths come with a lot of baggage: high cost, difficult maintenance (worst of all, some crucial components are no longer being made), drift, and tenuous reliability. These are issues that digital mostly manages to sidestep, so many musicians stick with digital.

With a little work, though, it is possible to use digital's greatest strength — its chameleon-like flexibility — to create a variety of sounds associated with analog synths. In particular, we'll look at how to re-create "sweep" effects, such as smooth resonant filter sweeps and pulse width modulation, that are normally difficult to implement in nonanalog instruments.

ANALOG SWEEPS IN A DIGITAL WORLD

One of the big advantages of analog synthesis is that when you bend pitch or do a filter sweep, the sound changes seamlessly. Do the same thing on a digital box, and you'll hear a series of stairsteps as the pitch or filter changes from one quantized setting to the next.

Theoretically, this is an unavoidable aspect of digital control, especially given MIDI's tendency to slice everything into 127 steps. But there is an interesting workaround that uses a variation on *wave sequencing*.

Wave sequencing, where a series of individual waves evolves slowly from one waveform to the next, is a synthesis technique that produces animated and complex timbres. Although the only true wave sequencing synths have been the Prophet VS (long since out of production) and the Korg Wavestation, there are ways to do limited wave sequencing with many other synthesizers. If done correctly, this pseudo-wave sequencing can give the illusion of a continuous sweep. The only requirements are that your synth must be able to delay the onset of an amplitude envelope and stack (layer) voices that use these delayed envelopes.

TAKING A PULSE

As a practical example, let's program a pulse width sweep. To begin, create four variations on the same patch (program) using four different pulse width waveforms (for example, 5%, 10%, 25% and 50%).

Now stack the four programs so that playing a key triggers all four, and delay each program's amplitude enve-

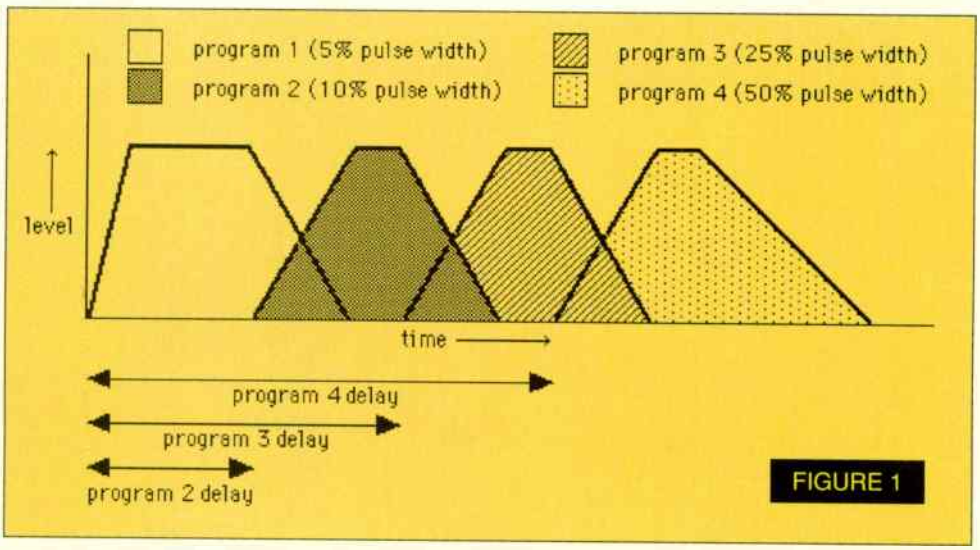

FIGURE 1

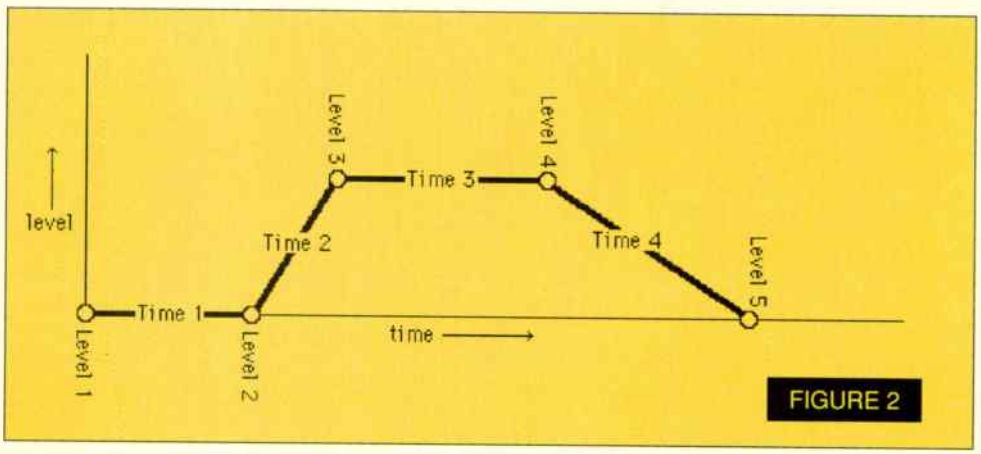

FIGURE 2

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lope (fig. 1). You will also need to adjust the attack and decay times so that the programs crossfade properly into each other. In this example, the decay time for program 1 equals the attack time for program 2, the decay time for program 2 equals the attack time for program 3, and so on. Set the overall attack with program 1's attack parameter. Program 4 will generally be the only one with sustain and/or release times greater than 0.

For the most convincing emulation, the total time from the beginning of program 1 to the end of program 3 will need to be relatively short. However, as you experiment more with this technique, you may find uses for abrupt transitions (good for weird "echo" effects), longer fade times, and other variations on this particular concept.

WAYS TO DELAY TODAY

If your envelopes don't have a delay parameter per se, there are two possible solutions. With a conventional rate/level envelope, set the 1st and 2nd level parameters to 0 (fig. 2). The first time parameter (Time 1) then sets the delay before the sound kicks in. Alternatively, some synths require that you layer programs to create a "combi," "multi," or "performance" in order to trigger several programs at once. Sometimes this mode will provide a delay parameter for the individual programs.

BEYOND PULSE WIDTH MODULATION

This technique is certainly not limited to pulse width modulation effects. If your synth has resonant filters, you can create variations on a program with different resonant frequencies, and crossfade between them to create filter sweep effects. I've also used this technique to "wave sequence" a series of sampled waveforms (such as flute, voice, strings, choir, etc.) for extremely "large" and animated pads. The results are quite unlike conventional sample playback synths.

Unfortunately, you don't get something for nothing: creating a wave sequence using these techniques requires a significant amount of button pushing and tweaking. But once you've nailed the desired effect, the overall sound can offer the same kind of smooth transitions formerly associated almost exclusively with analog synths. EQ

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MIKING THE ACOUSTIC PIANO

HOW TO HANDLE THE IVORIES — BOTH IN THE STUDIO AND ON STAGE

BY JACK RENNER

Telarc International is known to many classical and jazz music listeners as a record label that doesn't compromise when it comes to audio quality or musical performance. Jack Renner is the engineer responsible for recording the vast majority of Telarc CDs, and here he discusses his techniques for recording acoustic piano.

If you are going to make a successful acoustic piano recording, I really believe that to have a fighting chance you need a piano that has been impeccably prepared. This means that you need a piano technician who knows exactly what they are doing; knows what it takes to prepare a piano for recording so that it will hold up throughout the session, sound its very best, and make the artist comfortable. I happen to be married to one of the best piano technicians there is — Barbara Pease Renner — and she has really spoiled me! Once I know the instrument is ready for recording, my job is a lot easier.

I try to have as much control over the choice of the piano as is absolutely possible (sometimes it's not). What I have found — and I'm probably going to tick off a few people here — is that when we haven't worked in a studio, hall, or venue, we typically hear the manager of the room say, "We've got the greatest piano in the world. Everybody just raves about it." To me that is normally a bit of a red flag. We really

AIN'T IT GRAND? Jack Renner, the man behind some of Telarc's finest classical and jazz recordings, offers tips and techniques on proper mic placement.

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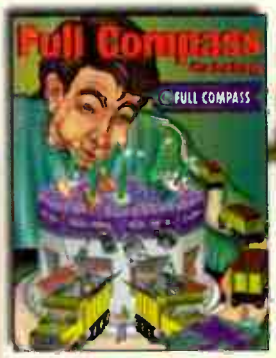

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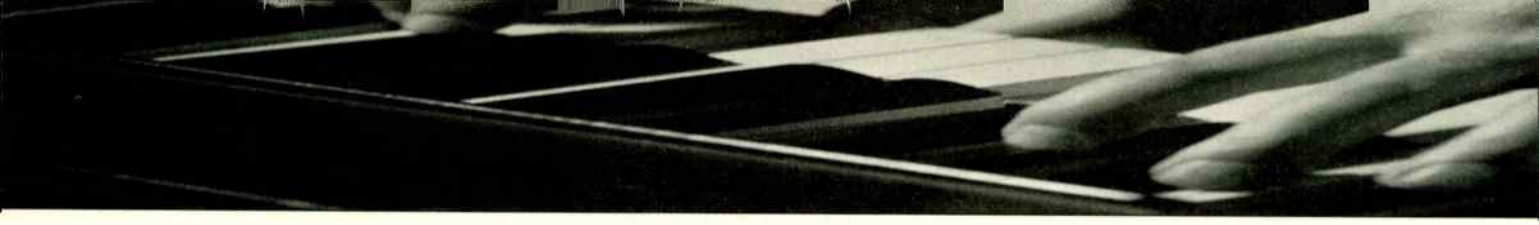

want to see and hear that piano before we commit. We select the piano carefully and may possibly have one brought in.

That's not to say that there aren't good pianos in concert halls and studios out there, because there are, but you have to be careful. Also, it helps to know the particular style, technique, and preference of the artist that you are dealing with. Somebody like Dave Brubeck requires and likes a piano that has an absolutely feather-light touch. Other players like pianos that you have to dig into to get something out of. Having said all that, let's talk a little about miking a classical piano first.

CREATING A CLASSIC

It makes sense for us to put the piano in a good-sounding room because there will be no artificial ambience added later. Assuming we have done that, each piano is slightly different in how it projects its sound. Each piano has a sweet spot where everything focuses. As you stand square in front of the piano, you are not necessarily where the sweet spot is. It will probably be someplace around towards the right, at the tail end of the piano (i.e., the end opposite the keyboard — Ed.), where everything focuses from top to bottom. At that spot, you'll hear good harmonics, and none of the frequencies will be sticking out.

The sweet spot varies from instrument to instrument and may be as much as a foot to a foot and a half right or left of that "mythical" point. Normally, I'd listen at a distance of about three to six feet from the piano. Once you've selected the sweet spot, you don't necessarily put your mics there, but that is where you center your stereo pair.

Unlike many engineers, I always use omnidirectional mics for piano recording — even in jazz sessions when I can get away with it. Then it's a matter of fine-tuning the position of the two mics. Some pianos sound better with a slightly wider spread; others with a more narrow spread. These mics are assigned to tracks one and two (or left and right) so that you hear the piano as if you were standing in front of it, not as the performer hears it.

Some people prefer the performer perspective where you'd hear the bass left and the treble right, but to me that is a little bit unnerving. I have found that with B&K 4006 omnis, the spread between the microphones is about 35 to 40 inches. This gives you a piano that has a reasonably believable size, but doesn't have a hole in the middle — which can happen if the microphones are too far apart. If the microphones are too far apart you can also get a piano that's wider than the room you are listening in. You need to optimize the overlap of the patterns in the center by varying the space a few inches one way or the other. When your mics are initially a little too close together, you may have a build up in the middle frequencies of the piano.

If you are going to make a successful acoustic piano recording, I really believe that to have a fighting chance you need a piano that has been impeccably prepared.

STICK 'EM UP

If the music requires a little more detail (a Mozart piece, for example) I might work a little closer, but generally the two microphones will be placed anywhere from three to six feet away from the piano. The height will depend upon what I hear during my setup and the angle of the mics will pretty much correspond to the angle of the lid itself.

While the piano lid is very helpful in projecting sound, it's a whale of a phase-creator, and some of the wavefronts coming out could be really strange if you misjudge the angle of the microphones. It seems to be more pronounced in the high frequencies, but as you move the mics up and down in height, you can hear the focus of the piano change.

Typically, I would record a classical piano (or if I've got control in a jazz session situation) full stick. Use the angle of the lid as a guide as to the way the mics should be pointing down towards the piano. If you stand off to the side, your mics should be tilted at the same angle as the lid. By positioning the mics in this manner, you can minimize the amount of reflections that the microphones pick up from the soundboard and the lid, giving you a more smooth sound.

What we are listening for is a good balance between direct and reverberant sound. That's why the height varies. As you move farther away from the instrument, the mics should be set higher. If you think about it, you have this sort of big jaw that's open as you're looking at the piano, almost as if the lid and soundboard are creating a horn. If (for example) you place the microphones five feet high and keep the mics at the same angle as you begin backing away from the piano, the farther away you get, the more the microphones would be looking lower and lower. So as the microphones move further and further from the piano, they should continue to creep up in height.

When I am doing a classical recording, I almost always use B&K 4006 (omnidirectional) microphones. The John O'Conor recordings for Telarc were done with B&K's. I have also made some very good-sounding jazz recordings with Neumann TLM170's, Sennheiser MKH-40's, or B&K 4011's (cardioid), which are very useful in clubs where you've got a drummer three feet away from the piano, and you can't hang a pair of omnis out there without getting the entire group in one set of mics.

KEEP IT SHORT

What I've been doing lately is using onstage preamps whenever possible. This keeps the microphone cables at a minimum length, and then we can go line level from the preamps out to the A/D converter, bypassing any further electronics. Our favorite pre is the Millennia Media HV-3, and we have our own pro-

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prietary 20-bit converters that were designed and developed by Dr. Thomas Stockham (who really was the father of digital audio in this country). The recording medium might be a Mitsubishi X-86 or a TASCAM DA-88.

There is no artificial reverberation or processing at all. When faders are available I will occasionally ride gain if need be, but I will not ride it to take the dynamic control out of the hands of the performer. But when running straight from the mic preamp into the A/D, you don't have an opportunity to do that. Recording 20-bit provides a lot of headroom and you can err slightly on the low side.

One of the things we first noticed (especially listening via headphones where ambient noise in the control room is not a problem), was that the decay of the piano was going on longer than we had become accustomed to hearing in 16-bit. That's one of the benefits of 20-bit. Even though we have to take it down to 16 bits for the CD, we use the Apogee UV22 (for us, it's the best-sounding unit on the market), and we're able to retain a lot of the information and higher resolution that's actually recorded on a 20-bit tape.

GETTING JAZZED

Wherever possible, I try to use the same B&K microphones for jazz as I do for a classical recording. As an option, I'll use a pair of B&K 4011's or Sennheiser MH-40's, which are cardioid. I've even used the omnis in clubs — in spite of the fact that other instruments are very close to the piano. Depending on the way the performers are set up, there may not be a way to work at a distance from the piano.

Cymbals especially can cause a lot of reflection off the lid, so I'll either place the microphones right at the edge of the rim or slightly inside the piano. That's where the B&K's really sound great. You can put them inside the piano, 35 to 40 inches apart (with the left mic over the treble strings and the right mic over the bass section), and record a very believable sound with omnis. If you used certain cardioids in this application, you might get low-frequency buildup or highlighting of certain frequencies. For the 4006, the 4011, or the MKH-40's, it's really not a problem.

In this situation I still like to work with the lid open because the piano sounds so much better that way. But if things are really tight, we'll go to the short stick. Sometimes that doesn't work, and on an upcoming recording we are going to bring some RPG Abffusors and see if we can do some slight baffling. The problem is that on a tight stage, there's not much room. In a larger space if there's leakage, I will use baffles but it really depends on the room.

In the Blue Note (NYC) where the drums are quite a bit farther from the piano than in a lot of clubs (even though that's a tight stage), you do have a little buffer zone. In that room, I'd baffle next to the piano. You don't want to start baffling off the drummer because jazz musicians — especially the piano and bass players — tend to listen for the drummer, particularly the cymbals. If you start baffling off cymbals, then you cut down that communication. Putting a couple of Abffusors around the piano gives me some protection for the back of the microphones, and that's usually just enough to do the job.

There have been situations where I miked even closer, or right inside the piano, working on the short stick. Reflections off the lid can be a problem in this situation, but it's usually something you can live with. In this case I'll use the 4006's with their "nosecones" attached. These are screw-on attachments that allow the mics to be placed closer to the source while still maintaining their pattern across the frequency range.

Bobby Short has an interesting take on this: he doesn't work with the lid up at all. He has the lid removed and then blocks are placed around the inside rim of the piano. The lid sits flat on the blocks, so there's a 4- to 5-inch opening all the way around the piano. This allows him to have eye contact around the room. In this case, you have to point the microphones sideways, almost parallel to the plane of the soundboard or the strings themselves, and that's where the nosecones really come in handy.

Of course, my main secret weapon is my wife. If you look at the John O'Conor CDs you'll see Barbara's name on almost all of them. Her professional standards are a wonderful complement to the high standards we employ at Telarc. Next issue, Barbara will offer tips on getting a piano ready for recording EQ

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SAMPLE-PLAYBACK SYNTH TIPS

SOMETIMES SUBTLE PROGRAMMING TWEAKS ARE ALL IT TAKES TO GET THOSE SYNTH SOUNDS YOU'RE SEARCHING FOR

BY CRAIG ANDERTON

Sample playback synths might not get any respect in today's analog-crazed world, but they offer a wealth of sonic power if you're willing to get under the hood and tweak a little bit. You don't have to be a programming genius; sometimes even a simple parameter change or two is all you really need to customize a sound to fit your needs.

Following are as many tips on getting the most out of these beasties as would fit into 1600 words. Try 'em, you'll like 'em. I've tried to make the tips as generic as possible, so read the manual to find out about esoteric options unique to your synth.

TOTAL CONTROL

Tweaking requires the right tools. Although some synths are not too painful to control from the front panel, rackmount units with small LCDs are difficult to program. There are three main ways to get around this:

1. Computer-based editor/librarian programs such as Opcode's Galaxy, MOTU's Unisyn, Emagic's Sound Diver, and Sound Quest's line of editors. In addition, public domain programs are sometimes available on the Web — do a search on your synth's name (which may also uncover other cool things like newsgroups, additional support software, and links to the "official" home pages of synth manufacturers).

2. Create "profiles" in sequencer programs. For example, Cubase, Cakewalk, and Logic make it relatively easy to set up screens with virtual sliders and knobs. These can transmit MIDI data to the synth being programmed and are well suited to real-time control.

3. Use hardware boxes that can transmit MIDI data (these are also fabulous for live performance). Peavey's PC1600 includes templates for a variety of synths and signal processors, so you can control multiple parameters, in real time — from real faders and buttons. Note, however, that with some devices, these changes may just temporarily offset existing programmed values, not change them. Thus, saving the program will not necessarily save the changes you've made.

MORE RESPONSIVE PARAMETERS

"Doubling" modulation routings can make a parameter more responsive. For example, most keyboards have a global pressure control, adjustable for heavy, light, or moderate action. I usually choose moderate, but occasionally need a patch with a lighter, more responsive action. Assigning pressure twice to the same parameter (such as overall level or filter cutoff; most parameters can accept more than one modulation source) increases the sensitivity for just that program. The controllers will sum together, thus creating more change for a given amount of pressure. This same trick works for velocity.

LFO WAVEFORM CROSSFADES

Using an LFO to crossfade between two waves (each must be followed by its own envelope-controlled DCA) provides a less static, more animated sound if you choose related waveforms (e.g., two different organ sounds, 5 percent and 50 percent pulse waves, two different basses, etc.).

Referring to fig. 1, pan the two DCAs to center. Drive one of the DCAs with the normal LFO waveform and the other DCA with an equal but opposite LFO waveform. Usually you do this by setting one DCA's quiescent level to zero and feeding it positive modulation, then setting the other DCA for maximum level and feeding it negative modulation (fig. 1 shows modulation as +99 and –99, respectively). Thus, while the LFO waveform increases the first DCA's level, it decreases the second DCA's level. You may need to tweak the modulation and level values for the smoothest crossfade sound, but it's worth it.

A PEAK EXPERIENCE

Strong signal peaks can be disastrous with digital recording — go much over zero VU, and you'll hear nasty distortion. Synths can often generate strong peaks, and unless you tame them, they

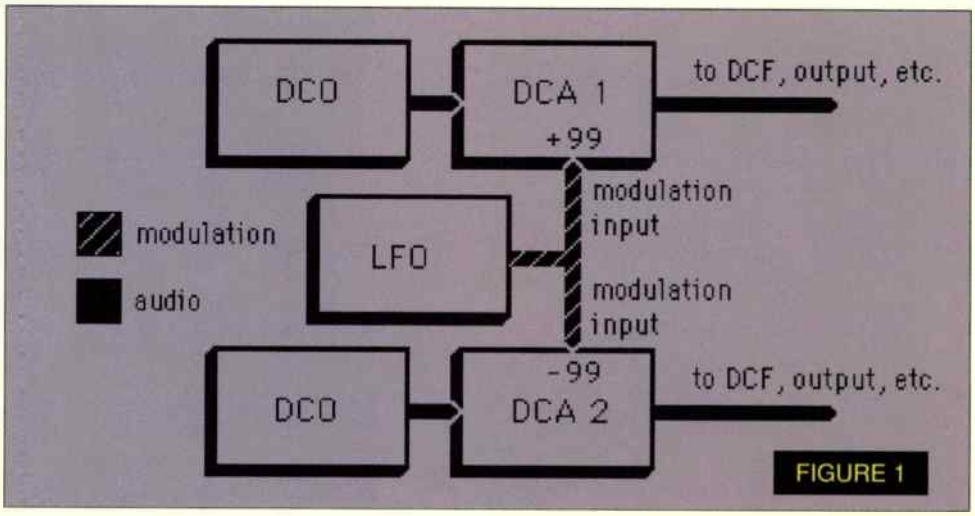

FIGURE 1

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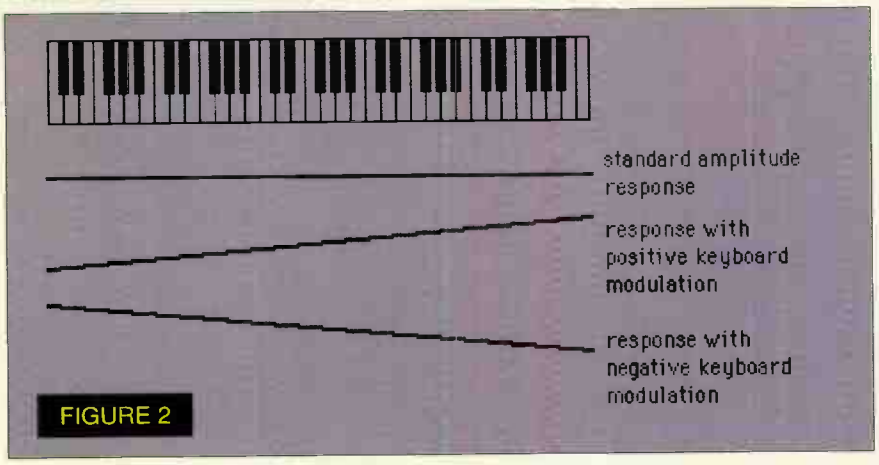

FIGURE 2

may create havoc when recording.

Proper synth programming can help. For example, even though detuned (chorused) oscillators can sound fat, there's a substantial output boost when the chorused waveform peaks occur simultaneously. To reduce this, drop one oscillator's level about 30–50 percent compared to the other. The sound will remain fat, yet the peaks won't be as drastic and will be less likely to cause distortion.

High-resonance filter settings are also a problem if you hit a note at the filter's resonant frequency. Instead of recording highly resonant sounds, consider using a parametric equalizer during mixdown to add resonance. If all else fails, you can always compress the output to cut peaks down to size (use as fast an attack as possible).

PANNING FOR GOLD (RECORDS)

Using an LFO to pan instruments back and forth usually sounds pretty gimmicky (although this can work with short percussive sounds, as you don't hear them long enough to detect an audible sweep). There is, however, a panning technique that works pretty well: modulate panning with velocity. When you first hit a note, its stereo position will depend on the velocity, but as it sustains, it will retain its location in the stereo field until replayed.

FUN WITH TRANSPOSITION

Transpose a bass sample out of its normal range and you can get everything from hammered dulcimers (try acoustic bass up two octaves with a long release) to muted guitar (picked bass sample up one octave, with a fast decay).

LAYERING TRICKS

• For a fuller acoustic guitar or piano sound, layer a sine wave along with the lower notes. To attenuate the sine wave at higher notes, modulate the wave's amplitude according to keyboard note position so that the higher you play on the keyboard, the lower the level (this follows the lowest curve shown in fig. 2). Also keep the overall level low — just enough to provide a subtle psychoacoustic boost.

• While we're on the subject, sine and triangle waves can add more depth to almost any sample because digitally-*generated* waveforms can have more presence than digitally-*recorded* sounds. For example, harp samples often have a slight muddiness caused by microphone limitations, room acoustics, A/D conversion, etc. Layer a triangle wave with the harp (adjust the triangle's amplitude envelope so that it "tracks" the harp); the triangle wave provides presence, while the sample provides detail and realism. Initially set the triangle wave level to 0, then bring it up slowly to taste. Keep it subtle — we're talking background reinforcement, not something obvious.

• To strengthen an instrument's attack, take advantage of the fact that bass sounds (slap bass, synth bass, plucked acoustic bass, etc.) tend to have fairly complex attacks. Transpose the bass wave up an octave and layer it behind the primary sound. You'll probably want to add a fairly rapid decay to the bass so that the sustain doesn't become a major part of the sound.

• For a more realistic pizzicato sound, layer some additional individual instrument samples along with the pizzicato sample. I generally add acoustic bass (and/or nylon guitar) with a very fast decay, and delay the aux-

continued on page 136

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BY STEVE LA CERRA

ENSONIQ ASR-X

Ensoniq's ASR-X is a complete groove machine/MIDI production box in a compact, tabletop package. Based on the sonic architecture of the company's successful ASR-10 sampling keyboard, the ASR-X includes a sampler, sequencer, digital effects, and a built-in synth. Sounds are playable via 14 velocity-sensitive trigger pads, as well as via MIDI (the unit includes MIDI in/out/thru). An internal sequencer may play the unit's onboard voices or be output to external MIDI devices. In addition to being compatible with all existing ASR-10 libraries, the ASR-X can also import sounds from Akai (S1000 and S1100) and Roland libraries via SCSI.

