

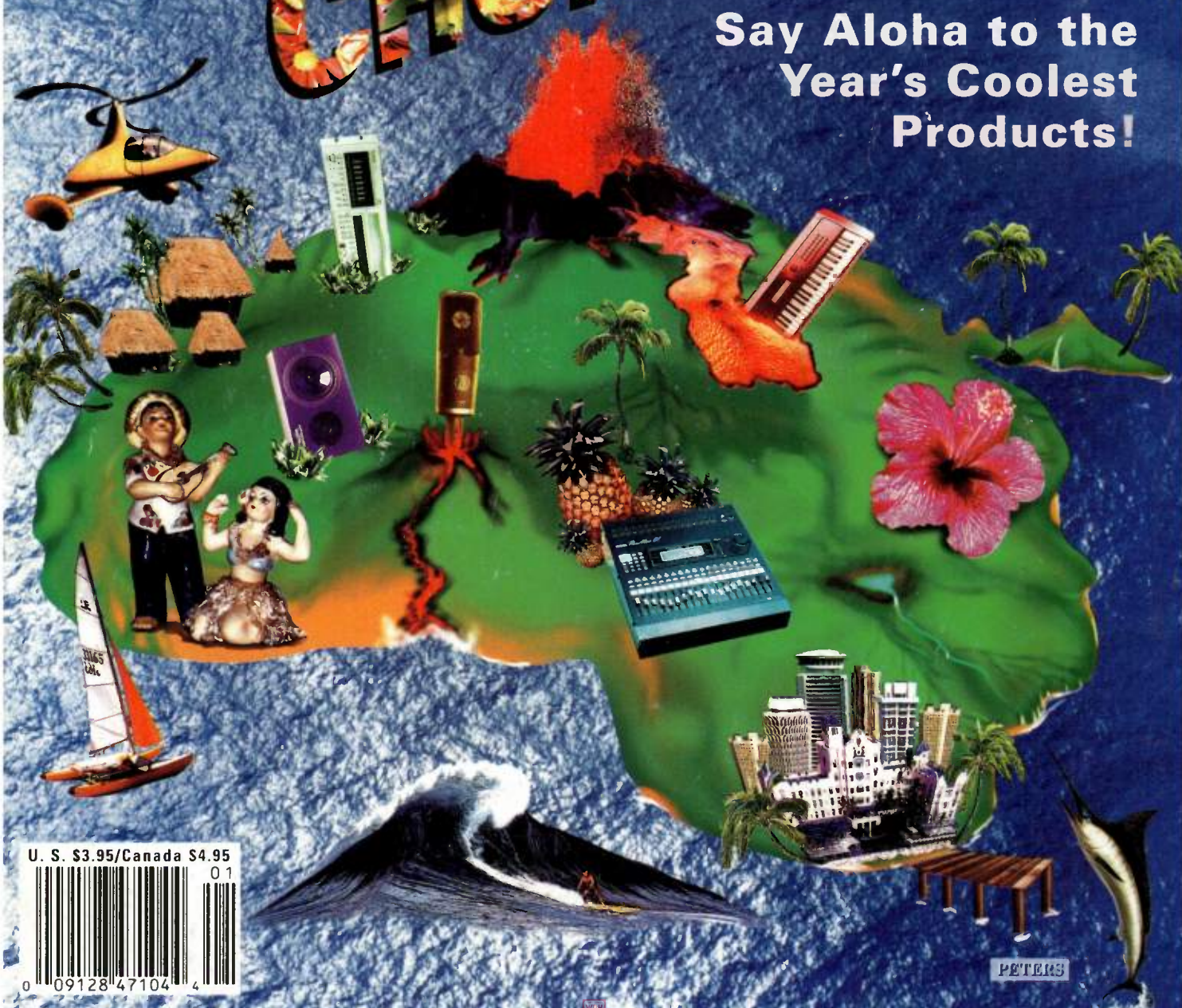
Fire Up Your MIDI Guitar ■ Buy the Best CD-ROM Drive

Electronic Musician

January 1995

EDITORS' CHOICE

Say Aloha to the
Year's Coolest
Products!



U. S. \$3.95/Canada \$4.95

01



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PETERS

We get a lot of calls from folks asking about who's using Mackie 8•Bus Recording/PA consoles.

Good question. After all, a board's only as good as its users.

So we grabbed the latest stack of 8•Bus Warranty Registration cards and hit the phones.

The names in this ad represent a cross section of current 8•Bus users. They range from platinum supergroups tracking new albums to high school choirs, from bar bands to sound designers working on network TV series and feature films.

There'd probably be more names but we didn't want to make the type any smaller than it already is — or keep tying up our already clogged phone system.

As our production of 8•Bus boards increases, so does this list. In a way, it's confirmation of the raves that magazine reviewers have heaped upon the console. Above all, it's proof that the Mackie 8•Bus is a serious tool for professionals. A tool that's getting used day-in and day-out for major projects.

Call our toll-free literature line 8AM-5PM PST and talk to a genuine Mackoid (no voice mail!). We'll send our obsessively-detailed 24-page color brochure on the 8•Bus Series.

Then become a part of this list by visiting your nearest 8•Bus dealer.



Currently in Spain tracking new album on multiple Mackie 24•8 consoles.
Def Leppard

Sound design & mixing of commercials for G.I. Joe, Kenner Toys, Hasbro Toys, Transformers 1/2-hour show, infomercials.
Lawrence Wakin • Tapestry Productions Inc. • New York, NY



Tracking for Madonna.
Shep Pettibone • Mastermix Productions Ltd. • New York, NY

Recorded Grammy-Nominated "Sunday Morning" off of the album Millenium on 24•8, currently working on new album exclusively on console.

"The 24•8 survived the 7.1 San Fernando Valley earthquake. It's definitely built for rock 'n' roll."
Sheldon Reynolds • Earth Wind & Fire • Los Angeles, CA

Music scoring for Pepsi Cola and McDonalds and Six Flags TV & radio commercials.
The Listening Chair • Dallas, TX

Recording and mixing of acoustic music & sounds from the American West. Recent albums include "Charlie Russell's Old Montana Yarns" by Raphael Cristy and "Where the Red-Winged Blackbirds Sing" by Jim Schulz.

Bruce Anfinson • Last Chance Recordings • Helena, MT

Pizza Hut commercial scored to film, scoring of theme presentation for The Baseball Network, self-produced album "Rick DePofi and the Mels," currently producing NY Noise's 1st solo artist, Aaron Heick (Chaka Kahn's alto player).
Rick DePofi & Craig Bishop
New York Noise • New York, NY

¹ Former posts include quality assurance with Warner Brothers, Sheffield Labs, Rainbow

OUR 8•BUS REALLY

Concert sound reinforcement at the Showcase Theater.

Bob O'Neill, Manager of Entertainment • Six Flags Great Adventure Theme Park • Jackson NJ

Used by students for learning recording and sound design.
The School of The Art Institute of Chicago, Sound Department Chicago, IL

Jazz choir sound reinforcement and recording.

Dwayne Pedigo • Plano East Senior High School • Plano, TX

Sound effects, music and voice for Atari arcade games.
Brad Fuller • Atari Games Corporation • Milpitas, CA



Tracking for R&B and rap groups including vocals for Polydor artist T. Max.
Brad Young & Dow Brain
Underground Productions
Boston, MA



Dialog editing for Untouchables, TV series and Movies of the Week. "I work out of my home now. It's quite an achievement to be able to get a higher sound quality than most of the other sound houses in town."
3-time Emmy winner David Scharf
Helix Sound • Los Angeles, CA

Wide range of multimedia projects including major motion pictures (the names of which can't be divulged).
John Acoca¹ • Oracular Multimedia
San Francisco, CA

Albums for alternative groups Twenty-Two Brides and The Cucumbers, demo for Freedomland.

John Williams • Ground Zero Studios • New York, NY

"Praise Songs" contemporary Christian album/CD, "Body Builders" children's album/CD.
Peter Episcopo • Bridge Song Media • Old Bridge NJ

Sound design for Pepsi Cola TV spot aired during last January mondo-bowl.

Hans ten Broeke² • Buzz, Inc.
New York, NY

Sound reinforcement for theater presentations and concerts in a 300-seat theater.

Centre Culturel Franco - Manikobain • Winnipeg, MB, Canada

² Quote: "It's the only analog component in my room. You hardly know it's there, it's so transparent."

Records, Chief Mastering Engineer at JVC.
Quote: "It's a great board, dude. Buy it!"

CONSOLES WORK.

In studios...in clubs...in video and film production facilities...
on the road: A sample of what satisfied 32•8, 24•8 and 16•8
owners are doing with their consoles (as of late April, 1994).



Frank Serafine, feature movie
sound designer/SFX wizard in
the Foley Room at his Venice,
CA production complex.



DNA sampling CD with
mega-drummer **Bernard
Purdie** (3000+ album credits)!
Frank Heller³ • Weasel Boy
Recording • Brooklyn, NY

³ Quote: "This job had extremely unusual
and demanding monitoring & effects
requirements. I honestly couldn't have
done it without the 32•8."

Rental for film mixing projects
and home
studios. "We love
them because we
never see them.
They're great for
our business."
Chris Dunn • Dreamhire
New York, NY

⁴ Suggested retail price. Slightly
higher in Canada.

OTHER PROFESSIONALS WHO OWN AND USE MACKIE DESIGNS 8•BUS CONSOLES*

Dave Abbruzzese,
drummer for Pearl Jam

Slash,
guitarist/songwriter,
Guns 'N Roses

Steve Brown,
guitarist/producer for Trixter

Natalie Cole,
solo artist

Greg Droman,
Grammy-nominated engineer
for Linsey Buckingham

Gregg Field,
drummer for Frank Sinatra

Michael Frondelli,
Engineer-Producer (Eric
Johnson, Crowded House, etc.),
Creative Director for Capitol
Records

Bill Gould,
bassist for Faith No More

Bashiri Johnson,
percussionist for
Whitney Houston, Madonna

Mick Jones,
producer for Van Halen,
guitarist for Foreigner

Art Neville,
producer, The Meters,
keyboardist, Neville Bros.

David Frangioni,
MIDI specialist/Engineer
Aerosmith, Eton John, and
Extreme

Danny Kortchmar,
producer for James Taylor,
Billy Joel, Rod Stewart

Bruce Kulick,
guitarist for Kiss

Kyle Lenning,
President Asylum Records,
Nashville

Clair Marlo,
Artist, Producer

Queensryche

Dave "Snake" Sabo,
guitarist for Skid Row

Ben Sidran,
producer

Leo Sidran,
songwriter for Steve Miller

Steven Tyler,
singer for Aerosmith

*Mention in this list is intended to indicate ownership only
and does not in any way denote official endorsement.



Producer Ricky Peterson's Pre/Post
Production Room with Mackie Designs 24•8
at Paisley Park.

R&B radio remix of **Boz Scaggs'**
"I'll Be The One" for Virgin
Records, recording solo album
for the Japanese
Go Jazz label.

Ricky Peterson, producer,
Paisley Park
Minneapolis, MN



MACKIE

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EM's gear-crazy editorial staff honors the year's hippest, coolest, and most innovative products.

By Steve Oppenheimer with the EM Staff

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Avoid tripping over your two left feet while dancing around in search of the perfect CD-ROM drive. We define system terminology, explain performance specs, and recommend the best drives for musicians and multimedia artists.

By Michael Brown

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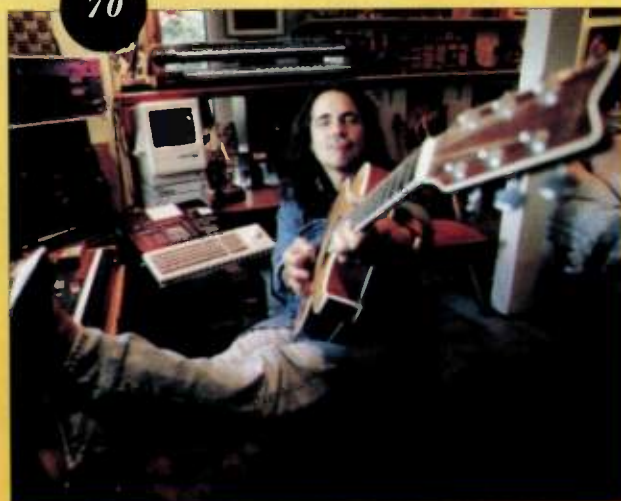
An electric riffster from a platinum-selling rock band switches to the acoustic guitar, turns his back on the big pro studios, and produces two chart-topping albums in a home studio. How did he do it?

By Greg Pedersen

78 SIX-STRING SYMPHONIES

Guitarists, cast off your sonic shackles! Learn how to program your MIDI guitar and synths to provide an immense palette of tonal colors.

By Scott Summers and Scott Wilkinson



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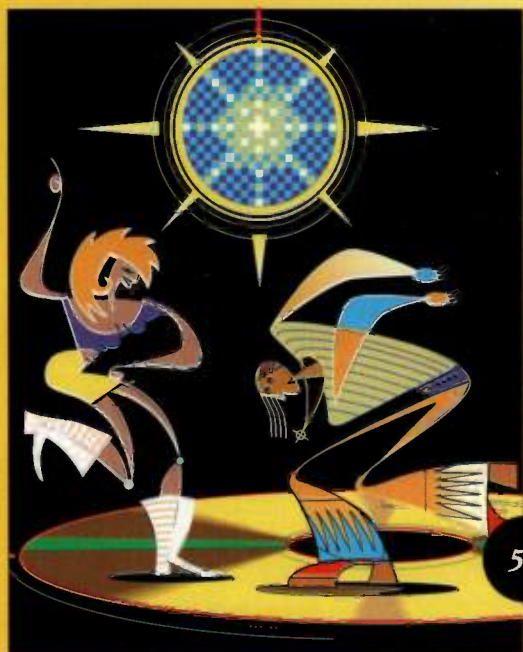
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56

Cover Illustration by David Peters.

Productive Destruction

The things we do, to do the things we do, for you

We knew it was coming, but there was nothing we could do. Rumble. Rumble. The laser printers sputtered and whined and spewed pages upon pages of text. Product photos and screen shots rained down in a merciless torrent. **EM** Art Director Linda Birch stared in disbelief and fear, while trembling copy editors awaited the inevitable. It was horrible. Forget about Frankenstein's monster, Godzilla, and Freddy Krueger; they're just overrated weenies. This month's huge, 43-category 1995 **EM** Editors' Choice Awards is the true mother of terror.

Fortunately, like the chase scenes in classic monster flicks, the anticipation was scarier than the thing itself. Once the feature was safely zapped into the electronic boundaries of *Quark*, we realized that "the monster" was actually a brilliantly conceived—and benevolent—entity. Our in-house, human, products database, Steve Oppenheimer, did a fantastic job of compiling product data, establishing categories, and selecting eligible nominees. Once the editorial staff voted on each entry, Steve tabulated the results, confirmed each winner, and wrote the whole story.

Well, actually, he wrote *more* than the whole story! The Editors' Choice feature became The Never-Ending Tale, initially weighing in at a George Foreman-like bulk of 7,000 words. (A typical **EM** feature is between 2,500 to 3,000 words.) I can only thank and thank and thank and thank our copy editors and art department—who had to figure out how to lay out the beast and do 43 color separations of product shots in less than two days—for digging in and getting the job done with a minimum of violent threats leveled at the editors.

Okay, I'm sure you're tired of hearing about all this turmoil. I just thought all the staff's travails bore mentioning because, once again, their efforts prove our dedication to giving you the best. For example, the product information offered in the feature is comprehensive and concise enough to provide an excellent guide for your equipment-purchase decisions all year long. We didn't just stop at brief mentions, we took the time (and space) to explain why we thought a product deserved an award. On the fun side, I marvel at how artist David Peters and the talented Ms. Birch managed to develop a cool way to illustrate the feature. In lesser hands, you would have gotten a bunch of gear sitting on a bench with an "Editors' Choice" logo pasted onto each product.

The Editors' Choice Awards, in concept and presentation, say a lot about the vitality and goals of **EM**. We sweat to give you useful information, strive to find products and technologies that enhance creativity, and make sure that we have a ton of fun helping you create beautiful music.

On a sadder note, **EM** contributor and *Mix* graphic artist Ric E. Braden succumbed to cancer at age 34 on November 4, 1994. The interaction of our magazines makes for a close-knit family, so this loss was like a punch in the stomach. Especially because Ric was a bright presence in the office—one of those quiet types who always has a smile and a laugh or two for everyone. Professionally, he was a gifted artist and musician who always strove to improve his craft and expand his creative experience. And although it's customary to say kind words about those who pass on, I couldn't find a nasty thing to say about Ric if I were a daytime talk-show host. He was a jewel. We'll miss his spark around here.



ROBERT PERRY

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Michael Molenda

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4 Play It



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MONITOR MAYHEM

One of my favorite things about being an **EM** reader is that the articles often challenge my preconceptions. I may wind up disagreeing, but thinking about the issues is an important process. Your piece comparing studio monitors got me going ("Boom Boxes," November 1994). I agreed with most of your comments about the monitors tested—and monitoring in general—but I can't agree with the premise that "hi-fi" speakers are automatically disqualified from serious consideration as near-fields.

Do any loudspeakers *really* deliver the Truth, the goal of a studio monitor? The fact that each of the tested pro near-fields sounded different tells us something. Knowing the monitors you tested, I would argue that although all are pretty good, none of them will fool you into thinking a live instrument or voice is in the room with you. Each monitor colors the sound to some degree, each is flawed, and each is a compromise.

The Yamaha NS-10s were introduced as consumer speakers. And as you note, they aren't accurate. They accent the upper midrange, have flaccid bass, and I can't mix with them because they make my ears hurt after a few hours of listening. It isn't right to say they tell the Truth, even if the range of sound they exaggerate does happen to expose hiss and noise, making them useful tools for that purpose.

However, after thinking about your article, I've decided there is merit to a third way of thinking. It would be won-

derful to track on a pair of speakers that might not be ideal for a long mixing session, but that would, because of their brightness, exaggerate flaws in the signal path. Then one might switch to a pair of more linear monitors for mixing.

Anyway, thanks again for another good article in what is, to my way of thinking, the premier magazine for the "projects."

Leslie Schefman
IN% "LeslieS@eworld.com

Leslie—Your points are well taken. No monitor speaker can deliver absolute truth. Beyond the electronics and construction of the speaker itself, monitoring environments and the relative condition of the listener's ears compromise audio "honesty."

*I must confess that I got a bit overzealous in my crusade to get the typical home recordist to critically assess his or her monitoring environment. I wasn't really talking about high-end audiophile speakers when I chided recordists about using "home stereo" speakers to mix their music productions. My goal was to get home-based engineers and producers to stop using mid- and low-level consumer electronics-store models. Just about every time a client or friend complains about their home mixes not translating to the real world, a consumer stereo speaker is part of the mixing equation. Believe me, I have already been soundly beaten up by **EM** contributor (and bandmate) Larry the O and ace photographer Robert Perry about my heavy-handedness on this issue.*

However, in my defense, most audiophile speakers are not designed for optimum signal coherency at one meter, the standard for a professional near-field studio monitor. Audiophile, and other consumer-level speakers, are typically designed to be heard in a room, along with all the resulting ambience (or lack thereof). High-level speakers can certainly sound amazing, but they don't often satisfy that 1-meter criteria.—Michael M.

BARGAIN HUNTING

Your magazine is the single, most useful invention since the wheel! Thanks for the many articles, reviews, and cover stories that have so often en-

lightened me and, I'm sure, many other people. Alan Gary Campbell's article "Unearthing Antiquities" (November 1994) was helpful. I would, however, like to present something which may be of interest.

I disagree with Mr. Campbell's statement, "Commissions on a piece of used gear are lower, so salespeople may understandably have little interest demonstrating it." I used to work at a music retail store that bought and sold used keyboards. Although I cannot speak for every music store, the exact opposite was true where I worked. The store owners would purchase a piece of gear at a ridiculously low price. Sometimes, this gear came onto the floor as part of a trade; other times, someone was desperate for money and had to get rid of the gear. At any rate, the store made it a rule to pay as little as possible for a piece of gear and then mark it up a lot to what they called "fair market value."

As an example of how much markup there is, the store I worked in received a mixer in perfect shape. The store bought it for \$380 and sold it for about \$800. Considering the average regular sale (of brand new items) earns only about \$50 profit, the store made a killing on this mixer. The employees were encouraged to move used gear because it made the most money. So, the point is: Talk them down! Although not all used gear is marked up this much, it is definitely worth your while to stand your ground and get a good deal.

Also, don't forget to shop around and learn the going price of a used piece of gear. Many stores have price guarantees that state a store has to match or beat the price of another store. Some of the more aggressive ones even claim to be able to beat mail-order prices. You can always use pricing information to your advantage.

E. Gore
South Bay, CA

BUZZ BUZZ BUZZ

I thoroughly enjoyed the article by Michael Brown entitled "Multimedia Musician: QuickTime 2.0"

BUD PEEN

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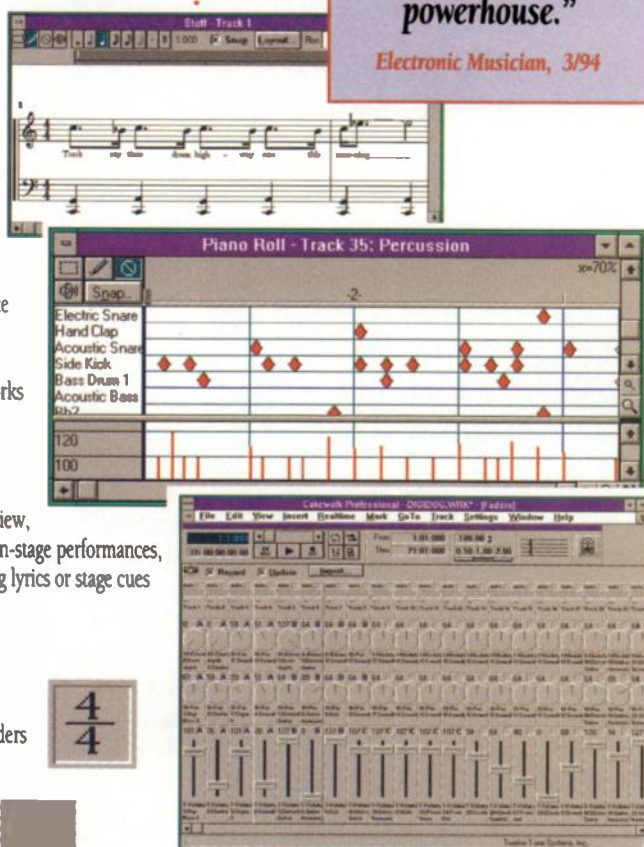
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- ⊗ Way More



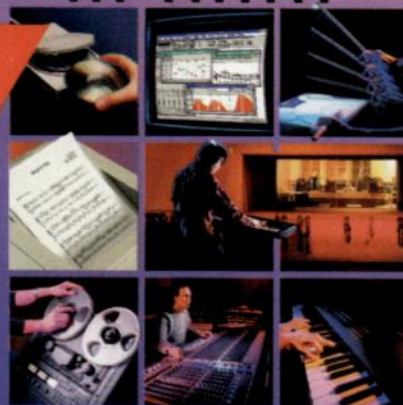
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At Lexicon, we've been making highly acclaimed digital effects processors for longer than anyone else: devices used in practically every studio in the world. Our systems offer pristine audio quality and unsurpassed control, making them the premier choice for musicians, engineers and producers alike.