The heart of the ASR-X is the unit's sampler, which is based around 20-bit A/Ds and 18-bit D/As. Internal memory is 2 MB, providing 20.5 seconds of mono sampling or 10.3 seconds in stereo at 44.1 kHz. Ensoniq has intelligently designed the ASR-X's sampler to be expandable with standard SIMMs for up to 34 MB of memory — which would allow 6 minutes in mono or 3 minutes in stereo at the same sample rate.

Sounds may be sampled via the unit's internal rear-panel, 1/4-inch TS inputs. These inputs connect to a stereo audio preamp (switchable for mic or line) with an audio level trim control. Beside sampling via the audio inputs, the ASR-X is capable of sampling its own internal sounds (or a combination of internal and external) and can resample through the built-in effects processor. Available sample-edit commands include copy, truncate, bit reduction, scale, normalize, and invert.

Each of the ASR-X's 32 dynamically assignable voices (based on the architecture of Ensoniq's MR unit) has a set of programmable parameters including independent dual-mode dynamic digital filters. Filter types include low pass, high pass, variable bandwidth bandpass, resonant low pass, and resonant bandpass. Voices may be routed through the ASR-X's internal effects processor, which employs the company's 24-bit, ESP-2 effects processor IC.

Augmenting the more traditional "global" reverb effect (which applies to all voices simultaneously), the ASR-X also has "insert" effects for use on individual sounds (very clever). Among the available insert effect algorithms are EQ, reverb, chorus, flanger, DDL, distortion, tunable speaker, chatter box, vocal morph, and auto-wah. Global reverb algorithms include plate, hall, and "huge places" (great for the monstrous snare drum hits).

Complementing the ASR-X's sonic muscle is an internal 16-track sequencer. Each sequence track has sound assign, mix, pan, effects bus, and track edit parameters such as quantize, erase, and copy. Any tracks can play either internal voices or external MIDI instruments, and up to 128 sequences (70,000 events maximum) may be input. Sequence resolution is 384 ppq and the sequencer can run to either its own internal clock or to an external MIDI clock. Five real-time recording modes are provided: replace, add, step, track mix, final mix, and (via MIDI input) multitrack. During mixdown, panning and volume changes can be automated.

For a relatively compact box, the ASR-X has some serious interface features. Stereo audio outputs are standard, and, by using the X-8 expander, eight more outputs may be added. A 3.5-inch floppy drive (included) may be augmented by a SCSI drive via the (optional) SP-5 SCSI interface. The SP-5 is a SCSI II interface — which is shipped with software and allows the ASR-X to access ASR-10/88, Roland S770, and Akai S1000 samples from a SCSI device such as a CD-ROM drive. Once loaded into the ASR-X any of these sounds may be processed in the same manner as any standard ASR-X sound. Other rear-panel features of the ASR-X include a headphone jack and one single- or dual-pedal input. The Ensoniq ASR-X is now available at a suggested retail price of $1595.

For further information, contact Ensoniq, 155 Great Valley Parkway, Malvern, PA 19355. Tel: 610-647-3930. Circle EQ free lit. #132.

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KORG Z1 SYNTHESIZER

Korg's Z1 DSP Music Synthesizer is a polyphonic 61-note, velocity- and aftertouch-sensitive keyboard, which comes stock with 12 voices (an optional expansion board increases the number of voices to 18). Unlike many keyboards, the Z1 does not use one specific type of technology to generate sound. Rather, it incorporates Korg's Multi-Oscillator Synthesis System (MOSS), which provides 13 different types of oscillator algorithms for generating sound (more on that later). The Z1's internal memory can store 256 programs and 32 "multi's" — each of which is a combination of up to six layered or split programs.

Additional programs and multi's may be stored to a memory card.

The big strength of the Z1 is that MOSS allows the synth to generate sound using a very wide variety of techniques, instead of just using one synthesis technique. In addition to the more typical analog synthesis, the Z1 is capable of physical modeling of sounds including brass, plucked and bowed strings, reed and electric piano. Augmenting the physical modeling is MOSS's ability to generate sound via VPM (Variable Phase Modulation), analog synthesis, cross modulation, and ring modulation. Up to two oscillators can be combined with a sub oscillator and noise generator to create hybrid sounds utilizing these various techniques. Several different types of filters are built into the Z1 (two per voice): resonance, low pass, high pass, and an interesting bandpass design that allows two simultaneous center-frequency points.

Tweakers will like the fact that the Z1 has dedicated parameter knobs for filter cutoff, resonance, envelope generator intensity, and filter and amp ADSR, allowing easy real-time control from the front panel. Beside the pitch bend and mod wheels, Korg has included five Performance Editor (PE) knobs that can be assigned to any MIDI controller (up to four parameters simultaneously). The Z1 also includes an X/Y vector touchpad for expression control. The rear panel of the Z1 has two assignable switches as well as inputs for damper, volume, and two assignable pedals.

As you'd expect, the Z1 has full MIDI implementation, including MIDI transmission of the built-in arpeggiator. This polyphonic arpeggiator holds five factory preset and 15 user-programmable patters and may be synchronized to an external MIDI clock.

Options for the Korg Z1 include the DSPB-Z1 expansion board (which adds six more voices) and an ADAT optical digital interface, the DI-TRI. The Korg Z1 is currently available at a suggested retail price of $2600.

For more information contact Korg USA, 316 South Service Rd., Melville, NY 11747-3201. Tel: 516-333-9100. Circle EQ free lit. #133.

MOOG MINIMOOG

Twenty-five years ago, the Minimoog became the first synthesizer designed for keyboard players, as opposed to those synths which made music, but required a class in engineering to operate. Once Keith Emerson got his hands on a Minimoog and recorded the solo for the song "Lucky Man," the rest became history — the Minimoog became one of the most popular synths in electronic music his-

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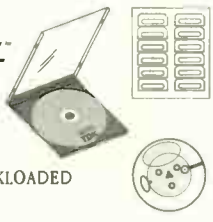

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tory. To this day, synthesists scour pawn shops and garage sales in hope that they'll find a Minimoog in good condition. The search has ended, because Moog is reissuing the Minimoog.

Moog Music, Inc. has been meticulous (some might say fanatical) about reproducing the Mini in order to retain the classic sound of the original instrument. All original blueprints and specifications were adhered to; in many cases, parts identical to the original were used for construction and in cases where such parts were no longer available from the original manufacturer, Moog has had them retooled and manufactured to precise original specs — including resistor networks, oil-damped potentiometers, and even the chassis hinges for the front panel. Approximately 600 point-to-point connections were hand-soldered for the analog circuitry. The only modifications Moog has made was the use of a detachable power cable and a modern keyboard mechanism.

If you're not already familiar with the Minimoog, it is a monophonic synth with three VCOs, a 24 dB per octave lowpass filter, two envelope generators, two VCAs, a noise source (white or pink), and an external audio input that may be used for processing of an external sound. Like the original, the front panel is hinged and adjusts to five different positions, allowing a player easy access to the controls while performing on the 44-note keyboard. Cabinetry is made of solid walnut, and a switchable power supply allows the Minimoog to operate under a variety of voltage conditions. The Minimoog is now available at a suggested retail price of $1495 — same as the original!

For more information, contact Moog at 513-794-1660 (tel.), 513-794-1668 (fax), or info@moogmusic.com (e-mail). Circle EQ free lit. #134

KURZWEIL K2000VP

Kurzweil's K2000VP is the latest keyboard in its popular K2000 Series of sampler/synthesizers. Containing a built-in, 32-track sequencer, DSP software and a 3.5-inch HD floppy drive, the K2000VP has a 61-note keyboard and can produce 24 voices. Incorporating Kurzweil's V.A.S.T. (Variable Architecture Synthesis Technology), the K2000VP has all the features of the original K2000, along with the latest operating system (3.54) and an expanded onboard RAM capability of up to 64 MB.

Some of the features provided in the K2000VP with software revision 3.54 include enhanced support for Jaz, Zip, CD-ROM, and external hard drives of up to 2 GB. Also

World Radio History

included is a new drive utility for viewing of drive format information. K2000-formatted media can now be recognized by PC-Exchange, and a verify option has been implemented in file backup/copy functions to ensure high data integrity. Version 3.54 also provides the ability to import MIDI Type 1 files and (when PRAM option is installed) an increase in the total number of drum channels available to eight.

Among the voices included in the K2000VP is Kurzweil's recently introduced Analog Collection, which contains re-created sounds of classic analog synths such as the ARP 2500, 2600, Odyssey, and Chroma, the Korg MonoPoly and PolySix, Moog Memorymoog and Minimoog, Oberheim Matrix 12 and OB-8, Roland Juno 106 and Juno 60, Sequential Circuits Pro One and Prophet V, and the Yamaha SK20 (the Analog Collection is also available to existing K2000 Series owners at a MSRP of $249). The Kurzweil K2000VP is now available at an MSRP of $1995.

For more information, contact Kurzweil, 13336 Alondra Blvd., Cerretos, CA 90703. Tel: 562-926-3200. Web: www.youngchang.com/Kurzweil. Circle EQ free lit. #135.

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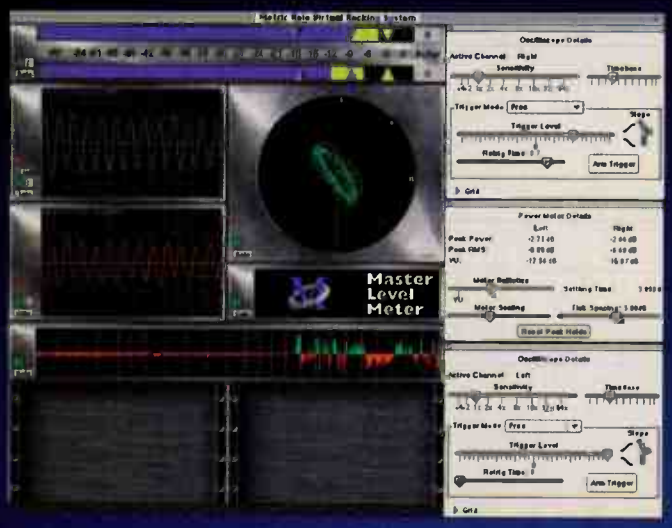

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ROLAND JP-8000

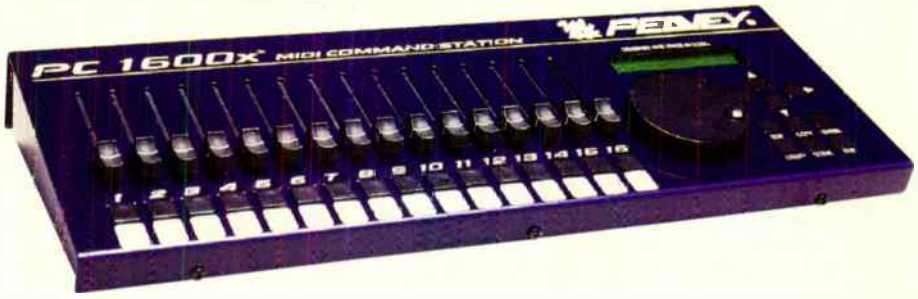
Even at a quick glance, you *know* that the Roland JP-8000 is not "just another synth." With almost 40 knobs on the blue front panel, this 49-note, velocity sensitive keyboard is as interesting under the hood as it is on top: the JP-8000 generates sound using "Analog Modeling" to produce analog-like tones using digital technology. A new DSP oscillator allows the JP-8000 to generate seven totally independent waveform algorithms. In addition to the traditional sawtooth, triangle, and square waves, the JP-8000 can also generate noise, super saw, triangle mod, and feedback oscillator waveforms. This combination gives the '8000 the ability to produce a wide variety of sonic textures.

On the front panel of the JP-8000 are a total of 38 knobs and sliders for real-time control of synth parameters such as waveform type, filter cutoff frequency and resonance, LFO rate and depth, and envelope. Much like a traditional analog synth, the JP-8000 also has knob controls for functions such as ring modulation, cross modulation, and oscillator sync. An assignable ribbon controller may also be used to control any of these parameters. All controllers send MIDI data in real time to any external MIDI device and Roland has also built in a Motion Control feature, whereby an onboard sequencer can automatically track and record real-time movement of controllers in (up to) eight-measure loops. This would allow a performer to, for example, make the controller moves, loop them, and then use two hands to play the sounds while Motion Control continuously played the controller data.

For DJ-style remix use, the JP-8000 includes a programmable arpeggiator and an "RPS" (real-time phrase sequencer). The arpeggiator has five different modes plus hold and tempo controls, while the RPS features 48 patterns, variable input quantize, and adjustable gate time. Loop length on the RPS may be adjusted from one to four measures.

In addition to MIDI In/Out jacks, a pitch bend/modulation lever, and onboard delay, chorus, phasing, and flanging effects, the JP-8000 has front-panel controls for bass and treble, and is capable of storing 128 patches and 64 performances in preset memory and another 128 patches and 64 performances in user memory. Since the JP-8000 uses Flash ROM, future upgrades are easily executed. The JP-8000 is currently available at an MSRP of $2295.

For more information on the JP-8000, contact Roland, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Web: www.rolandus. com. Circle EQ free lit. #136.



PEAVEY PC 1600X

OK all you MIDI tweak heads — here is something that you'll love. The PC 1600x MIDI Command Station from Peavey is a work surface that outputs MIDI controller data and can be used for digital workstations (including Pro Tools 4.0), sequencer control, or remote MIDI editing of synths with unfriendly front panels. Sixteen programmable faders are provided on the PC 1600x, and they can be assigned to transmit any continuous controller such as volume, pan, or modulation. They can also be programmed to transmit a MIDI String such as channel system messages or system exclusive messages.

Below each fader is a programmable button that may be assigned to messages such as program change, note on/off, fader mute (or solo), MIDI String (upon button press and release), or even send fader or send scene. One of the cool things about being able to use the button for "send fader" is that you can set the fader to a specific value without actually transmitting that value. When the button is pushed, the MIDI value is sent. If the button is held, the fader works normally. This type of control can allow you to instantly make drastic MIDI volume changes while mixing from one section of a song to the next section. Any fader may be a master over other faders for grouping purposes. In addition to the faders and buttons, the PC 1600x also provides a data wheel that may linked to a fader and used to transmit a MIDI value. Up to 100 fader scenes may be stored and recalled.

Busy synthesists will appreciate the fact that the PC 1600x can transmit a programmable setup string each time one of the presets is selected. The string can include bank select, program change, and volume setting for all 16

continued on page 145

World Radio History

Exclusive In-Studio Report:

Alesis M20 ADA

World Radio History

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20-BIT AT Recorder

BY ROGER NICHOLS

Alesis M20 20-BIT ADAT Recorder

Just when high-ticket digital audio stepped up to 24-bit multitrack recording to further widen the gap from 16-bit, Alesis responds with the model M20 — a 20-bit version of the ADAT. The M20 remains completely compatible with the earlier 16-bit ADAT format, now called ADAT Type I. Twenty-bit tapes, however, can only be played back on Type II machines such as another M20 or the Studer V-EIGHT ADAT Type II format machine (see sidebar).

You can sync M20's with any previous ADAT format machine, which means that you can have some 16-bit machines and some 20-bit machines recording in the same session. If you play a Type I tape in an M20, it will automatically detect the tape format and perform all operations in 16-bit mode. When you format a new tape, you have the option of selecting 20-bit or 16-bit formatting. A 16-bit formatted tape will play on any existing ADAT format machine.

The optical output of the M20 sends out all eight channels in full 20-bit mode. If the destination of the optical cable is a 16-bit ADAT, then the channels coming from the M20 can be dithered to 16 bits, resulting in a better recording than if it was originally recorded on the 16-bit ADAT.

SMPTE/EBU

The M20 was designed for professional timecode applications. RS-422, timecode, word clock, and video reference jacks are located on the back panel so you don't have to use any card options or external adapters to chase or generate timecode. Timecode is printed to a subcode area of the tape so you can have discontinuous SMPTE recorded without using up an audio track. The M20 operates at any frame rate at either 44.1k or 48k sample rates.

The MIDI In jack on the rear panel enables you to control the M20 with MMC (MIDI Machine Control) commands from a sequencer without an external box. No BRC and no AI-2 needed here. Any slave ADATs or ADAT-XTs will follow right along.

SNEAKING UP FROM THE REAR

As long as we are at the rear panel of the M20...You will find the standard ELCO connector used in existing ADAT installations for +4 balanced connections to consoles and mic preamps. What you will not find are the 1/4-inch jacks for –10 hookups. Instead you will find XLR connectors with +4 balanced I/O. You will notice that timecode I/O is also XLR. This ensures that you will not get SMPTE leaking into the analog inputs because of a nonbalanced SMPTE connection. There is also an RJ-45 connector for connection to an external controller and remote meter bridge. Plus, there is an expansion slot on the rear panel for an AES I/O card that will allow direct AES interface without an external converter.

Speaking of input connectors, behind those XLRs are separate 24-bit, 64x oversampling A/D converters and 20-bit, 128x oversampling D/A converters for each channel. Twenty-four-bit converters are used to gain better linearity at the 20-bit level. Twenty bits is only 25 percent more bits than 16 bits, but you have to remember that every bit doubles the resolution, so 20 bits is 16 times the resolution of 16-bits. Put that in your pipe and smoke it!

The M20 machines offer a new remote called the CADI (Controller Autolocator Desktop Interface) that can control up to eight M20's. The CADI has a jog wheel for scrubbing machines, and any M20 can be taken offline by the remote. The remote meter bridge will display the metering for up to four M20's. There are also error indicators for each machine to indicate drop outs or other error problems.

A LOOK AT THE FRONT PANEL

Every button function known to man is on the front panel of the M20. Transport controls, input/record select, synchronization controls, timecode generation, locate points, punch-in/punch-out points, offsets, locate times, and lunar phases on Io [the second satellite of Jupiter] can be controlled from right here. You can even have two digital inputs and the rest analog if you want.

There is a high-resolution meter mode that enables you to calibrate the record levels anywhere from –20 dBFS to –10 dBFS within 0.2 dB. What more could you ask for?

The M20 has an AUX track for recording analog audio so that you can scrub with the built-in jog wheel to locate edit points or punch points accurately.

INSIDE

Did I mention the new transport? Direct-drive capstan, direct-drive, full-servo reel motors with no idler wheels or brake adjustments, built-in tension

MANUFACTURER: Alesis, 3630 Holdrege Avenue, Los Angeles, CA 90016. Tel: 310-558-4530. E-mail: alecorp@alesis1.usa.com.

APPLICATIONS: Full 20-bit professional digital recording.

SUMMARY: More than just another ADAT, this is a big time rework from the ground up. Yeah, it costs more, but since when does better cost less?

STRENGTHS: Built-in SMPTE chase; true 20-bit recording; XLRs; individual input selection; more.

WEAKNESSES: I'll let you know when I find 'em.

PRICE: $6999 **EQ FREE LIT. #:** 137

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SO WHERE DID YOU WANT THAT CABLE PATCHED TO?

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Alesis M20 20-BIT ADAT Recorder

sensor arm so the tape tension remains constantly under computer control, twin tachometer output for computer monitoring of reel status, and automatic head cleaning. It is the fastest VHS transport I have ever seen!

One more thing, the operating software is in flash ROM, so any future updates can be done via e-mail and dumped in through the MIDI port. Cool, huh?

PUT TO THE TEST

The only way for me to tell how a piece of gear is going to operate under professional working conditions is to throw it into a full-fledged working environment. So, I had four M20's sync'd together for 32 tracks of 20-bit recording. The gig? A new Bela Fleck & The Flecktones album recorded in Nashville. We fed everything under the Sun into the M20's. Everything from custom Neumann U67's to Sony C800-G mics fed through Avalon, MTI, and GML mic preamps, to digital input from Apogee AD-8000 24-bit converters, to optical feeds from a Yamaha 02R. Monitoring was done digitally through the 02R feeding Meyer HD-1's and Sony MDR-7506 headphones.

We recorded 12 hours a day for six days and consumed 100 rolls of ADAT tape. We recorded 14 tunes with about 17 full takes per tune. At one point we added an original ADAT with the 4.01 update to the stack. It sync'd up and performed flawlessly, although somewhat slower in locating speed.

Bela, the band, and I spent quite a bit of time (about 20 bits to be exact) lis-

continued on page 144

YES
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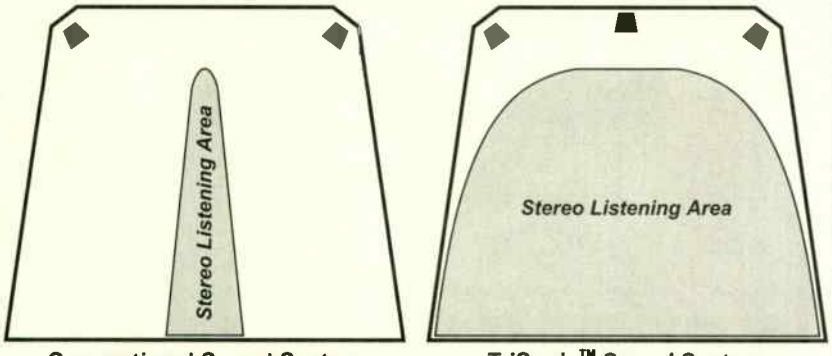

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STUDER V-EIGHT 20-BIT DIGITAL RECORDER

As EQ readers know, Alesis and Studer have entered into a technical alliance on the development of the 20-bit ADAT. Studer, though, as might be expected, offers some differences in its model — the Studer V-EIGHT. Studer has provided EQ with a first look at those differences.— H.G.L.

1. The V-EIGHT has a built-in mixer on the front panel, allowing you to mix up to 64 channels and send them out via the AES option or analog outputs.
2. Studer uses its own 24-bit converters (used in the Studer D-827 48-track digital machine).
3. Input and output level controls are available via trimpots next to each XLR connector on the rear panel.
4. All buttons on Studer's remote are lit for easy reading in dark studio situations.
5. The remote is powered from the machine and requires no additional power supply.
6. The chassis of the remote is aluminum.
7. Price: $8495.

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"The Furman IT-1220 is the easiest way to improve the professional level of your whole studio."

— Richard Dodd, Grammy® winning engineer/producer

Balanced POWER

"The Furman IT-1220 Balanced Power Isolation Transformer gives every piece of modern recording equipment the capability of operating at its personal best. I have experienced at least a 6 dB improvement in the noise floor of my already quiet studio.

I now have three IT-1220's at Vital Recording so that every piece of equipment can benefit from running on balanced power."

Three IT-1220's paired with three AR-1220 Voltage Regulators visible under the floor at Vital Recording.

That describes the experience of the well-known producer Richard Dodd, at his Nashville studio. Dodd has engineered for the Traveling Wilburys, Bob Dylan, Tom Petty, George Harrison, Joan Baez, and many others.

The use of balanced AC power can make an enormous difference in your own system's noise, too. One IT-1220 can supply your facility with 20 amps of 120/60V single-phase balanced AC power, using the common-mode cancellation effect to drastically reduce hum and buzz caused both by ground currents from power supply filtering and by radiation from AC supply cables. In turn, this can reduce the need to adopt cumbersome and expensive star-ground systems or use massive bus bars or heavy ground rods. There is no need to "lift grounds" or compromise the integrity of safety ground wires to achieve hum reduction. Furthermore, balanced power is safe and legal. It is now recognized for technical power applications in the US National Electrical Code (Article 530). And the IT-1220 itself is UL listed.

The IT-1220's heart is a specially wound and shielded toroidal isolation transformer with a center-tapped secondary, allowing the AC power to be balanced at its source. The current-carrying wires are no longer "hot" (120V) and "neutral" (0V), but two 60V lines of opposite polarity (referenced to the safety ground connected to the center tap), whose difference is 120V.

The IT-1220 provides 14 balanced outlets (two front and 12 rear) and includes an accurate, self-checking "smart" AC voltmeter, an Extreme Voltage Shutdown circuit, and a "Soft Start" circuit to prevent large inrush surge currents.

Contact Furman, the pro audio and video industry leader in AC power products, to find out more about how your installation can enjoy the same reduced noise levels that Richard Dodd experienced.

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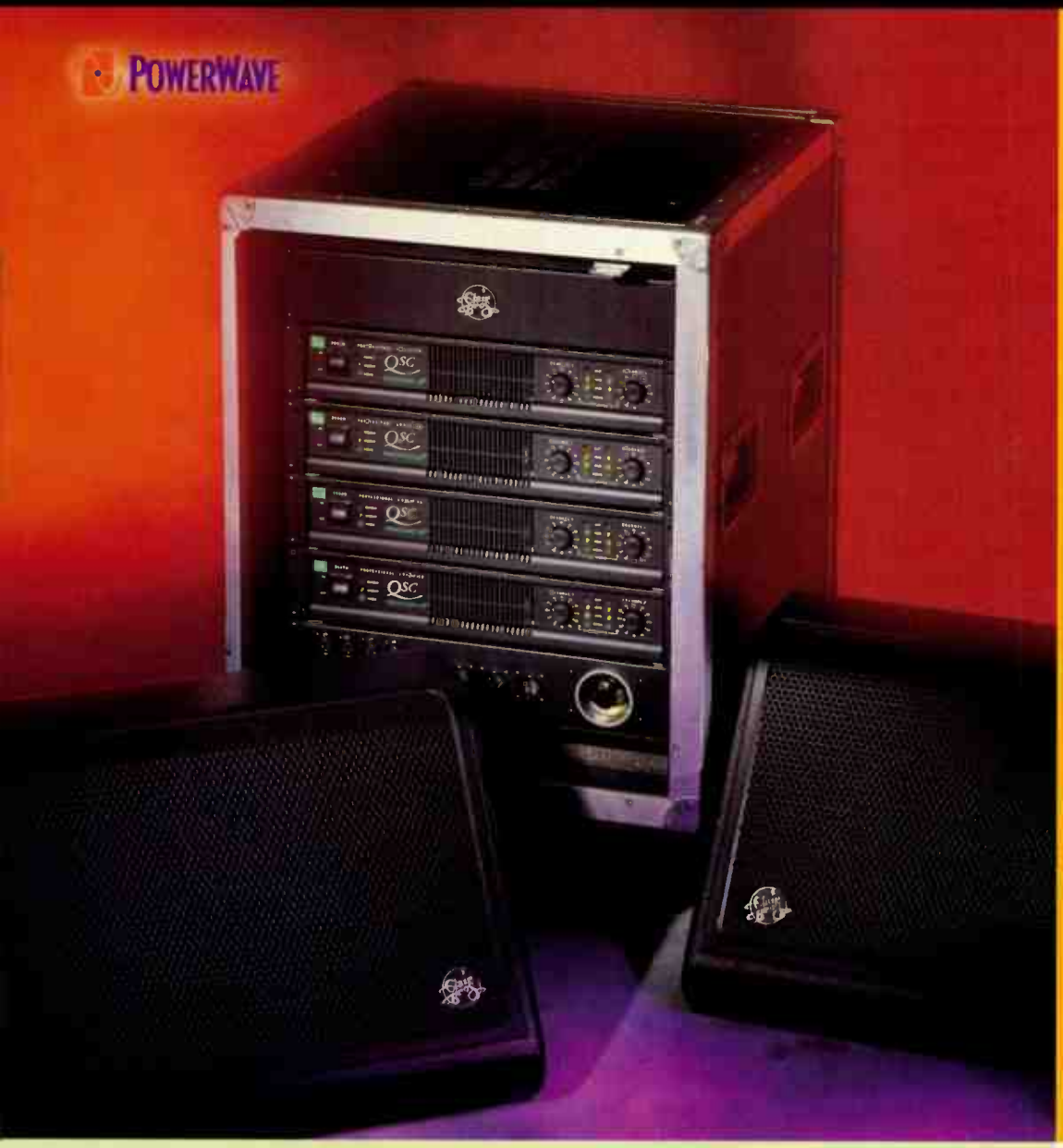

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This spring, Clair Brothers Audio added the QSC PowerLight™ 2.0HV to their touring inventory for use with their 12AM Series monitors. During their busy summer touring season Clair received positive feedback on the PL 2.0HV's great sound and, best of all, experienced no field failures. With remarks like these and the backing from a company who's been supplying power to top professionals for over 30 years; it's no wonder the PowerLight™ 2.0HV is shaping up to be a great amplifier for Clair Brothers.

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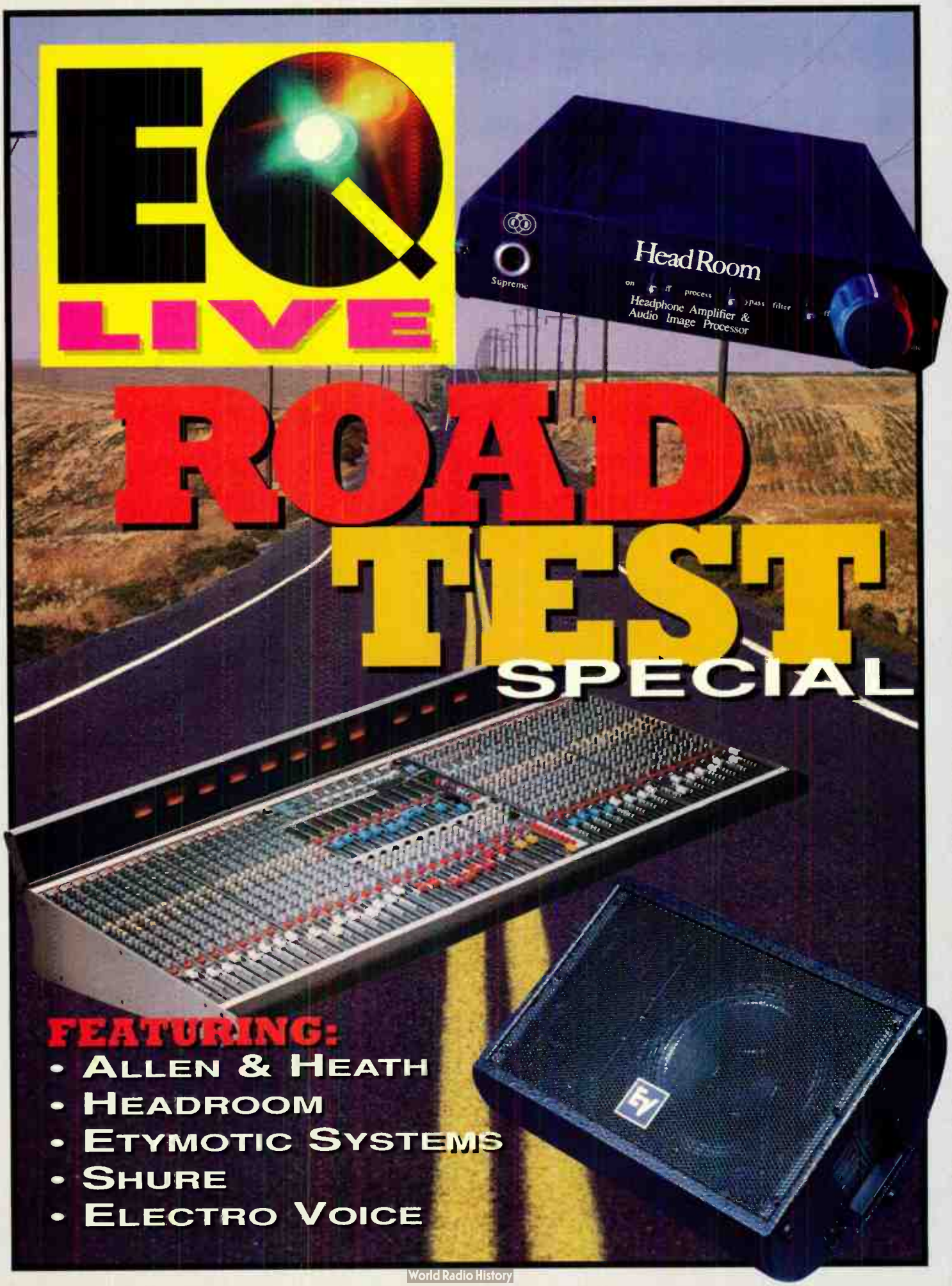

World Radio History

ALLEN & HEATH GL4000 CONSOLE

By MIKE SOKOL

Each mixing console has its own personality — some are easy to use while others seem to require some sort of sacrifice to properly route the signals. I had used some Allen & Heath small format consoles in a variety of rental situations over the past year and really liked the ergonomics and EQ of the design — both important points on my list of mixing board likes and dislikes. Therefore, when I saw some literature on the new GL4000, I knew I wanted to try one, especially since I had a number of large shows to engineer over the summer months. After a few e-mails to England and talks with *EQ*'s review Czar, Hector La Torre, I was put in touch with the boys on this side of the pond and shipped a GL4000 in 40-channel configuration. Of course, this happened right in the middle of the UPS strike, which had my demo console in a holding pattern on some truck for an extra week before arriving on the dock. Good thing it wasn't repair parts for a heart-lung machine.

The Allen & Heath GL4000 offers a lot of performance in a relatively small package. Features on each input channel include 10 auxiliary sends, a 4-band sweepable EQ with selectable Q on the midrange controls, variable low-pass filter, phantom power, phase reverse, and a mic/line selector that doubles as a 20-dB pad and allows line-level inputs on the XLR connector. Bus structure includes 8 subgroups, plus separate Left, Right, and Mono busses from each input strip. Each input strip and subgroup also has a 5-step LED level indicator to help you set the proper internal levels for maximum headroom with the least noise. In addition, four of the channel strips are stereo units, which allow you to return stereo effects without hogging extra input channels. You can use these as line-level returns without giving up the mic preamp. Channel mutes are un-

ROAD TEST

MANUFACTURER: Allen & Heath USA, 8760 South Sandy Parkway, Sandy, Utah 84070. Tel: 801-568-7660. Web: http://www.Allen-Heath.co.uk.

APPLICATION: Dual-function mixing console for front-of-house or monitor positions. Also allows for live recording on 2, 8, or 24 to 48 tape tracks.

SUMMARY: Affordable 8-bus board with major console attributes. Available in 24-channel base configuration. Modules can be added in groups of 8 channels for up to 48 inputs total. Meter bridge is optional.

STRENGTHS: Musical EQ and substantial headroom make this an easy board to use and like; solid ergonomics make it simple for guest engineers for use.

WEAKNESSES: Faders have a rough feel when new, but do smooth out with use.

PRICE: $8995, 24-channel basic unit; $2695, 8-channel expansion module; $949 to $1349 (depending on frame size), optional meter bridge.

EQ FREE LIT. #: 138

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der MIDI control, allowing you to store and recall up to 128 snapshots of channel mutes, eight of which are controlled by "hot" keys.

Basic structure aside, the GL4000 is a dual-function console. This means that it can be easily configured as a straight FOH (front of house), monitor, or combination FOH and monitor console. Plus it has some neat tricks for live recording (more on that later).

Here's the dual function part: Each of the auxiliary sends has a small subpanel switch that "flips" it with the subgroup fader. What this does is allow you to use the big group faders and level indicators for monitor control. On the back panel, you now get XLR sends for the monitor amplifiers. And if you properly hook up equalizers in the insert path, you now can monitor EQ changes in your headphone or cue wedge. The cue wedge function is selected by a subpanel switch next to the Mono fader. This means you can reconfigure the board from a straight FOH 48-channel stereo board with four matrix mixes and ten auxiliary sends per channel to a properly configured monitor board with ten discrete mixes plus a cue wedge in under a minute. Or you can set up four, six, or eight monitor sends, reserving the balance of the auxiliary sends for effects. This is especially useful for the type of shows I normally mix, which may need four or six monitor mixes, but only one or two FX mixes.

Additionally, all of the Allen & Heath boards have the mute switches *properly* placed in the signal path. That is, they mute everything on the channel strip. As factory configured, the auxiliary sends are post EQ and mute, and can be selected as post- or prefader from the front panel, depending on your usage. This allows you to set up a monitor mix that is post EQ, but prefader, meaning that the equalization you apply to the guitar pickup will be heard by the musician (desirable) but any level changes you do for the audience won't be. Then when you mute the channel, all of the monitor and FX sends are also muted, eliminating open mics and nasty surprises when the acoustic guitar is set down next to a monitor speaker. Very few live consoles are laid out this way, which if properly implemented, allows the opening act to be set up and completely muted without touching any of the aux levels or assignments. For other applications, a variety of fader, mute, and EQ paths can be selected via internal jumpers on each input strip.

The previously mentioned live recording functions include two very useful features: Auxiliary send level 10 can be pre- or postfader routed to direct outputs, which can drive a single channel of a multitrack recorder. With three or four ADATs in a rack, you could do a live 24- or 32-track recording without the need for a separate mic splitter or console. You also get eight additional assignable pre- or postfader group sends, which can be used to record to a single 8-channel deck. Because these can be assigned prefader, you eliminate having to fight the live-mixing actions when you're in mix-down mode. (This is nice for Alesis ADAT decks, which don't have any input level controls.) To top it off, you get a set of stereo tape outputs, allowing you to go directly to DAT or cassette for a check tape. This can be done very painlessly at a moment's notice. I'm sure you've all had an act decide they need a performance recorded at the last minute. On the GL4000, you can do it without breaking your stride.

I used the GL4000 in a number of live situations, some with guest engineers. First up was the Maryland Symphony Orchestra at Municipal Stadium in Baltimore. With some 70 musicians on stage, we used every input channel we could get, including the tape playback as a reverb return. If you think you need headroom for a rock act, wait until you get 48 mics going at the same time and a big crescendo hits. Not to mention that the orchestra crowd doesn't want to hear excuses about background hiss or distortion. (Don't even consider feedback, you'll never make it out alive.) Their engineer thought the EQ was a little "quick" for his taste, but I was able to briskly follow his instructions and "warm up the timps" or "notch out a viola note" as needed.

Next up was the Turtle Island String Quartet. These guys did everything from Mozart to Hendrix using Crown GLM mics and various direct pickups on their instruments. Their engineer was really impressed with the EQ section of the board, and didn't bother to patch-in his rack of parametric EQ he usually used. Plus the whole system was so quiet I had to stick my ear up to the speakers to see if the amps were turned on. I would have loved to record the act, but label contracts prevented me from rolling tape.

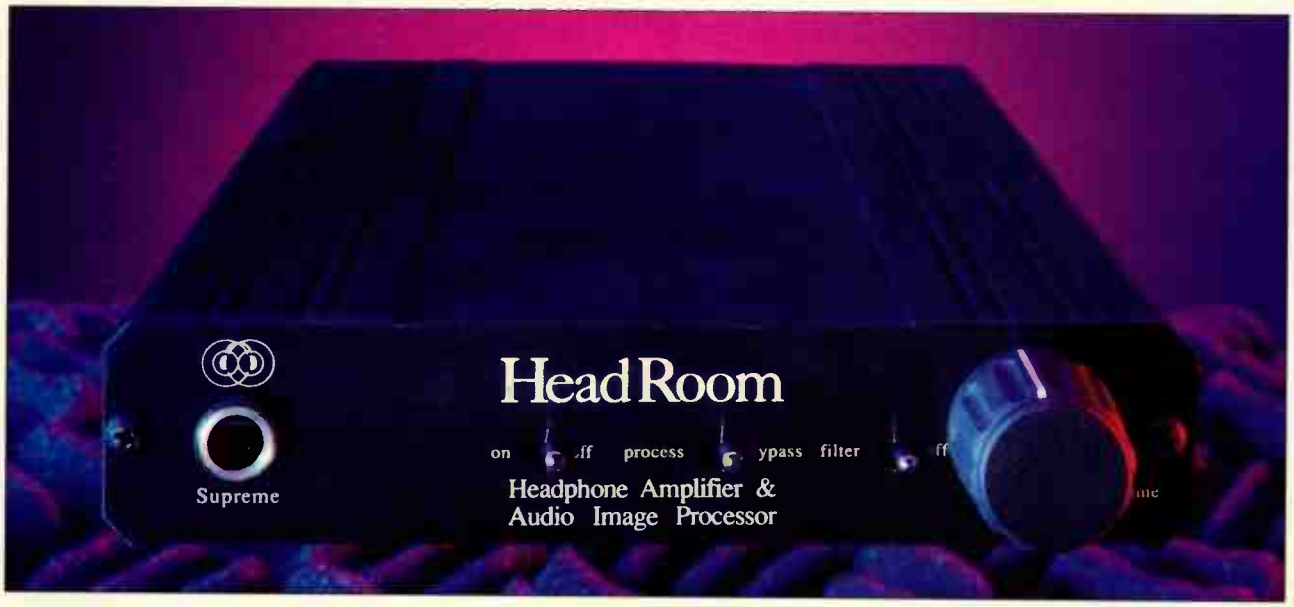
Finally, we did a show for Chumbawumba on the streets of Washington D.C. where we did a stealth soundcheck and rather short show before the sound police shut us down. Because we didn't want to attract undue attention before the show, most of the configuration had to be done offline and muted before the main speakers were turned on. I did some quick front board patching during the first song on the fly, which was pretty handy. The board layout would be good for summer festivals, where you never get a soundcheck and rarely get an input list. You usually just set mics as the band walks onto the stage and "lets it rip."

Did I like everything about the GL4000? No, there were a few gripes. On the top of the list was the somewhat rough feel of the faders. They did, though, seem to get smoother after a few hundred passes up and down (other well-used A&H rental boards I've mixed on didn't exhibit this problem). So I can only assume that the burnishing action of using them will make the faders smooth out after a few weeks of use. Secondly, a few of my traveling crowd of critics didn't like the color scheme, saying it reminded them of a board from the '60s. It doesn't have the slick, black "Vader Look" of other current consoles, but you can pick out the various controls easily in dim light, and in my mind "beauty is as beauty does." And, lastly, the fit and finish showed minor manufacturing flaws. Note that this is in direct comparison to a Yamaha PM4000, which does cost around $50,000 more than the GL4000 and weighs an additional 600 pounds for a similar number of channels. Surprisingly, for as light as it is — around 160 lbs. for a 40-channel version — the chassis feels very rigid, without any flexing or bending.

The GL4000 is excellently laid out and offers musically useful EQ and lots of configuration options that should allow you to keep it out on the road and making money for you. It's quiet enough to record with, but seems to have plenty of headroom for handling live surprises without bailing out. For the money, this board is an excellent performer for both FOH and monitor world positions. It should take to the road like a duck to water. EQ

World Radio History

Headroom Supreme Headphone Amp & Etymoptic Research ER-4S Earphones



By **GARY DAVIS**

How can you expect to hear what you're recording when the (loud) rock band is playing in the same room?

It's not easy to mix a live recording in the same room where the band is playing. Especially when it's with a minimum of gear and you're trying to stay out of the band's (and harm's) way. The headphone output on most portable recorders isn't loud enough to hear over the super-amplified music from the PA, and traditional "isolating" headphones, such as Sony MDR-V6, MDR-7506, and Koss Pro-4A, provide just enough isolation to barely hear your recording, but not enough to seriously judge the sound.

Let's look at two products that may help you solve the monitoring problem: the Headroom Supreme headphone amplifier and the Etymotic ER-4S high-isolation, personal monitors, both available from Headroom Corporation.

VOLUME!

Headroom Corporation, a group of audiophiles tucked away in Montana, have made a name for themselves by producing high-quality headphone amps designed to extend the pleasure of CD listening. I checked out their least-expensive battery powered amp, the Headroom Supreme ($449), to see how it would perform in real-world concert taping.

HEADROOM SUPREME

The Headroom Supreme is a small, thin, deep box (5 1/4" W x 1" H x 6 1/4" D) that weighs just one pound, not including four size "D" batteries, which weigh more than the amp and require Headroom's optional battery case ($25). Headroom also sells a high-quality, multi-compartment travel bag

ROAD TEST

MANUFACTURER: Headroom Corporation, P.O. Box 6549, Bozeman, Montana 59711. Tel: 800-828-8184 or 406-587-9466. Web: http://www.headphone.com; E-mail: heydude@headphone.com. Circle EQ free lit. #139

Etymotic Research, 61 Martin Lane, Elk Grove Village, IL 60007. Tel: 847-228-0006. Circle EQ free lit. #140

APPLICATION: Critical monitoring, especially at live gigs.

SUMMARY: Audiophile-quality headphone amp; in-ear, high-isolation earphones for use during live recording at concerts, rehearsals, and live broadcasts.

STRENGTHS: Earphones provide good isolation and great sound.

WEAKNESSES: Amp could be louder for some situations.

PRICE: Headroom Supreme Headphone Amplifier, $449; four-D cell battery holder, $25; travel bag, $129.

Etymotic ER-4S earphones, $330; combo pack of all above items, $859. (*Note:* Headroom products are sold only through the manufacturer, so there is no discount from published prices.)

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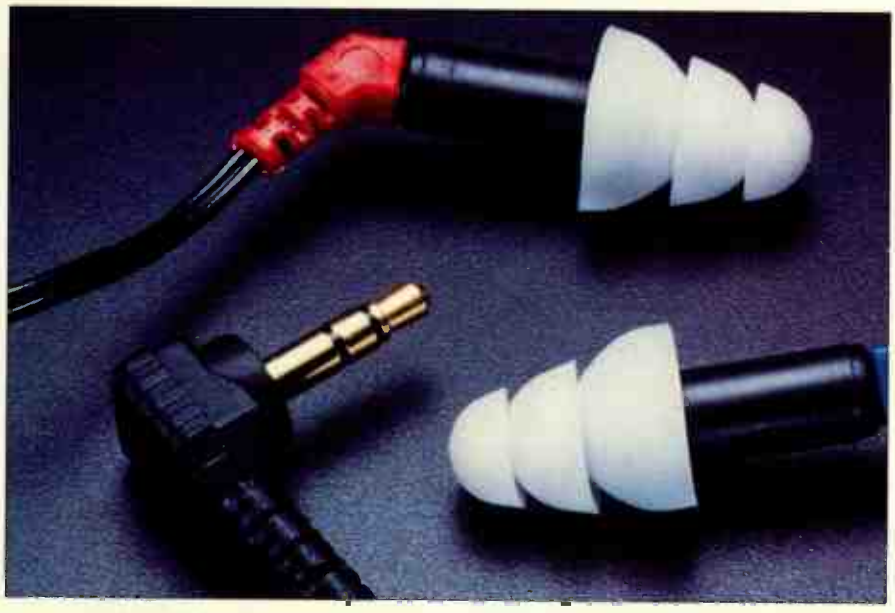
($129) that holds the amp, batteries, a small portable DAT recorder, and the Etymotic earphones. A complete system with the amp, battery case, travel bag, and the Etymotic ER-4S earphones is available for $859.

The headphone amp provides a 1/4-inch stereo headphone jack on the front and recessed RCA inputs on the rear. You'll need a dual-RCA/1/8-inch stereo mini cable to connect it to the Line output of most portable recorders, and an 1/8-inch/1/4-inch headphone adapter for most portable headphones. The front panel also contains a single stereo volume control and mini-toggles for Power, Processor, and Filter. Processor and Filter engage proprietary circuits to reduce the "headphone effect." Since I was interested in using the Supreme as a straight amplifier, I left these switches off.

As supplied, the Headroom Supreme has modest gain designed for listening to a high-output portable CD player through typical headphones. CDs are always recorded at full level (0 dB), but when doing field recordings, you may sometimes work at lower levels. Headroom offers a special "High-Gain" modification to the Supreme, so I tested both versions.



QUIET, PLEASE: Cut out as much room noise as possible by using Etymotic's ER-4S earphones.

EFFORTLESS

One word describes the sound of the stock Supreme amplifier: "effortless." The amp added absolutely no hiss or noise and wouldn't distort even at full volume. The output volume, however, was just loud enough for typical recording applications when the recording level was close to 0 dB (Sony D8 line output) and the band was playing in the same room. When using the Supreme in a live ADAT session, with some tracks considerably softer, the Supreme's gain was insufficient to hear the tracks.

Enter the High-Gain version of the Supreme. This amp provides 6 dB more gain, which is very useful for checking low-level recordings, but it can be easily overloaded by turning the volume all the way up. I measured the maximum undistorted output at 250 mW into 72 ohms (350 mW into 8 ohms). This isn't significantly different from the "$1.19 Headphone Amp" construction project I described in the November issue of *EQ*, though the Headroom Supreme does sound better. The High-Gain mod cannot be done by the end-user, though Headroom will perform it for free.

Headroom's 4-D battery holder is an oddly home-brewed affair, made out of a tough plastic "fishing tackle" box that doesn't cup the batteries like a traditional Radio Shack battery holder would. I found it quite unreliable (the amp *never* worked without fiddling when I arrived at gigs). Headroom suggested mounting it upside down in the travel case, so that less weight was on the delicate brass terminals. This seems to solve the problem, but as a $25 "necessary option," the battery holder seems ill-conceived to me. Also, there's no "power" light on the Supreme amp and the switches are awkward in dim light. With its high-current DC-to-DC converter, the Supreme will run down the batteries if you're not careful. Otherwise, battery life is quite good: I used the Supreme at ten shows on one set of batteries (and killed them off in one night when I left it "on").

This amp provides a good solution to headphone volume, though I can't honestly say it's the cheapest, smallest, or loudest solution. It may be the best-sounding amp, within its power and gain limitations, and if the price doesn't scare you off, its audiophile pedigree certainly doesn't hurt. For live recording applications, you should definitely order the High-Gain version.

HEARPLUGS

When monitoring a recording at a live show, volume is only half the problem. No matter how loud you drive the headphones, if you can still hear any music from the room "directly," you won't be able to properly judge your recording.

The Etymotic Research "Canal Phone" ER-4S in-ear earphones attempt to solve this problem by mounting high-quality transducers inside triple-flange rubber earplugs. The final connection — inserting the "hearplugs" into your ears to make a tight seal — reduces outside sound 20–25 dB and produces a tight, clean bass that most other headphones can't touch.

The Etymotic ER-4S's are remarkably small and light. The entire assembly, with two earphones, cord, and 1/8-inch stereo miniplug, weighs just one ounce and can fit inside a 35-mm film can. They produce just enough volume, when plugged directly into the "Line" output of a Sony D8 DAT recorder, to monitor a show peaking near 0 dB without extra amplification. For best results and maximum flexibility, however, I recommend an additional headphone amp.

The Etymotics clearly provide better isolation and bass than headphones like the Sony MDR-V6's. Their sound is so immediate and true, shot directly into your ears, that it's easy to be fooled into think-

World Radio History

ing you really are hearing only your own mix. Unfortunately, 20–25 dB of isolation isn't much when you're in a 100-dB+ soundfield, so you'll still be hearing a significant amount of room sound with the Etymotics in place. This problem can be solved, to a large extent, by wearing over-the-ear hearing protectors ($15–$30 at sporting goods and gun stores) over the Etymotics. The results are not particularly comfortable — the Etymotics transducers stick out as well as down — but the isolation is quite excellent, with only the slightest dull thud of room sound leaking through. (The Thunder 29 Ear Muffs ($29) offer good isolation, are more comfortable than most, and fold up for easy toting.)

MANUFACTURER'S SPECIFICATIONS

Headroom Supreme Headphone Amp

Output Power: 500 mW at 50 ohms
Distortion: .005% (limited by noise spec)
Gain: 4X: 1 V in, 4 V out (standard version)
S/N: –90 dB at 1 V
Current Draw: 400 mA idle, 420 mA full power
Battery Life: Approx. 20 hours/w 4 D alkaline cells
Measured: 250 mW before audible distortion at 72 ohms
Size: 5 1/4" W x 1" H x 6 1/4" D
Weight: 1 lb. (w/out batteries)
Complete System in Travel Bag: 3 3/4 lb., 10" W x 4" thick x 9 1/2" D

ER-4S Earphones

Frequency Response: 20 Hz–16 kHz, ±4 dB (to curve, which provides a slight high-frequency rolloff to compensate for the close proximity of the transducers)
Impedance: 100 ohms nominal
Sensitivity: 108 dB SPL at 1.0V input; 98 dB SPL at 1 mW
Maximum Level: 115 dB SPL at 3.0 V RMS input
Weight: 1 oz w/cord and plug
Cord: 4 feet, 1/8-inch stereo mini-plug, 1/4-inch adapter supplied

It is, of course, also possible to have an audiologist make custom ear molds to fit your ears more precisely, but the manufacturer states this is mainly for comfort, and doesn't significantly improve the isolation.

The main problem I encountered using the Etymotics was their stethoscope effect — even the slightest rustling of the cord — and any noises from inside your head (crabcakes, anyone?) seem enormously amplified. When monitoring loud rock music, this wasn't really a problem, but for their intended use (music appreciation in varying environments), it could be a major distraction.

SUCCESS!

The Etymotics sound great, producing a full-range, accurate sound. The combination of Etymotic ER-4S earphones, over-the-ear hearing protectors, and the Headroom Supreme amp will provide the most accurate, most isolated monitoring you can achieve when in the same room as the music you're recording. For a lot less than a recording truck, albeit on the lower end of the scale, these products provide a real solution to the mobile recording engineer's biggest problem. EQ

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ROAD GEAR

Spirit by Soundcraft LX7

LUCKY SEVEN

Spirit by Soundcraft's new LX7 sound reinforcement console can handle a variety of live mixing tasks. The LX7 is available in either 16- or 24-channel frames and offers a maximum of 32 inputs with seven separate bus outputs. With the inclusion of direct outs on the first 16 mono inputs and six auxiliary busses, the output count rises to 29 on the 24-channel board. Each mic input uses Spirit's UltraMic preamps, which provide 60 dB of gain range and 22 dBu of headroom. There are also channel inserts and direct outs on the LX7's first 16 inputs. Find out more by calling Spirit by Soundcraft, 11820 Kemper Road, Auburn, CA 95603. Tel: 916-888-0488. Circle EQ free lit. #141.