Now, we've done it again. The PCM-80 is the next generation of effects processing. Based on our renowned PCM-70, it features the latest versions of several favorite effects from its predecessor. But there the similarity ends.

The PCM-80 is based on a new hardware platform featuring the very latest in proprietary digital signal processing. It's a true-stereo processor with balanced analog I/O as well as digital interfacing - you can even mix the two sets of inputs together. Its 24-bit digital bus ensures the finest resolution within the PCM-80's multiple-DSP architecture.

Onto this powerful platform, we built brand-new algorithms offering a virtually unlimited palette of sounds - some based on your favorite PCM-70 programs, plus many entirely new effects. There's an immense range of chorusing, panning and delay-based programs which can be combined with Lexicon's famous reverberation for startling, other-worldly sounds. There are even dynamic spatialization effects.

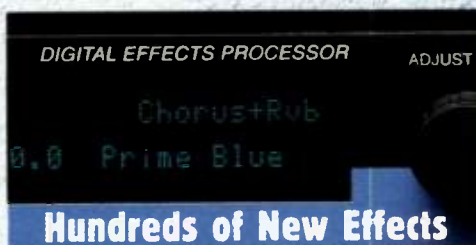
Perhaps the most impressive feature of the new PCM-80 is its unique Dynamic Patching™ matrix, which takes the PCM-80 into new sonic realms. Dynamic Patching provides incredibly powerful, synthesizer-like control over your effects. It maps data from external and internal controllers such as footswitches, envelope generators, MIDI controllers, tempo and LFO's - even the input signal itself - to any effect parameter. With up to 10 patches per effect, and an amazing eight steps per patch, the control possibilities become almost unlimited.

There's also a 'tempo' mode for every program which can drive almost any element of the PCM-80's effects.

Delay lines, LFO's and Lexicon's unique Time Switches can all be quickly aligned to the tempo of your piece, with both rhythmic and absolute time values. You can source the tempo from MIDI, or generate MIDI clock from your own tap.

To round it all off, there's an industry-standard PCMCIA card slot for extra program memory - and for future algorithms - plus SIMM sockets for extending delay memory. The PCM-80 is designed to carry on Lexicon's tradition of creating products with staying power.

There's more to know about the PCM-80, which we can't tell you here. Experience it at your authorized Lexicon dealer. It's everything you expected - and more.



Lexicon

HEARD IN ALL THE RIGHT PLACES

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LEXICON INC., 100 BEAVER STREET, WALTHAM, MA., 02154-8425 TEL: (617) 736-0300 FAX: (617) 891-0340 INTERNET E-MAIL: 71333.434@COMPUSERVE.COM (CIS: MIDI VENDOR 8)

• LETTERS

(October 1994). In spite of all the hype, multimedia is still viewed by many as an industry buzz word and not much else. I appreciate it when writers like Mr. Brown provide practical information.

Charles E. Locke, Jr.
Media Relations
The Blue Ribbon
Soundworks, Ltd.
Atlanta, GA

FLUTED DREAMS

What is the best type of mic for recording flute? Would a mic that's good for flute be hopeless for guitar and drums? Also, an article on which mics to use for recording different instruments would be fantastic.

Paul Kimmel
Minneapolis, MN

Paul—When recording flutes, I've been very happy with the timbres I've captured with large-diaphragm condensers such as the AKG C414, Audio-Technica AT4050/CM5, or Neumann TLM 193. Audio-Technica also makes a small-diaphragm condenser, the AT4031, that does a nice job. I don't want to confuse the issue, but any pro-quality large- or small-diaphragm mic should work fine. Just be sure to put some distance between the mic and the flute to take advantage of room ambience and avoid breath noises.

Application-wise, good large-diaphragm condensers are extremely versatile. I've used them to record vocals, Marshall stacks, kick drums, tablas, harps, acoustic guitars—you name it. A small-diaphragm model might not survive miking a raging guitar amp or a kick drum, but they can certainly record more than just a flute. I always advocate experimenting with a number of mics, if you have the time (and the mic selection). You never know when a bizarre mic/instrument combination will produce an awesome tone. (Of course, don't forget to pad the mic if you're planning to record a jet turbine or cannon blast with a condenser.)

I think your suggestion about an article detailing mic choices for specific instruments is a good one. I'll start working it up. Thanks for your support, and good luck with your recording projects.—Michael M.

THOSE WHO CAN, TEACH

Iwould like to start off by thanking you for saving my musical hide many times over. I'm a music student

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3. At the "@" prompt type C PAN

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THE INTERNET ADVANTAGE

• LETTERS

studying computer music composition, and I have been using your magazine as a "textbook" for the past year now. Your articles are way ahead of where many of my professors think they are.

Paul LaVigne
Hilo, HI

THE ONLY CHOICE

I love EM! When I was deciding whether I would subscribe to **EM** or *Keyboard*, I found I didn't have a choice. Thank you for a well-written magazine with intellectual appeal. I also appreciate the fact that you avoid foul language. I was taught that when a person used profanity, it was a sign they lacked intelligence, because they could think of nothing more creative to say.

Beverly A. Sumter
Warrensburg, MO

BINARY WORDS

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Get it? Neither did I until I discovered your wonderful mag! Quite a boon to those lost in the MIDI woods, in search of a SMPTE-thetic ear!

Wayne Zeringue
Metairie, LA

CONTROLLER MAPPING

I have yet to see any software for *Windows* or *DOS* that supports real-time SysEx recording or a multiport MIDI interface that will support controller mapping (like that found in the combination of *Vision 2.0* and the *Studio 4/5*). The only other sequencers I have seen that can support real-time SysEx are Mac-based or made by Roland.

Ben Campbell
Naperville, IL

Ben—You referred to Opcode's Vision 2.0, so I assume you're mostly looking at sequencers. Windows sequencers that capture SysEx were discussed in our November 1992 "Windows Shootout," though some things have changed since then. Steinberg's Cubase for Windows and Big Noise

Software's MIDI MaxPak (reviewed in the February 1994 EM) and SeqMax Presto can capture SysEx in real time and treat it like any other MIDI track data. With Twelve Tone Systems' Cakewalk Pro for Windows (reviewed in the March 1994 issue) and Passport's Master Tracks Pro for Windows, you can capture SysEx, but you have to set it up offline, and it is not handled the same way as note and controller data.

As for a PC interface that maps controllers, you're right: Nothing on the PC compares to the Opcode Studio 4 and 5. Then again, nothing on the Mac comes close to them, either. If you don't want to remap your controllers in a sequencer and seek a hardware device to remap them on the fly, consider a dedicated MIDI processor. The Anatek Pocket Mapper (reviewed in the January 1992 EM) or MIDI Solutions Mapper (reviewed in the July 1994 issue) are affordable, but limited, 1-In, 1-Out MIDI processors. You could patch them into a MIDI patch bay so they could address multiple destinations, but they can only map one controller at a time. The discontinued Yamaha MEP4 also can do the job, if you can find one.—Steve O.

I'LL HAVE THAT ON RYE

Regarding all the letters debating the pros and cons of the directions **EM** is going, I have one word for all of you: **SUBSCRIBE**. That way, the magazine costs less than two dollars an issue; it is cheaper than any decent sandwich out there; and you don't have to read every word. Just glance through the magazine to see if there's any value to you, then give it to the local library. I used to read **EM** cover to cover and sure, it's changed, but so have I in five years; and as you get used to anything, the law of diminishing returns may kick in.

Kyle Thorson
Culver City, CA

ERROR LOG

December 1994, "All that Jazz," cover and pp. 46-47: The photos were taken at Zeitgeist bar in San Francisco.

WE WELCOME YOUR FEEDBACK.

Address correspondence to "Letters," Electronic Musician, 6400 Hollis St. #12, Emeryville, CA 94608 or e-mail at emeditorial@pan.com. Published letters may be edited for space and clarity.

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The dbx 286 microphone processor does things to your acoustic sound you thought only a professional with a rack full of gear was capable of doing. As a mic preamp, it gooses the subtle audio details so they grace your tracks. While the compressor, de-esser, spectral enhancer and expander/ gate work to help you create a recording so clean and tight that it would make any professional studio envious (ticked-off actually). Now if that's not enough to get your heart racing, try taking a peek at its extremely skimpy price tag.

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286 MICROPHONE PROCESSOR

THE VOICE BOX'S VOICE BOX



WHAT'S

NEW

By Steve Oppenheimer



▲ A.R.T. MR-1

A.R.T. is offering the MR-1 (\$169), a palm-sized (5 x 5.5-inch), 16-bit, preset-only reverb processor. The algorithms are based on the company's RXR Elite reverb processor. The MR-1 has sixteen hall, room, and plate reverbs, selected with a rotary switch. Other features include 2-position, input- and output-level buttons; a bypass button; a wet/dry mix knob; and a clip LED. Power is provided by an external, 9 VAC supply. A.R.T.; tel. (716) 436-2720; fax (716) 436-3942.

Circle #401 on Reader Service Card

► FENDER PX-2200

Fender Electronics is shipping the PX-2200 series of powered mixing consoles, including the 8-channel PX-2208 (\$1,679.99) and PX-2208D (\$1,889.99), 12-channel PX-2212D (\$2,139.99), and 16-channel PX-2216D (\$2,349.99). All models include onboard digital effects except the PX-2208, which has a spring reverb.

Each input channel offers a balanced, XLR mic input; unbalanced, 1/4-inch line input; and TRS insert point. The mic pre-amp supplies up to 48 dB of gain. The 3-band, fixed EQ on each channel includes a low-frequency shelving band at 80 Hz; a peak/dip midrange band centered at 2.5 kHz; and a shelving high band at 12 kHz.

Each channel has two pre-fader, pre-EQ monitor sends; one post-fader, post-EQ effects send; and a post-fader, post-EQ aux send that can be changed to pre-fader/EQ via internal jumper. Other channel features include a pan pot, PFL solo switch, LED peak indicator, and a 60 mm fader. The 48V phantom power is switched globally.

The master output section offers separate faders for the left and right master buses, mono L/R sum, and the two monitor sends. There are two stereo effects returns, each with level and pan controls, PFL solo, and mono return level for each monitor mix.

The RCA stereo tape inputs and outputs have rotary level pots, which are pre-master fader. Master rotary level pots and AFL solo switches are provided for the effects returns. Level pots also are supplied for the solo bus and stereo headphones.

Two 9-band graphic EQs feed the power amps, unless the normal flow is broken by patching into the EQ input jacks. The graphic EQs and power amps can be switched between the monitors and mains.



The stereo DSP produces 127 preset reverb and delay algorithms, plus multi-effects (e.g., delay with reverb). Reverb and delay time can be edited, and a Reverb Defeat switch lets you kill the effects without changing send and return levels. The effects are selected with rotary switches.

The stereo power amplifier in the PX-2208 and PX-2208D delivers 150W RMS/side into 4Ω. The PX-2212D and PX-2216D power amps supply 300W RMS/side into 4Ω. Fender's DeltaComp clip compression and protection circuitry protects the amp and speakers from overload problems and shorted cables. Cooling is supplied by a 2-speed fan.

The road case (included) sets up and closes quickly thanks to a slide and spring latching system: The case folds out and becomes a console stand. The mixer's frequency response is rated at 20 Hz to 40 kHz (±1 dB); THD <0.025% (20 to 20k Hz), S/N ratio >90 dBu (+4 dBu), and adjacent-channel crosstalk -85 dB. Fender Electronics; tel. (602) 596-9690; fax (602) 596-1384.

Circle #402 on Reader Service Card

► RSP SATURATOR

RSP Technologies has unveiled the Saturator (\$699), a dual-channel, 2U rack-mount signal processor designed to "warm up" the sound of digital recordings. The unit combines 12AX7 tubes and proprietary digital circuitry to emulate the classic tape-saturation sound caused by recording "hot" signals with an analog tape recorder. Saturation ef-



fects range from very mild, for softening the high end of a digital recording, to a needle-pinning, rock 'n' roll sound.

The tubes and circuitry form the heart of a minimal signal path designed to produce a rich tube sound while minimizing unwanted noise and coloration. Each chan-

nel features Drive and output level controls for adjusting the tonal character and gain structure. Large VU meters are switchable between the output and saturation levels. Balanced XLR and 1/4-inch inputs and outputs are provided. Grooves in the front panel provide cooling and display the tubes. Solo Professional Products; tel. (810) 853-3055; fax (810) 853-5937.

Circle #403 on Reader Service Card

ESI-32

EMULATOR TECHNOLOGY. BREAKTHROUGH PRICE.

Looking for your first sampler? Or a reason to retire the one you've got? Look no further. ESI-32 delivers more power than samplers costing twice the price—at a price that will leave you wondering what the catch is.



No catch. No joke. The ESI-32 digital sampling instrument is jammed with the same features that has made the Emulator[®] IIIx professional digital sampling system indispensable in both studio and performance environments worldwide. Try these on for size...16-bit audio resolution; 32-voice polyphony; up to 32MB of sample memory; complete compatibility with EIIIx, Emax II and Akai S1000/S1100 sound libraries (That's over 50GB!); 32 4-pole digital resonant filters and a variety of powerful DSP functions (like time compression/expansion and virtually distortionless pitch transposition over 10 octaves)...just for starters. We've even included ten user-assignable front-panel trigger keys for playing sounds without connecting a keyboard.

That's right. All those BIG features that used to come with a BIG price tag are now yours for a price that's—small. Standard models start at just **US \$1,495**, to be exact.

While ESI-32 is ideal as a first sampler, it could also very well be your last. Right out of the box, ESI-32's professional features, stellar audio quality and incredible ease of use make it a great value at any price. But ESI-32 also offers expandability so you can customize your unit as your needs grow. Load it up with 32MB of RAM SIMMs, opt for S/PDIF digital I/O and advanced SCSI interface upgrades and replace the onboard floppy drive with a 3.5" Syquest 270MB removable hard drive.

Yep...ESI-32s can be a powerful introduction into digital sampling or ultimately support all of your power-user needs in full-blown studio and performance situations.

Naturally, you're going to want to see how ESI-32 stacks up against the competition. We invite the comparison. We're confident that when you see what you'll have to pay to match ESI-32's features, you'll make the next logical move...through the door of your local E-mu dealer to check it out in the flesh.



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Vision 2.0

Critics Rave...

ELECTRONIC MUSICIAN

"Vision 2.0 offers a unique combination of power and ease of use. There's simplicity for the user who wants to get to work immediately, along with the depth that a power user craves.... This package will be hard to beat. Those of you looking for a professional sequencer, or even those who are already using another one, owe it to yourselves to give it a test run.... When I began working with Vision 2.0 I carried with me eight years of experience with another sequencer.... Given that starting point, I'll have to admit that I (and more than a few of my musical friends) am startled at the outcome: I've decided to switch to Vision...." —*Dan Phillips, May 1994 issue*

KEYBOARDS RECORDING & COMPUTERS -GERMANY

"Users with professional expectations will find that Vision 2.0 will do almost everything that one can wish for. This sequencer, with the multitude of functions and operations does not have to hide behind the competition's products. I don't want to exaggerate, but in my opinion the term 'unbelievable' is actually too tame a word to describe the capabilities of Vision 2.0." —*Ralf Kleinermanns, March 1994 issue*

SOUND ON SOUND -UK

"Vision is one of the most well-behaved, and 'bullet-proof' pieces of MIDI software available for the Macintosh, and sets a standard which others will now find very hard to beat. All-in-all, Vision 2.0 was a joy to use, and I was able to set up the tracks to communicate effectively with my MIDI rig much more easily than with any other Mac sequencer. If I had to choose just one MIDI sequencer to be marooned with on a 'desert island' it would now almost certainly have to be Vision 2.0!" —*Mike Collins, June 1994 issue*

KEYBOARD MAGAZINE

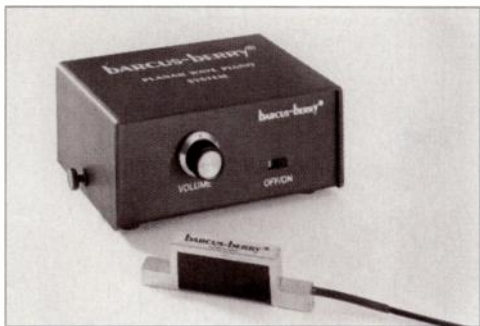
"Vision 2.0 has just been released. Given that this is the first time in four years that Opcode has seen fit to increment the 'ones' column, you've got to imagine that this is one serious upgrade. It most certainly is.... Vision 2.0 sports a streamlined, intuitive interface, a clean look, and simple, straight-ahead operation—without sacrificing power.... It is far easier to learn, far easier to understand, and far easier to look at than earlier versions. Of even more importance: the program is much more powerful than before, partly due to the addition of new functions, but primarily because the existing functions are now far more accessible and intuitive.... Our final verdict? If we had three thumbs, they'd all be pointing up." —*Michael Marans, March 1994 issue*

Vision for Macintosh, the professionals' choice in sequencing.

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S Y S T E M S I N C

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▲ BBE 4000N PLANAR WAVE

Barcus-Berry's 4000N Planar Wave piano pickup system (\$299) offers even response across the whole keyboard using a single pickup. There are no hot or cold spots. The $2\frac{3}{4} \times 1 \times \frac{3}{4}$ -inch sensor attaches to the acoustic piano's sound board at any convenient spot, using easily removed, pressure-sensitive adhe-

sive. The system can be used on grand or upright pianos, and no tools are required for installation.

According to BBE, the system provides a full-spectrum frequency response and high sound level without feedback. It is designed for excellent signal isolation, so there is virtually no bleedthrough from outside sound sources.

The $5 \times 3\frac{3}{4} \times 2\frac{1}{2}$ -inch control unit is sturdily built and includes a power switch; volume control; $\frac{1}{4}$ -inch, high-impedance input; XLR, low-impedance output; and $\frac{1}{4}$ -inch, high-impedance output. It is powered by a 9V battery, which provides approximately 2,000 hours of operation. BBE Sound; tel. (714) 897-6766; fax (714) 896-0736.

Circle #404 on Reader Service Card



▲ LEXICON PCM-80

Lexicon is shipping the PCM-80 digital effects processor (\$2,500), which replaces the company's popular PCM-70. The new model features 18-bit converters, 24-bit internal processing, and simultaneously available analog and AES/EBU or S/PDIF (switchable) digital I/O. It uses both a Motorola 56002 general-purpose DSP chip and Lexicon's proprietary Lexichip II, which is optimized for reverbs.

The PCM-80 comes with 200 presets aimed at a wide variety of applications, including music performance and production, video post-production, and dance remixing. Redesigned PCM-70 patches are augmented by new PCM-80 programs, which combine chorus, EQ, reverb, and delay effects.

The Dynamic Patching matrix lets you control any of the effects parameters from any ten of 143 possible control sources. The Tempo features let you sync delay effects with a tapped tempo (displayed in milliseconds and note durations) or MIDI Clock. Two dynamic spatialization processors let you place and manipulate the wet signal within an expanded soundstage.

Other features include an LFO that can

generate a wide variety of waveforms, an attack/release envelope generator, and independent left and right envelope followers. A PCMCIA slot admits RAM and ROM cards for

storing effects programs and increasing the processor's memory. The memory can also be expanded with standard 30-pin SIMMs.

In other Lexicon news, the company has announced operating system version 2.0 for the LXP-15 effects processor (upgrades \$149). Future units will be designated as LXP-15II. Version 2.0 includes 128 new presets, half of which are designed for studio use with a 100% wet/dry mix. The other half are designed for live performance with a mix value that varies depending on the effect. Some presets allow a footpedal to control the wet/dry mix.

Version 2.0 also includes enhanced reverb algorithms that provide a more natural reverb and are more responsive to the device's patching capabilities, according to the manufacturer. A new MIDI Mapping feature lets you recall any preset or register via MIDI Program Change. Control-knob ballistics have been enhanced for faster response, and the LFO has a smoother glide response. Program loading time has been improved, and changes between programs have been smoothed. Lexicon; tel. (617) 891-6790; fax (617) 891-0340.

Circle #407 on Reader Service Card

▼ SYMETRIX 488 DYNA-SQUEEZE

Symetrix has announced the 488 DYNA-Squeeze (\$579), an 8-channel compressor and level-matcher designed for interfacing between analog consoles and digital recorders. With digital recorders, you only achieve full bit resolution near the top of the amplitude range, so it pays to run the hottest possible signal from the console. Yet you must be careful to avoid digital clipping.

The 488 is intended to keep your console's output within the optimal range for digital recorders. The parameters are mostly preset in order to maintain the best settings for the unit's intended purpose. Manual controls are provided for threshold, output level, and bypass. Four-segment LED displays show the amount of gain reduction on each channel.

If the console's output level and the recorder's input level don't match (e.g., a +4 dBu console feeding a -10 dBu recorder), some of the signal's amplitude can be lost. The 488 provides +4 dBu to -10 dBu level matching on all eight channels. When combined with the compression feature, this lets the console provide the recorder with a hot, high-quality signal. Symetrix; tel. (206) 787-3222; fax (206) 787-3221.

Circle #405 on Reader Service Card



▼ MIDI SOLUTIONS QUADRAMERGE

MIDI Solutions' QuadraMerge (\$129) provides 4-in, 1-out MIDI merging. An LED indicates the presence of a MIDI signal. Power is supplied by the MIDI signal, so no power supply or batteries are required. MIDI Solutions; tel. (800) 561-MIDI or (604) 794-3013; fax (604) 794-3396.

Circle #406 on Reader Service Card



▶ TECHNO LAB DIGITAL-MANAGER

German manufacturer Techno Lab is shipping the Digital-Manager hard-disk recording system. This modular system is built around the Digital-Manager audio card (\$1,650), which plugs into a 16-bit slot of an 80386 or better PC with MS-DOS 3.3 or later. The 2-in, 2-out audio card connects to user-supplied A/D and D/A converters via S/PDIF optical or coaxial connectors. The card uses IDE hard drives, but it can be adapted for SCSI drives with the company's Manager Link hardware/software package.

The software supports eight virtual stereo tracks (i.e., eight stereo pairs). Signal processing includes a pair of 15-band graphic equalizers with selectable Q; programmable digital delay and reverb; and a multimode, resonant filter (lowpass, highpass, bandpass, or notch).

Audio blocks (regions) can be copied, overwritten, inserted, cut (and saved to another track), extracted (deleting material outside the selection), and triggered from the computer keyboard. They can also be crossfaded, looped, and reversed.

Other features include time compression/expansion, sample-rate conversion, phase inversion, pitch shifting, noise gat-

ing, and panning. FFT analysis can also be performed. Digital-Manager can import and export 8-bit and 16-bit AIFF and ADPCM files, and it can import WAV files.

The Miditoolbox feature lets you play a Standard MIDI File from within the program, attached to an audio block. You can align the SMF playback start time with millisecond accuracy, but it cannot continuously sync to time code.