BIG BOTTOM

Loaded with two 18-inch RCF L18P300 woofers, the TX9S subwoofer from Yorkville is designed to handle 1200 watts of power. The sub boasts a frequency response that ranges from 35–130 Hz and a sensitivity of 97 dB (1W@1M). Features include: two Speakon parallel inputs, 3/4-inch Baltic birch construction with two fixed wheels. Yorkville's TX Systems incorporate single space 19-inch rack-mountable multi-channel, self-calibrating processors with limiting and power amp sensing and include balanced XLR inputs and outputs. The TX9S carries a suggested retail price of $2149. For more details, contact Yorkville Sound, Inc., 4625 Witmer Industrial Estate, Niagara Falls, NY, 14305-1390. Tel: 716-297-2920. Web: www.yorkville.com/netwerks. Circle EQ free lit. #142.

Yorkville TX9S

POWER TRIO

Audio-Technica has unveiled three new live performance mics: the ATM23HE snare drum mic, the ATM87R Hi-SPL boundary mic, and the ATM89R handheld condenser mic. The ATM23HE is a wide-range, moving coil dynamic mic that is primarily designed for snare drum pickup. It has a hypercardioid polar pattern and a low-profile design. The ATM87R is designed for kick-drum applications and is a unidirectional condenser boundary microphone. The ATM89R is a hypercardioid model that features an interchangeable element design that permits the use of a number of additional polar patterns. For more information, contact Audio-Technica, 1221 Commerce Dr., Stow, OH 44224. Tel: 330-686-2600. Circle EQ free lit. #143.

A-T ATM23HE

THAT'S YOUR Q

Peavey's Q Factor 2212 and Q Factor 218 are the company's newest high-performance flying enclosures for permanent installation applications. The Q Factor 2212 uses two 12-inch neodymium mid-bass drivers in conjunction with an A/A™ 4000F ferrofluid-cooled, high-frequency compression driver. The 2212 also uses a high-frequency horn, which, combined with the A/A 4000F, yields a frequency response from 120 Hz to beyond 17 kHz, ±3 dB. The Q Factor 218 is the subwoofer to mate with the 2212. It has dual 18-inch neodymium woofers in a 7-cubic-foot vented enclosure. For more details, contact Peavey Electronics Corporation, 711 A Street, Meridian, MS 39301. Tel: 601-483-5365. Web: www.peavey.com. Circle EQ free lit. #144. EQ

Peavey Q Factor

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Our customers' comments

"Ghost is Killer! Classic fat British EQ like you've always dreamed of. And the faders are awesome...the taper on them is as smooth as anything I've ever used. Incredible. Ghost has just about everything I look for in a quality console; great tone....great feel...looks...even the name! I'd swear you custom made this for me. I could not have picked a better console for sound, features and feel."

Geno Porfido, Boulevard Recording Co. New Milford, NJ

"Other consoles I've worked with in the past just couldn't deliver the levels of punch and clarity I felt the music deserved. I never have this problem with my Soundcraft Ghost. The Ghost gives me the flexibility I need over a wide range of frequencies and has the body and warmth to really bring my music to life."

Johnathan Moffett, Drummer with Michael Jackson and Madonna

"After the first mix I did, I realised I was in a whole new league. This thing sounds beautiful. Very silky in the high end and full in the lows. The EQ is totally cool and the board has a quality feel to it. I know of nothing that touches it in its price range and I have been recommending Ghost for months to anybody who's looking for a console."

Garth Webber, Red Rooster Studio, Berkeley CA

"I've worked on many competing 8 bus consoles and none can compare to the Ghost in features, ergonomics and, most importantly, sound. The Ghost, simply put, sounds warm and musical - you don't have to work hard to get great sounding mixes on this board. The EQ is very flexible and we compared the mic preamps (using a Neumann U-47) to the Neve 1066s in our studio. We were very surprised at how favourably they compared to these megabuck classics."

Peter Thorn, What If? Productions.

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SHURE PSM 600 PERSONAL MONITOR SYSTEM

By **MIKE SOKOL**

CHECK OUT THE PERSONALS: Shure PSM 600's personal monitor system comes in either a hard-wired or wireless configuration.

I wish I had had a set of these when I was playing loud rock 'n' roll 25 years ago. As a keyboard player, I was tethered to my stack, so we tried experiments with various headphones and communication mics. It worked pretty well, but the bulk of the headphones made for a rather strange look on stage. Plus, you were basically called a wimp if you couldn't "take" the loud stage amplification. Times have changed, with many artists now accepting the fact that their ears are their livelihood. Too many shows with 120 dB SPL stages have left a lot of them deaf.

In-the-ear monitoring was a real revolution in monitoring. By placing a high-quality transducer in the ear canal, you could get as much volume as desired without the sound bleeding into other open mics. And they provided an airtight barrier to the outside, thereby attenuating the sound level of the stage — very useful if you were next to a loud drum kit or guitar amplifier. The only problem was price. The original wireless in-the-ear systems cost up to $20,000 per channel, which delegated them to only the largest tours.

Enter technology. Shure has introduced its version of an in-the-ear monitor system that they call PSM 600 (Personal Stereo Monitor). Available in both UHF and hardwired versions, the system provides great sounding in-the-ear monitoring at a price comparable with good floor monitors. Shure sent me both flavors, and operation is essentially the same with the exception of the RF section.

There are basically three parts to a wireless monitor system: [1] the RF transmitter, which accepts a line-level signal from your mixing board and converts it to a radio frequency; [2] a battery-powered beltpack receiver that demodulates the radio signal and provides level control; and [3] a set of tiny earphones that may be either personal (molded for your ears only) or universal (supplied with universal size foam plugs to fit anyone's ears).

The Shure transmitter is rack mountable with a "rubber ducky" an-

ROAD TEST

MANUFACTURER: Shure Brothers, Inc., 222 Hartrey Avenue, Evanston, IL 60202-3696. Tel: 847-866-2200. Web: http://www.shure.com.

APPLICATION: Universal or personal-type monitors replace or augment conventional floor monitors for live stage performance.

SUMMARY: Personal in-the-ear monitor system available in either hard-wired or wireless UHF versions. Supplied with universal personal monitors that can be personally molded.

STRENGTHS: Excellent quality sound and RF range; rugged construction should easily survive the road; supplied universal earpieces are good quality; MixMode allows musicians to mix themselves; dual-frequency selection allows you to minimize local interference.

WEAKNESSES: Price may be a little high for club acts, but certainly is a bargain compared to any professional floor monitor system.

PRICE: UHF RF system, $1590; hardwired system, $840.

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tenna. Shure makes a combiner that will sum the outputs of up to four transmitters into a common antenna. XLR/phone balanced inputs are used, allowing ease of hookup. Additionally, "loop-through" connectors are provided, facilitating multiple transmitter hookup. Stereo input meters and a separate headphone level control with 1/8-inch and 1/4-inch connectors on the transmitter itself is a nice addition that allows the mixing engineer to monitor the send to the musicians without affecting their levels.

The beltpack receiver is powered by a 9-volt battery and has an antenna along with level and pan controls on the outside of the case. Opening the battery compartment reveals a set of switches that allows you to select various options such as 1 of 2 UHF frequencies (out of a total of 5 pairs of frequencies available), high-frequency audio pre-emphasis, audio limiter, and stereo or MixMode. This last option is very interesting, since it allows the individual musicians to adjust their own mix.

Here's how it works: In stereo mode, the two signals put into the left and right inputs of the transmitter are routed directly to the left and right earpieces as might be expected. But in MixMode, the received signals are mixed to a mono signal and fed into both earpieces. If you send an instrument-only mix to the left channel and a vocal-only mix to the right channel, by adjusting the balance control, the musicians can fine-tune how much vocals or music they hear in the mix. Very handy.

The dual-frequency option is great since you can never predict if someone else will be on your channel. RFI happens. The receiver is made from metal that should withstand most stage antics. (In fact, the first thing I did was run across the lawn to test the range, and fell flat on my behind. Aside from my ego, no damage was done to me or the receiver unit.)

The in-the-ear monitors supplied by Shure are universal, with replaceable yellow foam adapters that can be used with various-sized ears. I found that while they provided a reasonably good acoustic seal, they weren't as comfortable or inconspicuous as my personal Garwood in-the-ear monitors. They did have a surprising amount of bass though, and playing bass guitar through them gave the startling impression of being thumped in the chest. Shure supplies information on how to get these universal monitors molded to your own ears for a modest price.

Finally, a non-RF version is available for a lot less money. If you're a keyboard player or drummer or maybe a guitarist that doesn't use RF, then this might be the way to go. Basically, it looks like a beltpack receiver, but instead of an antenna, a cable whip with XLR jacks are used for signal hookup. You just pop in a battery and go.

The overall sound of the PSM 600 system was excellent. I tried not only the universal in-the-ear-monitors, but also my personal Garwood earpieces and a high-quality set of headphones as well. The sound level could approach jet engine levels, so leaving the limiter engaged is a good idea. The high-frequency boost is around 10 kHz, which adds some "air" to the sound without that awful presence boost. If I were rockin' again, this is the personal monitor I'd take with me on the road. EQ

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RP583 Studio Tube Compressor/Limiter $700
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- RP520 Studio Tube Mic Preamp
- ADB3 Stereo Tube Direct Box
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World Radio History

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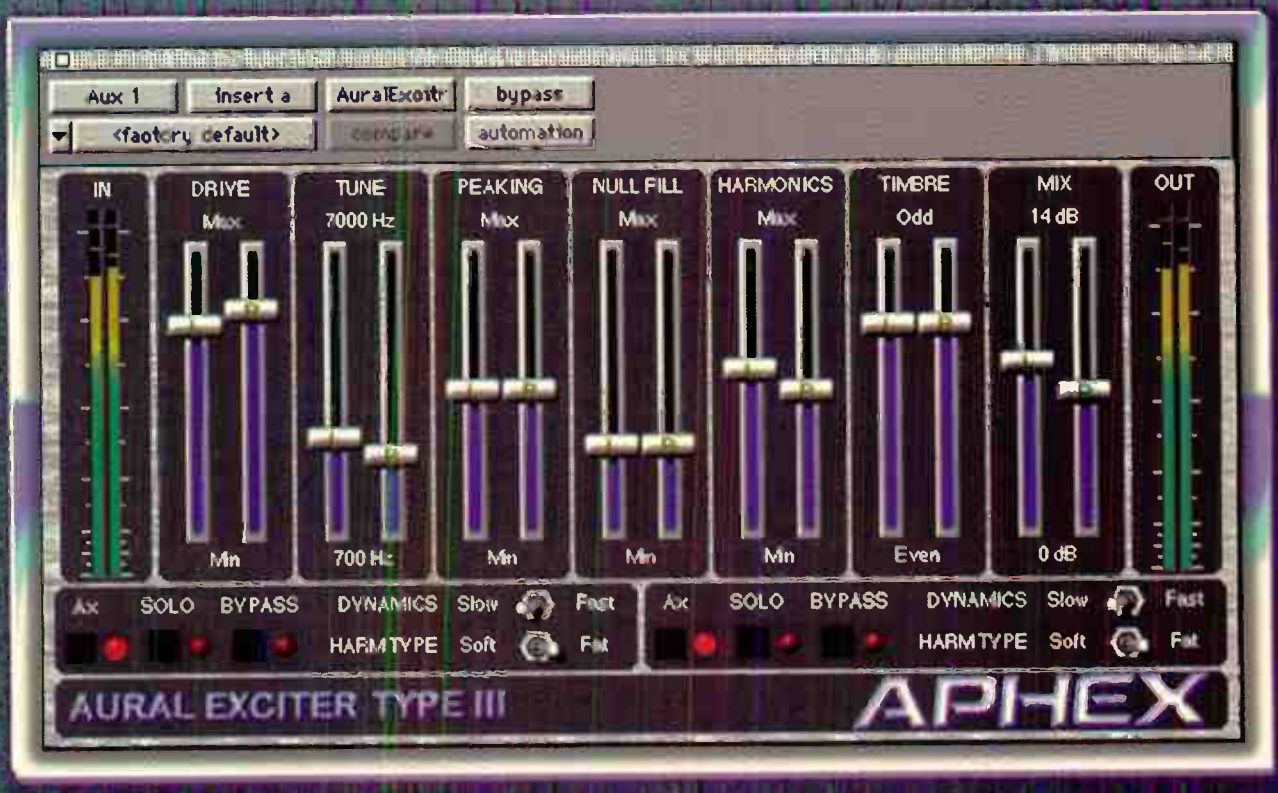

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ELECTRO-VOICE T221M STAGE MONITOR

By **MIKE SOKOL**

The Electro-Voice T221M monitor is a biamp-capable, two-way floor monitor with features that make it applicable to both weekend club musicians and sound professionals. The high frequencies are handled by a DH2T compression driver that Electro-Voice uses in its professional FOH systems. This 2-inch titanium-diaphragm driver is attached to a 80- x 55-degree constant-directivity horn. Protecting the driver from damage is the PRO [TM] power guard circuit. The bass frequencies are handled by a 12-inch, 400-watt woofer mounted in a Thiele-Small-designed vented bass enclosure.

The 49-lb. cabinet is constructed of 3/4-inch, 12-layer plywood bent into a curve for the back of the unit. The end panels are made from 13-ply birch, and the whole unit is covered with a sprayed-on textured black finish. Rubber feet are positioned for both the bottom and endplate of the cabinet.

Speakon 4-pole connectors are used for power-in and loop-thru. If you're currently using 1/4-inch phone speaker connectors, you can get adapters that will allow you to hook up a phone plug directly to a Speakon jack. If you're making new wires, though, do yourself a favor and change over to the Speakon connector system. It really works great.

The T221M uses a passive internal crossover at 2600 Hz, thus allowing a single amplifier channel to power it. It can, however, easily be converted to biamp mode by removing a panel and changing the position of a Molex connector. In biamp mode, you need to supply an external active crossover with a frequency of 1600 Hz or higher and a 24 dB per octave slope, as recommended by Electro-Voice. Power ratings are 400 watts long-term, 1600 watts short-term for the woofer; 60 watts long-term, 240 watts short-term for the horn. This rating is per EIA Standard RS-426A.

The T221M's sound is very smooth and vocally oriented, with even pattern coverage and some moderate boost in the 3 kHz and 8 kHz presence areas. This boost could be easily corrected with a 1/3-octave equalizer, but most musicians would probably appreciate this slight high-end boost. The bass

ROAD TEST

MANUFACTURER: Electro-Voice 600 Cecil Street, Buchanan, MI 49107. Tel: 616-695-6831. Web: www.eviaudio.com.

APPLICATION: Floor monitor speaker for front-line vocal and instrument monitoring.

SUMMARY: Low-profile 400-watt cabinet with 12-inch woofer and 1-inch throat horn with 55- by 80-degree coverage pattern.

STRENGTHS: Can be used in passive or biamp mode by changing an internal jumper; Speakon connectors make it compatible with professional sound systems; smooth dispersion pattern reduces feedback potential.

WEAKNESSES: No rigging points or floorstand mount.

PRICE: $1209 per cabinet.

EQ FREE LIT. #: 146

World Radio History

response was pretty impressive for a 12-inch driver in a small cabinet, but started dropping off below 100 Hz. This makes the T221M ideal for front-line vocals, but not useful as a drum monitor, where dual 15-inch woofers are usually specified. The low-profile, horizontal orientation of the cabinet gives the audience a better view of the performers, ridding the stage of the visual clutter of big, chunky floor monitors.

I used the T221M on a few live shows and, for a lark, in the studio. The first show featured the Turtle Island String Quartet (TISQ), where we set it up as a cello monitor. Now this was not your father's string quartet — these guys *rocked*. The cello had both a Crown GLM mic and a bridge pickup, so when the cellist did slap bass, things really started hoppin'. I used very little corrective EQ on the monitor and had lots of extra gain before feedback, even though the pickup microphone was very close to the position of the monitor on the floor.

Back in the studio, I used the T221M as a playback monitor, just to check tonal qualities and characteristics. The slightly forward sound of the cabinet made the musician's happy when listening to playback, but, of course, you wouldn't want to use any cabinet with an exaggerated high end as a mixdown monitor. This would force you to make inappropriate mixing decisions regarding equalization and relative levels. The T221M is designed to be a live monitor cabinet and works very well in that application.

If you're looking for the next step up in monitor quality, this could be the cabinet for you. While not inexpensive when compared to basic club monitors, it does get you to the next level without breaking the bank. In addition, the dual crossover mode allows it to be used in a variety of amplifier situations. You can start in the basic passive mode and then go to biamp mode for the increased SPL and level control. EQ

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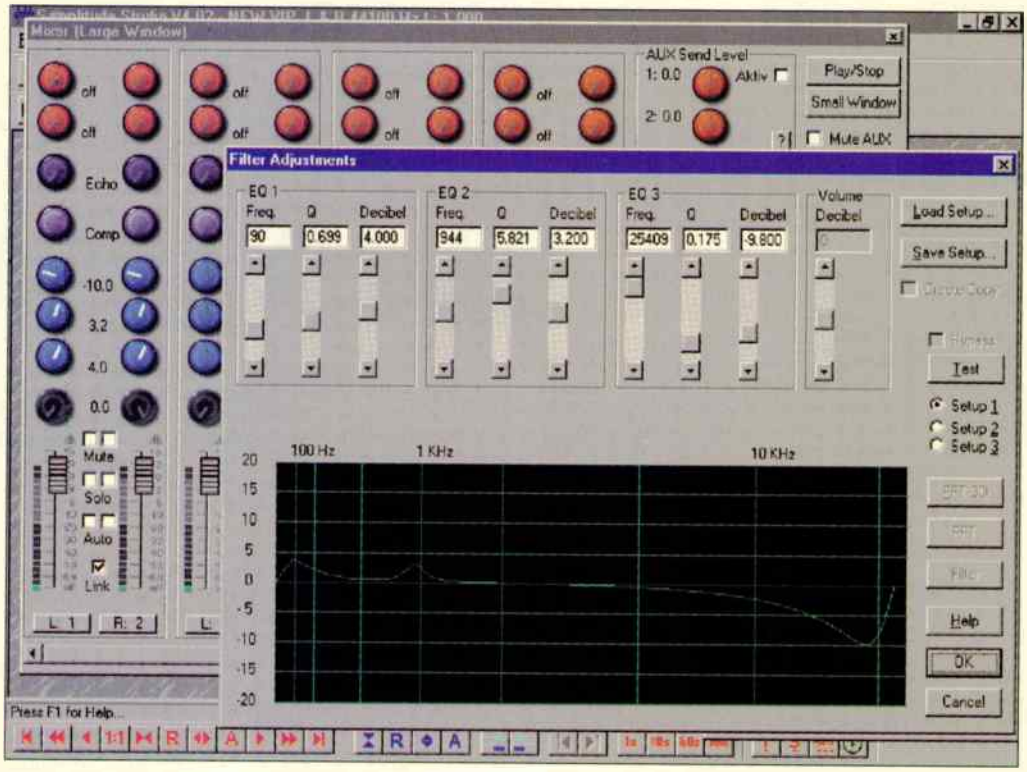
Sek'd Samplitude *4.0 Update*

Sek'd delivers an advanced program for those serious about hard-disk recording



BY CRAIG ANDERTON

Samplitude Studio has a reputation as an advanced and powerful, if somewhat nonstandard, multichannel digital audio recording program for Windows. The latest version does nothing to change that perception, but dramatically ups the ante in terms of power. (*Note:* A demo version is downloadable from their Web site.)

DEALING WITH I/O

Samplitude Studio 4.0 (hereafter called Samplitude) supports multichannel sound cards, but also supports any card that installs a standard Wave Audio drive for each stereo pair (this provides support for standard stereo sound cards, as well as some multichannel cards that can be set up to look like multiple stereo sound cards).

Currently supported multichannel cards include the ARC44 (4 channels of analog I/O), ARC88 (8 channels analog I/O + S/PDIF), and DARC88 (8 channel ADAT optical + S/PDIF) sound cards from Sek'd, as well as the Frontier Design WaveCenter, Digital Audio Labs V8, Event Electronics cards, and Antex Studiocard.

As with multichannel playback, the number of simultaneous recordable tracks is hardware-dependent. To play 16 tracks or more, you'll need a pretty hefty system: Sek'd recommends a 200 MHz Pentium or Pentium Pro, SCSI AV drive, and Windows NT.

VIRTUAL REALITY

Samplitude's most confusing element is the use of three different types of "projects" — RAM, Hard Disk, and Virtual. In a nutshell, RAM projects record data in RAM or load the data in from

EQ LAB REPORT

MANUFACTURER: Sek'd America, 3321 Industrial Dr., Santa Rosa, CA 95403-2075. Tel: 707-578-2023. Web: www.sekd.com.

APPLICATION: Record and process multitrack digital audio, with AVI support for project video.

SUMMARY: Definitely not an entry-level program — Samplitude is for power users who want to do more with digital audio than just record and play it back.

STRENGTH: Excellent DSP; good video integration with scrubbing; real-time mixer with fader/pan automation; supports multichannel sound cards; burns CDs with optional program; reads audio from CDs for conversion into WAV files.

WEAKNESSES: No plug-in architecture (e.g., DirectX); depth of program, coupled with somewhat confusing architecture and obscure documentation, can be overwhelming.

SYSTEM REQUIREMENTS: Windows 95/NT, 16 MB RAM, DX2/66 (P90 recommended), CD-ROM drive, 20 MB hard disk space, VGA 256 colors/800x600 resolution, 16-bit sound card.

PRICE: $599 **EQ FREE LIT. #:** 147

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hard disk. While fast, the amount of RAM limits recording time, so this mode works best with small bits of digital audio. Hard Disk projects work like traditional digital audio editors: the hard drive provides virtual RAM, while the system RAM acts as a buffer. Virtual projects (VIPs) "point" to the RAM or HD files and provide the main workspace.

MIXING IT UP

One of the main additions is an 8-channel, real-time mixer (which scrolls if there are more than eight channels used in a recording). Each channel, mono or stereo, includes two aux sends (which can drive any supported sound card available), delay, dynamics, 3-band parametric EQ, mute, solo, fader, link two mono tracks to stereo, and automation. Fig. 1 shows the EQ window for two tracks (linked as a stereo pair); in addition to the cool "rocket scientist" graphic curve, you can save and load setups and switch between three active setups.

For dynamics, you can compress, limit, distort, and gate, with adjustable threshold, attack, release, ratio, and gating. The distortion ain't exactly a stack o' Marshalls, but is pre-EQ so you can shape it. The delay goes from 0 to 2000 ms (also calibrated in BPM), and offers multitap as well as traditional echo and track delay.

There are master effects too, including 3-band EQ, dynamics, a "stereo enhancer" (which is pretty bogus — it messes with the phase, so don't play back in mono!), and phase correlation display so you can keep the mastering and duplication houses happy. Since these effects are calculated in real time, they aren't destructive. Furthermore, there's real-time recording and playback automation for the faders and pan.

One other cool mixer feature: if you're shy on computer power, you can bounce tracks through the mixer with effects to reduce the amount of real-time processing, as well as obtain more tracks. Premixed tracks can't be undone (unless you saved the original tracks that make up a premix), but still, if you need to do a massive, 12-part rhythm guitar part, you can bounce your way to fulfillment.

GETTING A FIX ON FX

Although there's no provision for DirectX plug-ins, Samplitude 4.0 folds in several effects from Samplitude Master (its CD creation/editing program) such as de-clipping, convolution, impulse, sophisticated noise reduction, graphic EQ, and time/pitch stretch. The effectiveness varies; de-clipping works best with signals that aren't severely distorted (e.g., a few clips here and there) and time/pitch stretch is not convincing on program material. The impulse effects, though, are very tasty, and while convolution isn't a mainstream effect, it's fun. These are destructive edits (although copies can be made) that apply only to RAM and HD projects.

One of the most interesting functions is a Fast Fourier Transform (FFT) where you can alter a signal's spectral curve with freehand drawing. For example, if the FFT shows a big bump at a certain frequency, just draw it out! This is a flat-out fabulous way to tailor frequency response. Way cool.

CAPTAIN VIDEO

Not only can you run an AVI file in parallel with Samplitude 4.0, you can choose "Show Video Track," where clicking the cursor in the VIP window displays the frame of the AVI clip corresponding to that location, so you can position events precisely where the frames fall. For this operation and for scrubbing, the audio and video are sync'd; if both play back simultaneously, they "freewheel" from a common start point. (If the audio or video playback rate differs, Samplitude includes an adjustable lead or lag to compensate.) You can also import and export audio to/from AVI files, and while the video capabilities aren't going to replace an Avid video editing system,

continued on page 144

TWIDDLY BITS VOLUME 8, MIDI BREAKBEATS

Think of it as a drum machine on a disk — just add sounds. MIDI Breakbeats (Mac or PC 3.5-inch floppy) contains over 400 type 1 Standard MIDI File drum loops, organized as 27 basic musical styles (drums and bass, hip hop, dance, jazz, funk, and related styles). There are 27 "master" files in two versions: GM-style, with all drums on one track (typically including a dozen or so alternate loops for each style that provide variations on the main rhythmic theme and fills), and a version designed for re-mapping with each drum on its own track (the variations follow sequentially).

Furthermore, 8 of the 27 files are optimized for XG/GS dual drum mode, where two drum sets can play simultaneously (there's even a sys ex file provided to switch your tone module to dual drum mode). Other XG/GS goodies include a tutorial file on tips and tricks, as well as files for altering snare pan, pitch, and reverberation without affecting other drum sounds (although you can switch this to affect other drum sounds instead).

Additional files include GM and GS/GX demos and seven individual instrument loops of conga, hi-hat, snare, manic snare (great for jungle), and ride cymbal. These are excellent additions to the main files, as is a Cubase mixer map, which gives a measure of real-time control. Couple it with something like a Peavey PC1600, and Cubase users regain some of the benefits of using a machine like E-mu's SP-1200 that has real faders.

The files are uniformly excellent — no duds or filler in the batch. The mixture of played and programmed parts gives "human feel," as well as machine groove options. Even the documentation is helpful, and contains useful applications information.

There's really nothing to complain about with any of the Twiddly Bits disks, and Volume 8 is no exception. You get a lot of very well-produced MIDI drum grooves for $34.95 — what more could you ask for? —*Craig Anderton*

MANUFACTURER: Keyfax Software, Box 958, Aptos, CA 95001-0958. Tel: 408-688-4505/800-752-2780. Web: http://www.usgmedia.com/keyfax. Circle EQ free lit. #148.