However, the company's Manager Time Access hardware/software package (\$439) allows Digital-Manager to read and write SMPTE time code and MTC for synchronization with external devices, providing two MIDI Ins and two MIDI Outs. Other options include the *Harddisk Saver* software for Disk-Manager (\$189) or the *Harddisk Saver* hardware/software package (\$439), both of which let you store up to 650 MB of data from a hard drive to a 90-minute DAT tape.

Also new from Techno Lab is Digicon II (\$189), a battery-powered component that converts coaxial digital-audio connections to optical and vice versa. The product removes the SCMS copy bit, al-



lowing DAT-to-DAT digital recording via S/PDIF. The rest of the subcode is not disturbed. Sampling frequencies from 32 to 48 kHz are supported. The Destroyer (\$159) is a board that installs inside a DAT machine (check with the manufacturer for compatibility). Like Digicon II, it removes SCMS, but it does not do coax/optical conversion. Techno Lab USA; tel. (402) 895-7382; fax (402) 894-2147.

Circle #408 on Reader Service Card

▼ MIDIMAN MICROMIXER 18

MIDIMAN has released the MicroMixer 18 (\$299.95), an 18-channel line mixer. The diminutive (8.5 x 6.5 x 1.7-inch) device can be rack-mounted with a rack adapter (included) that lets it slide forward out of the rack for easy access to the controls.

Twelve of the input channels have gain

and pan rotary pots, along with two post-fader stereo sends and LED clip indicators. The other six inputs are configured as three stereo pairs that mix at unity gain into the right and left channels. The unity-gain inputs are intended as effects returns or for instruments that are controlled by MIDI Volume. The master section includes one mono aux return and one stereo aux return, a mono send, rotary left and right master level pots, and rotary left and right headphone pots. Levels are monitored with a pair of 4-LED ladders. All inputs and outputs use 1/4-inch, unbalanced connectors.

According to the manufacturer, an excellent signal/noise ratio (better than 110 dB) is achieved because no signal goes through more than two of

the mixer's high-quality op amps. The frequency response is rated at 5 Hz to 100 kHz (+0/-1 dB), THD is better than 0.01% from 20 to 20 kHz, and adjacent-channel crosstalk is better than -85 dB.

Also new from MIDIMAN is the WINMAN 2x2, a 2-in, 2-out MIDI interface for Windows PCs. The unit's two inputs are independent, as are the two outputs, providing support for 32 MIDI channels. Because WINMAN 2x2 is a 16-bit card, it can be assigned to any one of ten available interrupts, about twice as many as an 8-bit card. This is especially important for users who have complex systems with more peripherals than available interrupts.

The product can work at any bus speed and offers full Windows MME compatibility. It also includes a DOS driver for use with Twelve Tone Systems' *Cakewalk* sequencer. MIDIMAN; tel. (818) 449-8838; fax (818) 449-9480.

Circle #409 on Reader Service Card

(continued on p. 25)



THE RD-8. NOW PERFORMING HIT A PROJECT STUDIO NEAR YOU.



Audio for Video Projects

Chris Taylor—Crossroads Studios

It can be sync'd to a 24-track for extra tracks; it can stand on its own for 8-track digital recording, as in our audio for video suite; it can be stacked with other RD-8s or ADATs™ for multitrack digital recording—and all without any extra hardware

Post Production Projects

Brando Triantafyllou—Editel, Chicago

We use it as the master machine with two ADATs for Post Scoring and Composition for commercial TV productions. I also like the fact that the Fostex RD-8 can act as a stand-alone digital recorder; it has the balanced time code inputs and outputs that I use with automation, and it has a really good layout of the front panel controls.

The RD-8 Digital Multitrack Recorder

Whether you're working on the next hit movie soundtrack or the next hit, the RD-8 is right at home. Save key settings and locate points in the Table of Contents. Then, when you re-load your tape—into any RD-8—you can begin working right away. And if you're using MIDI, no other MDM gives you the breadth and depth of control that you'll find in the RD-8. It's the fully professionally machine that knows how to rock.

MIDI Projects

Frank Becker—Frank Becker Music

The computer sequencer and the RD-8 can be synchronized either by SMPTE with the RD-8 as master, or by MIDI Machine Control with the computer sequencer acting as master.

Location Projects

Paul Freeman—Audio by the Bay

We rolled twenty-eight 120 minute tapes of full field audio on the RD-8 in more dirt, more heat and more cows, for 18 days, with grime and a river, and the RD-8 never had a hiccup.

Composing Projects

Christopher Hoag—Composer

Personally, I believe the Fostex RD-8 is intelligently laid out, easy to use and, more importantly, it sounds good.



Fostex

**Your shrink doesn't listen to you.
Your boss doesn't listen to you.
Even your dog doesn't listen to you.**

We hear you. Introducing the new standard in synthesizer modules: the Roland JV-1080. The module which has the features you've been asking for and some you haven't even imagined yet. For starters, it has 64-note polyphony, is 16-part multitimbral and comes with 512 of Roland's newest and hottest patches. It's also ultimately expandable, taking up to four SR-JV80 Series 8 Mbyte expansion boards simultaneously. An additional SO-PCM Series wave card can be added which gives you a whopping 42 Mbytes of internal ROM. That's over 1500 Roland patches at your fingertips. It's more performance power than was possible ever before.



With the optional M-512E Memory Card, you can store an additional 128 user patches.

We heard you when you asked for effects. In addition to global reverb and chorus, the JV-1080 has 40 insert effects combinations including rotary, dual pitch shift, tempo delay which syncs to MIDI clock, Hexa-chorus, distortion, and even multiple effects like overdrive/flanger.

If that weren't enough, we made it easy to use and gave it a General MIDI mode so it's compatible with the world of Standard MIDI Files (SMF). You asked for extensive synth editing parameters. We heard you. So the JV-1080 has 10 advanced tone structures and even LFOs that sync to MIDI clock.

But perhaps best of all, the JV-1080 has a surprisingly affordable price. Which should be music to your ears.

Haven't you waited long enough? Visit your nearest Roland dealer today and ask to hear what you've been asking for all along: the JV-1080. Or call (800) 386-7575 and select 3 to receive an exciting, full-color brochure. Think of the JV-1080 as our way of letting you know we hear you. Loud and clear.





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The new KRK K-Rok close-field monitor looks as if it's been carved out of solid granite. These bizarre-looking little monsters feature a unique box design that produces better linearity and low-end punch than any monitor in their class.

Featuring a powerful 7" long-stroke

woofer, a 1" silk-composite dome tweeter and fanatical KRK engineering, the affordable K-Roks (\$449.00 per pair) deliver the smooth response and high power handling capability that have made KRK monitors legendary.

Perfect for the home studio, K-Roks provide world-class performance without blowing your budget. Why settle for some cheaply-constructed mini-monitor when you can own an authentic KRK reference monitor for about the same dough? Contact your local KRK dealer for a K-Rok demonstration. K-Rok, fanatical by design.



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REV UP



► CODA

Coda has announced *Finale for Windows 3.0* (\$749; academic edition \$275; upgrades \$99). The new version features a new user interface, all-new documentation, online help, dozens of templates, tape deck-style playback controls, more one-step editing functions, and an easy Instrument List for setting playback sounds. Other improvements include the ability to open multiple documents and views, movable and resizable tool palettes, partial-measure selection and editing, and more choices of musical symbols.

Coda has also announced *Finale 3.2* for Macintosh (\$749; upgrade from v. 3.0 \$49; upgrade from any pre-3.0 version \$99). Smart Slurs is a major new feature that provides intelligent, automated control over every aspect of slurs. You can define slur contours and placement relative to notes and establish exact pa-



rameters for breaks from one staff system to another. Slurs can automatically attach to notes and adjust for stem direction, arc heights (using the user-defined contours), and extracted parts.

HyperScribe has been improved to allow staff playback during multitrack recording. Bookmarks have been added for quickly accessing marked locations. Other enhancements include Smart Shape trills that automatically adjust with the measure width and break with systems; a Save Preferences command; a new time signature display for mixing

styles, such as numeric and symbolic representations of cut and common time; and a Fill Incomplete Measures feature that places the appropriate rests in incomplete measures. Coda Music Technology; tel. (800) 843-2066 or (612) 937-9611; fax (612) 937-9760.

Circle #410 on Reader Service Card

OPCODE SYSTEMS

Opcode Systems has released *OMS* version 1.2.3 (free upgrade). The new upgrade provides MIDI compatibility for the Power Macintosh 6100, 7100, and 8100, fixing data-input problems that occur when using the modem port for MIDI. Input on the printer port is still unreliable. This fix is similar to the one Opcode added to *OMS* two years ago to provide MIDI compatibility for Apple PowerBooks. Opcode Systems; tel. (415) 856-3333; fax (415) 856-3332.

Circle #411 on Reader Service Card

▼ GLYPH SCSI SWITCH/EXTENDER

Glyph Technologies is shipping an intelligent SCSI Switch/Extender, which is available in two versions: the 2U rack-mount GSS-410R (\$995) and the desktop GSS-210S (\$495). The GSS-410R is a 4-in, 1-out switch that lets four SCSI initiators, such as computers and samplers, share a SCSI chain of up to six devices, such as disk drives, without recabling. The GSS-210S offers two inputs. A small, front-panel switch toggles between the initiators.

To avoid crashing the system, the device checks the SCSI bus for activity when the user switches between initia-

tors. If no data is being written or read, the device makes the switch. If data is being passed, the unit delays for a few seconds, then checks again. If it still senses data flow, it checks one more time before making the switch.

The device also extends the length of SCSI cable runs, thanks to a proprietary repeater circuit with high-quality, surface-mount termination. SCSI-1 users can use cable runs of up to 20 feet, and SCSI-2 users can use cable runs of up to approximately 40 feet.

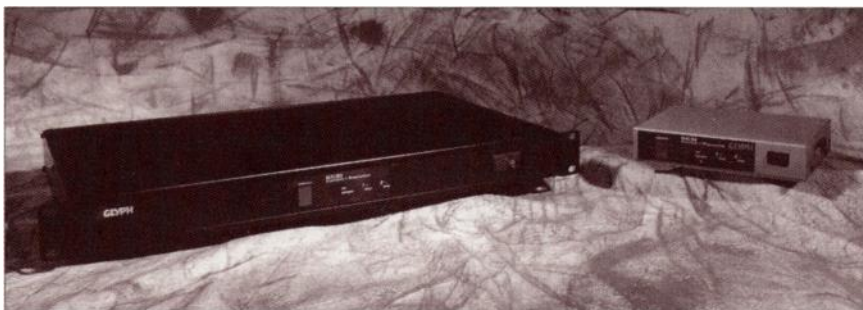
The unit uses standard, 50-pin, Micro "D" connectors, and cable kits are available from Glyph. Power is supplied with a

small wall-wart that requires only one outlet on a standard power strip.

Also new from Glyph are the GCD-100 series CD-ROM drives, available in rack-mount (GCD-100R, \$495) and desktop (GCD-100S, \$395) configurations. These dual-speed SCSI drives feature S/PDIF outputs for transferring digital audio to samplers and DAWs. In addition to CD audio playback, the devices offer Macintosh HFS, MPC-2, ISO 9660 and High Sierra, CD-ROM XA, and Kodak Multisession Photo CD compatibility. Other features include a tray for loading discs, a headphone jack, a volume control, and RCA analog audio outputs.

The GCD-100 drives come with *Direct-Sample*, an application for the Macintosh and Windows that facilitates digital-audio transfers from any CD audio disk to the computer via SCSI. Through the first quarter of 1995, Glyph is bundling Steve Reid's *Percussion Sampler, Volume 1* audio CD sample collection as a bonus. Glyph Technologies; tel. (607) 275-0345; fax (607) 275-9464. ☉

Circle #412 on Reader Service Card



**PG Music
announces...**

PowerTracks Pro™

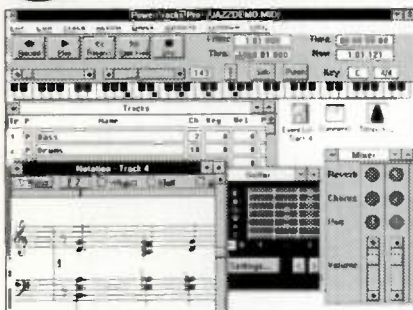
SEQUENCER/NOTATION/PRINTING FOR WINDOWS (IBM)

...at the incredible
price of \$29

"Solid sequencing at an unbelievable price" Electronic Musician - Sept. 93 **NEW! Music Printout**

PowerTracks is a professional, fully featured MIDI sequencing/notation/printing program, and is so easy to use! And we include versions for Windows 3.1 AND DOS so you'll be able to use PowerTracks on all of your machines!

NEW PowerTracks Pro 2.2 for Windows



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Yes! We include the DOS version for free in the same package.

NOTE: The DOS version doesn't support music notation, or other graphical features.

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Pro Recording, Playback, Synch, Edit & Sys-Ex Options: 48 tracks, real/step/punch record, sound-on-sound, MIDI file support, sync (SMPTe, MIDI Time Code, MIDI edit/quantize/cut/copy/paste/undo/data filters/transpose), multi-port support, 480 ppq timebase, sys-ex editor-library, patch names, banks & much more

MUSIC NOTATION: Enter/edit/display music in standard music notation. Intelligent/automatic features such as: correct beaming/lying of notes/minimize rests option! "Jazz eighth notes" option (this automatically allows jazz swing eighth notes & triplets to be notated properly!) Reads in any MIDI file & displays it as notation!

MUSIC PRINTOUT (ON ANY PRINTER!!): Print any track in standard music notation. Selectable staves per page and bars per line. Selectable margins and paper size. Portrait or landscape (sideways) printing. Titles, composer, style, copyright information. Make your own lead sheets! You can also print the piano roll window for even more detailed analysis of a track!

Deluxe Windows Interface: Multiple Windows - staff roll, event list, tracks, bars, meter, tempo, piano keyboard, guitar fretboard.

BUT POWERTRACKS GOES MUCH FURTHER... WITH EXCITING FEATURES NOT FOUND IN OTHER SEQUENCERS!

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Our customers love PowerTracks!! Here are some actual comments from customers...

"Killer software" "Unbelievable" "Intuitive and powerful" "Best MIDI program on the market" "I love the notation" "Incredible features & easy to use" "Other packages just don't compare" "Totally unbelievable - I love it!"

REQUIREMENTS: PowerTracks for Windows - Windows 3.1, IBM Compatible AT, 386 or higher, 2mb RAM. Supports any device compatible with Windows 3.1 including Roland MPU401, Music Quest MQX interfaces, Key Electronics MIDIATOR, SoundBlaster, AdLib, TurtleBeach, etc. PowerTracks for DOS - DOS 3.3 or higher, 640K, XT/286/386 or better, MIDI interface (Roland MPU401, Music Quest MQX series, SoundBlaster MIDI and FM sounds, Midiator, Roland SC7, Yamaha TG100) or AdLib/SoundBlaster compatible sound card

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REQUIREMENTS: MACINTOSH 2mb memory, system 6 or 7, MIDI interface + synthesizer module with guitar, bass, drums sound, 2mb hard drive space required. **WINDOWS (IBM)** 2mb RAM memory, Windows 3.1, SoundCard (Roland SoundBlaster, etc.) or MIDI system with guitar, bass, drums sound, 3.5" or 5.25" high density floppy disk, 2mb hard drive space required. **ATARI** 1040ST/TT/Falcon with floppy disk drive, mono or color

The New Orleans Pianist is a music program with a huge library of over 65 "New Orleans Style" piano music standards, played on MIDI keyboard by top New Orleans pianists Henry Butler, Jon Cleary, Tom McDermott, Joel Simpson & David Torkanowsky playing a wide variety of New Orleans, R & B, Blues & Ragtime piano music.

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ON-SCREEN MUSIC NOTATION, CHORD SYMBOLS & MUSIC PRINTOUT OF THE PIANO PARTS (WINDOWS VERSION ONLY!)

OVER 65 FAMOUS NEW ORLEANS PIECES INCLUDING... St. James Infirmary, When the Saints Go Marching In, Down by the Riverside, Burnt Mouth Boogie, Creole Lament, King Porter Stomp, The Pearls, Bogalusa Strut, My Bucket's Got a Hole in It, John Brown's Body, Margie, Charleston Rag, Maple Leaf Rag, The Entertainer, Raise the Rafter, Dirge for James Black and many more...

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PRO

FILE

Darkness, Darkness

Lisa Germano on the dark side of being a girl.

By Stephen M. H. Braitman

Geek the Girl is the first album Lisa Germano has recorded that actually frightened her. "It's an intense record for me," says Germano. "I don't even want to listen to it when I'm around other people."

The reason, perhaps, is that *Geek the Girl* (4AD Records) is an intricately wrought, highly personal survey of oppression and fear. It's a dark portrait of what confronts a young girl in a less-than-sympathetic society. Germano weaves her musical confessions into one of the most significant song cycles of the post-feminist era. Along with Liz Phair, Tori Amos, and Polly Harvey, Germano writes from personal experiences that are unblushingly gritty. "...A Psychopath," for example, is about a man who made Germano's life a living hell for two years, and it is one of the more harrowing songs on *Geek the Girl*.

"The song is about a stalker, and it kind of worries me that I'm sharing that experience," admits Germano. "But I felt it was important for people to feel why women are scared of stalkers. I put a real 911 call on the

track; it was a lady calling because, at that moment, somebody was actually breaking into her house. Women are not just paranoid. This stuff happens."

Recording *Geek the Girl* was liberating and challenging for Germano, because she had total control over the album's production. She learned producing skills from the ground up during the recording process and ultimately played just about every instrument on the album. The use of instrumentation on *Geek the Girl* is interesting because pianos, guitars, mandolins, zithers, and penny whistles evoke emotional timbres, rather than conventional musical phrases.

"I can't really play anything except the violin," confesses Germano. "I think of the songs as little sonic paintings, which is why they'll probably never get any radio play."

Germano recorded most of the record in her home studio on a single Alesis ADAT machine, although some of the songs were bumped up to sixteen tracks after Germano and co-producer Malcolm Burn critically au-

ditioned the work in progress.

"I didn't record some of the tracks very well originally, and there was too much [audible] hiss," she says. "So we rented another ADAT and re-tracked some parts."

Germano was fascinated with adding different sounds to the sorrowful, dark texture of the album, in addition to instrumentals and snatches of melody. "I wanted a few changes of mood," explains Germano. "I get sick of hearing voices all the time. After you throw all these words at the listener, instrumental passages are a nice break for the ears. I also used this Italian folk song, 'Frescolita,' that my dad gave me on tape twenty years ago. It's kind of like a gangster tune, and I put it on two spots of the record that are very intense to make things even scarier."

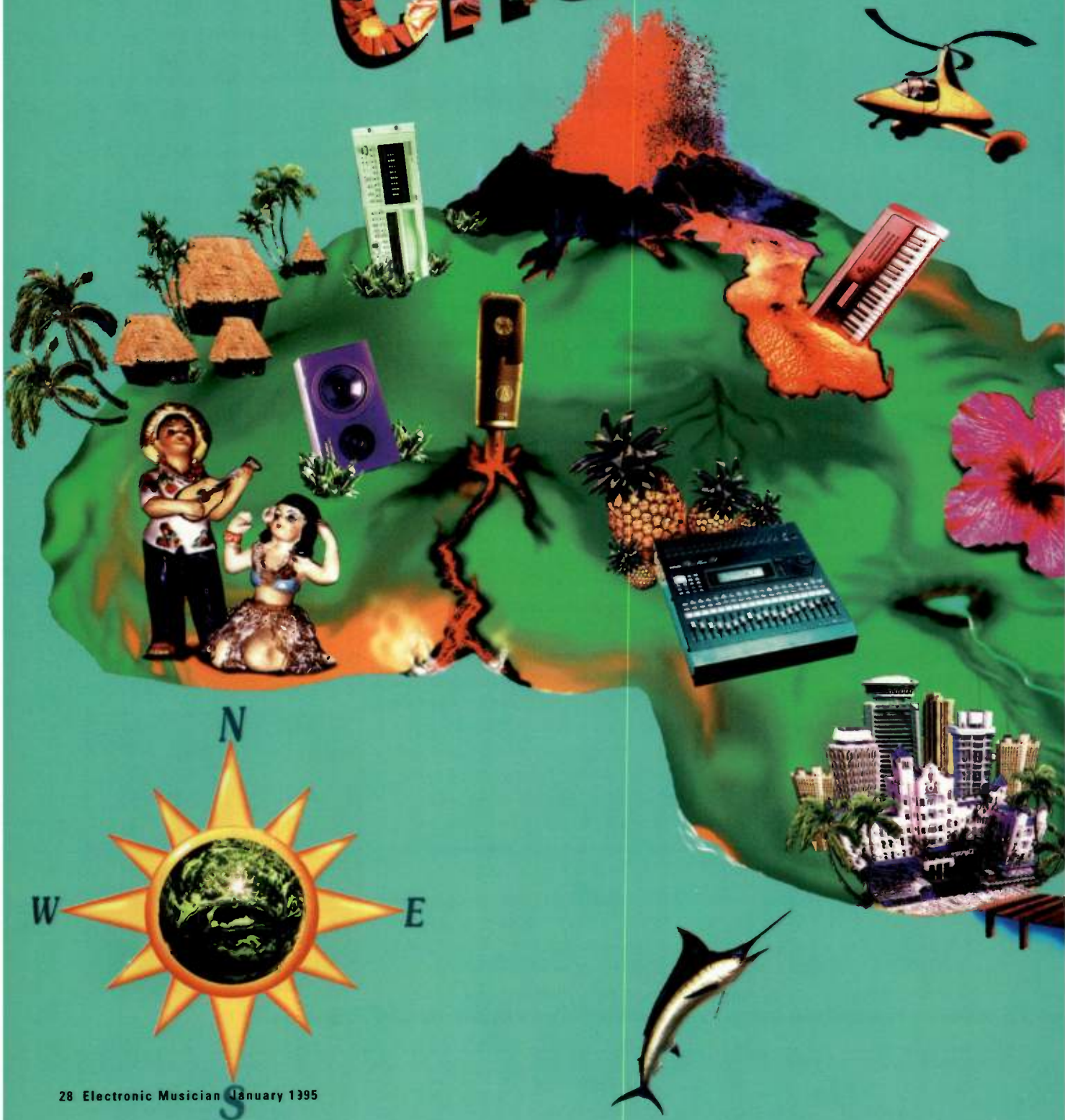
Although *Geek the Girl* is a seamless web of sensuous depression—and a psychologically dense journey through a gloomy soundscape—Germano maintains a keen sense of humor in the wake of the album's dread and woe. "My next record is going to be called *Fun Fun Fun for Everyone*," she laughs.

Stephen M.H. Braitman is editor-in-chief of SF Live.



Lisa Germano

EDITORS' CHOICE





I'm not crazy about fancy awards ceremonies. You won't catch me watching the Oscars, Emmies, or Country Music Association awards. (Okay, I sometimes watch the CMA awards, but only to catch the performances.) After all, it's very easy to avoid all the hype and hullabulloo and see—or listen to—the contenders and make up my own mind.

By Steve Oppenheimer with the EM Staff

In contrast, I believe the EM Editors' Choice awards fill a real need, because few people have the luxury of checking out each music product themselves. Admittedly, we editors don't see every single product out there, but we get our hands on a lot of gear, and we constantly talk shop with our top writers and industry experts. The continuous interaction with musicians and manufacturers makes us especially qualified to offer opinions about which products are totally cool. In short, we take our Editors' Choice awards seriously, so that *you* can take them seriously, too.

Illustration by David Peters

The 1995 Editors' Choice awards go to products that were released between October 1993 and October 1994 (when I wrote this article). If a product shipped at the last minute, such as Lexicon's PCM-80, we probably didn't

have a fair chance to evaluate it. Such products will be eligible next year. Software applications that got major upgrades are eligible, but if a program just got a minor tweak, say a bug fix or two, we didn't consider it "new." So, without further ado, here are the EM editors' choices for 1995's products of the year.

**EM's editors take you
product-hopping on a tour of
the year's coolest gear.**



PETERS

1

AUTO ACCOMPANIMENT SOFTWARE

PG Music Band in a Box PRO 6.0 (\$88)

This category turned out to be dogfight between the Windows version 6.0 of PG Music's *Band-in-a-Box* and The Blue Ribbon Softwork's *SuperJam!* for Windows. Both are cool programs that we wouldn't hesitate to recommend for your practicing and songwriting pleasure. However, the newest Windows upgrade of *Band-in-a-Box PRO* is a killer, with more than 50 new features, including printable standard music notation with lyrics, melodies, and chords and automatic harmonization with more than 100 harmony styles. We think it established a small, but clear edge over its competitors in 1994.

2

COMPUTER PERIPHERAL

**Glyph SCSI Switch/Extender
(rack-mount \$995; desktop \$495)**

If you have two SCSI initiator devices (e.g., a computer and sampler, or two computers) that share multiple targets, such as drives, you run up against two SCSI "gotchas": a hard limit of seven total SCSI devices and a total chain length of approximately twelve feet (for SCSI-1). The SCSI Switch/Extender allows two SCSI initiators (four initiators in the rack version) to share a SCSI chain of up to six target devices without recabling. The device checks the SCSI bus for data activity and only switches when the coast is clear. Thanks to the Extender circuit, SCSI-1 users can use cable runs of up to 20 feet, and SCSI-2 users can use cable runs of up to approximately 40 feet.

This device can save serious headaches if you have multiple hard-disk recorders (as in post-production rooms) and must back them all up to a remote drive or array. There's no more repatching and no need to move the drives out of the equipment room. Huzzah!

3

DIGITAL AUDIO SEQUENCER

EMAGIC Logic Audio 2.0 (\$699)

Digital audio sequencers are a very big deal on the Mac. Four strong programs went head to head in 1994, but EMAGIC's *Logic Audio* caused the most fuss and wins the prize. That's saying something, because Steinberg's *Cubase Audio* and Opcode's *Studio Vision Pro* made big strides, too.

New in *Logic Audio 2.0* is *Digital Factory*, a suite of utilities that provide such features as high-quality time compression/expansion, the ability to apply and edit audio grooves without slicing up the audio file, and pitch-to-MIDI/score conversion. Steinberg offers several of these functions, but you have to buy extra programs to get them. The functions are included in *Logic Audio*, which already is one of the least expensive programs of its genre.

In addition, *Logic Audio* is jammed with features; there's virtually nothing you can do in the other programs that can't be done as well here. The learning curve is stiffer, but once you get there, you can work quickly, switching between multiple custom screen setups to optimize your windows for each task. The code appears very tight, too, as

the program eats relatively little RAM considering its capabilities. Mind you, *Cubase* competes closely with *Logic*; *Studio Vision* is far and away the most popular program of this type; and MOTU's *Digital Performer* has loyal adherents. But if you need the whole nine yards, think logically.

4

Honorable Mention: Opcode Studio Vision AV (\$595)

Studio Vision AV integrates sequencing with 16-bit digital audio on AV Macs and Macs with Apple Real-Time Architecture-compatible cards, such as Spectral Innovations' NuMedia card. You can even record 8-bit sound on a Quadra or 500-series PowerBook with no additional hardware. It imports *QuickTime* movies, and except for having just two input tracks and four playback tracks, it has most of the features in Opcode's *Studio Vision Pro*, which, as indicated earlier, are potent indeed. With this much bang for the buck, *Studio Vision AV* easily earns an honorable mention.

5

DYNAMICS PROCESSOR

dbx Model 266 (\$299)

The Project 1 series signal processors began a new generation of dbx products that returned the veteran manufacturer to prominence. The dbx Model 172 SuperGate got our nod for the best new dynamics processor for 1994. This year, the Model 266 stereo compressor/gate takes the prize, providing smooth compression, quality expansion, responsive gating, and a sidechain insert. You get a full set of front-panel controls, with separate ratio and threshold controls for the compressor and expander. The threshold ratio goes all the way from -40 dB up to +20 dB. This is a pro-quality, blue-collar tool: solid, hard-working, and reliable.

6

Honorable Mention: Symtetrax 602 (\$1,995)

Symtetrax's 602 Stereo Digital Processor is more on the white-collar side, in that it's much fancier and pricier than the dbx 266. It provides simultaneous digital-domain dynamics processing (compression, limiting, automatic gain control, de-essing, dynamic noise reduction, and downward expansion), stereo delay with modulation and feedback, and 3-band parametric EQ that can be swept from 31 Hz to 21 kHz, with up to +18 dB boost and -50 dB cut. Is that enough for you? Well, consider that in addition to its stereo analog inputs and outputs, the 602 has AES/EBU I/O on XLR jacks and S/PDIF digital I/O on RCA jacks. It's fully MIDI programmable, too. The 602 is pro-quality all the way.

7

MUSIC-EDUCATION PRODUCT

Coda Vivace (\$2,295)

Coda Music Technology, producer of *Finale* and *Finale Allegro*, recently released a new product aimed squarely at the educational market. Vivace is a hardware/software package for the Macintosh that does something quite remarkable: As you play a solo part on any acoustic instrument into a microphone, Vivace plays a pre-programmed accompaniment with its internal Proteus sound module. What's so remarkable about that, you ask? Nothing much—

MUSIC SOFTWARE

MAC : Performer • Digital Performer • FreeStyle • Vision • Studio Vision • Music Shop • Notator Logic • Notator Logic Audio • Deck II • Metro • Finale Allegro • Mosaic • Nightingale • Overture • MiBac Jazz • Max • Unisyn • Galaxy Plus • Alchemy • Recycle • Time Bandit • Digitrax • Practica Musica • Listen • Claire • Opcode MIDI interfaces • **IBM PC** : Cakewalk Professional for Windows • Cakewalk Home Studio • Max Pak • Seq Max • Sequencer Plus • Micrologic • Power Tracks Pro • Quick Score Deluxe • Copyist DTP • Music Printer Plus • Music Prose • Score • ShowTune • The Jammer • Drummer • Sound Globbs • MusicStation • WavePlayer • Super Jam • Power Chords • Piano Works • Play it by Ear • Rhythm Ace • Wave for Windows • Software Audio Workshop • Quad Studio • Sample Vision • Miracle Piano Teaching Software • Musical World of Prof. Piccolo • Sound Impression • Turtle Tools • Music Quest MIDI interfaces • Voyetra MIDI interfaces • Turtle Beach sound cards • Roland sound cards • **BOTH** : Cubase • Cubase Audio • Cubase Lite • Master Tracks Pro • Trax • Finale • Music Time • Encore • Sound Quest Editor/Librarians • 1000 Super Cool Drum Patterns • Band in a Box • The Pianist • The Jazz Pianist • The Jazz Guitarist • Mark of the Unicorn MIDI interfaces • MiBac Music Lessons • CD-ROMs • Korg Audio Gallery • Roland SC-7 • ADAT Computer Interface • Niche ACM

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Encore - IBM/MAC
The Jammer - IBM
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except for the fact that *it follows your tempo*, which you can change at any time as you play.

With variable sensitivity, Vivace can accommodate the needs of students from beginning to advanced. For example, it should be set to play at a steady tempo without following for a beginning student, while more advanced players can practice cadenzas and the subtle nuances of expressive tempo changes while the accompaniment follows them like a puppy dog. A large library of standard solo repertoire and method-book material can be purchased piecemeal, and the number of selections continues to grow with contributions from outstanding MIDI musicians around the country. This is clearly the coolest educational product to appear in a very long time.

8

EFFECTS PROCESSOR

Alesis QuadraVerb 2 (\$799)

Don't be fooled by its sobriquet; the QuadraVerb 2 is to the original QuadraVerb what a 1965 Ford Mustang 2+2 Fastback is to a 1965 VW Bug. They perform similar jobs, and each is cool in its own way, but they're not in the same league. With the Q2, you can put eight simultaneous effects blocks in any order, in series or parallel, using a graphic LCD that shows routings as virtual patch cords. Each effects block can be a stereo or mono chorus or flanger; multiband, multimode EQ; pitch shifter; multitap delay; or reverb. The MIDI control is extensive, and the converters are 18-bit.

So far, the QuadraVerb 2 comes off as a very nice processor for the price, maybe good enough to be a winner. But there were lots of great contenders. We considered the Sony HR-MP5 multi-effects box, Eventide's Ultra-Harmonizer offerings, and the head-spinning Lexicon Vortex. The Roland SDE-330 delay and SRV-330 reverb also got strong support for their surround-sound capabilities. What puts the QuadraVerb 2 over is that in addition to 1/4-inch analog I/O, it has ADAT multichannel, optical, digital I/O. If you're an ADAT user, or have anything with an ADAT interface, that puts you one step closer to the well-integrated, digital multitrack studio.

9

Honorable Mention: Lexicon NuVerb (\$1,795)

A bit higher up the ladder, the Lexicon NuVerb merits an honorable mention, at the least. It's a Macintosh NuBus card and not of interest to well over half EM's readers, but for those with a spare NuBus slot, this is the most completely computer-programmable effects processor yet. It was designed to interface with Digidesign's TDM bus, so Pro Tools users are a major target market. The NuVerb's Mac front-end software is powerful and extremely detailed, and the card sounds like a pro-level Lexicon reverb and delay should. Enough said.

10

ENHANCERS/EXCITERS

dbx Model 296 (\$349)

The dbx Project 1 series is on a roll. The Model 296 is a great way to not only add high-frequency clarity and low-end

presence, but put a hurt on hiss. It uses dynamic EQ with an envelope follower to add highs and lows as a function of the input signal's amplitude, but it also has a noise-reduction circuit. Try it for cleaning up a hiss-haunted master tape or enriching a vocal track.

11

EQUALIZER/FILTER

Peavey Spectrum Analog Filter (\$449)

Minimoog whiz Charles R. Fischer possesses an acid pen and a curmudgeonly reviewer's attitude. So when I dealt him the Minimoog-inspired Spectrum Analog Filter for review (coming soon), I got ready to duck and cover. Thankfully, Peavey did it right, especially with regard to the sound.

The Spectrum Analog Filter contains a 4-pole VCF based on the ever-popular Moog filter, a VCA, a pair of ADSR envelope generators, and an envelope follower. Basically, except for oscillators, the device contains most of a Minimoog-style analog synthesizer. The front panel is laden with knobs for direct parameter tweaks, but you can also command much of the unit via MIDI messages and control voltages.

Does the Spectrum Analog Filter sound *exactly* like a real Minimoog filter and VCA? Well, not quite, but it sounds great, and it's close enough to a Mini for most purposes. Besides, try fitting your Minimoog into one rackspace. If you want to warm up that icy-sounding, digital synth you've been whining about, this will do the trick.

12

GUITAR AMP SIMULATOR

Tech 21 SansAmp PSA-1 (\$795)

Until Tech 21 brought out the first SansAmp, guitar-amp simulators were few and far between. Now, plenty of guitar multi-effects boxes include an amp simulator, but Tech 21 still makes the best.

The SansAmp PSA-1 has all the parameters of the SansAmp Rackmount but adds presets, programmability, and MIDI control. It's easy enough to use that even technophobic guitarists could learn to love it. You can get a huge variety of colors from the PSA-1, and it has so much kick that even Marshall amplifier snob and admitted "tube ampaholic" Michael Molenda fell in love with it. I won't even try to retrieve the review unit from him; I think he'd kill for it. All you have to do is pay for it.

13

HARD-DISK RECORDING SYSTEM

Spectral Synthesis Prisma (\$3,995)

In the ever-widening field of digital audio workstations, it's pretty tough to get ahead, especially for a small company. On the Mac or the PC, you end up taking on the reigning DAW king, Digidesign (now owned by Avid, the reigning video workstation king). And there's always a new company trying to knock you off; in 1994, for instance, British manufacturer Soundscape released the SSHDR-1, a promising Windows-based DAW.

Spectral Synthesis is a relatively small company that year after year produces one of the best DAWs on the planet.

Their latest, the *Windows*-based Prisma, records and mixes twelve channels of digital audio on 96 virtual tracks, using an ISA-bus card with built-in SCSI. You can get a wide variety of analog and digital I/O options, sync to VITC or LTC (Prisma also supports MTC and MMC), and record and backup to pretty much any SCSI drive, including removables of all sorts.

The software is straightforward, the system is expandable, the sound quality is absolutely top-notch, and you can use Spectral's converters or your favorite third-party converters. Coolest of all, Prisma is designed to run any of a variety of user interfaces, so as Spectral releases new operating systems, you'll be able to pick one that fits your special needs.

14

INNOVATIVE PRODUCT

E-mu Morpheus (\$1,495)

No category was more difficult to nail down, because 1994 was a vintage year for innovation. The Yamaha VL1 Virtual Acoustic Synthesizer, which won the Synth category, got a close look. So did the ProMix 01, our Recording Mixer winner, and Howling Dog Systems' *Power Chords Pro*, which got an honorable mention in the Sequencer category. Ditto Mark of the Unicorn's *FreeStyle* sequencer, with its unique user interface that lets you pick instruments and do takes instead of working with tracks. And there was Wildcat Canyon's *Autoscore* pitch-to-MIDI program, and Grande's *NoteScan*, which accomplishes a similar task. Lexicon's filter-morphing Vortex effects processor was an Innovative Product finalist, too.

But we kept coming back to E-mu's Morpheus synthesizer because when it was released, there was nothing else on the market like it. We were floored; no other new product came from left field like this one. Morphing (i.e., continuously changing and interpolating) between extremely sophisticated, and often radically different, synth filters provides complex, dynamic timbral changes you simply can't create with other instruments. If you crave a unique, mind-warping synthesizer, the Morpheus should be on your short list.

15

INSTRUMENT PREAMP

ADA MP-2 (\$999)

ADA was one of the first companies to release a MIDI-controlled preamp, the well-received MP-1. Its latest effort, some seven years later, blows the original away. You get ten tube sounds plus EQ, which provides much more tonal variation than you get with most tube preamps. Best of all, the MP-2 sounds great. It's warm and fat, yet much less noisy than its predecessor. Most of the factory presets are of the metal-shredding variety, but the unit is capable of far greater timbral variety.

You can MIDI-control any sixteen parameters per program, and the Macro feature lets you change factory-programmed sets of parameters as a group. There are some limits—for instance, Program Changes only call up user RAM presets, not ROM presets—but overall, this is at the top in its class for any year.

16

LIVE-SOUND MIXER

Allen & Heath GL2 (\$1,495)

A quality sound-reinforcement board has to offer versatile patching and routing, a sweet EQ section (preferably switchable between monitors and mains), a clean signal path, good mic preamps, plenty of aux buses, and an easy-to-grasp layout, especially if independent engineers have to be able to walk in and use it. Allen & Heath's rack-mount, 12 × 4 × 2 GL2 has it all.

It is clearly the most flexible, yet accessible, board we've seen in this price class. The GL2 has inserts everywhere, six *simultaneously available* aux sends, and so much routing flexibility I won't even try to describe it here. Allen & Heath's board can be quickly adapted into a dandy stage monitor mixer or multitrack recording console. The 4-band EQ section is particularly outstanding, with two sweepable mid bands and classic British warmth. The sound is clean, the crosstalk minimal, and the specs quite good. You can even link multiple GL2s with an optional module.

You may wonder why we didn't pick Yamaha's ProMix 01, which is one of the most talked-about products of the year and is our 1994 choice for Recording Mixer. The ProMix really shines when you have time to program it and learn your way around. It isn't the kind of board you'd want to face cold at a big gig in a strange venue. The ProMix 01 is a fine machine, but it can't touch the GL2 for mainstream familiarity, patching versatility, and sweet EQ. So although it's a very good board and a heck of a bargain, we're going with the GL2.

17

MODULAR DIGITAL MULTITRACK

Fostex RD-8 (\$4,295)

The Alesis ADAT has been one of the most successful and important products of the last few years, so when Fostex joined the ADAT alliance with a fully ADAT-compatible MDM, they grabbed our attention. Essentially, the RD-8 is a genuine ADAT with the equivalent of an onboard BRC for location and synchronization functions. It offers Track Slip (up to 170 ms delay) and a host of features for scoring to picture, such as time-code pull-up/down for transfers between film and video.

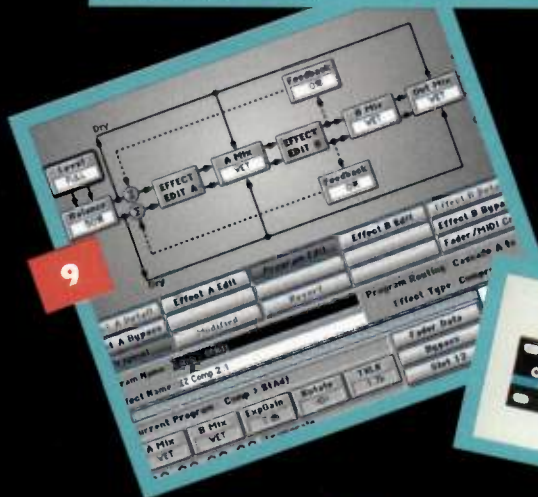
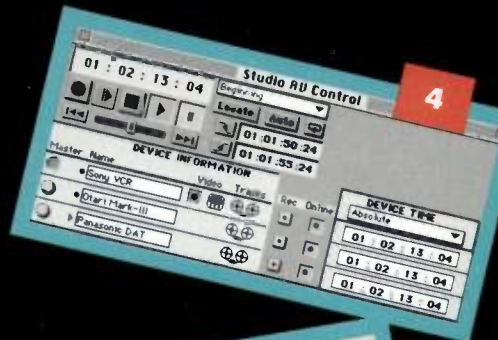
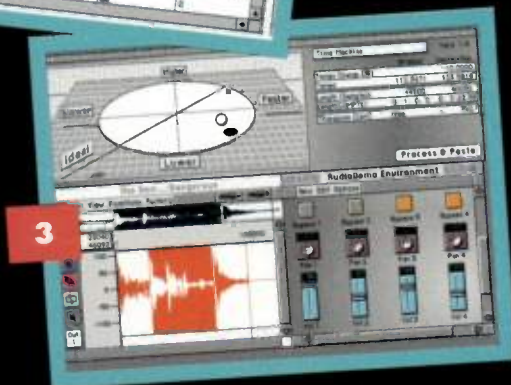
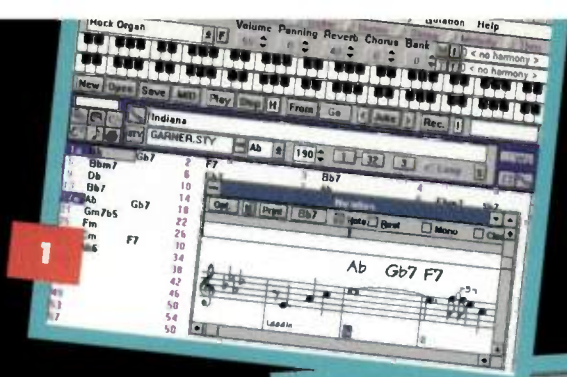
But the RD-8 also has features not available on the Alesis ADAT and BRC. For instance, you can punch in and out of multiple tracks while recording continues unabated on other tracks. A format-search function finds the point on the tape where the formatting ends. And the RD-8 includes "user bits" embedded in the time-code track that let you create and display take numbers or other brief identifying marks. The Fostex box also includes MIDI connectors and supports MIDI Time Code and MIDI Machine Control. It's just another case of making a good thing better.

18

MIC PREAMP

Peavey VMP 2 (\$799)

Good microphone preamps usually have relatively few features, the most important being excellent sound quality



We Have Ways To

“The PF P100 could well be the best transportable digital piano on the market today.”
-Mark Vail, Keyboard-

PF P100 DIGITAL PIANO

- 88 key digital piano with “Action Effect” and adjustable touch sensitivity
- AWM2 sound generation
- Single, duo and split mode playing
- 20-watt stereo amplifier and built-in speaker system
- MSRP: \$2995.00

PF85 DIGITAL PIANO

- 88 velocity-sensitive keys
- AWM sound generation
- Full-response stereo speakers
- Automatic transposing and tuning
- MSRP: \$1995.00

“Coming from Yamaha—maker of some of the finest acoustic drums on the planet—we expect nothing but top-notch drum samples and the RM50 certainly delivers.”
-Greg Rule, Keyboard-

RM50 RHYTHM PROGRAMMER

- AWM2 Rhythm sound module
- 16 way multi-timbre
- High quality drum module with 6 trigger-to-MIDI converters
- 6 individual outputs plus stereo out
- MSRP \$899.00

“The RY30 features excellent sounds that can be extensively edited.”

-Bob O'Donnell, Electronic Musician-

RY30 RHYTHM PROGRAMMER

- AWM2 16-bit samples, 96 voices
- 20 songs, 100 preset patterns, 100 user patterns
- 22 bit D/A for unprecedented sound quality
- Dynamic filters
- MSRP: \$595.00

“Yamaha's RY10 rhythm programmer features the simplest and sleekest programming procedure of any drum machine on the market.”

-Rich Watson, Modern Drummer-



RY10 RHYTHM PROGRAMMER

- AWM samples, 28-note poly
- 250 editable drum sounds
- 50 main, 50 fill-in preset patterns
- 50 main & 50 fill-in user patterns
- MSRP: \$299.95

“...I'd have to call the TG500 (Tone Generator) the Mighty Mo of modules.”
-Patrice Rushen-

TG500 TONE GENERATOR

- 64 note polyphony
- AWM2 16-bit sample playback synthesizer
- 16 way multi-timbre
- 8 MB of ROM samples
- Expandable sample RAM
- MSRP: \$1495.00

“They'll be talking about this one.”
-Jim Presley, Yamaha-

TG300 TONE GENERATOR

- Second generation AWM2 sampled voices
- 32-note polyphony
- General MIDI
- Built-in DSP
- Mac/IBM Interface
- MSRP: \$TBA

TG100 TONE GENERATOR

- General MIDI compatible
- 28-note polyphonic
- 192 voices plus 10 drums
- Effect processor built-in
- Mac/IBM Interface
- MSRP: \$449.95

Make People Talk.