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Sonic Foundry *Acoustics Modeler Plug-In*

Add and match ambience to your tracks with Sonic Foundry's versatile plug-in

BY WADE MCGREGOR

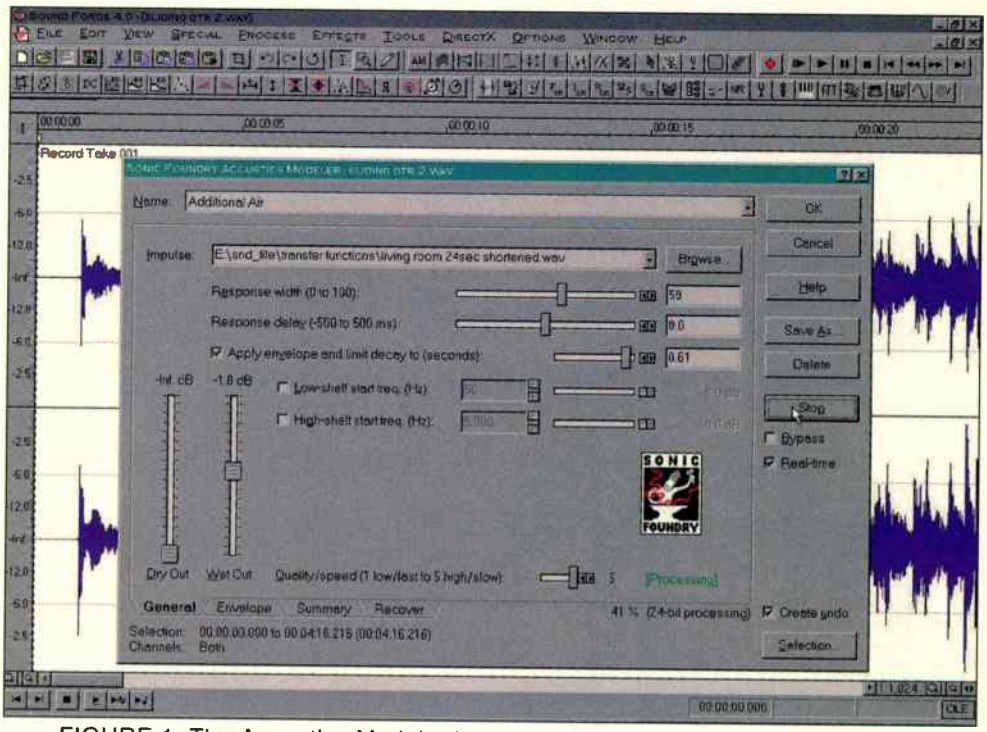

FIGURE 1: The Acoustics Modeler has a number of parameters available for the user to determine the basic qualities of the process. Shown here in Sonic Foundry's Sound Forge 4.0a.

If you have ever recorded an overdub or punch-in in a studio different from the one where the original track was recorded, you know how difficult it is to match the room ambience. This applies to anyone recording in the studio, on location, or in concert — and especially to anyone who must post audio-for-video. The Acoustics Modeler Plug-In from Sonic Foundry is the best solution for this dilemma anyone has ever offered the professional sound industry.

Acoustics modeling has been the realm of academics and acoustical consultants for the past two decades. One of the pioneers in this field, the late John Walsh, developed a sophisticated system for modeling in the '70s. Many other researchers have since developed methods to auralize (make audible) the computer models used to develop the design of concert halls and other critical acoustical spaces. None of this work was readily available to those working in audio production; instead, it was a way of letting the designers and owners of a facility listen to potential design approaches before committing them to bricks and mortar.

Essentially the modeling process captures the time and frequency interactions of an acoustic space (or signal processor) and creates a filter that produces the same qualities. The result should be identical when comparing a sound that was recorded in the original space and an identical but "dry" sample of the sound with the "filter" of the space applied to it. For instance, if you record a vocal in a small overdub booth, the tone of the voice is a combination of the microphone used and the sound reflected from the nearby surfaces also picked up by this microphone.

If we record a main vocal track in a large studio but then want to use some of the "scratch vocal" originally recorded in the iso-booth while the band was playing in the big studio, we have a problem. The main vocal track

EQ LAB REPORT

MANUFACTURER: Sonic Foundry, 100 South Baldwin, Suite 204, Madison, WI 53703. Tel: 608-256-3133. Web: www.sonicfoundry.com.

APPLICATIONS: This applies to anyone recording in the studio, on location, or in concert — and especially those working in postproduction.

SUMMARY: Match the room ambience of recordings made in different locations.

STRENGTHS: Very powerful; real-time preview; easy to use.

WEAKNESSES: Some sounds not captured well (e.g., distorted guitar).

PRICE: $249

EQ FREE LIT. #: 149

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will have the ambience of the big room and the iso-booth track will have little or no ambience. The two tracks do not match and trying to intercut the two tracks will sound like an obvious edit.

the microphone, and mic preamp, channel EQ, etc.

To capture this signal chain for later modeling we must play back the Acoustics Modeler test signal. This requires the addition of a loudspeaker into the signal chain and, obviously, that will add the tonal qualities (unless you have the perfect loudspeaker...) of the loudspeaker into the transfer function. If you have significant differences between the original and modeled sounds, it is likely that the sound source (loudspeaker) is the culprit. It is also critical to maintain the same relationship between the sound source and microphone when capturing the transfer function, and this includes matching the loudspeaker dispersion to that of the instrument or voice. This is a conceptual limitation in the use of the Acoustics Modeler, where this can be optimized, the resulting model is extremely accurate. The modeling algorithm developed by Sonic Foundry is excellent.

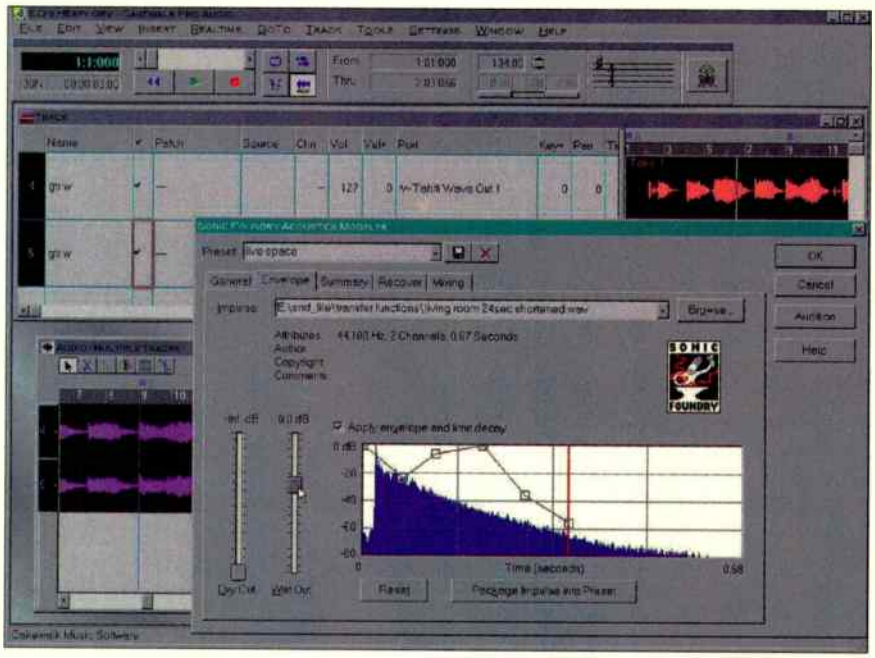

FIGURE 2: The Envelope tab allows the user to exert powerful changes to the time and level of the acoustical model. This can provide effects akin to moving the relative mic position or even gating the reverberation. Shown here in Cakewalk Pro Audio 6.01.

Anyone who has tried to match the ambience of a studio or concert hall with a reverb processor already knows how unsatisfactory that can be.

Sonic Foundry to the rescue. Using the supplied test tones that are included with the Acoustics Modeler software (on CD-ROM), the original big studio sound qualities can be captured and later applied to the iso-booth track. If the iso-booth track has an absolute minimum of room coloration and the same vocal mic, then the match between the two tracks (after processing) will be startlingly accurate. Allowing the two tracks to intercut seamlessly!

Achieving these results will take forethought and some effort. The technical term for the sound qualities you capture to achieve this is transfer function (derived from the system's impulse response). The transfer function of any two-port (input and output) system describes all of the changes to the signal that occur in passing through this signal chain. For microphones recording voices and instruments this includes the room acoustics, the characteristics of

The program offers three tabs on the pop-up display window: General, where you select the model to apply and accuracy of the transfer function (a trade-off between real-time processing speed and the accuracy of the result) [see

continued on page 144

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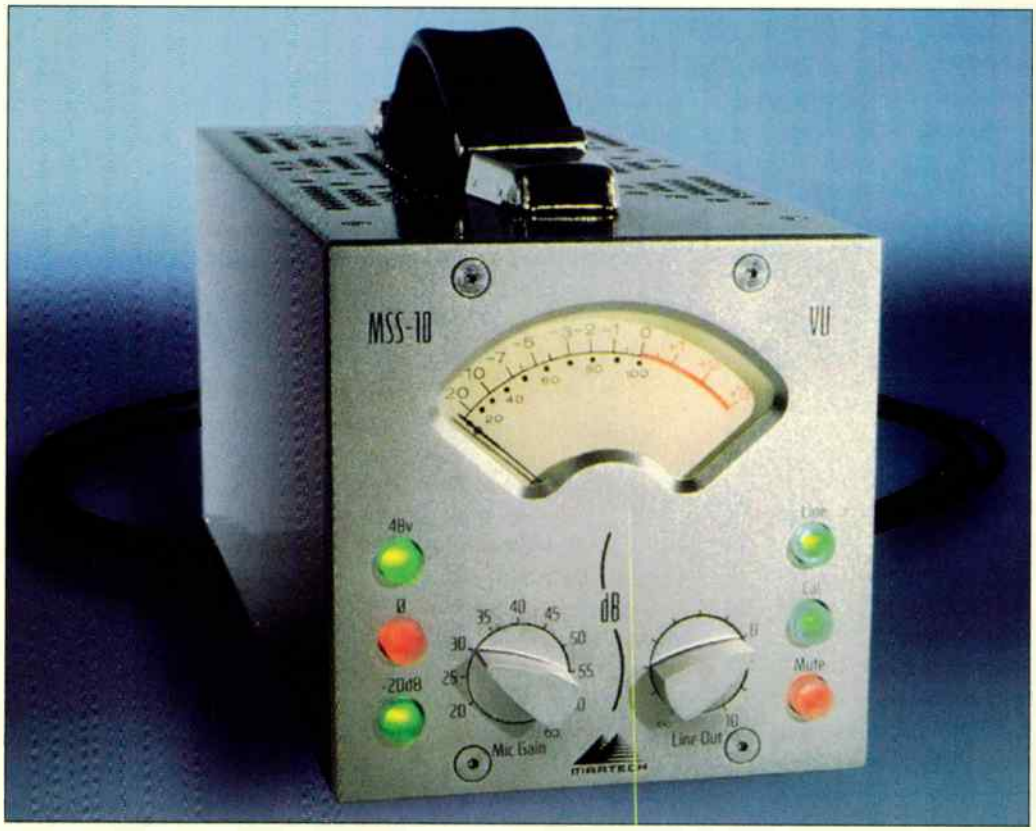
Martech Model *MSS-10 Mic Preamp*

A mic pre-amp that let's your mics sound the way they were meant to be heard

BY MIKE SOKOL



The look and feel of the MSS-10 is very retro-lab. Its matte-finished, silver

I've been reviewing a lot of mic preamps for *EQ* lately. For someone who collects and uses a wide variety of both collectable and contemporary microphones in the studio and on the road, it's been a lot of fun. What I've noticed is that most of the mid-priced mic pres fall into two main categories: [1] the "personality" units and [2] the "precision" units. The "personality" pres tend to use tube-based circuitry to fatten, compress, or otherwise flavor the sound. The "precision" pres try to act like a straight wire with gain. The Martech MSS-10 falls into the latter category.

CLINICAL GAIN

It's simply a straight wire with gain. Nothing more or less. All of Martech's circuitry detail point to this goal. As an example, for decades audiophiles have argued about the sonic differences of different kinds of capacitors in the sound path. Martech answers that question simply by eliminating all capacitors in the signal path. Same with the question about inverting amplifiers and how they sound. All amplification stages in the MSS-10 are noninverting. If you want repeatable gain, then use the 5-dB stepped control. If you like to ride the gain while recording, patch in the variable line-out amp.

EQ LAB REPORT

MANUFACTURER: Martech, a Martinsound Company, 1151 West Valley Blvd., Alhambra, CA 91803-2493. Tel: 800-582-3555/626-281-3555. Web: http://www.martinsound.com.

APPLICATION: Studio mic preamp with both calibrated (5-dB steps) gain and switchable attenuation allows for use as a replacement mic pre for your board or in single-channel per track recording. Meter can be used separately as a remote recording level indicator separate from the mic preamp.

SUMMARY: Very high-quality mic pre with all the bells and whistles — phase reverse, 20-dB pad, 48 V phantom power, and more; circuit design features no capacitors or inverting amplifiers in the signal path; laboratory-grade precision.

STRENGTHS: Extremely detailed sound; custom-designed input transformer with great CMRR; separate mic-level and line-level signal paths with both stepped gain (mic path) and variable loss (line path); large and well-lit meter.

WEAKNESSES: Some may feel it has no real sonic "personality."

PRICE: $2250; rack unit, $250 (holds four devices; rack unit is free with purchase of four MSS-10's).

EQ FREE LIT #: 150

World Radio History

front panel and illuminated buttons make it look like something NASA would hang in the space shuttle. It reminds me of a laboratory grade piece of equipment you could bet your hypothesis on. The controls all have a solid feel and the stepped gain control turns with a satisfying clunk — like the door on a well-built car.

LESS IS MORE

I used the MSS-10 during several studio recording sessions with male and female vocal and acoustic guitar. The male voice sounded great, with a real sense of bottom, probably due to a 10 Hz (or maybe lower) frequency response. This is where the capacitor-less circuitry design really shines. The bottom is "just there" without sounding rubbery. This recording was approved for a radio spot and has since been on the air. Now you may find this hard to believe, but I could hear the quality of the preamp come through on an AM radio station. And I used no other signal processing, just a Shure SM7 with a great voice direct to hard disk.

Both the talent and the customer thought I did some special processing trick, but it was "just" an MSS-10. This would be a great preamp for a world-class voice-over talent. Put it between a Neumann mic and a good DAT deck and life would be sweet.

On acoustic guitar, it translated the full spectrum without any smear. Both the bottom and top were there in the original proportions. Finger detail was especially precise. On female voice, it handled dynamics that would have left a lot of lesser mic pres crying. [I should have tried it to record the howitzers (*1812 Overture*) for the July 4th concert I recently did at the Antietam Battlefield: it probably wouldn't have clipped.]

WARTS AND ALL

Of course, like a great camera, a great preamp doesn't hide any warts. This isn't the unit to make your cheap $50 mic sound like it cost a thousand bucks. It simply amplifies what you put into it. If you want a preamp with personality, you can get one for a lot less bucks. If, however, you want a mic pre that provides effortless precision, one that neither adds or subtracts from the original signal, then this is the preamp for you.

Martech's flowery prose in the manual notwithstanding, I really think this unit has no sound of its own. Of course, without a "perfect" preamp to judge it against, it's hard to tell, but there was never any straining, coloration, or artifacts to be heard. If you really want to hear what your best microphones sound like, plug them into an MSS-10 and prepare for the sweet truth.

Mike Sokol is a communications integrator and audio engineer who's just published his first book, The Acoustic Musician's Guide to Sound Reinforcement & Live Recording. For more information visit his Web site at http://www.soundav.com or e-mail him at: jmsokol@intrepid.net.

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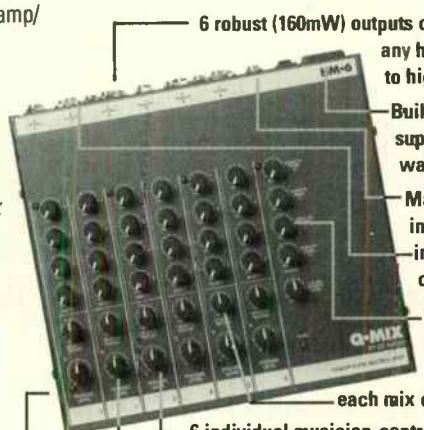

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Sonorus STUDI/O *Sound Card*

Link your Windows and ADAT worlds with Sonorus's sound card

BY CRAIG ANDERTON

Sound cards continue to improve and specialize — consider the STUDI/O, a Windows 95/NT and MacOS PCI card that interfaces ADAT/S/PDIF digital audio (up to 24 bits) with your computer. There are two optical ins, two optical outs (each configurable for S/PDIF or ADAT; thankfully, the S/PDIF ignores SCMS), and an 18-bit stereo, analog monitor out.

Even if you're not into ADAT, but are into multichannel hard-disk recording, STUDI/O can treat the ADAT as eight A/D and D/A converters and work with digital mixers such as the Korg 168RC. You can even stack four boards together for 64 channels.

COMPATIBILITY

Windows can see the STUDI/O as eight stereo sound cards, one 16-channel card, two 8-channel cards, etc. These definitions can be different for the input or output. Currently, STUDI/O works with software using Windows Wave Audio drivers such as Cakewalk, CoolEdit, Goldwave, Musicator, Samplitude, SAW, Sound Forge, etc. However, just because a card can provide 16 channels of digital audio doesn't oblige your software to accept it. (The latest versions of Samplitude, Cubase VST, and SAW Plus can record more than two channels simultaneously; the Sonorus Web site includes up-to-date compatibility info.) Logic Audio can address two tracks, but does multichannel operation only with E-magic's Audiowerk 8 board.

WINDOWS CONTROL SOFTWARE

All control pages are accessible from a system tray pop-up menu. Pages include:

- Setup. Save "presets" of most parameters.
- Meter/mixer. The meters can do peak hold (momentary or held) or instantaneous readings. Other settings include meter range (30 to 144 dB), zero reference level, and decay rate. Since the mixer can feed two different digital output destinations as well as the analog out, STUDI/O is also a barebones digital mixer with mute, solo, pan, and faders. *Note:* Fitting all the

EQ LAB REPORT

MANUFACTURER: Sonorus, 111 E. 12th St., 2nd Fl., New York, NY 10003. Tel: 212-253-7700. Web: www.sonorus.com.

APPLICATION: Interface ADAT and S/PDIF, 24-bit digital audio to Windows or Mac OS computers.

SUMMARY: Not exactly a budget board, but does a lot and can handle two ADATs.

STRENGTHS: Handles 24-bit audio; meters and faders; primitive but usable digital mixing; analog monitor outs; ADAT/S/PDIF compatibility; sample-rate conversion for some applications; includes four, 2-meter fiber-optic cables.

WEAKNESSES: Nine-pin ADAT sync/word clock requires Sync Backplate option; no MIDI (requires second board for sync to MIDI + Digital Audio programs); inadequate documentation.

SYSTEM REQUIREMENTS: PCI slot, 8 MB RAM. Windows: Windows 95 or NT, Pentium processor. Mac: Mac OS, Steinberg's Cubase VST, PowerPC or better processor.

PRICE: $989 **EQ FREE LIT. #:** 151

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mixer faders and meters onscreen requires 1024 x 768 monitor resolution.
• Input and output routing. These "electronic patchbay" pages connect physical inputs/outputs to logical inputs/outputs.
• Format. This diagrams the current hookup. In Fig. 1 (which also shows meters and faders), ADAT feeds one optical in, a CD (sample-rate converted to 48 kHz) feeds the other in; one output returns to ADAT, and the other goes to a S/PDIF digital in (e.g., A/D converter). This page also accesses advanced settings, such as "phase flipping" to allow playing "blackface" (Original Formula) ADAT tapes on XTs and retain proper polarity. You can also attenuate the digital signal, dither to 16 bits, work with sample rates below 44.1 kHz, or boost the optical output for driving long cables.
• Clocking can lock to either input, or use an internal 44.1 kHz, 48 kHz, or variable speed clock. A Word Clock I/O option exists, but you need the Sync Backplate Option (approximately $150), which is slated for release in October '97. This will supposedly include a software utility for entering sample-accurate record and playback start times.

An additional screen shows various errors (loss of clock, no sync, invalid data, DRAM test failure, S/PDIF parity errors, etc.). Errors remain flagged until cleared.

MAC CONTROL SOFTWARE

STUDI/O provides ASIO drivers for Cubase VST, so the Cubase Audio System Setup menu handles software tweaks. Configurations are 16-channel dual ADAT or single ADAT + S/PDIF. Cubase shows the input record enables, bus assignments to STUDI/O outputs, metering, and faders; unfortunately, the Mac software lacks the error indicators.

SYNC'ING, NOT SWIMMING

The optimum way to record is all in one pass. However, you can fly tracks back and forth between hard disk and ADAT, or record in multiple passes (e.g., you have two ADATs, but your computer can't record more than eight simultaneous channels). Use MIDI + Digital Audio software and an AI-2, Cooper box, Alesis BRC, or equivalent to send MTC from the ADAT to the sequencer. Start the ADAT, and the sequencer follows along. Since the STUDI/O lacks MIDI, you also need a MIDI interface (e.g., SoundBlaster).

However, sync'ing ADATs through MTC will not provide sample-accurate sync (this also applies to the WaveCenter board) as this requires hooking into ADAT's 9-pin sync bus. MTC is accurate to better than 1/4 frame in real-world use, so the only possible problem would be if a stereo pair spreads over two different machines so each half has to be recorded on a separate pass — even a millisecond or two of "slop" can shift the stereo image slightly. The Sync Backplate accepts ADAT 9-pin sync, although its usefulness hinges on whether Sonorus-compatible software knows what to do with this data.

Recording in one pass eliminates these problems, since the ADATs lock to sample accuracy via their own 9-pin sync bus. Incidentally, the manual is pretty good about explaining digital audio sync and clocking, but omits important information such as what's being installed on your hard disk (there's no true uninstall option), system requirements, whether SCMS is implemented, how to patch the input and output connections (it's easy enough to figure out, but still...), and using MTC for track-flying. Also, some computer functions are incorrectly named, which could confuse Windows 95 novices.

OVERALL

I know that $989 is a lot to spend on a card, but this is a lot of card (there's also a CD-ROM with demo programs). I tested it with an original ADAT, prototype M20, S/PDIF CD player, and Samplitude 4.0; everything worked as advertised.

As to STUDI/O vs. the lower-cost WaveCenter, the WaveCenter is an excellent match for MIDI + Digital Audio programs since it provides a multi-port MIDI interface. It also includes coax S/PDIF, as well as optical ADAT/S/PDIF. However, it handles only one ADAT at a time, lacks the analog monitoring, metering, and faders, is ISA bus only (sorry, Mac fans), and does not allow for word clock in/out or ADAT 9-pin sync in.

Bottom line: If you live in an 8-channel Windows/ADAT world and need MIDI along with your digital audio, the WaveCenter is an excellent choice. If you work with two or more ADATs and already have a MIDI interface, speak Mac and Windows, or want to connect to 16-channel digital mixers with ADAT interfaces, the STUDI/O is the board to beat. EQ

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CIRCLE 88 ON FREE INFO CARD

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Opcode fusion: *VOCODE Plug-In*

Opcode offers a software vocoder that provides excellent resolution and 1000 bands

BY CRAIG ANDERTON

EQ LAB REPORT

MANUFACTURER: Opcode, 3950 Fabian Way, Suite. 100, Palo Alto, CA 94303. Tel: 650-856-3333. Web: http://www.opcode.com.

APPLICATION: Add vocoding effects to DirectX, AudioSuite, or Adobe Premiere-compatible programs on Windows or Mac.

SUMMARY: You can now own a hot vocoder, for cheap.

STRENGTHS: One thousand bands give excellent resolution; bi-platform; sounds just like the real thing; versatile; cost-effective; high fun factor.

WEAKNESSES: No high-pass filter to add sibilant sounds from modulator (an oft-used technique in vintage vocoders); can't shift carrier pitch via MIDI.

SYSTEM REQUIREMENTS: Macintosh (PowerPC only) capable of running Opcode Vision 3.5, Studio Vision 3.5, BIAS Peak, Macromedia Deck, or MOTU Digital Performer 2.1; Windows 95/NT (Pentium only) capable of running Cakewalk 6.0 or Sonic Foundry Sound Forge 4.0

PRICE: $149.95 **EQ FREE LIT. #:** 152

Vocoders impart a "talking instrument" effect (you've probably heard this in radio station IDs and Kraftwerk CDs) by sending the signal to be vocoded (the carrier) through a filter bank. The signal doing the vocoding (the modulator), usually a mic, goes through a similar filter bank and produces control signals that alter the level of the carrier's filters. For example, say an "S," and the carrier's high filters open up. (For more on vocoders, see my book *Multieffects for Musicians*, published by AMSCO.)

I love vocoders, but hardly ever use them for voice. Most of the time they're modulating one instrument with another, such as using bass for the carrier and drums for the modulator. But now there's a software alternative for any vocoder application: fusion:VOCODE, from Opcode's fusion:EFFECTS series, plugs in to DirectX apps in Windows or Premiere- or AudioSuite-compatible Mac programs (according to the company, a TDM version is coming soon).

FIGURE 1: It even looks kinda neat; VOCODE is intelligently laid out and easy to use.

Unlike hardware vocoders, where the number of bands varies from 8 to 32, this sucker has 1000 bands and sounds fabulous — yet emulates vintage vocoder sounds as well. I'm real picky when it comes to vocoders, but this is the real deal.

THE BASICS

Fig. 1 shows the plug-

continued on page 136

World Radio History

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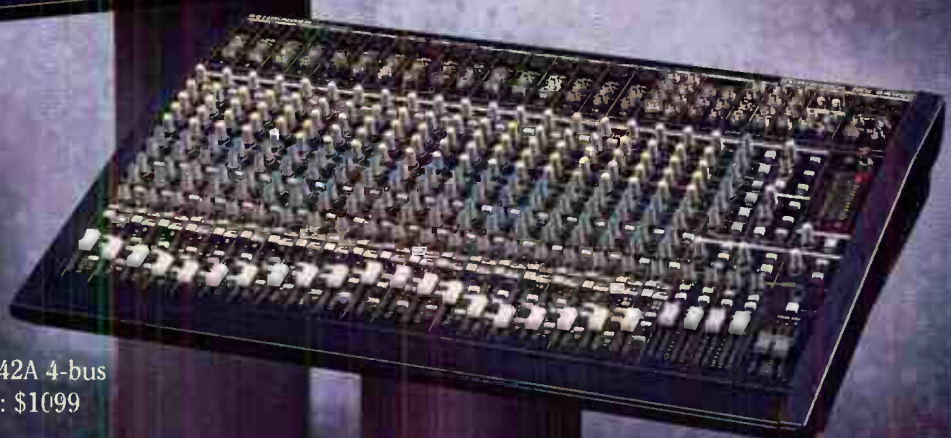

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For more about Behringer mixing consoles, please call (516) 364-2244, fax (516) 364-3888 or write to: Samson Technologies Corp., P.O. Box 9031, Syosset, NY 11791-9031. Visit Behringer at www.samsontech.com

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CIRCLE 10 ON FREE INFO CARD

SQUEEZE BOX

continued from page 62

tracks, with the left hand (bass) on a third mic and track, then mix the bass to the middle and separate the higher and lower pitches of the right-hand left and right. It sounds huge, especially for Cajun stuff.