WX11 MIDI WIND CONTROLLER

- Standard Boehm fingering
- 7 octave range • Includes BT7 MIDI Interface • MSRP: \$505.00

KX88 MIDI MASTER KEYBOARD

- 88 keys with initial and after-touch response • Total MIDI control, including real-time performance effects, voice and function programming • MSRP: \$1995.00

KX5 REMOTE KEYBOARD

- 37 keys with initial and after-touch response • 2-octave transpose control • MSRP: \$595.00

“The QY20's user interface is excellent, its sequencer is surprisingly flexible and the fact you can operate it anywhere is wonderful.”
-Greg Rule, Keyboard-

QY20 MUSIC SEQUENCER

- 100 AWM sampled sounds • 100 drum samples, 8 kits • 100 preset patterns, each with 6 sections • 100 user patterns • MSRP: \$599.95

QY10 MUSIC SEQUENCER

- 8-track sequencer • 28-note polyphony • 76 preset patterns • 24 user patterns • MSRP: \$399.95

“The SY99...it's unquestionably the keyboard of the nineties!”
-Kenny Kirkland, The Tonight Show-

SY99 SYNTHESIZER

- 76 keys • Combines 16-bit sample playback with most advanced FM synthesizer ever • 22-bit D/A conversion • 512K sample RAM (expandable) • MSRP: \$3995.00

“The SY85 is a terrific synth.”
-Jim Aikin, Keyboard-

SY85 SYNTHESIZER

- AWM2 16-bit sample playback synthesizer • 30-note polyphony; 16 way multi-timbre • 6 megabytes of ROM samples • 512K of sample RAM (expandable) • MSRP: \$1995.00

SY35 SYNTHESIZER

- Dynamic Vector Synthesis • AWM and FM tone generation • 8 way multi-timbre/layer capability • 256 FM sounds, plus 128 AWM samples • MSRP: \$899.00

MDF2 MIDI DATA FILER

- 3.5" floppy disk drive • Standard MIDI file compatible • 16 character LCD display • Disk read/write in realtime • MSRP: \$449.00

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12



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22

and a reasonable price. When you find both in the same product, as in Peavey's VMP 2 2-channel tube-mic preamp, it catches your attention. In addition to its 12AX7-based warmth and excellent frequency response specs, the VMP even offers a few extras. There's a 20 dB input pad; switchable, 48V phantom power; 1/4-inch and XLR inputs; high and low shelving, tube EQ (the low end is switchable between 80 and 40 Hz); and an EQ Bypass switch. Sure, other tube preamps sound great and have bells and whistles, but see how many you can find at this price.

19

MICROPHONE (CONDENSER)

Audio-Technica AT4050/CM5 (\$995)

When Audio-Technica released their AT4030 condenser mic, we thought the company had reached a new peak it would find hard to top. Were we ever wrong! When **EM** Editor Michael Molenda put it through its paces, the AT4050/CM5 proved even better than its illustrious predecessor. It's exceptionally warm, yet clear and articulate. Michael especially loved it on acoustic instruments and a *capella* vocal performances. Its warmth makes it a good choice for creating natural-sounding digital recordings. Last, but not least, the 4050 offers multiple polar patterns, which is an unexpected bonus in a microphone that costs less than \$1,000.

20

MICROPHONE (DYNAMIC)

Audix OM-5 mic (\$329)

This hypercardioid dynamic mic was somewhat of a dark-horse winner, as Audix isn't a big name in the microphone business. Hearing is believing, though; I put the OM-5 up against my favorite dynamic vocal mic (a beyerdynamic TG-X 480), and it stood the test well. It puts out a clear, hot signal, and feedback rejection is excellent. It didn't suffer from a lot of handling noise, either. As dynamic mics go, the OM-5 is smooth throughout its range and doesn't require a lot of EQ. It handles 144 dB SPL, so you should be able to use it for pretty much any dynamic mic application.

21

MIDI CONTROLLER

Kurzweil PC88 (\$2,295)

Of all the products that came through here in 1994, the PC88 appealed to the most **EM** staff members. I constantly had to fend off pesky staffers who wanted to borrow my review unit.

If the PC88 were just a master keyboard, it would be a worthwhile product, but not a category leader. The 88-key weighted action is excellent, and you can program the unit's two wheels, four sliders, and three buttons to do pretty much whatever you like. Kurzweil even throws in a killer MIDI arpeggiator. But except for the arpeggiator, several other master keyboards provide far more control features. The key to the PC88's value is its expandable on-board sounds. The stock, 32-voice polyphonic unit sports 64 sample-based sounds. You can't edit the sounds, but their overall quality is quite good, especially the pianos and bass-

es. A minimal, but editable, effects processor is included to fatten things up.

The extra kick comes when you add the optional VGM Expansion Board (\$495), which provides a full set of quality General MIDI sounds, 32 extra sounds, a second effects processor, and doubled polyphony. All the food groups are represented, and most are well done. In case you haven't grasped the obvious, this makes the PC88 a one-stop gigging machine. All you need are audio cables, an amp with speakers, and a live power outlet.

MISCELLANEOUS HARDWARE

"Miscellaneous" categories are weird, because it's hard to compare radically different products. However, we wanted to reward two worthy products—Aquila Systems' MR2 MIDI wireless system and Sound Sculpture's Switchblade-16 MIDI-controlled audio switcher—that don't fit in a conventional structure. Both deserve to be winners.

22

Aquila Systems MR2 MIDI wireless (\$1,499)

Signal dropout is a fact of wireless life. With an audio signal, it's a nuisance; with MIDI, it's a tragedy. Lost bits could mean the system lock-up of your noisiest nightmares. Aquila's MR-2 uses diversity, spread-spectrum wireless technology, which considerably reduces most dropout problems. The MR-2 can provide a steady signal at 350 feet, even without a clear line of sight. With this reliable wireless technology, you can maintain a clean, MIDI controllers-only stage area and park the rest of your rig at the mixing station. Going cable-free can also be great for MIDI-controlled lights and other visual effects.

23

Sound Sculpture Switchblade-16 (\$2,299)

Sound Sculpture's Switchblade-16 isn't the first MIDI-controlled audio switching system, but it's the best by far. If you've always wanted totally automated, flexible effects routing and have the budget to swing it, this is your best bet. Any combination of its sixteen inputs can be routed to any combination of its sixteen outputs, with automated gain control. Four internal LFOs can be swept to control gain in various ways.

The MIDI implementation is superb; you can even use SysEx and Control Changes to set up the connection and control matrix. Continuous controllers can handle gain changes, including a reverse slope for panning and cross-fades. **EM** reviewer Peter Freeman dubbed the Switchblade the "Rolls Royce of commercial effects-switching boxes" and is using it as the heart of his bass effects rig for the current Seal tour.

24

MONITOR SPEAKER (NEAR-FIELD)

Audix Studio 1A (\$599/pr.)

A few months back, I dumped a stack of monitors in Michael "Ears" Molenda's office so he could haul them to his studio for a test drive. In the resulting cover story (see "Boom Boxes" in the November 1994 **EM**), he revealed that the Audix Studio 1A is one heck of a fine near-field

THE NEW TSR-24S LETS YOU CREATE YOUR OWN SOUNDS IN TWO STEPS. 1-DREAM THEM UP. 2-LAY THEM DOWN.

With the TSR-24S, frustrating menus and time-consuming steps don't control your programming. You do. Choose the effects you want, in the order you



want, then program and listen to them instantly. No catches. Naturally, the TSR-24S has plenty of raw material, with an arsenal of more than 75 effects. Plus, multiple modulation effects

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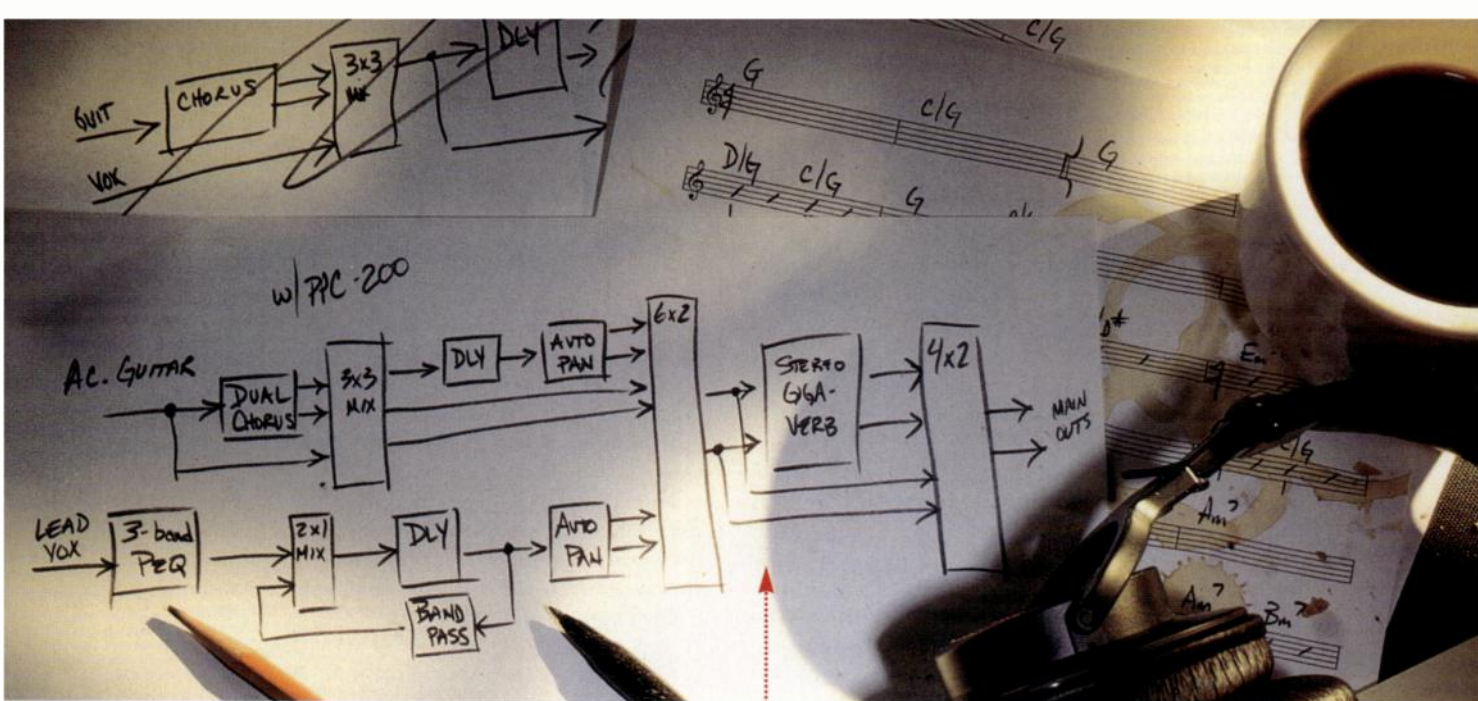
Gigaverb (the world's most flexible reverb),

DUAL DISCRETE STEREO

Take true stereo inputs, add four assignable outputs, and you get a lot of routing configurations. Let's see, there's stereo in, quad out; mono in, quad out; dual mono in, dual stereo out...well, you count 'em.



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capability and instant module/parameter access mean your great ideas become great music in a matter of seconds. No other machine at any price can match its flexibility. But even before you start dreaming up new sounds, you'll have to take the real first step. Drop by your nearest DigTech dealer today.



ALGORITHMS

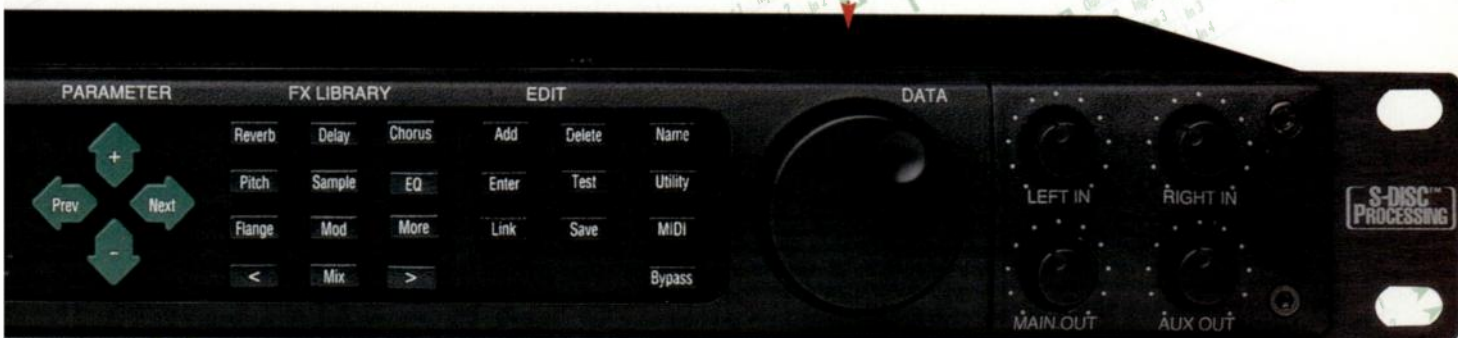
Want reverb, chorus and flange?
Press a couple of buttons.
Reverb, chorus and reverb again?
Redundant effects are not a problem. Link effects in any order to create algorithms, then program them in nearly limitless combinations.

EXPANDABLE

Add the available PPC 200 card, and you'll have the power of two TSR-24S processors. Parallel processing means seamless effect changes and more.

S-DISC™

This chip defines DSP horsepower. S-DISC delivers superior sound, quiet operation and performance unmatched by anything in the market. This incredibly powerful chip was designed specifically for audio.



monitor speaker. It is clear and transparent, yet produces a rich sound that Michael dubbed "luxuriant." The imaging and precision are excellent, and Michael reported dead-on translation of his mixes to other sound systems, a crucial requirement for a serious reference monitor. The Studio 1A's mids and highs are smooth, and the lows sound tight well below its specified 50 Hz bottom limit.

25

Honorable Mention: Alesis Monitor One (\$399/pr.)

It was no small matter choosing the Audix Studio 1A, because it had very tough competition. The KRK 6000 was close behind the Audix speaker, especially with regard to imaging and critical resolution. However, Alesis' Monitor One is such a big-time bargain that it merits the honorable mention. It provides excellent clarity, and although the bass response isn't very punchy, it is smooth and present. For pure monitoring quality, we don't think the Monitor Ones keep up with the Studio 1As and KRK 6000s, though I have spoken with established recording engineers who beg to differ. But we all agree they're very good speakers for an excellent price.

SEARCHING FOR EXCELLENCE

Most of the award winners have been covered in an EM review. Dates in parentheses refer to coverage of earlier versions. Back issues are available from the Mix Bookshelf; tel. (800) 233-9064 or (510) 653-3307; fax (510) 653-5142.

Product	Review
ADA MP-2	10/94
Alesis Monitor One	4/94
Allen & Heath GL2	7/94
Aquila Systems MR2	12/94
Arboretum Hyperprism 1.1	8/94
Big Noise MIDI MaxPak 3.0	(v. 2.0 2/94)
dbx 266	5/94
dbx 296	5/94
Dr. T's QuickScore Pro	(QuickScore Deluxe 1/93)
E-mu Morpheus	5/94
EMAGIC Logic Audio 2.0	(v. 1.7 2/94)
Fostex RD-8	1/95
Howling Dog Systems Power Chords Pro 2.0	6/94
Innovative Quality Software SAW3.2	(v. 2.2D 12/93)
Kurzweil PC88	12/94
Opcode Studio Vision AV	(Studio Vision 1.0 2/91)
OSC Deck II 2.1	(v. 2.0 3/94)
PG Music Band in a Box 6.0	(v. 1.0 for DOS 10/90)
Roland S-760	7/94
Sound Sculpture Switchblade-16	11/94
Tech 21 SansAmp PSA-1	10/94
Turtle Beach Monterey	10/94
Twelve Tone Cakewalk Pro for Windows 3.0	(v. 2.0 3/94)
Yamaha MT8X	7/94
Yamaha VL1	6/94

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MONITOR SPEAKER (POWERED)

Genelec 1030A monitors (\$1,998/pr.)

In years past, the name Genelec evoked two responses: It probably sounds great, and I probably can't afford it. But the average project studio can consider buying the 2-way 1030As. True, a pair costs almost two kilobucks, but that includes a 130 watt/side power amp, with each cabinet bi-amped at 80W for the bass and 50W for the treble, crossed over at 3.5 kHz.

These are top-notch near-field monitors. Their imaging is excellent, and the clarity and detail are exceptional. The 6-inch cone woofer offers a surprisingly smooth, full bass response down to 52 Hz, and the 1-inch, metal-dome tweeter easily extends up to 20 kHz.

27

MULTIMEDIA PRODUCTION SOFTWARE (ENTRY LEVEL)

Apple HyperCard 2.2 (\$139)

Given the fact that Apple's *QuickTime* 2.0 for the Macintosh supports General MIDI and features GM instrument samples licensed from Roland Corp., we almost gave the award to that product. After considering that *QuickTime* is not a production package—you must have audio and video capture and editing tools for that—we decided to give the nod to Apple's *HyperCard* 2.2. Besides, you can easily embed *QuickTime* movies and soundtracks into a *HyperCard* stack. In terms of support for audio, *HyperCard* has no equal among low-end multimedia authoring systems on either the Mac or Windows platforms. The availability of powerful MIDI add-on tools, such as EarLevel Engineering's *HyperMIDI* 3.0, also influenced our decision.

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MULTIMEDIA PRODUCTION SOFTWARE (PROFESSIONAL)

Adobe Premiere 4.0 (\$795)

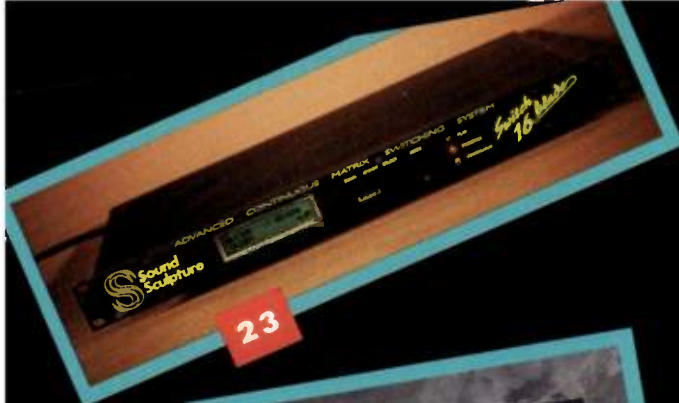
Unlike many multimedia production systems, Adobe's *Premiere* 4.0 doesn't treat audio as an afterthought. Most notable among the program's audio-support features is its support for 99 tracks of stereo digital audio. Although you would probably mix down your music tracks before flying them into your video, you can use the remaining 97 tracks to lay down dialog, sound and Foley effects, and ambient sound. The only caveats: You need a high-end machine, lots of RAM, and a spacious hard-disk drive to really take advantage of the software's power. Aside from that, *Premiere* not only outperforms everything in its class, it offers far more flexibility than conventional tape-based video-editing systems. To top it off, there are versions for Windows and the Mac, including a native Power Mac version.

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MULTITRACK CASSETTE MINISTUDIO

Yamaha MT8X (\$1,679)

I admit 1994 wasn't a big year for multitrack cassette decks, but the MT8X would merit an award in a more competitive



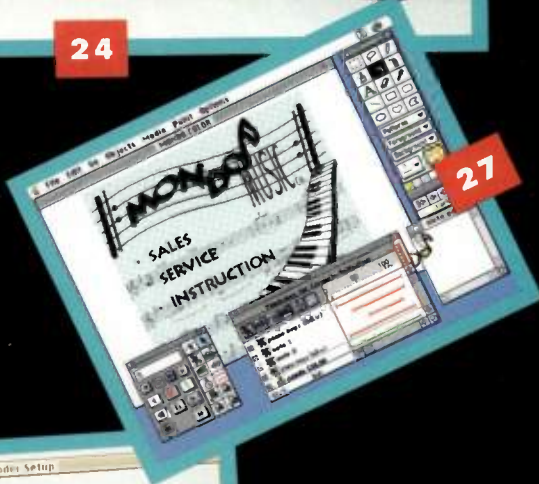
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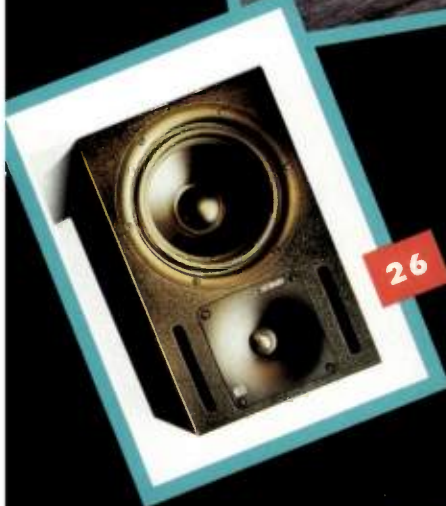
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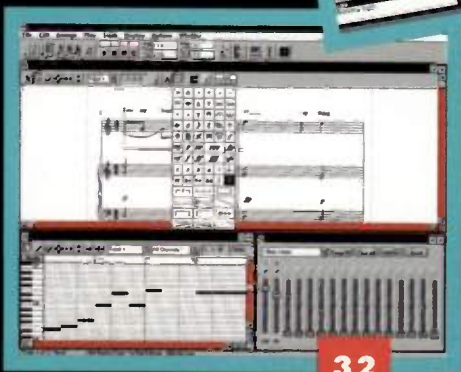
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33

"Get more done. Make more money. Sleep easier."

I was always fascinated by automation — used to drool at the mega-buck automated consoles at NAMM, AES or elsewhere. But I always passed it off as more envy rather than rational thinking. Sure, automation sounded good — but what would it really do for me? Was it worth the money.

It didn't really hit me till I looked at (and tried) the TASCAM M-3700. First off, the console is priced within reach of most any project studio. That's

good. But what it could do — and what it did — really got me. It proved to me that automation is affordable and could help me do more projects and make more money. And, I never have to worry about remembering to log my fader positions and mute points, I can sleep easier at night.

For me, automation isn't a luxury — it's a necessity. We keep track of all of our customers' mixes on disk so we can recall them anytime. Plus, we can provide our customers with multiple mix options — they can A/B test them and make more informed decisions. In the end, they get a product they are more comfortable with because all their "what if" questions have been answered. That means they'll come back.

What makes the M-3700 so affordable is the entire automation system is built into the console. You don't need to dedicate an external computer or other MIDI device to use it. It includes two types of VCA automation. And each is easy to use.

Snapshot automation with 99-scene memory can be set or recalled using keyboard or MIDI program change

Store automated mixes on standard 3 1/2" floppies

Disk drive included at no extra cost

Enter song names or transition times with the DATA ENTRY dial.

MIDI compatible for dynamic real-time fader and mute automation.



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Double your inputs!
8-Bus in-line
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Available in 24 or
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interfaces are
available for
power users.

Impressive
Master Section:

complete control of AUX sends,
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you can take a picture of all
fader and mute settings. Think
of it as a mixer with a photo-
graphic memory. Then there's
dynamic automation: real-time
recording of your fader and
mute movements. Which means if you're fading in
and out, bringing up the horns, then vocals and
other dynamic movements the console remembers
them. Next time, just sit back and listen.

The M-3700 is a great console even with-
out the automation system. But now that I
have it — I won't give it up! Until you try an
automated console, you'll just keep wondering
what it can do for you. Try the M-3700. It
comes with all the features you'd expect in a
recording console and more. And if you're an
automation "power user," JL Cooper's Pro 3700
automation expander works with most any
Macintosh computer. You can do more. You can
make more money. But you'll need to take the
next step to automation and buy the TASCAM
M-3700 today. Once you do, you'll sleep easier.

Quality components, rugged design!

TASCAM

Take advantage of our experience.



year. It's a big accomplishment to get eight tracks of clean audio onto a cassette tape without gobs of crosstalk; before the MT8X, only Tascam and TOA had even tried it.

The MT8X's sound quality is very good for a cassette deck, the transport is smooth, the display is large and easy to read, and you can monitor anything you want. Signal-routing is a breeze, though I wish you could pan the stereo aux returns. Punch-ins leave a noticeable gap, but the Auto Punch and Rehearse features work great. I could quibble over the inevitable compromises—for instance, you get mic preamps on four channels, but no XLR connectors—but for the dough, I like this unit a lot.

MULTITRACK RECORDING SOFTWARE (DEDICATED)

Despite the ballyhoo over integrated digital audio sequencers, it's important to recognize that not everyone needs or can afford these high-end solutions. If you want to get into digital audio, Innovative Quality Software's *SAW* and OSC's *Deck II* will get you started *and* leave you room to grow.

30

Innovative Quality Software Software *Audio Workshop 3.2* (\$599)

If you want to do multitrack recording on the PC and don't want to spend a small fortune, you have few choices. Fortunately, *Software Audio Workshop* (SAW) is a very good choice for Windows users and has gained many adherents.

SAW works much like a sequencer, including the ability to trigger audio Regions via MIDI. It gives you eight audio tracks, configured as four stereo pairs, on a DAL CardD, Creative Labs Sound Blaster 16, or Turtle Beach Multi-Sound-series sound card. The waveform editing tools are good, and the main window includes an overview of the entire sound file. Version 3.2 also adds several limited, but welcome, signal-processing utilities. Unlike the version we reviewed last year (v. 2.2D), the program now lets you hear previously recorded tracks as you overdub.

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OSC *Deck II 2.1* (Mac) (\$399)

Over in Mac land, OSC continues to rule this particular roost. *Deck II 2.1* gives you four tracks of hard-disk recording on any Digidesign card and eight tracks with Pro Tools and OSC's *8-Track Tool* (\$129). But like Opcode's *Studio Vision AV*, the program also supports AV Macs and sound cards that support ARTA and can do 8-bit audio on a Quadra or 500-series PowerBook.

The program offers solid automation features, the ability to import and sync to *QuickTime* movies, and integration with OSC's *Metro* MIDI sequencer. For toppers, a new plug-in architecture lets you run third-party signal-processing software (from companies such as Jupiter Systems and Waves) within *Deck*. And the whole thing is easy to use.

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NOTATION SOFTWARE

Dr. T's *QuickScore Professional* (\$69)

Surprise! Even certain jaded editors didn't expect Dr. T's to kick butt this way. After all, *QuickScore Deluxe* was okay, but

MANUFACTURER LIST

ADA; tel. (510) 532-1152; fax (510) 532-1641

Adobe Systems; tel. (415) 961-4400; fax (415) 962-0850

Alesis Corporation; tel. (310) 558-4530; fax (310) 836-9192

Allen & Heath; tel. (801) 566-8800; fax (801) 566-7005

Apple Computer; tel. (800) 776-2333 or (408) 996-1010; fax (408) 974-6615

Aquila Systems; tel. (800) 386-4554 or (215) 957-5450; fax (215) 957-5450

Arboretum Systems; tel. (415) 931-7720; fax (415) 931-7725

Audio-Technica; tel. (216) 686-2600; fax (216) 688-3752

Audix; tel. (714) 588-8072; fax (714) 588-8172

Big Noise Software; tel. (904) 730-0754; fax (904) 730-0748

Coda Music Technology; tel. (800) 843-2066 or (612) 937-9611; fax (612) 937-9760

dbx; tel. (801) 566-8800; fax (801) 566-7005

Dr. T's Music Software; tel. (617) 455-1454; fax (617) 455-1460

EMAGIC; tel. (916) 477-1051; fax (916) 477-1052

E-mu Systems; tel. (408) 438-1921; fax (408) 438-8612

Fostex; tel. (310) 921-1112; fax (310) 802-1964

Genelec/QMI; tel. (508) 435-3666; fax (508) 438-4243

Glyph Technologies; tel. (607) 275-0345; fax (607) 275-9464

Howling Dog Systems; tel. (800) 267-HOWL or (613) 599-7927; fax (613) 599-7926

Innovative Quality Software; tel. (702) 368-2213; fax (702) 368-2470

KAT; tel. (413) 594-7466; fax (413) 592-7987

Kurzweil/Young Chang; tel. (310) 926-3200; fax (310) 404-0748

Lexicon, Inc.; tel. (617) 891-6790; fax (617) 891-0340

Opcode Systems; tel. (415) 856-3333; fax (415) 856-3332

OSC; tel. (415) 252-0460; fax (415) 252-0560

Peavey Electronics; tel. (601) 483-5365; fax (601) 486-1278

PG Music; tel. (905) 528-2368; fax (905) 628-2541

Roland Corp. US; tel. (213) 685-5141; fax (213) 722-0911

Sound Sculpture; tel. (303) 442-1954; fax (303) 447-3502

Spectral Synthesis; tel. (206) 487-2931; fax (206) 487-3431

Spirit; tel. (800) 777-1363 or (801) 566-7586; fax (801) 568-7662

Steinberg/Jones; tel. (818) 993-4091; fax (818) 701-7452

Symetrix; tel. (800) 288-8855 or (206) 787-3222; fax (206) 787-3211

Tech 21; tel. (212) 315-1116; fax (212) 315-0825

Turtle Beach Systems; tel. (717) 767-0200; fax (717) 767-6033

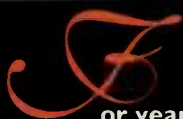
Twelve Tone Systems; tel. (800) 234-1171 or (617) 926-2480; fax (617) 924-6657

Yamaha Corp.; tel. (714) 522-9011; fax (714) 739-2680

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For years the Peavey DPM C8 has been the industry standard for MIDI controllers. And its beautiful craftsmanship and superior software have kept it at the top of the list.

Now Peavey introduces a stream-lined version of our acclaimed C8... the DPM C8p. Like the C8, the C8p has the same Peavey reputation for top quality performance. The BIG difference is that the C8p has a more compact design AND A LOWER PRICE TAG.

The C8p was designed for situations where room and carrying space are a concern. It would be great to have that beautiful C8 on stage every where you play, but we are aware of some of the obstacles musicians find on the road.

On the C8p, we've taken off the bulk of the wood, removed non-essential hardware*, rearranged some of the features (like placing the control wheels on top of the unit), and simply made it more sleek and compact in the process.

The C8 architecture has become so popular that we want to make it more available to everyone, by not only chopping the chassis down a bit, but also the price.

So drop by your local Peavey dealer now and ask to see the new C8p. Another Peavey family member with more bang for the buck.

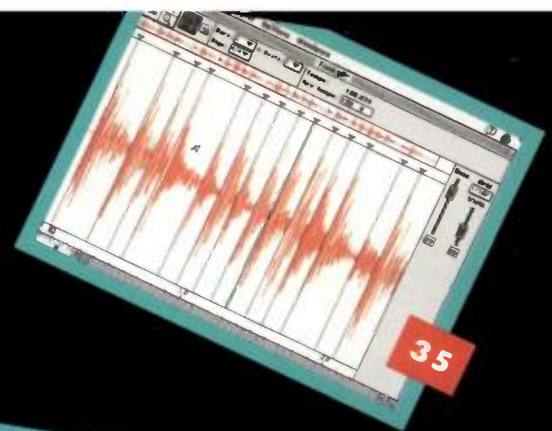
* Disk drive not included.

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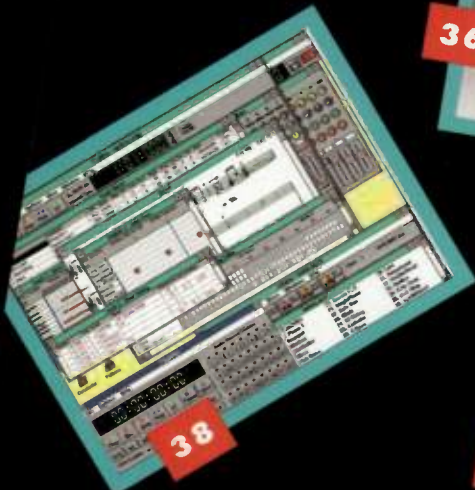
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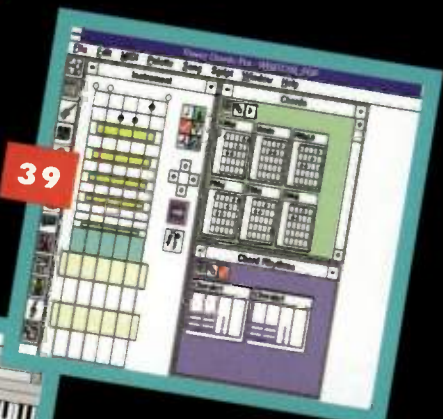
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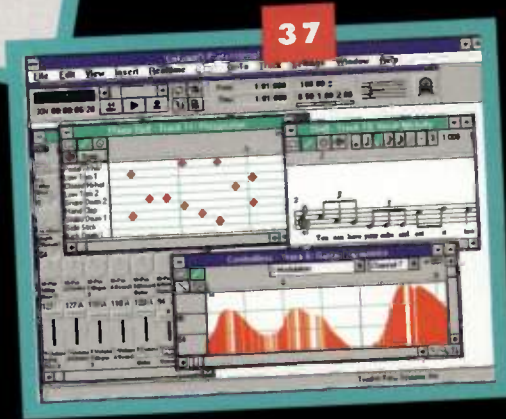
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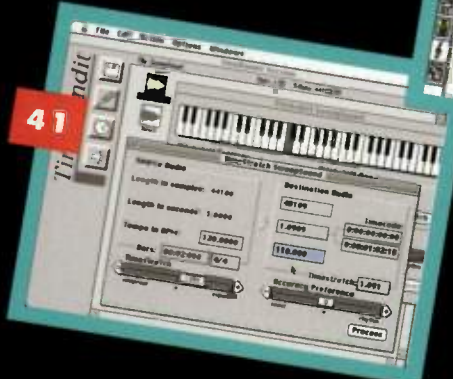
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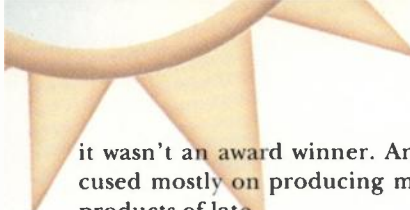
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it wasn't an award winner. And the good Doctor has focused mostly on producing multimedia music-education products of late.

Nonetheless, Dr. T's still cares deeply about electronic musicians, and *QuickScore Professional* proves it. How much would you pay for a *Windows* program with completely real-time score entry and real-time graphic notation, piano-roll, and controller editing? Let's throw in punch-in/out capabilities, global song-arranging, a MIDI mixer that sends any Control Change message, and a very nice selection of musical symbols. Just for grins, we'll add solid text-entry and page-layout features. Of course, it has to be very easy to use, and it has to support any *Windows*-compatible printer and sound card. That's *QuickScore Professional* in a nutshell. The price? Much lower than we expected.

33

PERCUSSION CONTROLLER

KAT trapKAT (\$1,099)

We had a few solid contenders in this category, notably the Roland TD7 drum set. But somehow, every year, the folks at KAT keep coming up with the best new electronic percussion controller on the planet.

In 1994, KAT put an entire drum set's worth of pads in one controller, and it's a doozy. The trapKAT has 24 pads of various sizes, including fourteen raised rim sensors, plus additional inputs for hi-hat and kick-drum controllers. It uses fingertip-sensitive, force-sensing resistors, and its rubber pads are even thicker than those in the drumKAT, so they feel great when played with fingers or drumsticks. You can program all the basic parameters you need, and KAT even throws in some built-in practice patterns, including GM-compatible grooves. The trapKAT is the hottest percussion controller around, at least until KAT reveals their 1995 products.

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RECORDING MIXER

Yamaha ProMix 01 (\$1,999)

This category provoked some interesting discussions, because Yamaha's ProMix 01 isn't an ordinary mixer and doesn't replace a general-purpose recording console. Nonetheless, it looks to be one of the year's most desired products. The biggest pluses are that everything takes place in the digital domain, and it's all automated via MIDI. You even get moving faders.

You get a ton of regular features, too, starting with sixteen balanced mic/line inputs, half with XLRs, plus one unbalanced, stereo line input. There are two stereo effects processors, fed by two of the four aux sends. You'll find plenty of uses for the three assignable, stereo dynamics processors and the 3-band parametric channel EQ. The graphic, backlit LCD lets you see EQ curves, not just values. Also high on the list of good things: 20-bit converters and a stereo S/PDIF digital output.

The ProMix 01 is a specialized device, however, because it does not have channel direct outs, inserts, or subgroup outs. (Obviously, these features would considerably raise the price.) That means you can't use it for traditional, one-pass (band-style) multitracking, where you need to send

several inputs to record discrete tracks. Therefore, it is not a replacement for a traditional board.

On the other hand, with its MIDI automation, it should be a big winner for submixing, mixing all-MIDI projects, performing live (especially with sequences), and final mix-down, particularly mixing to DAT via the S/PDIF outputs. If Yamaha had added ADAT 8-channel optical I/O and a stereo S/PDIF input, the board would be a complete killer. But as is, it's a major breakthrough.

35

SAMPLE-EDITING SOFTWARE

Steinberg ReCycle 1.0 (\$199)

Users of any professional Mac sequencer are accustomed to Groove Quantize, which lets you apply the rhythmic relationships within one group of MIDI notes to another group of MIDI notes. But if you want to alter the tempo of a sampled audio loop, replace the sounds within it, and process them individually, Steinberg's *ReCycle* for the Macintosh is the ticket. The program cuts the audio file into slices that can be sent to a sampler and manipulated. You can tweak the groove's feel and timing and even quantize the audio loop to match a MIDI track. The main down side is that at this point it only supports Akai samplers and Digidesign's SampleCell I and II.

ReCycle was so cool that it overshadowed some other fine sound-editing programs. In particular, we also liked Sonic Foundry's *Sound Forge* sound-file editor (\$179). It's tops on the PC, and it translates between many audio file formats, but it breaks no new sound-editing ground—yet. At press time, Sonic Foundry is getting ready to ship version 3.0, though, which looks like a very hot item with a strong future.

36

SAMPLER

Roland S-760 (\$2,750)

Roland's S-760 was the only major new sampler to ship within our eligibility period, but it would have been a contender in any year. This 24-voice beauty is a direct descendant of Roland's S-750 and S-770 sampler and the SP-700 sample player, with two obvious differences: It takes up just one rackspace, and you get a heck of a lot more bang for the buck.

Almost all the best S-series features are there, including an option that lets you use an external video monitor. The S-760 comes with 2 MB of RAM, but you can load it up to 32 MB, which veteran sampler users will greatly appreciate. Finally, although the operating system takes a little getting used to, before long, you'll be able to get the job done with ease.

SEQUENCING SOFTWARE

I thought we'd end up in a big argument over this category, though at least it wasn't a Mac-versus-PC thing. (Most of the top Mac programs competed in the Digital Audio Sequencer category.) We had lots of sentiment for Twelve Tone Systems' *Cakewalk Pro* for *Windows* 3.0, the long-time leading sequencer on the PC. But Big Noise Software's

MIDI MaxPak 3.0 won a lot of hearts with its power and modular architecture. Ultimately, we declared it a tie, and justifiably so.

37

Twelve Tone Systems'

***Cakewalk Pro for Windows 3.0* (\$349)**

Cakewalk Pro 3.0 adds Groove Quantize, which is familiar to *Cubase* users but otherwise was not found on the PC until now. A modified Piano Roll view has been added for percussion editing, and MIDI Machine Control is supported. Lyrics can be included in printed notation, and a separate, scrolling Lyrics view acts as an onstage teleprompter, which sing-along artists will appreciate. There are 96 independently assignable MIDI faders that can send any note or controller message and can be ganged in various linkage modes. And *Cakewalk* still has all the features that made it the leader on its platform, including its CAL programming language.

38

Big Noise *MIDI MaxPak 3.0* (\$299)

Rather than put all its features in one large basket, *MaxPak* spreads them out among five applications that completely integrate within Big Noise's *MIDI Director* environment. For example, the powerful *SeqMax* graphic sequencer supplies 64 tracks; if you want 128 tracks, you can run two *SeqMax* modules in perfect sync. Groove Quantize was one of the many additions in version 3.0, keeping the program

competitive in this aspect of the feature wars. Editing is fast and efficient. The *MixMax* module allows you to build custom, automated MIDI control panels with graphic editing. If you want two separate panels—say, for synth levels and effects parameters—you can use two modules, which run in sync with each other and with *SeqMax*. Then there are features such as the *JukeMax* live sequence player, *LibMax* generic SysEx librarian, and *TapeMax* MMC machine-transport controller, which has seven autolocate markers and RTZ. The program's flexibility is marvelous, especially because you only have to load the parts you need. Overall, it's a sweet suite.

39

Honorable Mention: Howling Dog Systems'

***Power Chords Pro 2.0* (\$199)**

This *Windows* program is a different creature altogether. Howling Dog Systems' *Power Chords Pro 2.0* is a specialized sequencer that lets you create fretted-instrument chord voicings with strumming and picking patterns, write drum patterns, create melodies, and generally muck around with rhythm. The program is GM/GS compatible, but can be customized for other synths. You can apply rhythm and Velocity-altering effects such as Humanize and Quantize to an entire pattern, or to selected notes. Some of these effects, such as Strum Up/Down, are simply not found in a regular sequencer. For pattern-oriented work, including creative applications you haven't even thought of yet, *Power Chords Pro* is a great tool.

The Lexicon **Reflex** Dynamic MIDI reverberator.



Our new **Reflex Dynamic MIDI™ Reverberator** is one serious piece of Lexicon gear that gives any studio the famous Lexicon sound on a project studio's budget.

Reflex offers the famous Lexicon sound, with **eight stunning algorithms** to bring new dimensions to your recordings.

There's reverb, rich chorusing and echo effects, flanging, multi-tap delays and a **unique resonator program** — a total of **112 Presets**. And **128 User Registers**.

The new Hall algorithm includes two elements derived from our top-level processors, for **the most realistic reverb** available in its class.

Lexicon's randomization process **reduces coloration** and improves the character of longer reverb tails. Additionally, a pair of early reflections is available, allowing you to increase the audibility of a stage or walls, resulting in **incredibly realistic hall and room simulations**.

Reflex also incorporates

40

SIGNAL-PROCESSING SOFTWARE

Arboretum Hyperprism 1.1 (\$495)

This award category didn't even exist last year, as the genre was too new. Now, signal-processing software is a hot item, especially for Mac users. We liked the various *Sound Designer II* plug-ins from Jupiter Systems and Waves, but Arboretum Systems' *Hyperprism* was just too much fun to pass up. The program requires a Digidesign audio card and can process a sound file or an audio signal.

In *Hyperprism*, you alter two effects parameters together by drawing on a resizable window with the mouse. The mouse's position at any given point represents the instantaneous values of the two parameters. The Macintosh program records every move, as you create continuously changing effects in real time. You can apply the resulting algorithm to create a processed version of the sound file, or save the results as a *Hyperprism* file to be applied later. Best of all, you can do multiple passes using other effects parameters and create a multi-effect algorithm. Finally, new version 1.5 (\$595) adds real-time MIDI control.

41

Honorable Mention:

Steinberg Time Bandit 1.5 (\$399)

Steinberg's *Time Bandit* 1.5 is an awesome time compression/expansion application for the Mac. Admittedly, it doesn't have as much sex appeal as a real-time effects pro-

gram, but if you need to fit a 35-second music bed into a 30-second radio spot or movie scene, you'll be mighty glad to have the *Bandit* on your team. A nice bonus is that version 1.5 uses a smart installer to run in native code on a Power Macintosh and in 680x0 code on older Macs. To my knowledge, Steinberg is the first music-software developer to release a native Power Mac application.

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SOUND CARD

Turtle Beach Monterey (\$399)

The Monterey's digital audio quality is the best in its price range, which by itself might be reason enough to give it the nod. Its new WaveFront synth has especially nice brass, winds, and percussion, and the reverbs are surprisingly smooth for a sound card. To top it off, you can use the bundled *Wave SE* software to export WAV files directly into the synth's sample RAM and play them under MIDI control. It takes some time to load the samples, but most sound cards won't do it at all.

43

SYNTHESIZER

Yamaha VL1 (\$4,995)

Nineteen ninety-four was an excellent year for new synthesizers, with top-quality offerings from virtually all the major manufacturers and several small ones. Ultimately,

The affordable new standard in reverberation.



Lexicon's **Dynamic MIDI™**, allowing real-time control of effects parameters via MIDI. For example, the mod wheel on your keyboard can control Reverb Decay Time, or alter the pre-delay from a drum machine snare hit. Plus, Reflex lets you **slave delay times to MIDI tempo** and do MIDI bulk data dumps. Reflex works with any existing LXP-1 editor, such as our

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Of course, Reflex is **at home not only in the studio, but in musician's racks as well**. Reflex is part of the same Performance Series as the **Alex, JamMan and Vortex** — all extraordinary processors which maintain Lexicon's impeccable standards for sound quality.

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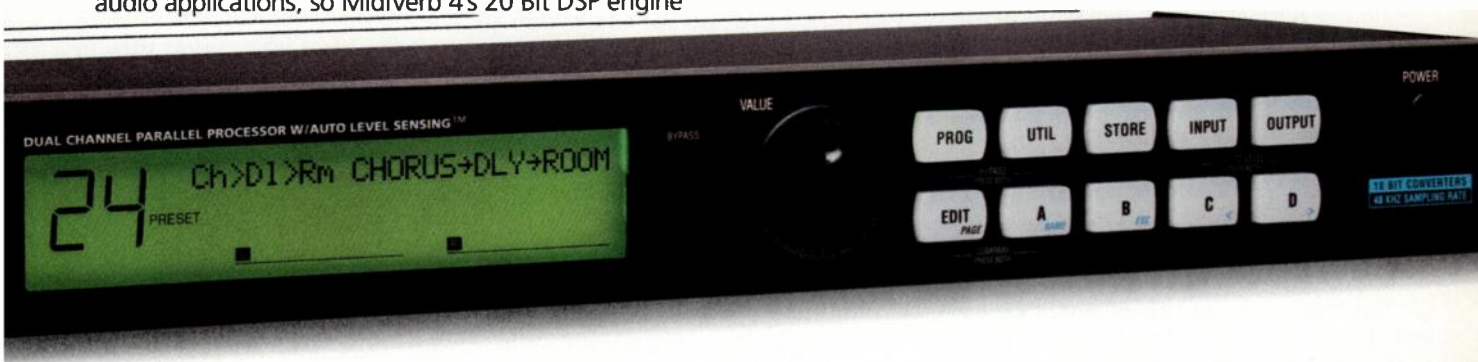
Forget what you know about digital multi-effects processors, the new Alesis MidiVerb 4 has rewritten the book. While the competition has been chasing the standards set by three generations of MidiVerbs, our engineers were researching ways to integrate the form and function of digital reverb way beyond anybody else's imagination...or capabilities. It makes the MidiVerb 4 the cleanest, quietest, richest sounding and, yes, the smartest machine of its kind. Here's how...