Or, when recording an English concertina, on which every other note of the natural scale switches side, in the mix try cross-panning left and right during a glissando — it's dizzying! And, when you're working with players who are willing to take risks with their sounds, especially in pop or jazz recording, play aggressively with inline sound processing, letting the player experiment with new sounds his box can produce. I was never so surprised as when I put my spare-sounding concertina through a Boss guitar flanger and it turned the sound into something from the Left Bank of the Seine — all that was missing was Lili Marlene...

Back to basics: squeezeboxes are either the friend or decided enemy of the engineer. They can totally make or utterly ruin a recording. The trick is to spend some time getting to know their idiosyncrasies and make them work for you. After a generation of obscurity, they're back with a bang in nearly every style of music, so make friends with them — they'll more than pay you back for it.

John Townley designed and built the first 12-track recording studio in New York City (home of many Frank Zappa productions) and was founding editor/publisher of Concertina and Squeezebox Magazine. He is an author and maritime historian and plays a Dipper F/C Anglo concertina.

SYNTH TIPS

continued from page 91

iliary samples by a few milliseconds compared to the main pizzicato sample.

• To add some male voices to an ethereal female choir, layer a triangle wave tuned an octave lower. This gives a powerful bottom end that sounds like guys singing along. To maintain the ethereal quality in the upper registers, consider modulating the triangle wave amplitude according to keyboard position so that the triangle wave is not apparent on higher notes.

• String synthesizers of the '70s, based on sawtooth or pulse waves, created rich, syrupy string sounds that weren't super-lifelike, but sounded pretty cool nonetheless. Sampled strings may sound more realistic, but often lack the smoothness of analog simulations. For the best of both worlds, dial up a sawtooth or pulse wave and adjust its envelope for as realistic a string sound as possible. Now, if you layer it behind a string-section sample, the synthesized waveform will "fill in the cracks" in the digital waveform.

• Layering samples with other samples can also produce useful, if unexpected, results. Surprisingly, it's possible to create a pseudo-sax section from a single sax by layering a string section sample behind it (fade in rapidly during the string's characteristic attack, though, so the "bow-scrape-against-string" is not noticeable).

DRUM SOUND TECHNIQUES

Percussion instruments, when played across a keyboard, acquire a sense of pitch. Layering these with more conventionally melodic samples can yield hybrid sounds that are melodic, but have complex and interesting transients. The percussive sound usually melds with the sustain so completely that your ear doesn't identify it as a separate sound.

Cowbell is one of my favorite samples for this application. Claves, triangle dropped down an octave, struck metal, and just about any other pitchable percussion can also give good results. I particularly like layering these with fairly simple samples for the sustain, such as electric piano loops or filtered triangle waves.

One last tip: it's hard to find gong samples because they would need so much memory. To approximate the real thing, layer two cymbals. Tune one cymbal down two semitones to provide the attack; tune the other down an octave or more for the sustain (its attack will sound pretty bad when transposed down that low, so you might want to adjust the amplitude envelope for a bit of an attack time). It won't be a real gong, but it will often come close enough.

YOUR TURN!

These suggestions are just the tip of the iceberg. Sample playback synths can be a rich source of sounds that exceed your expectations, but you have to get in there and do some parameter value tweaking. So go ahead and mess around — you have nothing to lose but sounds that are like everybody else's. EQ

OPCODE FUSION

continued from page 134

in's window. The initial file you call up becomes the Modulator, whose sole control is level. Carrier has level, emphasis (increases filter resonance), depth (controls how much the modulator affects the carrier), and signal source. This can be one of several built in waveforms; a mini on-screen keyboard selects the notes being vocoded (you can make pretty big chords — I never really could discern a limit). Or you can import your own waveforms. In neither case can you change pitch via MIDI, which would be convenient. As a bonus, several drum loops are included; check them out as modulators.

AT THE TONE

The Tone section has five ±36 dB boost/cut frequency controls: low-frequency shelving (200 Hz), three midrange (400, 800, 1600 Hz), and high-frequency shelving (3.2 kHz). Output offers level (with an auto-normalization option veteran vocoderists will appreciate) and mix for setting the balance between the modulator and vocoded sound.

The Control panel varies depending on the plug-in architecture you're using, and sets previewing and bypassing options. The Lo Fi option is for low-fidelity proofing in real time. Uncheck it, and VOCODE builds a hi-fi preview, which can take a few seconds with anything but the fastest computers.

There are two memory buffers, so you can copy your edit into the other buffer, tweak away while leaving the first edit undisturbed, then compare the results. You can also save and load patches, although the DirectX version allows importing AudioSuite or Premier plug-ins as well as DirectX, and can export in a format the Mac version can read.

WHAT ELSE?

There's no printed documentation — the manual is all online, with context-sensitive help. Or use Adobe Acrobat (included on the distribution CD) to read the manual through from beginning to end. It's short and sweet, though, and the program is blissfully easy to install, set up, and use (installation requires entering a serial number).

Want a vocoder? This is it. Congratulations to Opcode for applying both retro *and* forward thinking to come up with a truly cool plug-in. EQ

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World Radio History

Working the Web

PHOTO BY STEVE JENNINGS

Is it really a paradigm shift or merely an account transfer?

BY JON LUINI & ALLEN WHITMAN

We thought, in this column, that we'd return to a subject near and dear to our hearts and yours — money. Let's assume that digital download sites are not quite up to speed yet. Let's point out the obvious: Distribution of physical product is in greater demand and therefore offers a greater revenue source than electronic distribution. Amusing Statistic #1: If you make your music available through electronic distribution, a listener can download your song for 25 cents. That money is split between the host site, the web credit company handling the transaction, and you. It could require somewhere in the neighborhood of 100 downloads to equal the money you make selling one independently released CD at a show or through mail-order.

Here, then, is a round-up of ideas and information to assist you in creating, augmenting, and streamlining your Web presence (and, more importantly, your Internet fan base) and maybe making a few dollars on the side.

Amusing Statistic #2: The Artist Formerly Known As You-Know-Who posts, on one of his sites (www.love4oneanother.com), an 800 number for a mail-order CD. There are no soundclips to preview. There is no other way to find out about or purchase this particular album. There is no press or promotion. The album is not even manufactured yet. But 84,000 CDs were pre-sold within a few months.

His is a picture-perfect example of a successful direct-marketed fan base. No label, distribution, radio, or promotion outside of a mention on the Web site. No middlemen. The Internet is a tool for the independent musician to easily interact one-on-one with his/her listeners and to fulfill orders for physical product on demand — all without layers of unnecessary commercial bureaucracy! Hell, if Kenny Rogers can sell 400,000 albums in one hour on QVC to a tight little American demographic (Amusing Statistic #3), imagine what the potential worldwide reach of your Internet presence offers.

Of course, some of these artists have control over their music. If you enter the major-label maelstrom, you'll most likely be forced to give up these opportunities.

INFORMATION AND IDEAS

We feel these points bear repeating: If you do not have one already, get or create a Web site. Most local music or arts-oriented print publications have classifieds that include offers from small Web site development companies. Shop around not only for price, but for emotional affinity. It's an underrated commodity. To create your own homepage, download Web site building tools (try looking on www.shareware.com) or use search engines to locate HTML editors. Use the abbreviation "HTML" (HyperText Markup Language) in the engine's dialog box. Or try a mainstay such as NetObjects, Adobe Pagemill, or Netscape Composer (which is free). Constructing your own Web site can be a total creative gas. You have your music, artwork, words, video, and who knows what else to play with. Go off.

Call attention to your site by promoting it. Start with your local geographical area. Find local music Web sites and politely offer to trade links and information with them. It benefits everybody and builds community. Use a search engine using the name of your town and the word "music" or "arts." Go to www.city.net and search in your town to see if there is any relevant information. Find out who's doing what on the Web in your area by asking everybody — at shows, music stores, recording studios, etc. This approach creates a foundation in your locale that, once established, can be extended around the world. Music need not be the only common ground here. Get with Web-based organizations that share your political, ideological, artistic or ecological views. Go to www.submit-it.com and find out about having your Internet existence included by major search engines (Lycos, Yahoo, Excite, etc.) Finally, place the URL for your Web site everywhere. On your letterhead, business card, albums, faxes, t-shirts...we've even seen it tattooed!

Breathe life into your site by maintaining it. Alter, manipulate, and update your site frequently. Aesthetically, it encourages people to return, and, usefully, it becomes a tool that actually does something. Answer e-mail promptly and politely. Thank someone for contacting you. Offer to place them on a mailing list for updates about shows, music, and subjects relevant to you. Get an "OK" from the person contacting you before adding their e-mail address to your mailing list. Create a separate fan list for your listeners to post e-mails to each other. If you feel it's justified, create a chat area for real-time conversation among your listeners. Update your itinerary immediately upon confirming shows and events. Offer free stuff to fans through oddball contests. Most musicians think nothing of sending CDs to already swamped record label employees. Why not give free CDs to your fans? These are the people who really matter.

If you like to perform, play a *lot*. Tour like hell. Nothing can replace the experience of live music. Promote yourself shamelessly from the stage. Build your following and pay attention to them. Without them, you are alone. Of course, if the solitary environment of the studio is your preference, you can still benefit.

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Amusing Statistic #4: 97 percent of major-label releases sell less than 700 albums in their first year. All the promotion in the world, a fat advance, and a nice haircut will not guarantee you anything. And, if you sign with a major label, they own the rights to your masters. Forever. We FezGuys have heard of contracts so severe that, technically, even voice-mail messages and home videos are owned by the label!

Another case history: A band with a local following makes a live CD and sends out an e-mail message to fans announcing the album's release. In three weeks they sell 200 copies, through mail-order. E-mail announcement only, and only to the fans who agreed to sign up on the list. No other form of promotion is used. It generally costs less than $2 apiece to manufacture 1000 CDs. If the band sells 200 CDs at $15 apiece the gross is 3000 dollars. In three weeks! The Web presence of the band has justified itself.

Our experience in energetic and aggressive Web-based promotion for musicians is an extremely positive one. Next month we will discuss the state of Electronic Distribution, which has had a microscope placed on it by the media in recent months. Where it is, where it's going, and how the musician can benefit.

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THINGS THAT ARE NEW AND LITIGIOUS

New: Nordic Entertainment has been busy: they now boast a menu of 3000 downloads, their ad banners have been linked, they are using only high-quality MPEG Layer 3 for encoding, and they are netcasting radio station KQST-FM (Sedona, AZ). Nordic also sells carefully inventoried collectors vinyl on the site. [**www.nordicdms.com**]

Progressive Networks has changed its name to Real Networks and released v5.0 featuring MacroMedia Flash animation functionality, improved video quality, and more efficient commerce capabilities. [**www.real.com**]

Xing Technologies has a new CEO, Hassan Miah, formerly with the Hollywood-based talent behemoth CAA (Creative Artists Agency), freeing founder Howard Gordon to return to the trenches and focus on product development and strategy. For information, player, and encoder, go to **www.xingtech.com**.

Litigious: Real change often isn't seen until the first major courtroom dramas. It looks like we're starting to get close, though. For starters: Microsoft is being sued by the U.S. Government for anti-trust violations. 'Nuff said. Next up is the RIAA (Recording Industry Association of America — the support group for the beleaguered major labels), which is threatening to sue a handful of Web site owners who were offering full MP3 (MPEG Layer III) songs made available without permission from the artist or label.

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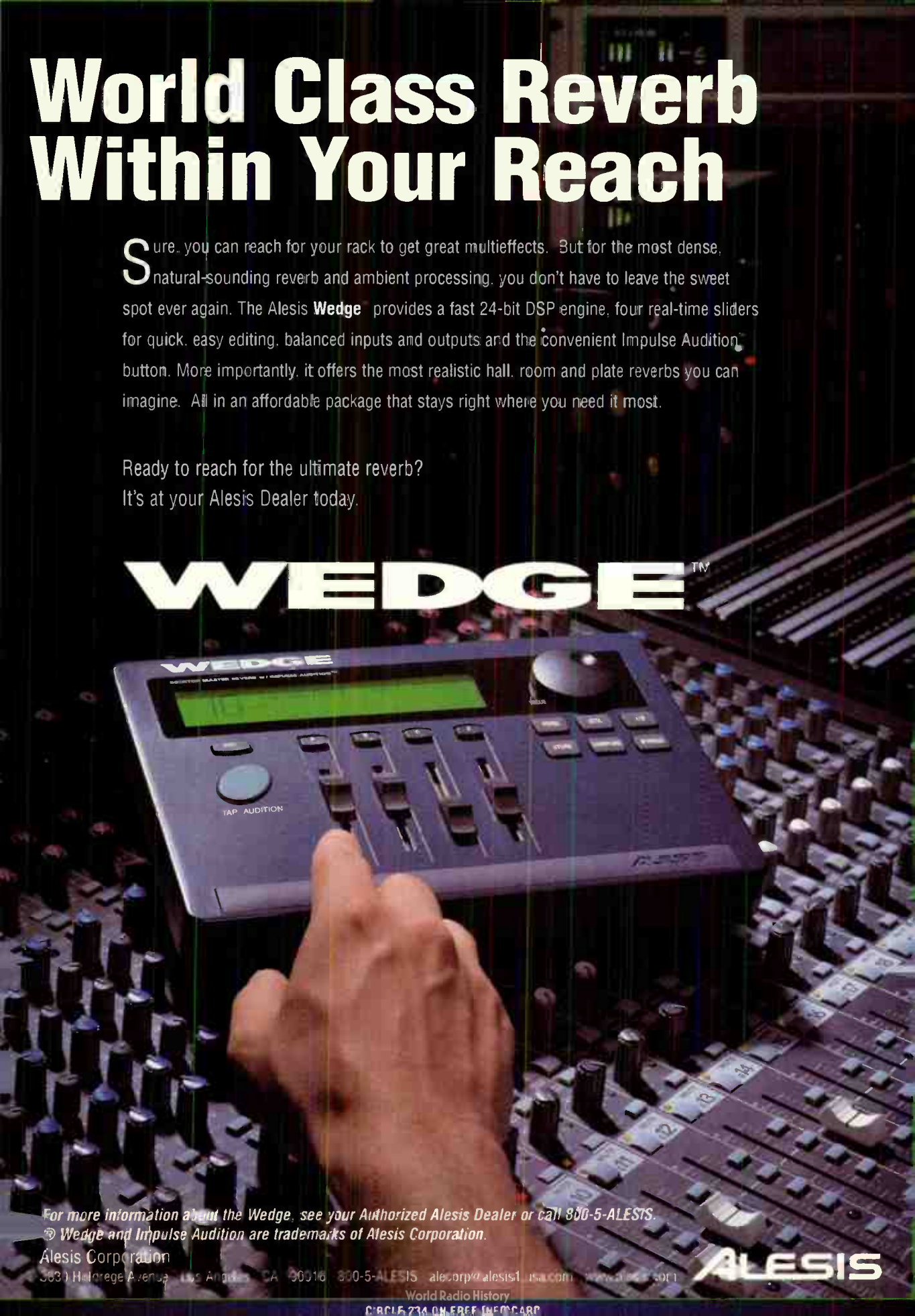

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ALESIS

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CIRCLE 234 ON FREE INFO CARD

My First Gig: Keyboard Roadie

Some tips and techniques on keeping your keys sounding right

BY EDDIE CILETTI

My first gig was as a keyboard technician for Daryl Hall and John Oates. This was way back in 1975 when their keyboard player had a Yamaha organ, ARP String Ensemble, Hohner clavinet, and Mini-Moog monophonic synthesizer. Daryl Hall alternated playing a mandolin and a Wurlitzer Model 200 electric piano.

Keeping all of these boxes in tune required a diverse knowledge of several disciplines. The easiest to tune would have been the String Ensemble and the organ, each being based around a bank of 12 oscillators plus octave dividers. These were very stable for the duration of that tour. The Mini-Moog was temperamental. It was affected by heat (lights), cold (the weather depending on the position of the stage door), and power variations. The keyboard was one long resistive voltage divider that was "stretched" into place by two trim pots. Analog tone generators can be less predictable than their mechanical counterparts, going sharp or flat depending on temperature, voltage fluctuations, and circuit design.

STRINGS AND THINGS

The clavinet pounded the strings with rubber hammers that would eventually take on the imprint of the string and have to be replaced. Like an electric guitar, the clavinet's pickups are susceptible to magnetic fields from hum-radiating power transformers. The Fender Rhodes and the Wurlitzer Electric Piano are both "string-less" electromechanical devices. The Rhodes uses wire-like steel tines fitted with a sliding tuning spring. Each note has its own magnetic pickup. The bell-like attack is sparkling and clear.

The Wurlitzer's best feature is its real piano action. The flat steel reeds generate a fat, saturated sound at the bottom end while the top octave has more of a kiddy-toy quality. Tuning is another matter. The steel used to make reeds, tines, or strings will fatigue over time and go flat, which is at least predictable. In all but the Wurlitzer, getting back up to pitch is easy.

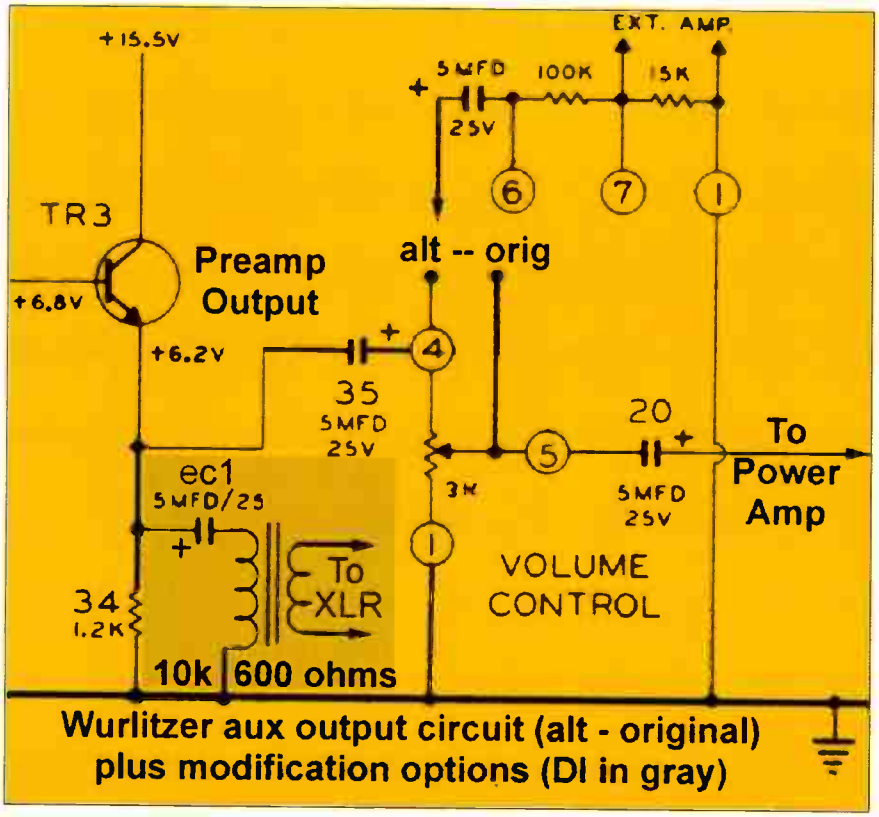
LIGHTENING THE LOAD

Because Wurlitzer's reeds are weighted with solder, the only way to go sharp is to lighten the load. The manual suggests using a file to remove the solder, but this is not practical for one reason: the Wurlitzer uses a capacitive pickup similar in principle to a condenser microphone. Just as guitar pickups have magnets, capacitive pickups have a polarizing voltage. If the filings get in between the reed, which is at ground potential, and the pickup plate, which is at 170 volts... *Pow!* You get a snap-crackle-pop that no breakfast cereal can match. Compressed air is the short-term solution.

I found a more delicate approach to solder removal — an extremely fine pair of diagonal cutters. Instead of creating lead "dust," each lead shaving is held in the jaws of the cutters until removed by hand. Sometimes tuning can be tweaked by loosening the retaining screw and repositioning. "Longer" is flatter and "shorter" is sharper.

PARTS & INFO

Electronically, the discrete transistor circuitry is pretty straightforward. The manual specifies only Wurlitzer part numbers and a cross-reference is provided in the manual. Reeds range in price from $2.50 to $5 and are numbered from 1 to 64 starting at the bass end. Parts, service and additional information are available from Morelock's Organ Parts (601-462-7611),



World Radio History

Star Sound (213-231-0541), and Altech Organ Services (800-378-0202). A detailed service manual is under $20.

GOING DIRECT

There are several versions of the Wurlitzer Electric Piano (some with vacuum tubes), the 200 series being most common. Most have a black plastic top and removable chrome legs. These are the Professional Portables, models 200A and 200B weighing in at 56 pounds *without* legs, sustain pedal, and carrying case. Other models included the home (203 and 203W), student/teacher (206/205, 207, 207V), and baby grand (270).

Auxiliary (line-*ish*) and Monitor (speaker) outputs are provided. A direct box can be connected to either output; both follow the volume control, but only the Monitor Jack disables the internal speakers. Be sure to optimize signal-to-noise and headroom via the volume control. One possible modification would be to feed the aux output from the output of TR3 rather than from the wiper of the volume pot. (See the schematic.)

Because of the high-impedance nature of the capacitive pickup, noise can be a problem especially in light-dimmer and RF-infested environments. Some versions of the piano will have three-pin grounded power cables while others will have the nongrounded, two-pin type. For touring applications, a transformer direct box is probably best and should be located as close to the piano as possible.

In the studio, feeding the aux output into either an active balanced line input or an unbalanced input of an active level-matching box should minimize the noise. Two screws secure the sustain pedal linkage at the rear of the piano. Either one is a good place to make an external ground connection. Use care not to disturb the linkage.

END OF THE LINE

At the beginning of the Hall & Oates tour, I purchased a book that described the "circle of fourths and fifths," a method of tuning by ear where the listener is trained to hear the beat frequencies of these intervals. I also got a felt damper, four rubber wedges, plus a tuning fork and hammer to practice on a real piano. During the tour I was provided with a Conn Strobotuner, yet another electromechanical device, but one that saved my life. There was no way I was going to learn to tune by ear on a noisy stage. It was only after the tour ended that I got to tune a real piano, *by ear*! It took two days — three hours each day — after which I was one fried puppy.

Visit www.tangible-technology.com or send e-mail to edaudio@interport.net.

MIC UNDRESSED

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pin-compatible tubes — the EF-14 and the UF-14 — which are somewhat more available and less pricey (about $350). This approach requires no mechanical modifications, although a few circuit changes are necessary. At one time, Neumann made a Nuvister kit that adapted a subminiature tube to fit in the original socket. Nat Priest (212-343-0265) created his own version of this vacuum tube alternative for under $200. Stephen Paul Audio also has a more modern, 9-pin upgrade.

PASSIVE COMPONENTS

Any older electronic device is likely to require some maintenance, even if never plugged in. This is especially true of electrolytic capacitors. So far, however, no parts have required changing, but both mics are under observation for signs of potential failure.

I did, though, increase the value of the polarizing and bias resistors from 100 meg and 60 meg, respectively, to 160 megaohms each. The original values created a gradual low-frequency roll-off and, based on a suggestion given by David Josephson, I made the changes while keeping the original parts. Not only was David especially patient with my numerous e-mails, he also suggested a great primer on microphones by Dr. Gerhart Bor. Neumann once distributed this book, but it may no longer be in print.

HI-FI

It's not difficult to see why the U47 remains one of the popular vocal mics. Warm, but not murky, present, but not irritating, you can easily imagine its impact on popular music back in the '50s. It certainly contributed to the "High Fidelity" sound of that era!

P.S.: Thanks also to Russ Hamm and Phil Kapp at G Prime (212-765-3415).

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EQ

COMING UP IN JANUARY

IT'S IN THE MIX. EQ talks to underground legend Bill Laswell about his recent remixes of Bob Marley and Miles Davis. Laswell also discusses the techniques he uses in his new New Jersey-based studio.

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World Radio History

ALESIS M20 REVIEW

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tening to the difference between 16-bit and 20-bit for every instrument. Everything sounded better 20-bit except the 16-bit drum samples. That makes sense!

The feel and operation of the machines screamed "professional" throughout the sessions. I never once felt like I was trying to get away with using "semi-professional" gear in a professional environment.

CONCLUSION

The new M20 is more than "just another ADAT." It is a whole new machine from the ground up. If you balk at the price, note that it is about the same price as a full-function timecode DAT machine, and you get six extra tracks for free! You may want to do yourself a favor, though: Make sure that wherever you go to check one out that you don't listen to it. If you do listen, you won't leave the dealer without one. EQ

SEK'D REVIEW

continued from page 122

they're a useful addition for project studio work.

...AND THE REST OF THE STORY

An audio CD copy function is great for importing samples. Samples can be exported as compressed MPEG files, but, best of all, adding the programs CDAudio or CDAudio+ lets you burn CDs directly from Samplitude.

The documentation is a definite improvement over previous versions and there's a separate tutorial. Some sections still are sketchy, however, and parts of the online help and even the dialog boxes contain residual German (Samplitude's country of origin). While the manual does indeed document the program, software this complex almost demands some kind of graduated learning experience.

Samplitude is clearly designed for power users who demand a lot and aren't afraid to roll up their sleeves and spend some quality time learning a program. The processing options are exceptionally varied and well-implemented, the mixdown automation is useful, and the ability to address multiple channels is crucial in today's studio. While Samplitude is deep and occasionally cryptic, ultimately this is a highly rewarding program. EQ

SONIC FOUNDRY

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fig. 1]; Envelope, where you can modify the response to suit your needs; and Recover, where you can create your own impulse responses for future use.

Although the results from Acoustics Modeler are a very accurate match of the original acoustical environment, you can modify the result on-the-fly. The Envelope controls provide control over how much of the resulting time response (such as long or short reverberation) you use. This provides the very flexible control over the level of early reflections (the sound reflected by nearby surfaces) relative to the level of late reflections (the echoes and reverberation that we associate with the size and surface qualities of a room).