MidiVerb 4
Dual Channel Parallel Processor

Advanced Fully Integrated 18 Bit Architecture

Alesis is the world leader in full custom VLSI design for audio applications, so MidiVerb 4's 20 Bit DSP engine

labeled buttons comprise the front end of MidiVerb 4's fast, intuitive user interface. Four parameters are shown simultaneously and there's even screen help



is so advanced it eliminates massive quantities of discrete circuitry, making it a revolutionary blend of electronic design and functionality. And to insure state of the art performance, the input is sampled at the professional standard 48kHz sampling rate via 18 Bit, 128 times oversampling A/D converters.

The Power of Great Sound

MidiVerb 4's superb reverb and effects algorithms are the direct result of our ten year mastery of the art and technology of sound. Dense, natural reverberation, and rich chorus, delay and pitch effects deliver unbeatable sonic performance. 20kHz bandwidth, 90dB signal to noise ratio, 18 Bit and 8 times oversampling D/A converters combine to make MidiVerb 4 perfect for even the most pristine digital recording.

Fast, Fun, Flexible

But great sound is only the beginning. You get 32 full Stereo configurations, as well as powerful independent Dual Channel Parallel Processing. Plus, a special Cascade mode allows the output of channel 1 to feed the input of channel 2 in any of 7 dual channel configurations. A large custom backlit LCD, data entry wheel and clearly

prompts to put you at ease if there's ever a programming question. You can tweak one of the superb 128 preset or 128 user programs, or start from scratch and get the sound you need in no time.

Auto Level Sensing™

No, this won't tell you if your car's on a hill. But, if you want to start mixing in a flash, or the drummer's starting the count and you just plugged in, our exclusive Auto Level Sensing feature automatically sets the input level for optimum use of MidiVerb 4's wide dynamic range, so you'll never have to trade off patience for excellent sound.

It's a MidiVerb

Of course, because it's a MidiVerb, you can modulate effect parameters in real time via MIDI, select programs, and automate your effects during mixdown with a MIDI sequencer.

MidiVerb 4 is based on a classic theme, but it's new in every way. We had as much fun designing it as you will using it. And as always with a MidiVerb, the best part is the price. At \$399*, you have to see, hear and own the MidiVerb 4 today. At your Alesis Dealer now.



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For more information on the MidiVerb 4, call 1-800-5-ALESIS or see your Alesis Dealer.

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the amazing Yamaha VL1 Virtual Acoustic Synthesizer overcame E-mu's innovative Morpheus Z-Plane synth and Oberheim's retro OB-Mx analog synth to win the prize.

We didn't choose the VL1 merely because it is the world's first commercial physical modeling synth, although that helped. Yamaha's instrument is simply the best thing going for acoustic wind-instrument emulation, especially when used with Yamaha's BC2 breath controller. The flutes, double reeds, and saxes are outstanding, and the bass guitars are a surprising bonus. Perhaps the brasses could be improved a bit, but we're picking nits.

The unit responds more like an acoustic instrument than any other synthesizer, and it's superb when controlled with a wind controller (e.g., the Yamaha WX11). True, the VL1 is monophonic, expensive, and has an extremely steep learning curve, especially for nonwind players. But it's clearly the best of the best for 1994. **EM** Technical Editor Scott Wilkinson, a veteran wind player, established his credentials as the Patrick Henry of reviewers, declaring, "Give me this synth, or give me death." Thank goodness he bought the synth.

CHAMPAGNE TIME!

Without a doubt, 1994 was an excellent year for new products. In fact, we've had so much fun using, discussing, and writing about them that we haven't had much time left for mundane things such as eating and sleeping.

It looks like 1995 is going to be another big year for creative designs combined with maturing technology. To begin with, we've already seen further development of our award-winners. For instance, Yamaha has a rack-mount version of the VL1 for less than three grand, E-mu implemented morphing in its UltraProteus, and Arboretum *Hyperprism* 1.5 is a big step forward.

In addition, some promising products shipped just a tad too late to make this year's competition. For example, we're very eager to check out Lexicon's PCM-80 effects processor, Korg's WaveDrum physical modeling instrument, Mark of the Unicorn's Digital Timepiece machine synchronizer, and E-mu's ESI-32 and Emulator IV samplers.

The recent Audio Engineering Society convention also featured several promising new products and upgrades. We saw a new version of Digidesign's Pro Tools, Sony's version of the Tascam DA-88 modular digital multitrack tape recorder, excellent new speakers from several manufacturers, and much more. (I'll report on the 1994 AES show in next month's "What's New" column.) To top it off, several manufacturers gave us a glimpse at next-generation products and even some entirely new technologies.

And just think; we used to do it all with just an instrument, a mic, and a tape recorder!

EM Senior Editor Steve O. just wants to go home, feed his german shepherd, scarf a meal, and get horizontal.

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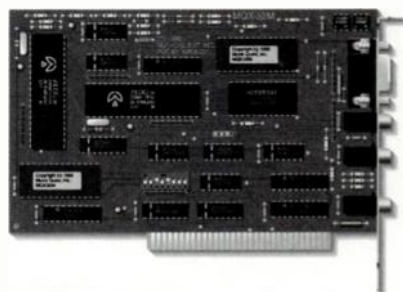
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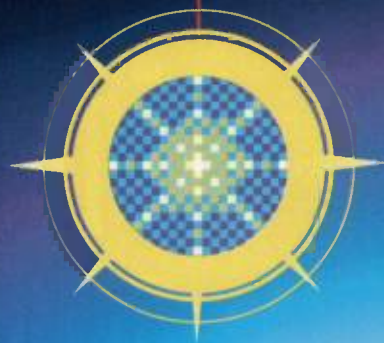
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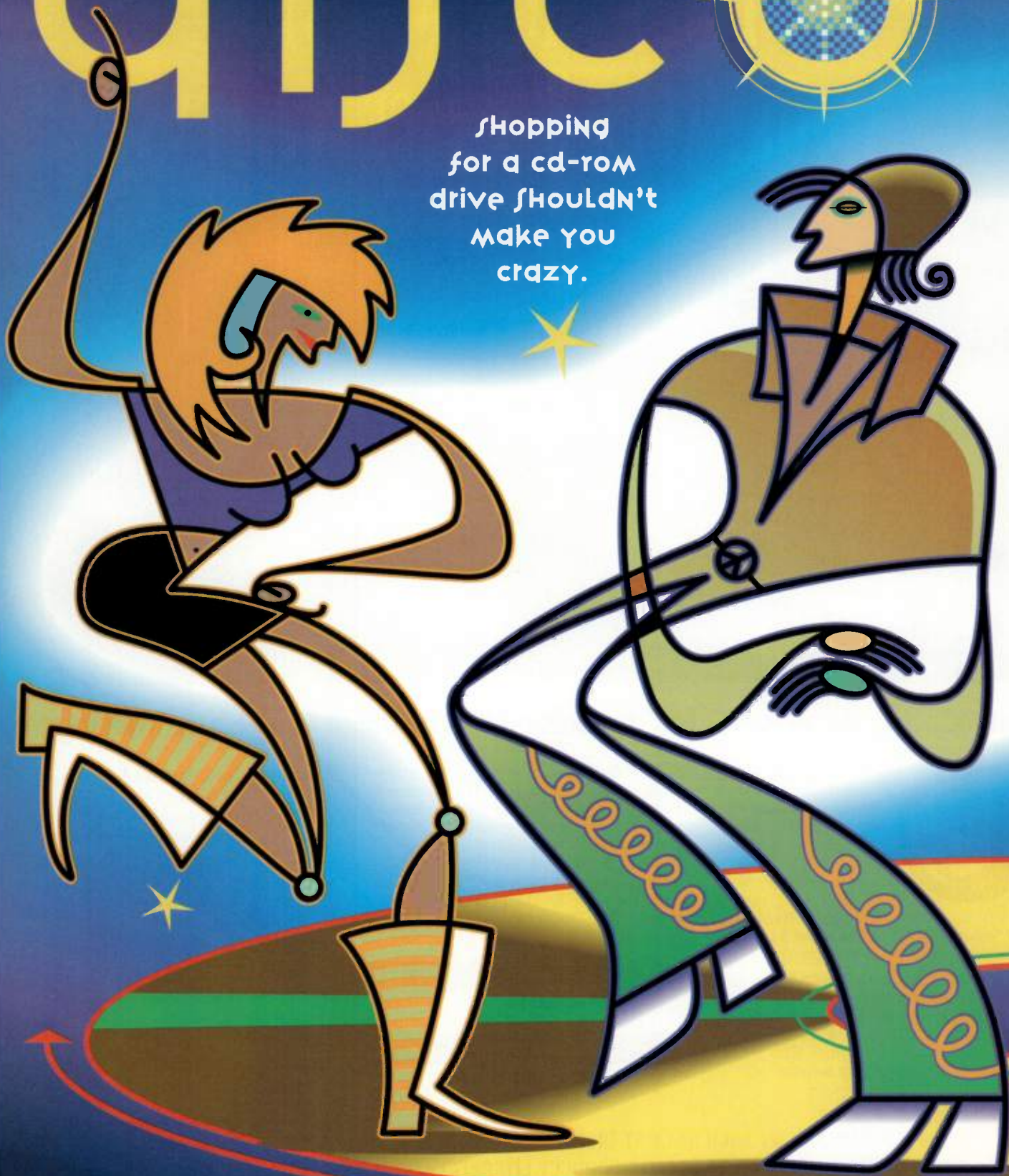


illustration by dave ember

by michael brown

Madniid



So, you've finally decided to take the plunge and buy a CD-ROM drive. You've waited long enough to join the multimedia revolution. But just before you plunk down your hard-earned cash for what you thought was a wicked-fast, double-speed drive, the salesperson asks, "Are you sure that's what you want? I've got several of the new triple- and quad-speed models in stock."

Before you can answer, more questions roll off his tongue and proceed to swirl inside your head. "What type of interface do you need? Are you going to use it with a sound card? Do you want an internal, external, or rack-mount unit?"

How did this seemingly simple decision get so complicated? The truth is, choosing a CD-ROM drive doesn't have to be difficult. First, you must figure out what

applications you're going

to use it for. Next, you should familiarize yourself with the various configurations and types of available drives.



Once you've completed these two steps, it's a simple matter of matching your needs with the drives in your price range. Sure, a \$699 quad-speed drive is faster than a \$395 double-speed model, but that doesn't necessarily mean the former option offers musicians the most bang for the buck.

I LIKE 'EM SCUZZY

For musicians, sound designers, and multimedia producers, the most important feature of a CD-ROM drive is not how fast it is, but the type of interface it uses. This becomes apparent when you consider the most common audio applications for these devices. Aside from checking out games and other multimedia software, a CD-ROM drive lets you access libraries of samples and sound effects. With the proper software (see the sidebar, "Cool CD-ROM Stuff"), you can transfer digital audio files directly from CDs to your hard-disk drive over the SCSI bus. Then, you can edit the sounds to your heart's content.

As it stands, however, you can perform this trick only if you interface your CD-ROM drive to your computer using a SCSI port. All Macs have SCSI ports, but most PC-compatibles don't. Instead, nearly all PCs use the less expensive, less powerful IDE/ATA (In-

tegrated Device Electronics/AT Attachment) interface as a hard-disk drive controller and a separate device controller for the CD-ROM drive.

That situation is rapidly changing as more PC-compatible manufacturers adopt the IDE/ATAPI (Integrated Device Electronics/AT Attachment Packet Interface) standard. Although IDE/ATAPI supports the *concept* of transferring digital audio through the system bus, no software is currently available to make that promise a reality.

All of the device controller standards that we've discussed so far—namely, SCSI, IDE/ATA, and IDE/ATAPI—are capable of controlling a CD-ROM drive. Nevertheless, many PC-compatible manufacturers continue to install proprietary drives and interfaces (usually from Sony, Mitsumi, Panasonic, or Philips) into their machines. These proprietary drives and interfaces are also commonly found in PC-compatible multimedia upgrade kits.

In fact, the Sony, Mitsumi, and Panasonic CD-ROM interfaces have become so common that they are built right into many of the sound cards manufactured for use with PC-compatibles. This is an economical approach, because you don't need a separate controller card for your CD-ROM drive. However, it effectively bars you from using an external or rack-mount CD-ROM drive, because the interface connecting pins are found only on the sound card's circuit board, not its mounting bracket.

An external SCSI drive is usually your best choice, because it can be used with

more than one host system. Many popular samplers, including the Kurzweil K2000S, possess a SCSI port to which a CD-ROM drive can be connected. If your CD-ROM drive is locked up inside your computer's case and controlled by a non-SCSI interface, you can't use the drive with anything else, including your sampler. The bottom line is that SCSI is currently the best mass-storage interface for musicians.

LET'S MAKE A DEAL

If you're shopping for a new PC-compatible, and you want to edit digital audio files from CD sample libraries, avoid buying a preconfigured multimedia system. Instead, ask the dealer to custom-configure a system for you with a SCSI host adapter and an external, SCSI-based CD-ROM drive.

If you already have a PC-compatible, inexpensive SCSI host adapters are available from companies such as Adaptec and Future Domain. These adapters let you connect either an internal or an external, SCSI CD-ROM drive to your system. If you choose an external drive, of course, you can also use it with your sampler or even another computer.

SPINNING WHEELS

When you begin shopping for a CD-ROM drive, you'll probably be asked if you want a double-, triple-, or quad-speed drive (sometimes labeled 2x, 3x, and 4x, respectively). These labels identify how fast the drive is capable of transferring data from the disc to the host (your computer or sampler). Single-speed CD-ROM drives are not yet completely obsolete, but they'll soon go the way of the low-density floppy.

A fast data-transfer rate is important when transferring large files—such as digital audio or video—from a CD-ROM to a hard-disk drive. Double-speed drives have data-transfer rates of at least 300 KB/s, triple-speed drives can do at least 450 KB/s, and quad-speed drives can do at least 600 KB/s.

In order to play Red Book audio tracks, however, the drive must be able to play the disc at the single-speed rate (150 KB/s). Nearly all faster drives automatically slow down to single-speed when they encounter a Red Book audio track. That's cool, but look for drives that are also capable of *copying* Red Book audio files at their fastest speed. That's an important feature when



NEC's MultiSpin 4Xe quad-speed CD-ROM drive is capable of 600 KB/s data-transfer rate and 220 ms average access time.



SERIOUS FUN.

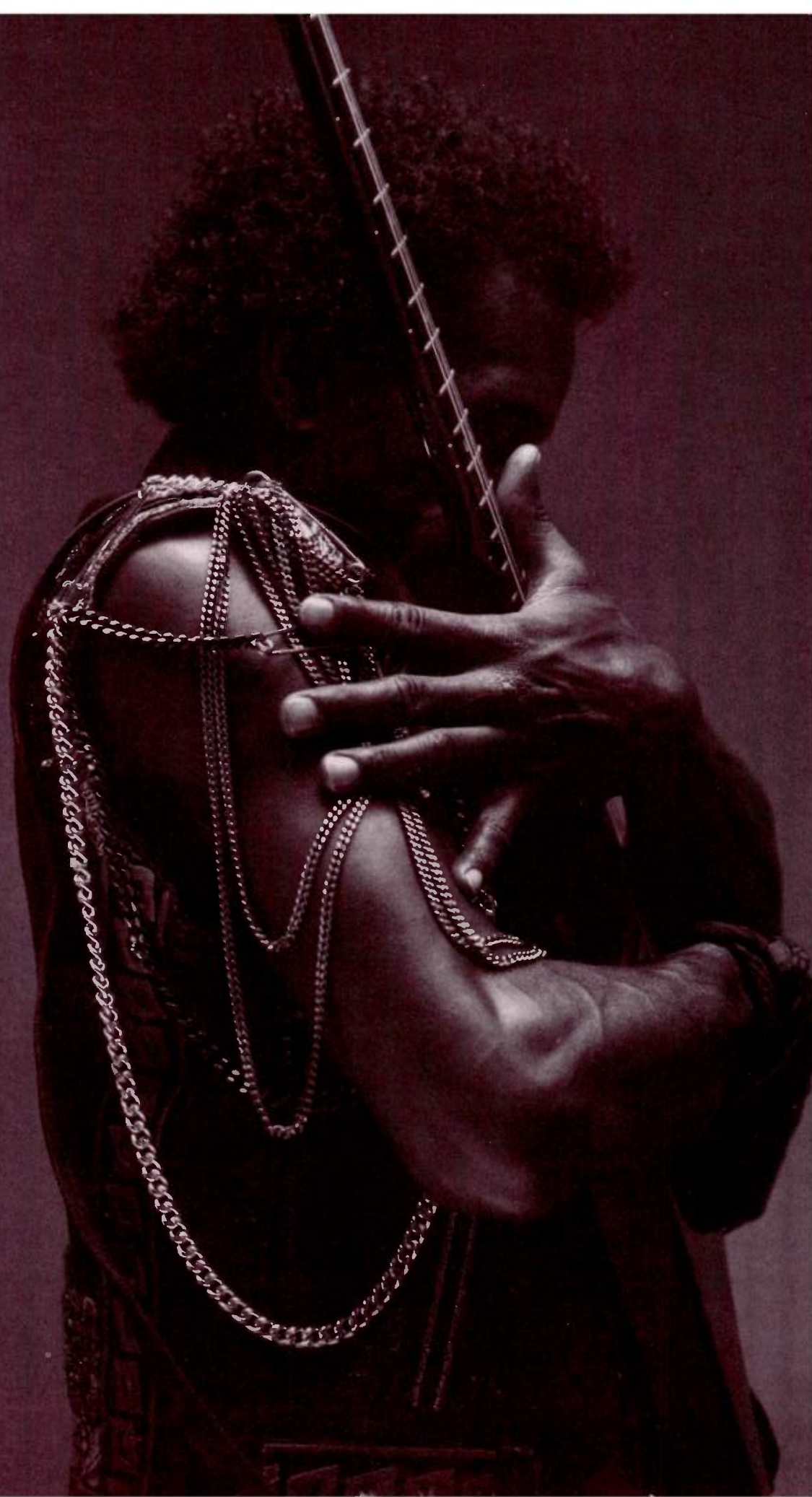
SERIOUS. Like for starters: 160 great sounding Tones (128 General MIDI compatible, plus 32 unique to the KC20), crystal-clear sound quality thanks to a 16-bit DAC, a built-in IBM/MAC/NEC Serial Computer Interface requiring no external interface other than a cable, 64 User-Definable Patches that store splits, layers and parameter data for the Digital Reverb and other effects, 7 killer Drum Kits each with incredible varieties of sound textures. Kawai's been packing power into small packages for some time now, but this time we've even outdone ourselves: the KC20 is one serious machine.

Isn't it time you had some serious fun with your music? And at just \$699.00 retail, the KC20 is seriously the most bang for a buck you're going to find at your dealer's. Check it out today. Your guitar player may hate you for it, but hey, it's about time they shared some of the limelight.

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you're transferring large files to your hard-disk drive.

The second specification to examine is average access time. This indicates how fast the drive's read head can locate and read a specific piece of information on the surface of the disc. Average access time is important when you perform many searches, such as in a database or encyclopedia. You should expect an average access time of at least 300 ms from a double-speed drive, 250 ms from a triple-speed drive, and 200 ms from a quad-speed drive.

CACHE ME OUT

The final spec to be concerned with is the size of the drive's cache. This is an area of RAM on the drive in which data read from the disc is temporarily stored before it is sent to the host. Data can stream out of the cache much faster than it can from the surface of the disc, so theoretically, the larger the cache, the faster the drive's performance. Of course, in order to achieve this higher performance, the data has to be in the cache when the application asks for it. If the data has to be retrieved from the disc anyway, the size of the cache is almost irrelevant.

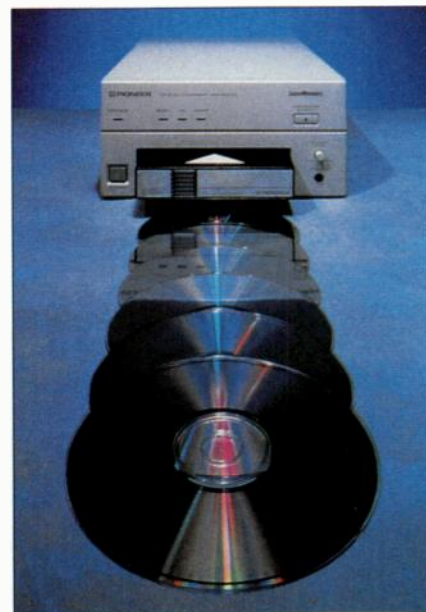
With a read-ahead cache, the drive's firmware instructs the drive to read more data from the disc than the host actually requested. When the host *does* request this information, it can be read from the cache very quickly. A read-

ahead cache is particularly useful when working with large digital-audio and digital-video files.

Generally speaking, a double-speed drive should have a cache of at least 64 KB. Triple- and quad-speed drives should have a cache of at least 128 KB; many have 256 KB, and a few feature a full 1 MB.

ALL I WANNA DO...

If you intend to use your CD-ROM drive only for playing multimedia titles, such as games and encyclopedias, a double-speed drive is perfectly adequate. Many current titles are optimized to run on single-speed drives. Playing a CD-ROM title that has been optimized for a single-speed drive on a



You can load as many as six CDs at a time into Pioneer's DRM-604X quad-speed CD-ROM changer.

CD-ROM RESOURCES

DRIVE MANUFACTURERS AND VARs:

Dynatek Automation Systems, Inc.; tel. (902) 832-3000; fax (902) 832-3010

Glyph Technologies, Inc.; tel. (607) 275-0345; fax (607) 275-9464

NEC Technologies, Inc.; tel. (708) 860-9500

Peripheral Land, Inc.; tel. (510) 657-2211; fax (510) 683-9713

Pioneer New Media Technologies, Inc.; tel. (310) 952-2111; fax (310) 952-2990

Toshiba America Information Systems, Inc.; tel. (714) 457-0777

SCSI HOST ADAPTERS:

Adaptec, Inc.; tel. (408) 945-8600; fax (408) 262-2533

Future Domain Corp.; tel. (714) 253-0400; fax (714) 253-0913

DIGITAL AUDIO EXTRACTION SOFTWARE:

FWB, Inc.; tel. (415) 474-8055; fax (415) 775-2125

Optical Media International; tel. (800) 347-2664 or (408) 376-3511; fax (408) 376-3519



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3M Reliability



double-speed or faster unit results in only a very slight performance boost. The same holds true for CD-ROMs optimized for double-speed drives playing on a triple- or quad-speed drive.