This simple adjustment of the time envelope — using lines and adjustment boxes directly on the graphic response display (see fig. 2) — can radically change any predefined impulse response. You have much of the same control as that provided by a reverb unit but over a much wider range of acoustical spaces than any reverb unit can produce. Not only is this easy to use, but the results are remarkably musical. The real-time preview feature of the DirectX plug-ins (this feature depends on a fast processor and varies between applications — Sound Forge being one of the fastest DirectX implementations) allows you to interact with the controls and quickly achieve a useful result.

The Acoustics Modeler tool is ideal for anyone working with dialog tracks for video or film, where it is necessary to conform speech recorded in lively acoustical spaces with speech that is added later in the studio. A quick recording of the Acoustics Modeler test tone while on location can provide a snapshot of the acoustic space that will be invaluable in the subsequent postproduction.

I bounced the test tones over to a CD-R and that allowed me to capture the room ambience with a little portable CD player, self-powered loudspeaker, and the mic/DAT recorder used in the session. A couple of minutes at the end of the session was all that it took to record the transfer function. Once back at the studio, the Acoustics Modeler software compares the test tone to the recorded test tone from the field to create an impulse response WAV file. This file is then called up whenever that ambience is required.

The impulse is easy to create with the simple, clear instructions detailed in the User Manual. This process provides a means to capture any acoustic space (with the above caveat about the loudspeaker used) and can also capture the qualities of your favorite reverb processor, delay unit, equalization curve, microphone, guitar amp, etc. If you can send an audio signal into the device and record the output, you can capture the sound quality of the device, with one significant exception. Impulse responses (the basic form of the transfer function) must be recorded without any transform variance over time. Simply put: any compression, limiting, pitch shift, variable delay or signal clipping will adversely affect the impulse response.

Although you may achieve some interesting effects when capturing the sound of a guitar amp that is highly distorted (e.g., clipping and transformer compression), the resulting Acoustics Model is unlikely to be accurate or even satisfactory. This is a limitation of this approach and not of the software itself. For example, I tried to capture the sound quality of a telephone (often included in dramatic scripts but rarely achieved satisfactorily), but the companion of the telephone system rendered the impulse response worthless as an Acoustics Model.

As a DirectX Plug-In, Acoustics Modeler can be used with a number of audio applications, including Sonic Foundry's Sound Forge 4.0a, Cakewalk Pro-Audio 6.01, and Steinberg's Wavelab 1.6. This allows you to add the acoustic signature of your favorite space to individual tracks (in multitrack audio programs supporting DirectX) with ease. The huge library of acoustic signatures supplied with the software will be sufficient for many users of this plug-in. The facility of capturing your own acoustics models extends the use of this tool into areas that have never been accessible in postproduction. This is not just another reverb plug-in (although it offers excellent reverb right out of the box), Acoustics Modeler is a whole new way to add tone and ambience to recorded tracks. This is one of the most powerful, versatile, and easy-to-use effects tool you can buy.

Wade McGregor is a principal consultant for Mc2 System Design Group, an acoustical consulting firm based in Vancouver, BC. For more info visit their home page at www.mcsquared.com.

World Radio History

KEYBOARD LOOKS

continued from page 97

channels, in addition to an 80-byte sys ex string. Using this feature, an entire MIDI rig can be instantly reconfigured on a per-song basis with the PC 1600x telling each of your synths what bank, patch, and volume to run at. If the PC 1600x is connected inline with other MIDI devices, data from the PC 1600x can be merged with the incoming data from the source and sent to the destination in a variety of ways.

For example, patch the PC 1600x between a sequencer and a sound module, assign the faders to control MIDI pan, and the note on/off data from the sequencer will merge with the newly created pan data from the PC 1600x. The merged MIDI data is then sent to the sound module. Alternately, the new MIDI data can replace the existing data or — in Update mode — any fader move will match the last value of the incoming data for seamless "pick-up" editing of parameters.

The Peavey PC 1600x carries a suggested list price of $399.99 and is available now.

For more information, contact Peavey, 711 A Street, Meridian, MS 39301. Tel: 601-483-5365. Web: www.peavey.com/midi. Circle EQ free lit. #153.

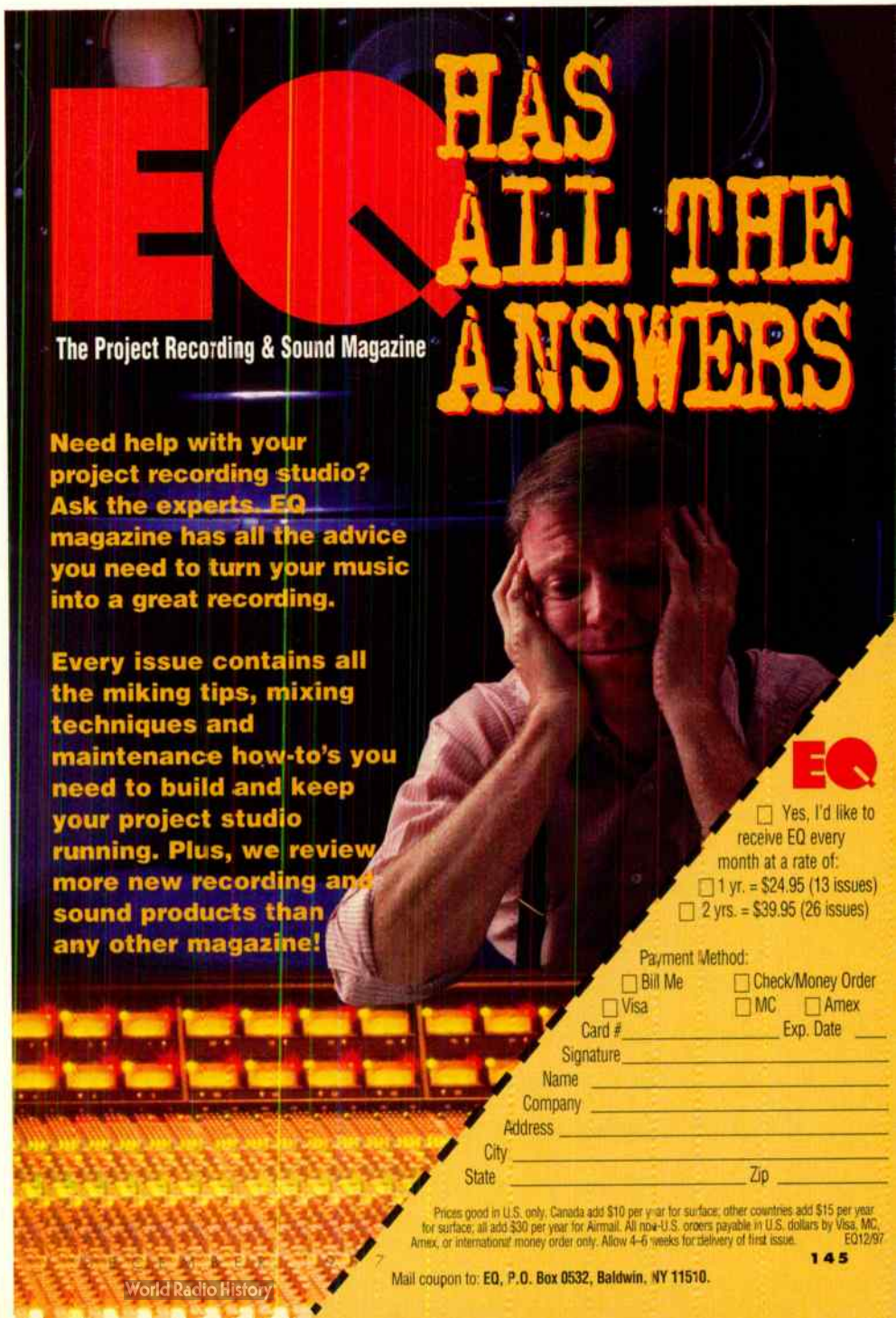
ALESIS NANOTRACKER

The Alesis NanoTracker is a 16-channel MIDI recorder built into a compact, 1/3-rack chassis. Designed as a sequence sketchpad and MIDI data storage/recall device, the NanoTracker will be appreciated by gigging players that need to run sequences live but don't want to drag around a computer and MIDI interface. Capable of recording and storing up to 100 sequences (100,000 notes internally), the NanoTracker is standard MIDI file compatible and has rear-panel jacks for MIDI in and out, start/stop, and sequence advance pedal inputs, and a 1/4-inch audio output for a click.

Operationally speaking, the NanoTracker works much like a tape recorder. You press the front-panel Record button to start recording or Play to play back. A numeric LED display indicates what sequence is active. If you have made a mistake, an Undo button makes it easy to try again. Overdubs can be played over any of the 16 MIDI channels, and the NanoTracker allows assignment of different MIDI instruments to any of these tracks. Other sequence functions include a built-in click, quantization to a variety of note values, and 1-millisecond timing resolution (500 ppq at 120 bpm). One of the really cool features that Alesis built into the unit is Tap Tempo, which lets you simply tap the desired sequence tempo into a front-panel button.

Onboard memory of the NanoTracker is 512k of flash and 128k of SRAM. On the front panel of the NanoTracker is a PCMCIA card slot that greatly enhances the NanoTracker's abilities by allowing use of Flash RAM cards. Using a Flash RAM card, the device may access an additional 50 sequences, totaling a very healthy 8 MB of MIDI data. The cool thing about this is that you can take your sequences with you on a card and (a) not worry about running out of memory and (b) not have to wait for a slow 3.5-inch drive to load in the data. The Alesis NanoTracker will be available in March of 1998 at a suggested retail price of $249.

For more information, contact Alesis, 3630 Holdrege Avenue, Los Angeles, CA 90016. Tel: 310-558-4530. E-mail: alecorp@alesis1.usa.com. Circle EQ free lit. #154.



World Radio History

Beware of *the Cyber Jerks*

You've got locks on your doors, but how protected is your computer system?

BY MARTIN POLON

Many years ago, the late and generally unappreciated Edward Wood Junior made a series of really bad theatrical motion pictures starring a gravely ill and drug-addicted Bella Lugosi. Lugosi, who had earlier made a fortune for Hollywood studios at his peak by portraying Count Dracula in horror movies, now was reduced to bellowing "Beware" in a bad Hungarian accent at the opening of Wood's films. It would be appropriate to resurrect Lugosi to wail his warning to the audio and recording studio community concerning computer use and naive attitudes towards cyber vandals and crime in cyberspace.

The widespread use of computers in studios for audio and business purposes leaves many small and large studio operators open to the many cyber vandals plaguing the Internet and the audio industry in general. In fact, this is not a new issue, but the widespread enthusiasm for computer usage in audio businesses and project recording facilities as well as commercial rooms, has in many cases overwhelmed good sense in protecting studio computers from the cyber version of "Midnight Audio Supply."

Consider the following most recent occurrences:

1. One studio operator had been accessing the Internet with a cable modem, using a PC running Windows 95. Cable modems are provided by cable TV operators who essentially form an extra large network of users whose cable modems are connected to the computer via Ethernet. Another user on the loop was able to access the studio in question's computer files online first due to a minor, though potentially fatal, file sharing flaw extent in Windows 95, secondly due to the studio not having defeated the option of file sharing on their machine, and thirdly due to the studio leaving the computer on and on the cable 'Net 24 hours per day.

The end result was the loss and/or scrambling of all billing and expense files for the year to date. It is not clear that the other cable modem user truly had mischief on his or her mind, but the end result of their browsing through the studio's files was the same!

This studio's operators will surely have an interesting time with the Internal Revenue Service come next April 15. Needless to say, there was no daily backup for all that data on the hard disk, but that's another story! An interesting coda is that if tax records on a PC are lost through a lack of daily backup, the IRS can view the occurrence as negligence.

2. An owner of an audio equipment supply facility received an e-mail message from a studio client he had been soliciting, explaining that the client had received an lower e-mail bid 24 hours after the e-mail bid from our "hero" had been received. The client had not solicited this second bid and the equipment list was identical to the original first bid. The second bid was only several dollars lower than the first, but the company that was buying the equipment had to respond to the lowest bid received, based on the facilities incorporation bylaws.

The mystery of how the specific information could have been acquired by the competitor may not have been quite as Byzantine as first feared. Both of the computers in question were always accessible through remote access software, and the one was equally accessible by anybody using or even just touring the studio. Yet there is a nagging doubt that someone could have entered either computer via cyberspace. The password in each case was simply the name of the business being accessed.

3. There have been several studios who have noticed, as all Internet users should, that "cookies" have been left in their systems folder, preferences file, or browser cache — if using a Mac — and in the DOS root file for whatever browser is being used with Wintel systems. These cookies are placed by a Web site that you have visited and are capable of grabbing and storing information about and/or on your computer and returning that information to the Web site the next time you visit it. Even more curious has been the recent development of these cookies that will momentarily seize the computer's Internet connection while online and surreptitiously transfer "stolen" information in a handful of nanoseconds to its home page.

The bottom line is: Do you know who — and where — your computer is sleeping with last night? Take your computer offline when you are not using it! Why give some hacker the option of penetrating your system and your studio?

Don't use remote access schemes to connect to your system from other locales unless you absolutely have to and you use a lengthy random combination of numbers and letters that will defy automated password breaking programs. Never use any combination of your business name, what you do, family names, your dog's name, etc. Please do not use C3PO or R2D2, since most hackers have seen the *Star Wars* trilogy far more times than you have!

Guard your passwords for on-premises security on all your computers and change them regularly, especially after a staff member leaves or is fired. You have no idea how entertaining your office computers are to band members while your one on-premises employee tries to protect the studio equipment in a "four walls" setup.

Regularly inspect the various cache folders used by your Web browser for cookies and purge these files on a periodical basis. There is no damage to the browser and you will gain several megabytes of space as you clear out the cache files. While it is true that the browser will eventually clear all these files once a preset value is reached, it is probably better for you to remain in control of this phenomenon! EQ

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HARD DISK RECORDING

digidesign AVID
A Division of Avid Technology, Inc.

ProTools Project™
Digital Audio Workstation for Macintosh

ProTools Project is designed to provide ProTools functionality at a more affordable price. The system includes an audio card as well as award winning Pro Tools software and you choose either an 888 or an 882 I/O interface to complete the package. Project also features 8 tracks of record/playback, 4 bands of digital EQ, MIDI record/playback and Quickpunch. Digidesign also has an upgrade path when your ready to expand your system.

REQUIRES–
- Qualified NuBus or PCI Macintosh CPU
- Hard Drive, system software 7.1 or greater
- 24MB RAM minimum
- 14" monitor (17" recommended).

ProTools 4.0 Software–
Pro Tools version 4.0 software provides the next step in the evolution of Digidesign's award-winning digital audio production software for the Mac. Fully Power Mac native, 4.0 features noticeable improvements in every major area. ProControl™ support, improved automation features, relative fader groupings & group nesting, plug in MIDI personality files, multiple edit play lists, Sound Designer II™ functionality, Finder-style searching & sorting, and mmmore.

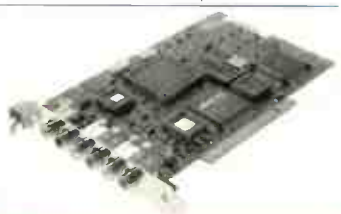
Session 8™
Digital Audio Workstation for Windows

Session 8 is a professional quality digital audio recording, editing, & mixing system created specifically for personal and project recording studios. Designed to operate with Windows 95 or Windows 3.1, Session 8 offers professional recording features, powerful random access editing, automated digital mixing, & unparalleled integration with most popular MIDI sequencers.

FEATURES–
- 8-channel direct to disk digital recording
- Random access, non-destructive editing
- Automated, intuitive digital mixing environment
- Built-in volume & pan automation
- Complete SMPTE frame rate support
- Digital parametric EQ
- Frame accurate sync with built in .AVI video playback window
- Support for multiple hard drive partitions
- Auto sample rate convert to 44.1 or 48 kHz mono .WAV file format
- Choice of audio interface options

digidesign AVID
A Division of Avid Technology, Inc.

Audiomedia III™ Digital Audio Card



Available for both Macintosh and Windows OS systems, Audiomedia III will transform your computer into an powerful multitrack workstation. Compatible with a wide variety of software options from Digidesign and Digidesign development partners, Audiomedia III features 8 tracks of playback, up to 4 tracks of recording, 24-bit DSP processing, multiple sample rate support and easy integration with leading MIDI sequencer and other software programs.

PORTABLE HARD DISK RECORDING

Roland® VS-880 V2

This new version of the popular VS880 incorporates powerful additional software functions that allow you to get the most out of this baby's incredible creative potential.

FEATURES–
- Auto Mixing Function records and plays back your mix in realtime
- Process the master output with a specific inserted effect such as total compression.*
- Simultaneous playback of 6 tracks in MASTER MODE.
- 10 additional effect algorithms (30 total) including Voice Transformer, Mic Simulator, 19-band Vocoder, Hum Canceler, Lo-Fi Sound Processor, Space Chorus, Reverb 2, 4-band Parametric EQ, 10-band Graphic EQ, and Vocal Canceller.
- 100 additional preset effects patches.

- In total, over 20 powerful and convenient features in editing/sync sections have been added. Some require the optional effects expansion board

FOSTEX DMT-8 VL

The latest in the Fostex HD recording family, the DMT-8 VL truly brings the familiarity of the personal multi-track to the digital domain.

FEATURES–
- 18 bit A/D, 20 bit D/A
- Built in 8 channel mixer. Ch 1&2 feature mic/line level
- 2 band EQ and 2 AUX sends per channel
- Cut/Copy/Move/Paste within single or multiple tracks.
- Built-in MIDI Sync, 6 mem locations.
- Dual function Jog/Shuttle wheel provides digital "scrub" from tape or buffer without pitch change. 1/2X to 16X.
- Divide the drive into 5 separate "virtual reels", each with it's own timing information.
- NO COMPRESSION!

CD & CASSETTE DUPLICATION

marantz
CDR615 / CDR620
Compact Disc Recorder

Both next-generation stand-alone write-once CD recorders, the CDR615 & 620 offer built-in sample rate conversion, CD/DAT/MD/DCC subcode conversion, and adjustable dB level sensing. They also feature adjustable fade in/out, record mute time & analog level automatic track incrementing. A 9-pin parallel (GPI) port, headphone output with level control and RC620 remote are also included. The **CDR620** adds a SCSI-II Port, XLR (AES/EBU) Digital In/Out and Digital cascading, 2x speed record, Index Recording and playing and defeatable copy prohibit and emphasis.

Telex
ACC2000/ACC4000
Cassette Duplicators

Designed for high performance & high production, Telex duplicators offer easy maintenance and operation. The **ACC2000** is a 2-channel mono duplicator while the **ACC4000** is stereo. Each produces 3 copies from a cassette master at 16x normal speed & by linking additional copy modules, you can duplicate up to 27 copies of a 60 minute original ***in under 2min!***

ACC2000XL/ ACC4000XL
The XL Series feature "Extended Life" cassette heads for increased performance and wear characteristics. They also offer improvements in wow and flutter, freq. response, S/N ratio & bias.

STUDIO DAT RECORDERS

SONY
PCM-R500

Incorporating Sony's legendary high-reliability 4D.D. Mechanism, the PCM-R500 sets a new standard for professional DAT recorders. The Jog/Shuttle wheel offers outstanding operational ease while extensive interface options and multiple menu modes meet a wide range of application needs.

FEATURES–
- Set-up menu for preference selection. Use this menu for setting ID6, level sync threshold, date & more. Also selects error indicator.
- Includes 8-pin parallel & wireless remote controls
- SBM recording for improved S/N *(Sounds like 20bit)*
- Independent L/R recording levels
- Equipped with auto head cleaning for improved sound quality.

TASCAM
DA-20/DA-30mkII

- Multiple sampling rates (48, 44.1, and 32kHz).
- Extended (4-hour) play at 32kHz.
- S/PDIF Digital I/D, RCA Unbalanced In/Dut.
- SCMS-free recording. Full function wireless remote.

DA-30mkII Additional Features–
- Variable speed shuttle wheel.
- Digital I/D featuring both AES/EBU and S/PDIF.
- XLR balanced and RCA unbalanced connections.
- SCMS-free recording with selectable ID.
- Parallel port for control I/O from external equipment.

Panasonic®
SV-3800/SV-4100

The SV-3800 & SV-4100 feature highly accurate and reliable transport mechanisms with search speeds of up to 400X normal. Both use 20-bit D/A converters to satisfy even the highest professional expectations. The **SV-4100** adds features such as instant start, program & cue assignment, enhanced system diagnostics, multiple digital interfaces and more.

FOSTEX
D-15TC/D-15TCR

The new Fostex D-15 is the least expensive timecode DAT on the market. It has a host of new features aimed at audio post production and recording studio environments. 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)

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
- Parallel interface

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- 126dB dynamic range.
- Switchable 10dB and 20dB pad.
- 20Hz–20kHz.

CAD

E-300
Studio Condenser Microphone

A multi-patterned side address mic that combines vintage capsule design with advanced headamp electronics, the E-300 has an unusually wide frequency response of 10Hz to 20kHz & an exceptional dynamic range of 137 dB. It also features extremely low self noise of 11dB. Ideal for even the most critical studio applications.

Shown with optional ZM-1 Shockmount

Unique powering of all Equitek Series microphones is accomplished with a pair of rechargeable nicad 9-volt batteries in combination with 48V phantom power. This overcomes inherent current limiting associated with most phantom power supplies & can supply 10x the current.

audio-technica

AT4050/CM5
Cardioid Capacitor Microphone

The AT4050 multi-pattern condenser expands upon the AT4033 to set the standard for studio performance mics.

FEATURES–

- 2 capacitor elements.
- Cardioid, Omnidirectional, & figure 8 polar pattern settings.
- Vapor-deposits of pure gold on specially-contoured large diaphragms are aged through 5 steps to ensure optimum characteristics over years of use.
- Transformerless circuitry results in exceptional transient response and clean output even under extremely high SPL conditions.

SENNHEISER

MD 421

For over 20 years, the MD 421 has been one of Sennheiser's most popular dynamic mics. The large diaphragm, dynamic element handles high sound pressure levels, making it natural for recording guitars and drums. The MD 421's full-bodied cardiod pattern, and 5-position bass control make it an excellent choice for most instruments, as well as group vocals, or radio broadcast announcers. One listen and you'll know why its a classic.

MIXING BOARDS

MACKIE.

Get on the 8-Bus!

Since its introduction, Mackie Designs' 8•Bus Series consoles have proven that excellent sonic quality, practical features and extreme durability can be affordable. All 3 versions offer extensive monitoring, 4-band EQ, accurate, logarithmic taper faders, and expansive headroom. The 24x8 and 32x8 can be expanded using Mackie's 24•E Expander console which consists of 24 input channels and tape returns and may be daisy chained to provide 128 or more total input channels.

Available in 16x8, 24x8, & 32x8 versions.

FEATURES-

- Each channel includes Mackie's well-known Mic preamp and a -10/+4 switchable tape return
- 8-assignable submasters and a L/R mix master
- 4-band, true parametric EQ
- Extensive routing capabilities
- Optional Meter Bridges available
- Optional 24•E Expander console available
- Rugged all-metal chassis
- In-line monitoring effectively doubles input channels

TASCAM M-1600
16 & 24 Channel 8-bus Consoles

Great for modular Digital Multitrack setups and hard disk recording, the M-1600 is part of Tascam's next generation series of recording consoles. It features multiple options for inputs and outputs and uses the same, easy to install D-sub connectors as Tascam's more expensive consoles, all in "a compact design.

FEATURES–

- XLR Mic inputs w/phantom power on 8 channels.
- Signal present/overload indicators on each channel.
- Balanced & Unbalanced tape returns & Balanced Group/Direct outputs using D-sub connectors.
- TRS Balanced Line Inputs on all channels.
- 3-band EQ with sweepable mids.
- 5 Aux sends (1 stereo)
- 4 assignable aux returns

Perfect for use with DA-88 and ADAT setups.

MINIDISC MULTITRACKS

TASCAM 564
Digital Portastudio

The Tascam 564 Digital Portastudio combines the flexibility and superior sound quality of digital recording with the simplicity and versatility of a portable multitrack. Using MiniDisc technology, the 564 has many powerful recording and editing features never before found in a portable 4-track machine.

FEATURES–

- Self-contained digital recorder/mixer.
- Uses low-cost, removable MiniDiscs..
- 2 AUX sends / 2 Stereo returns.
- 4 XLR mic inputs.
- Channel inserts on inputs 1 & 2.
- 5 takes per track, 20 patterns, 20 indexes per song.
- Random access and instant locate.
- Non-destructive editing features with undo capability include: bounce forward, cut, copy, move.
- Full-range EQ with mid-range sweep.
- S/PDIF digital output for archiving
- MIDI clock and MTC.

SONY

MDM-X4
MD Multi-Track Recorder

MD recorders are here! Offering up to 37 minutes of high-quality 4-track digital recording, the MDM-X4 is truly the next generation of personal multi-tracks. With a built-in mixer, exclusive Track Edit system, and a Jog/Shuttle wheel for sophisticated editing with ease, the MDM-X4 will encourage you to flex your creativity.

FEATURES–

- Records on high quality, removable MD data discs
- 3.5-gen. ATRAC LSI for wide dynamic range.
- 10 Input / 4Bus mixer.
- 2 AUX sends, 3-band EQ. • 11-point locator.
- Random access memory for quick playback and record from anywhere on the disk.
- Editing features include Undo, Redo, & Section/Song editing for flying material between different tracks.

STUDIO MONITORS

ALESIS

Monitor One

The award winning Monitor One provides the last critical link in the recording studio's signal chain, giving you an accurate reproduction of what is being recorded.

FEATURES-

- Excellent image and transient reproduction, powerful bass, and smooth, extended high frequency detail.
- Exclusive SuperPort speaker venting technology
- Ferrofluid cooled 1" silk-dome driver

TANNOY

PBM 6.5II

The PBM 6.5 II is the industry standard for studio reference monitors. They provide true dynamic capability and real world accuracy.

FEATURES–

- 6.5" low frequency driver and 3/4" tweeter
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

JBL

4206 & 4208

The 4206 & 4208 studio reference monitors are 6" and 8" respectively. Both offer exceptional sonic performance, setting the standard for today's multi-purpose studio environments.

- Multi-Radial baffle ABS baffle virtually eliminates baffle distortion.
- Superb imaging & reduced phase distortion.
- Pure titanium diaphragm high frequency transducer provides smooth, extended response.
- ***Magnetically shielded for use near video monitors.***

SPIRIT

Absolute Zero

Absolute Zero monitors maintain a wide frequency response at high and low listening levels, both on and off-axis for consistent results everytime.

FEATURES-

- High definition linear phase design
- Wide, controlled dispersion
- CAD optimized, low loss crossover
- Custom designed drivers
- Long throw 170mm LF driver
- 25mm soft dome HF unit on proprietary waveguide

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PORTABLE DAT RECORDERS

TASCAM DA-P1

- Rotary 2 head design, 2 direct drive motors.
- XLR mic/ line inputs (w/phantom power)
- Analog and S/PDIF (RCA) digital I/O.
- 32/44.1/48kHz sample rates & SCMS-free recording.
- Built in MIC limiter and 20dB pad.
- TRS jack w/ level control for monitoring
- Includes shoulder belt, AC adapter, & battery.

HHB PDR1000/PDR1000TC

The PORTADAT has fast become an industry standard location DAT machine. Popular for film and video production use, as well as ENG/EFP, the PDR1000 features a large backlit display, 4 motor transport and AES/EBU and SPDIF digital ins and outs. The PDR1000TC adds the ability to record, generate and reference to timecode as well as jam sync to convert absolute time to timecode.

FEATURES-
- 4 head Direct Drive transport
- XLR mic & line analog ins, 2 RCA line outs. Digital I/O includes S/PDIF (RCA) and AES/EBU (XLR).
- L/R channel mic input attenuation selector (0dB, -30dB)
- 48V phantom power, limiter & internal speaker.
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status, ID number, tape source status and machine status.
- Nickel Metal Hydride battery powers the PDR1000 for 2 hours. AC Adapter/charger included.

PDR1000TC Additional Features–
- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97, 29.97DF, & 30 fps.
- External sync to video, field sync and word sync.

NEW Options-
- **MS1000 Master Sync module** ensures drift will be no more than 1 frame every 10 hours.
- **HM1000 Headphone Matrix** provides a rotary switch for selection of Stereo, Mono Left, Mono Sum, & M/S (mid-side) Stereo modes.

SONY TCD-D10 PROII

A reliable, high-performance DAT recorder, the portable TCD-D10 PROII is designed with rugged professional use in mind. It has many enhanced features including absolute time recording, allowing immediate use of the tapes as source material for Sony's PCM-7000 series DAT editing system.

FOSTEX PD-4 V.2

The second-generation portable, professional TC DAT recorder from Fostex. Version 2 software includes many features and functions for improved performance in the field.

FEATURES–
- 4-head design • Punch-in/out
- Pre or post striping of SMPTE/EBU timecode
- 3 in X 2 output mixer with 3-position pan functions
- Selectable 48V phantom powering and variable low-cut filters

EFFECTS PROCESSING

lexicon PCM-80 & PCM-90 Digital Signal Processors

A great combination for any studio owner with an ear for the best. The **PCM-80** delivers high quality multi-effects based on the legendary PCM 70, maintaining Lexicon's high standards for sonic clarity and extraordinary processing power. The **PCM 90** is a digital reverb with its roots stemming from the studio standard 480L and 300L effects systems. Reverbs from telephone booths to the grand canyon, the PCM 90 is incredibly realistic, an excellent addition to any rack mount arsenal.

Buy a PCM-80 from B&H before December 25th, 1997 and receive a FREE Pitch FX Card & $100 - a $350 Value!

Buy a PCM-90 from B&H before December 25th, 1997 and receive a FREE Dual Reverb Card & $250 - a $500 Value!

lexicon MPX-1 Multi-Effects Processor

Lexicon's latest addition to their Digital effects family, the MPX-1 features top-quality effects in an easy to use 1 rack space unit. With 56 Pitch, Chorus, EQ, Modulation, Delay, and world-class reverb effects accessible from the front panel, as well as TRS and XLR balanced I/O and complete MIDI implementation, the MPX-1 creates a new standard for cost and quality in a multi-effects device.

t.c.electronic Wizard M2000 Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and 6 different routing modes making it a great choice for high-end studio effects processing.

FEATURES–
- 250 factory programs including reverb, pitch delay, chorus, flange, phase, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement
- 20-bit A/D conversion, AES/EBU and S/PDIF digital I/O.
- "Wizard" help menus, 16-bit dithering tools.
- Tap and MIDI tempo modes
- Single page parameter editing, 1 rack space.

SONY DPS-V77 2 Ch. Master Effects Processor

Sony's latest effects processor, the DPS-V77 yields excellent sonic quality combined with realtime control, a digital I/O and many more features that will put a smile on the face of any discerning studio engineer.

FEATURES–
- 198 preset &198 user-definable programs.
- Control up to 6 parameters in realtime via MIDI information and an optional foot pedal
- Use the AES/EBU & SPDIF digital I/O to link multiple V-77s together & when working with digital mixers
- 10-key pad input
- Shuttle-ring equipped rotary encoder allows for quick patch changing.
- A noise gate circuit is provided ahead of the input for guitar players and other instrumentalists who want top quality effects without sacrificing tone.

Roland SRV-330 Dimensional Space Reverb

The SRV-330 provides exceptional sound quality, using proprietary Roland Sound Space technology to achieve three-dimensional spatial effects with conventional two-channel playback

FEATURES–
- Discrete stereo reverb algorithms for independent processing per channel
- 30-bit internal signal processing for a clear and accurate sound
- 300 preset and 100 user patches
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SONY MDR 7506

The Sony **7506's** have been proven in the most trying studio situations. Their rugged, closed-ear design makes them great for keyboard players and home studio owners.
- Folding construction
- Frequency Response 10Hz to 20k Hz
- 1/4" & 1/8" Gold connectors
- Soft carrying case
- Plug directly into keyboards

beyerdynamic DT 770 Pro

These comfortable closed headphones are designed for professionals who require full bass response to compliment accurate high and mid-range reproduction.
- Wide frequency response
- Durable lightweight construction
- Equalized to meet diffused field requirements
- Padded headband ensures long term comfort

SENNHEISER HD 265/HD580

The **HD-265** is a closed dynamic stereo HiFi/professional headphone offering high level background noise attenuation for domestic listening and professional monitoring applications. The **HD 580** is a top class open dynamic stereo HiFi/professional headphone that can be connected directly to DAT, DCC, CD and other pro players. The advanced design of the diaphragm avoids resonant frequencies making it an ideal choice for the professional recording engineer.

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KEYBOARDS & SOUND MODULES

Roland A-90EX
Master Keyboard Controller

The A-90EX is an 88-note, weighted master controller with one of the best keyboard actions currently on the market. It offers incredibly realistic piano sounds, powerful controller capabilities and 'virtual' programmable buttons which can be configured to operate your software and other devices. The A-90EX combines the majestic sound of a concert grand, the expressive action of a fine acoustic keyboard and the comprehensive MIDI functions of a master controller—all in a portable stage unit.

FEATURES–
- Master Volume Slider and Global Transpose features
- Proprietary 88-note hammer-action, velocity sensitive keyboard with aftertouch
- 2 types of stereo-sampled grand pianos, various acoustic and electric pianos (including a great classic Rhodes).
- Stores up to 64 Performances

Roland JV-2080
64-Voice Synthesizer Module

Roland resets the standard with the incredibly expandable JV-2080 64-Voice Synthesizer Module. This amazingly powerful package offers unprecedented expandability, digital signal processing, and remarkable operational ease, all housed in a 2-unit rack-mount design.

FEATURES–
- 64-Voice / 16-part multitimbral capability.
- 8 slots for SR-JV80-Series wave expansion boards.
- 3 independent effects sets plus independent reverb/delay and chorus.
- 6 outputs, Main Stereo and 4 assignable.
- NEW patch finder and Phrase Preview functions for easy access to all patches.
- Large backlit graphic display
- Compatible with JV-1080, XP-50, & XP-80.

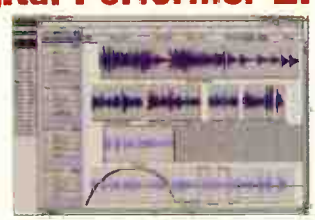
KURZWEIL
K2500 Series **Music Workstation**

Building on the same features that made the 2000 series popular, the 2500 utilizes the acclaimed V.A.S.T. technology for top-quality professional sound. Available in 76-key (K2500), 88 weighted key (K2500X) and rackmount (K2500R) configurations, the K2500 combines ROM based samples chosen from the best of Kurzweil's collection, on-board effects, and full sampling capabilities on some models (K2500S, K2500RS & K2500XS).

FEATURES–
- True 48-voice polyphony
- Fluorescent 64 x 240 backlit display
- Up to 128MB sample memory
- Operating system stored in flash ROM (for software updates via floppy disk and SCSI)
- Full MIDI controller capabilities
- 32-track sequencer • Dual SCSI ports
- Advanced file management system
- Sampling option available
- Optional DMTI Digital Multitrack interface for data format and sample rate conversion with ADATs/DA-88s

MIDI SOFTWARE

Mark of the Unicorn
Digital Performer 2.1
Macintosh MIDI Sequencer w/ Integrated Digital Audio



Digital Performer contains all of the sequencing capabilities of Performer V.5 and adds Digital Audio to the picture. Apply effects such as Groove Quantize, shift, velocity scaling and more– *All IN REALTIME.*

FEATURES–
- MIDI Machine Control, Quicktime Video playback.
- Sample rate conversion.
- Spectral effects, pitch correction.
- Real-time editing and effects processing
- Full featured Notation section that rivals dedicated notation software programs.
- Playback using Quicktime Musical Instruments
- Virtual automated mixing
- Non-destructive MIDI output processing

SAMPLING

E-mu Systems, Inc.
e-6400 **Emulator**

The e-6400 offers the power of E-mu Systems' renowned Emulator Operating System (EOS) and superb audio quality in a package perfect for the budget-minded professional. The e-6400 comes with stereo sampling, 4MB of RAM and is fully upgradeable to E-mu's top of the line Emulator sampling synthesizers, the E4X, and E4XTurbo.

FEATURES–
- 64 voice polyphony (expandable to 128)
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- 8 balanced analog outputs
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- Standard SCSI interface
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- Note variation slider gives you realtime control of any sound's tuning, attack, decay, or filter frequency.
- Floppy Disk Drive
- Powerful expansion options.

MIDI HARDWARE

Mark of the Unicorn
MIDI Time Piece™ AV
8x8 Mac/PC MIDI Interface

The MTP AV takes the world renowned MTP II and adds synchronization that you really need like video genlock, ADAT sync, and word clock sync, even Digidesign superclock!

FEATURES–
- Same unit works on both Mac & PC platforms.
- 8x8 MIDI merge matrix, 128 MIDI channels.
- Fully programmable from the front panel.
- 128 scene, battery-backed memory.
- Fast 1x mode for high-speed MIDI data transfer.

Mark of the Unicorn
Digital Time Piece™
Interface

Think of it as the digital synchronization hub for your recording studio. The Digital Timepiece provides stable, centralized sync for most analog, digital audio, and video equipment. Lock together ADATs, DA-88's, ProTools, word clock, S/PDIF, video, SMPTE, and MMC computers and devices flawlessly. It ships with "Clockworks" software which gives you access to its many advanced features and remote control of some equipment settings such as record arm.

OPCODE
Studio 64X
Cross Platform Interface

The Studio 64X is part of Opcode's new Studio X Series. This 64 channel MIDI interface is compatible with both Macintosh and Windows and features SMPTE synchronization as well as OMS (Open Music System) compatibility for total integration with any OMS compatible application.

FEATURES–
- Cross-platform Mac and Windows compatibility
- 4 MIDI inputs and 6 MIDI outputs, 64 MIDI channels
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- SMPTE timecode-generation and synchronization
- Front panel patchbay, SMPTE access and panic button

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ACROSS THE BOARD

continued from page 162

11. Brooke Siren AR-416 rackmount direct boxes. I have been using the stand-alone AR-116 for 10 years. I need more!

12. Sony V-77 effects processor. These things just keep getting better.

13. Z-Systems 32x32 digital audio router. I have too many things for my 8x8. I hope Glen is designing the 64x64.

14. Inertially guided DSS satellite dish. It is designed for boats. The antenna stays locked on the satellite even when the boat is bounding over the waves. I wonder if it would work during an L.A. earthquake. I would hate to miss *The X-Files* because of some silly temblor.

15. Sharper Image LASER range finder. Accurate to within one yard up to 800 yards. I could keep it right next to my LASER sighted blow gun with the poison darts.

16. Turbine powered yacht. I saw one. It had two 4000 horsepower jet engines that would push this 50-foot cabin cruiser over 70 knots. With this kind of technology, you could water ski behind the Queen Mary II.

17. Genex 8-channel, 24-bit, 96 kHz optical disc recorder.

18. Aardvark's Master Sync provides a common clock to all of your digital devices. No more clicks and pops.

19. Panasonic Linear Motor razor. Yup, the carbotitanium blades are speed controlled by an optical sensor so they don't get over 12,000 cycles per second.

20. TC Electronic FireworX digital effects processor with 24-bit A/D and D/A converters.

21. Garmin GPS III Pilot. What the heck, this would be my 5th GPS receiver, but who's counting.

22. A gift certificate from MARS. Either the planet or the music store. Makes no difference to me.

23. A new Titanium road bike from Ernesto's Bike Shop in Miami. Some "girl" kicked my butt on a 50-mile bike ride today, and I'm pissed. Maybe they make turbine-powered bicycles?

24. M&K MPS-150 THX speaker system with MPS-150 SUR Tripole surround speakers. Yes, I said THX certified. I heard them in L.A. two weeks ago hooked up to a Yamaha 02R with version 2 software mixing 5.1 surround.

25. JLCooper software for controlling multiple Yamaha 02R consoles. All of your parameters and mix data is stored on the computer instead of in the 02R.

26. Magellan handheld GSC-100 combination GPS navigation receiver and satellite communication system. It sends and receives directly from the ORBCOMM network of up to 28 satellites. You can send and receive e-mail from the middle of the Pacific Ocean, or downtown Truth Or Consequences, New Mexico. A must have for any Gear Slut.

27. A Little River Marine single scull rowing craft. You know, one of those needle shaped rowing boats like George Peppard sculled during the opening credits of *Banecek*.

28. Seagate 23 GB Fast/Wide SCSI hard disk. Now you have almost enough room for recording.

29. DLT-4000 backup tape drive. Back up those 23 GB drives at hard disk speeds. Up to 40 GB per tape.

30. More Monster Cable. You can never have too many Monster Cables.

That ought to hold you for another couple of years. Let me know if you get any of this for Christmas so I can say, "See, honey! His wife bought him one, why can't I have one?" EQ

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If Wishes *Were Horses*

Just in case you were wondering what to buy me this year...

BY ROGER NICHOLS

If wishes were horses, beggars would ride. So here I am again with my Xmas wish list. If it looks like I am begging for some of these things, you are probably right. Just working on the list invoked some primordial desire to obtain as many of these items as I could, so a few of them are already in my possession. Here goes:

1. Spectron 1000 watt class "D" power amp. It has been beating everything in shoot-outs across the country. Designed by John Ulrich, who started Infinity back in the '60s.

2. Four Alesis M20 20-bit ADATs. OK, I'm greedy. They are going to be as addictive as potato chips. Bet you can't own just one.

3. Pro Tools 4.1 24-bit hard-disk recording system including the new 24-bit 888 I/O boxes. Nothing sounds like 24-bit! I'm going to transfer all of my CD collection to 24-bit. (Someone out there is going, "Yeah, me too!")

4. A Breitling Emergency. A Titanium Aerospace watch with built-in ELT (Emergency Locator Transmitter) for pilots.

5. Two Apogee AD8000 24-bit A/D converters with AMBUS 24-bit D/A card and AMBUS Pro Tools interface.

6. Meyer HM-1 Studio nearfield monitor system with the HM-1 subwoofer. Following in the tradition of the HD-1 monitors that I use for mixing.

7. Mackie HUI hardware interface for Pro Tools, so it acts like a real console.

8. Yamaha CDR-400 CD recorder. Proving to be the new standard with 4x record, 6x playback, and 2 MB buffer.

9. 100x CD-ROM drive for my PC. Yup, they exist and they are only $169. I'm waiting for someone to get hurt by the shrapnel when a high-speed CD comes apart while turning at 50,000 rpm.

10. DVD-R so I can record my own DVD discs. Guess I'll be waiting a while for this one.

continued on page 160

JOHN DENVER REMEMBERED

John Denver was born December 31, 1943 in Roswell, New Mexico. He died October 12, 1997 in a plane crash near Monterey, California.

I met John in 1979 and had engineered and produced his albums since 1980. When we weren't in the studio working, we would go fishing or hiking or skiing in the Rockies. I certified John as a SCUBA diver so we could go diving with Cousteau. Connie and I traveled with him to Australia to dive on the Great Barrier Reef. He let me fly right seat in his Lear Jet and perform some aerobatics in his Christian Eagle biplane. We stood on the Great Wall of China and contemplated our place in the universe.

John was the ultimate Gear Slut. He had me beat by a mile. One time John came through New York when I was working on a Steely Dan project. He called me at the studio and asked if Donald Fagen and I wanted to go on a sunset helicopter cruise around Manhattan. John called me two days before the crash to check on his latest project. Connie was recording vocals on his new single. He asked me if I wanted to meet him in Santa Maria to pick up his new plane. I had to go to Nashville, or I would have.

John cared about people and the environment. He often got bashed by the press. Every summer he would pay to bring underprivileged children to an Aspen Summer camp. When gas prices skyrocketed, he bought an underground gas tank and filled it up for the busses. Public opinion made him take it out because everyone believed he was using it to fuel his Porsche. With the increase in fuel prices, summer camp attendance had to be cut back.

Remember the Billy Joel concert in The Soviet Union? John made that possible. For over ten years, there was no cultural agreement between the United States and Soviet Union. After two years of negotiation, the Soviet government allowed John to go to Moscow, Leningrad, and Tallinn in 1984 to perform for small audiences of government officials. They were impressed. The audience couldn't speak English, but they sure were singing John Denver songs. The road was cleared for the following year: the first public concerts by an American in over ten years. The cultural agreement was signed and the record showed that it was made possible by the efforts of John Denver.

John's songs may have been three-chord wonders, but he played the hell out of them. He was an excellent guitar player and singer. He performed thousands of sold out concerts over the years with just him and his guitar. He is the only guy I know who could do vocals on 30 songs in two days in the studio, all of them in one take.

John supported Windstar, The Hunger Project, UNICEF, Plant-It 2000, and many other organizations that helped to improve the quality of life for us all. Most of all, John supported his friends and his family. Connie and I will miss him as a friend, as part of our family, but most of all, we will miss him as a great human being.

—Roger Nichols

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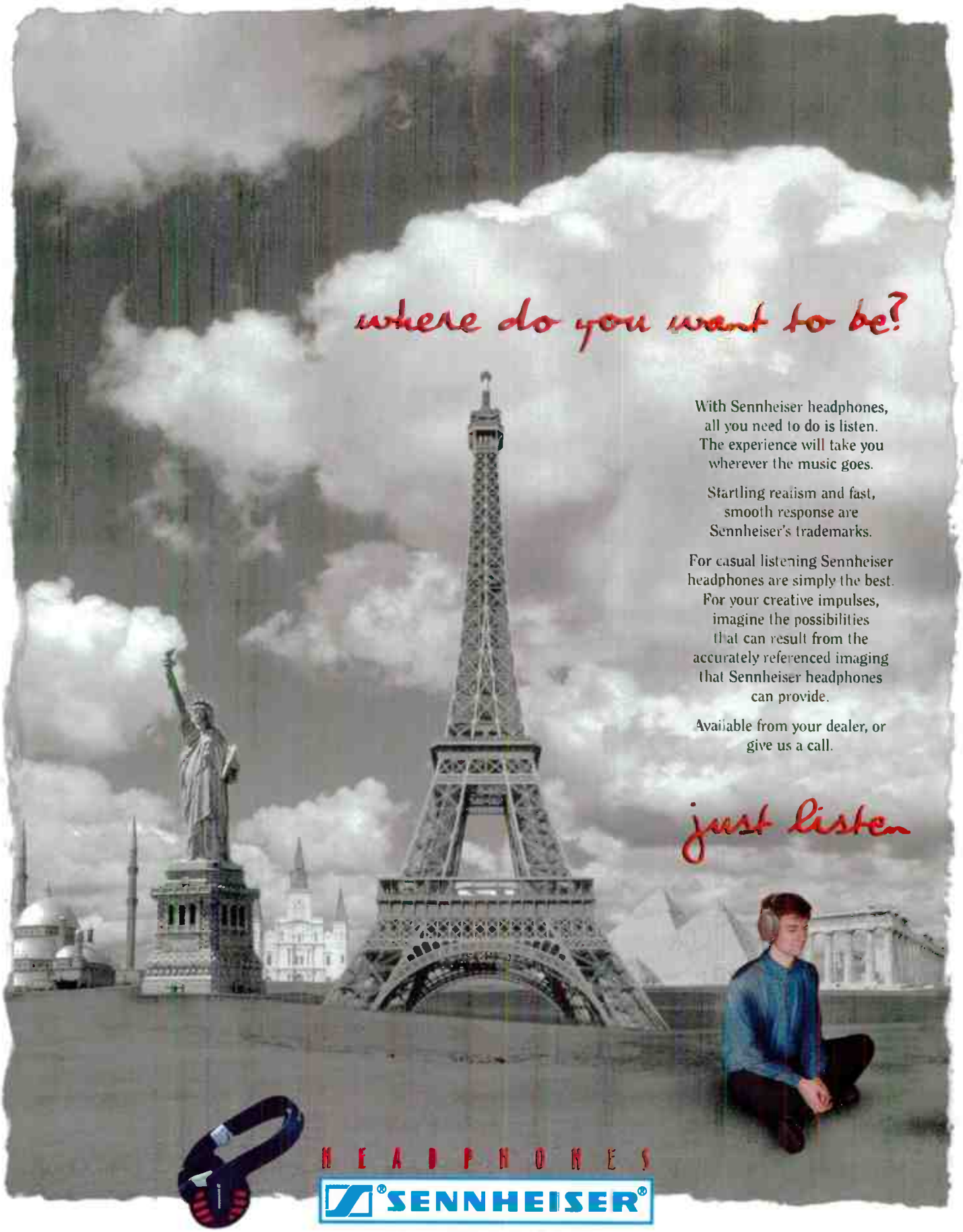

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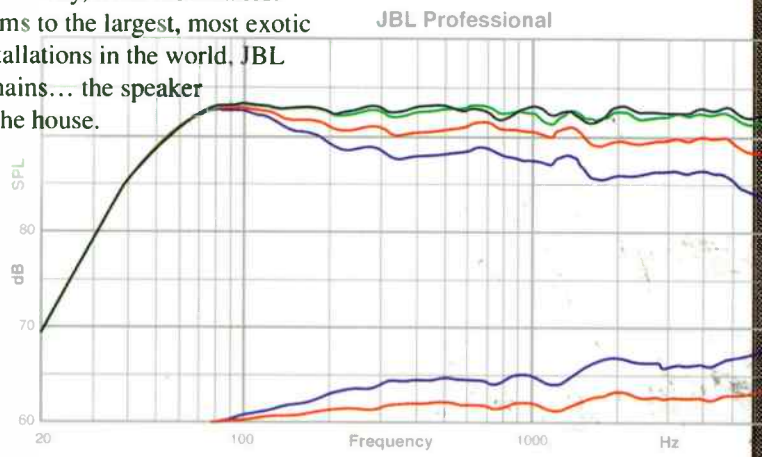

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Eye & I

PHOTO BY JONATHAN POSTAL

If you've got your health, you've got everything

BY AL KOOPER

This will be an unusual column for me. It will be serious, although, like my other columns, it's about my everyday life. I'm writing about it because perhaps it can help somebody who may find themselves in my situation. I am definitely not the self-pitying type, so, please, "don't let me be misunderstood," to quote the 1965 Animals record of the same name.

It started in early December. I remember noticing one day that my vision seemed "different." Now, I'm a glasses-wearing mofo with a good left eye and an unhealthy prescription in my right one. My vision seemed worse somehow, but I couldn't tell exactly why. Three days later, I happened to close my left eye and noticed a problem with the right one. It seemed like the aftermath of a flashbulb shoot. My vision was clouded, obliterating a great deal of the straight-on sight in my right eye. This was on a Friday — I couldn't get an opthamologist appointment until Tuesday. *To say the least, I was worried.*

Now, I have gone 55 years without noticeable health incidents. No cancer, AIDS, loss of limbs, or even a broken bone. Five years ago, I was diagnosed with Diabetes 2 — but I quickly got that under control with a severe change of diet. Truly a lucky guy. I've been blessed in that way, and I never take it for granted. Tuesday came, and I sat in the doctor's chair with my pupils dilated as he repeatedly stabbed and raped my eye with blinding lights. Later he told me soberly that he had made an emergency appointment for me the next day with the head of the Neuro-Vascular Department at Massachusetts General Hospital. He thought there was a serious problem with my right eye.

That night, I stared repeatedly out of the right eye with my left eye shut. After a minute or two, I could close that eye and "see" a glowing pattern that basically outlined the extent of my sight loss. In the new doctor's office, I took a test with just my right eye. I stared into a diorama-type box and pressed a button every time I saw a flashing light within my field of vision. The test took approximately ten minutes. A short while after I was done, the nurse handed me a sheet of paper. On it, the pattern I was able to "see" in my head with my eyes shut was clearly drawn. They had been able to document the exact outline I had seen in my head! With these results in hand, I received the doctor herself. An elderly, white-haired British woman, she had not the slightest thread of a sense of humor:

"You've had a stroke in your right eye, brought on, I believe, by diabetic origins. Your sight loss is most assuredly permanent. The end arteries in your right eye are most probably blocked, and your optic nerve appears to be swollen. Through medication, we will attempt to thin your blood and get it back into the eye to prevent further sight loss. We will also attempt to stop the swelling of the optic nerve with anti-inflammatory steroid treatment. There is no cure for this, and the methods we attempt are empirical; that is, from patient to patient, we are experimenting to try and stem this sort of damage."

I sat there stunned. Never for a moment did I consider permanent sight loss and yet, right off the bat, here it was. Two thirds of the vision in one eye — gone forever in one terse doctoral paragraph.

I sat there stunned. Never for a moment did I consider *permanent sight loss* and yet, right off the bat, here it was. Two thirds of the vision in one eye — gone forever in one terse doctoral paragraph.

The doctor then went on to describe a worst-case scenario of the side-effects of each medication. The one for the steroids was particularly gruesome. She didn't flinch when I told her I was considering not taking them because of these possible side-effects: "You think about it tonight and let me know first thing in the morning. We must get moving right away."

I went home and called one of my friend's uncles, who is the author of a major diabetes book and a respected west coast doctor: "Yes Al, it's a serious drug, but she's only got you taking it for three weeks in a tapered dosage. The

continued on page 144

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