For example, the Cinepak compression algorithm in Apple's *QuickTime* lets you optimize digital-video movies for playback on either single-speed or double-speed drives. For a single-speed drive, it streams the video from the disc at 100 KB/s. For a double-speed drive, this rate is increased to 200 KB/s. Video compression algorithms for Microsoft's *Video for Windows*, such as Intel's Indeo, function in a similar fashion. Once the video has been compressed, it streams from the disc at the

same rate no matter how fast the CD-ROM drive may be. Now that double-speed drives are becoming more prevalent, the trend has shifted to optimizing titles for that standard.

One factor that affects the performance a CD-ROM title has nothing to do with the CD-ROM drive or the host adapter. If the host computer has a slow video card (which many PC-compatibles without a local video bus do), or if it has insufficient RAM (8 MB is the absolute minimum for a Mac or PC-compatible; 16 MB on a Power Mac), the audio will break up and the video will stutter.

CABLE ME

If you're a PC-compatible user, some of the multimedia titles available for that platform contain both MIDI tracks (which are played by the sound card's synthesizer) and Red Book audio tracks (which are played through the drive's D/A converters). With an internal

drive, a cable connects the audio outputs on the drive to the audio input on the sound card. The two audio streams are then mixed together and played through the sound card's audio output.

This presents a minor problem if you're using an external drive. One solution is to run the audio outputs from the drive and the sound card into a mixer. Another work-around is to buy speakers with two sets of inputs. Otherwise, you can build a custom cable to take the audio output from the RCA connectors on the back of the CD-ROM drive to the audio input on the sound card's circuit board.

SSSSSMOKIN'!

Compared to even the slowest modern hard-disk drive, which boasts a transfer rate of at least 2 MB/s, the performance of most CD-ROM drives is downright s-l-o-w. However, when used as a means of distributing multimedia

COOL CD-ROM STUFF

Here are some notable CD-ROM-related products and trends:

- Glyph Technologies recently introduced the first CD-ROM drive with S/PDIF digital audio outputs. The GCD-100S (\$395) is a desktop model; the GCD-100R (\$495) is a rack-mount version. The double-speed SCSI mechanism in both models is a Chinon CDS-525S with a 64K cache. This device is designed for musicians and

you to leverage your investment in SCSI peripherals, including CD-ROM drives, by sharing them with multiple hosts. Model GSS-210S (\$495) allows two SCSI initiators (computers, samplers, or digital audio workstations) to access a daisy chain of up to six SCSI devices. With the rack-mount model GSS-410R (\$995), four SCSI initiators can access the chain. Both models allow you to extend SCSI-1 cable runs up to 20 feet and SCSI-2 cable runs up to 40 feet.

- Many CD-ROM drive manufacturers are replacing the much-hated disc caddy with the same type of motorized tray mechanism found on audio CD players. The trade-off is that you can't mount these drives vertically, because there's nothing to hold the disc in place while it's being loaded.

- If you have an extensive library of CD-ROMs and find yourself constantly swapping discs in and out of your drive, you may want to consider buying a CD-ROM changer. For example, Pioneer New Media Technologies' double-speed DRM-602X (\$895) uses a magazine to shuffle

as many as six discs in and out of the drive mechanism. Pioneer's quad-speed model DRM-1804X (\$2,495) can shuffle the discs in three 6-disc magazines in and out of its mechanism. That puts 18 discs (nearly 12 GB of information) right at your fingertips.

- If you don't want to wait for a CD changer to shuffle through all those discs, Toshiba America Information Systems' TXM3501-A4 (\$2,470) puts four quad-speed CD-ROM drives in a single enclosure. The array uses a single SCSI port, but each mechanism functions as an independent unit with its own SCSI ID.

- If you need to take your CD-ROM drive on the road, or you just like to keep all your equipment mounted in racks, DynaTek and Glyph Technologies both offer CD-ROM drives and other mass-storage devices in rack-mount units.

- Optical Media International's *Disc-To-Disk* (\$199, Mac or Windows) and FWB's *CD-ROM ToolKit* 1.1 (\$79, Mac) let you copy digital audio from a CD to a hard-disk drive over the SCSI bus. Glyph bundles its *Direct Sample* digital audio-extraction software with its drives, but doesn't sell it separately.

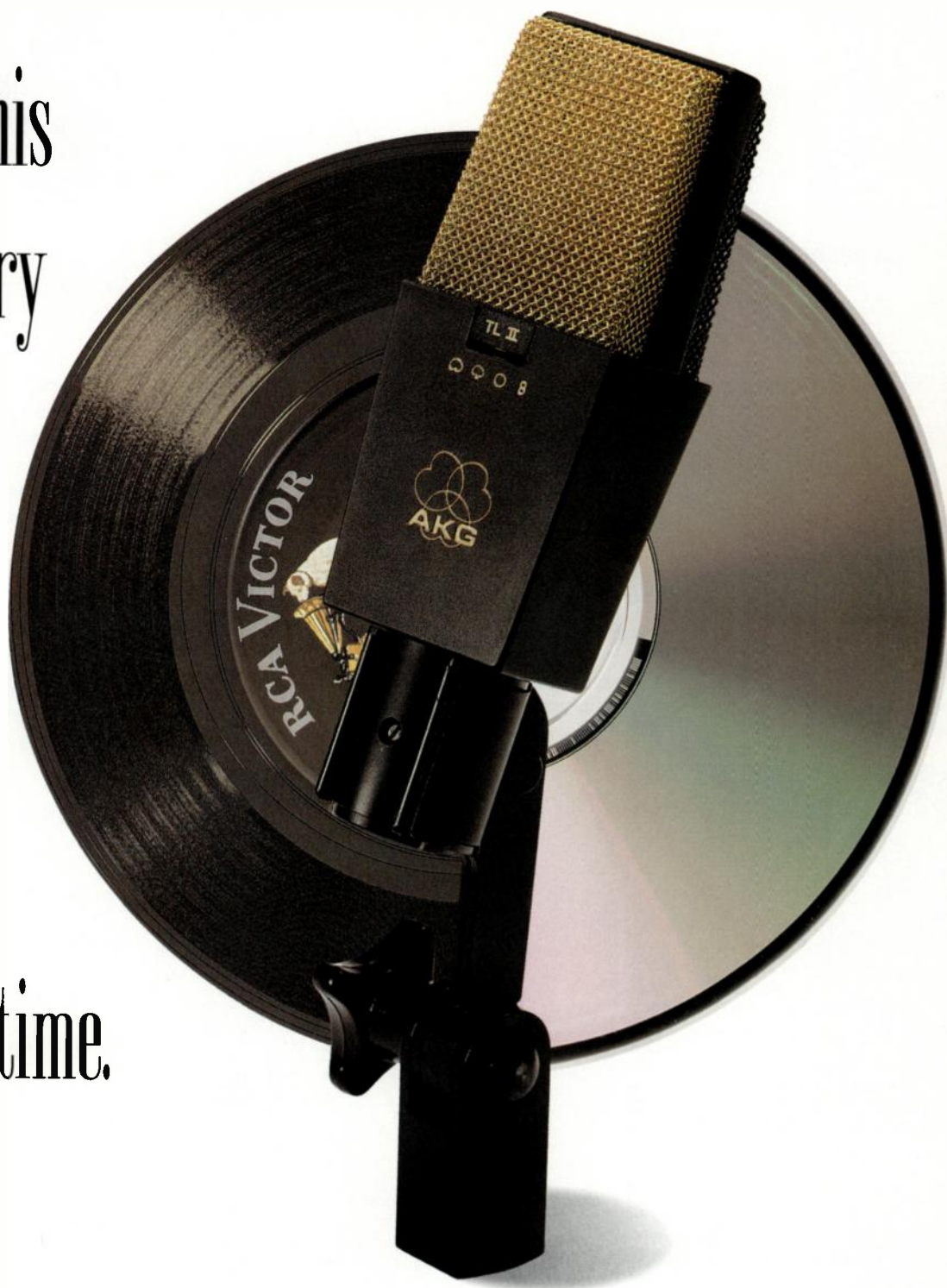


OMI's *Disc-To-Disk* software lets you copy digital audio from a CD to your computer's hard-disk drive over the SCSI bus.

sound designers who work with samplers and digital audio workstations with S/PDIF inputs.

- Glyph also produces the SCSI Switch/Extender. This device allows

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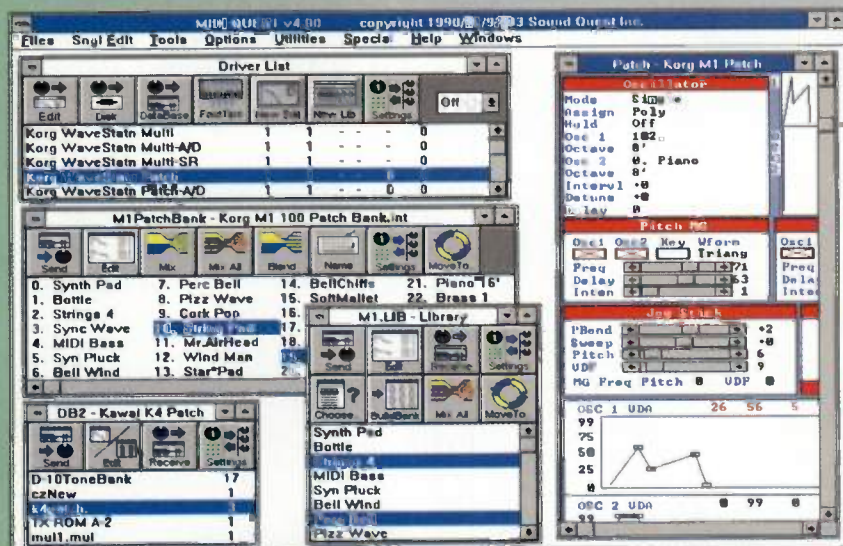
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productions—or for disseminating large quantities of any type of data, for that matter—CD-ROM can't be beat.

As we went to press, Peripheral Land, Inc. of Fremont, California, announced a drive that appears to leapfrog far beyond even quad-speed drives. The PLI 15x QuickCD (\$1,295) includes a proprietary 2x CD-ROM drive mechanism and a proprietary controller, in addition to a huge 16 MB cache.

PLI claims the drive is capable of a 2.25 MB/s data-transfer rate (fifteen times faster than a single-speed drive) and 35 ms average access time. Although this is still not as quick as a fast hard-disk drive (with an average access time of less than 9 ms and data-transfer rates of 4 MB/s to 17 MB/s), these are astonishing performance specs for a CD-ROM drive.

DECISION TIME

The key to getting the most bang for your CD-ROM-drive buck is knowing what you need and what you can do without. Having a SCSI interface is pretty important, because that's the best way to transfer digital audio between CDs and your hard drive. If you transfer lots of digital audio or search through large databases, a quad-speed drive may be a good investment. (Many people feel that triple-speed drives don't offer enough extra performance to warrant the extra cost.)

If you don't need the speed, or if your primary interest is playing games and using multimedia reference materials, there are bargains galore in the double-speed drive market.

Of course, now that you have a better understanding of CD-ROM technology, you may decide you don't need a CD-ROM drive after all. In that case, your money might be better spent accelerating your computer, adding RAM or hard-disk storage, or—what the heck—taking your neglected loved one out for a night on the town.

EM Associate Editor Michael

Brown's boss and his neglected loved one both wish he would have finished this article on time

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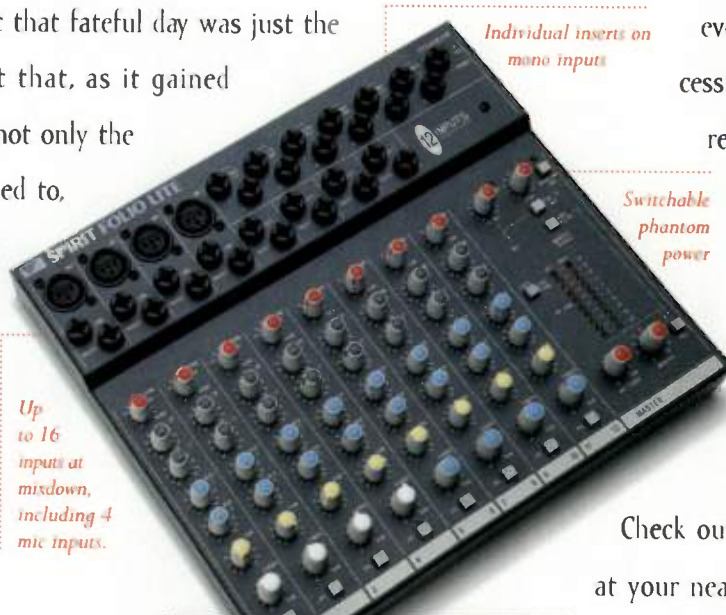
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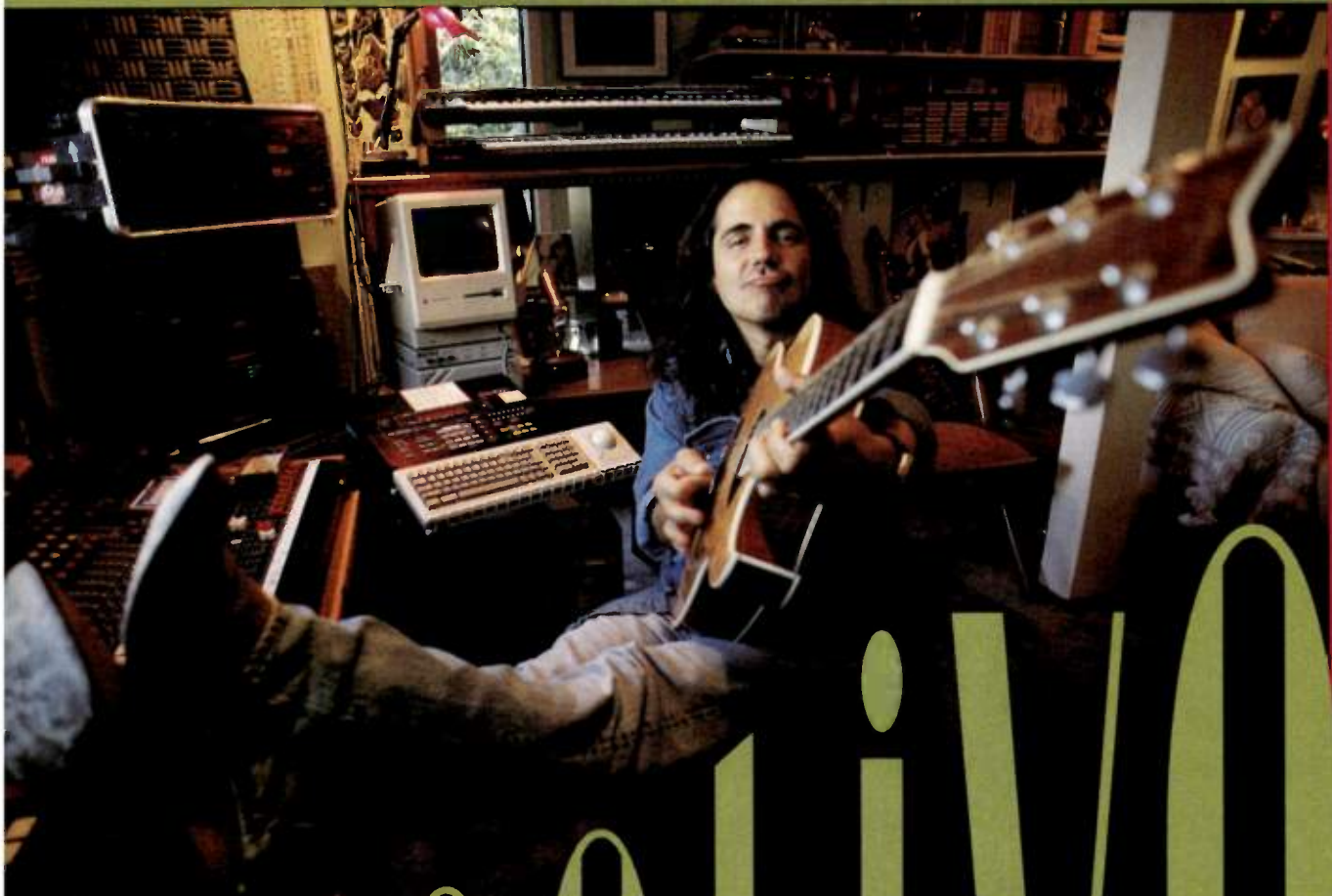


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creative

For most of his career, guitarist Craig Chaquico has been identified with the blistering lead work that helped Jefferson Starship earn sixteen gold and platinum record awards. Last year, however, Chaquico switched musical gears and released an all-acoustic solo album, *Acoustic Highway*. It didn't take fans very long to embrace the new, unplugged Chaquico. *Acoustic Highway* shot to the top of Billboard's Adult Contemporary chart, as did the recently released follow-up, *Acoustic Planet*, which smashed the record-breaking 29-week reign of Yanni's *Live at the Acropolis*.

But even more amazing than Chaquico's critical and commercial one-two punch is the fact that both of these hit albums were recorded at the guitarist's personal studio in Mill Valley, California. For Chaquico, home sweet home beats the multimillion dollar studios every time.

"The working conditions are better at home," he says. "For one thing, you don't have people sitting around judging what you're playing. It's important to be able to experiment and make a lot of mistakes before you find something you like. Under all the pressures of working in a large studio, you tend to stifle experimentation and play what you already know. That's not the most creative way to work."

HOME BOY

Chaquico's home studio has been in existence for more than a decade, but it wasn't always equipped to produce sterling audio quality.

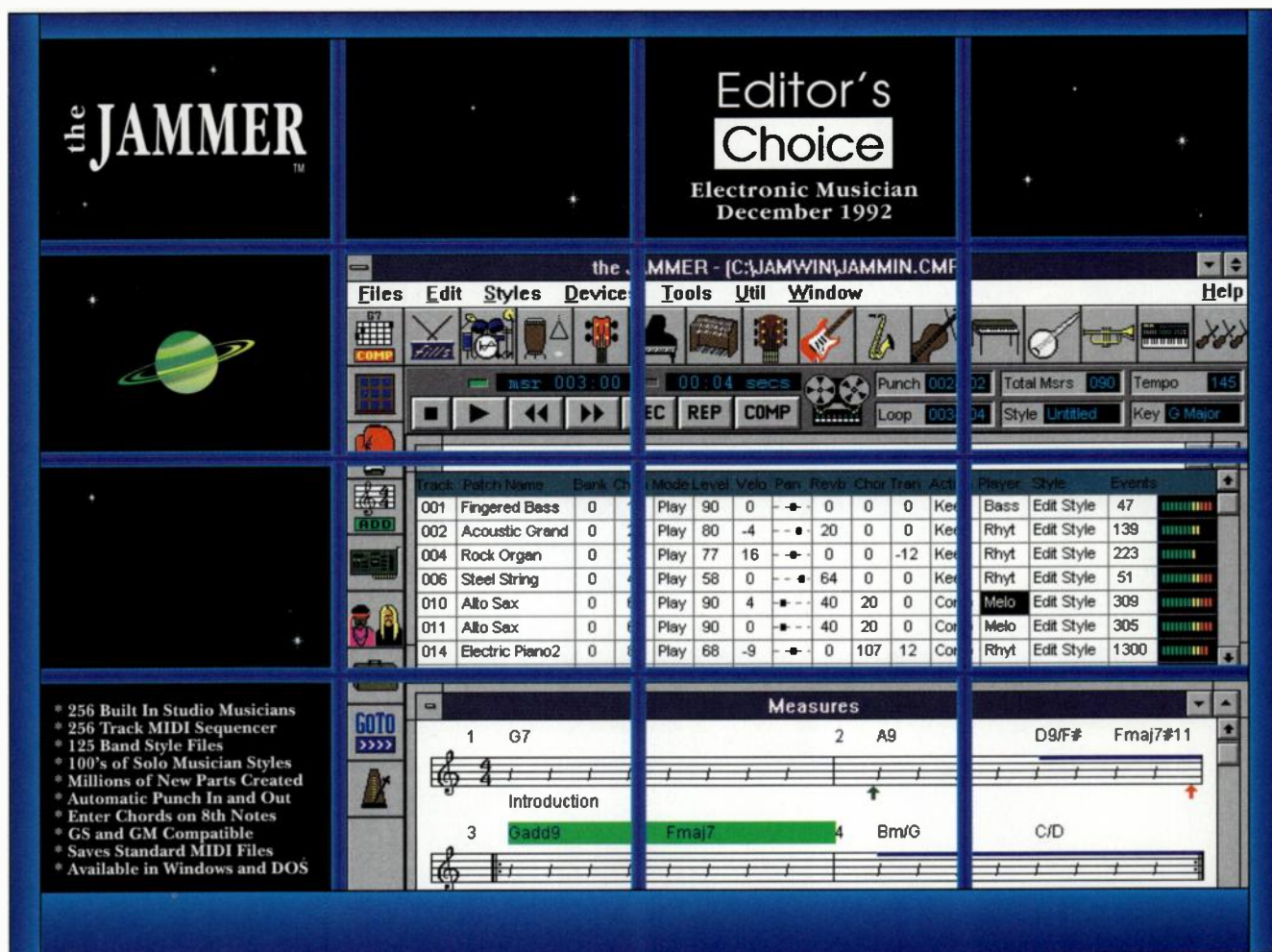
"My original studio started off as a tumor on the side of the stereo in my living room," he quips. "When I recorded all my demos for Jefferson Starship, the



SPACE

8-track recorder ran through the same receiver and speakers as my home stereo system."

But after moving his equipment around to various locations in the house and recording *Acoustic Highway* in a room so small that he could lay on the floor and touch the opposite walls, Chaquico broke down and built a proper studio space in his garage.

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The new studio is spacious and comfortable and is soundproofed with double walls and doors. Adding to the cozy environment is a huge bay window that offers an absolutely breathtaking view of Mount Tamalpais.

"It was a lot easier recording the new album [*Acoustic Planet*] in the privacy of the garage," says Chaquico. "Now, the studio is detached from the house, so there are fewer distractions. It used to drive me nuts trying to listen to a track and hearing people walking around. Also, there's finally enough space to have all my guitars in the room with me, instead of strewn around the house."

ACOUSTIC ALCHEMY

It may surprise some recordists that Chaquico's acoustic albums are not only unplugged, they are "unmiked." Chaquico simply plugs his acoustic-electric Washburn EA-20 guitar directly into the board.

"The Washburn has a piezo-electric pickup built into the bridge, which I think reproduces the natural sound of the acoustic guitar better than traditional magnetic pickups," explains Chaquico. "Unfortunately, once the guitar body starts vibrating [when played], the pickup also starts vibrating, making the guitar extremely susceptible to feedback. Once I've patched the guitar through a compressor and turned up the studio monitors, all it wants to do is feed back all day."

It wasn't a small chore to combat the feedback gremlins, which usually appeared around the 200 Hz to 300 Hz range. Chaquico's Washburn went through an intensive customizing process before it could be recorded safely.

"At first, I tried stuffing sweatshirts through the sound hole to dampen the vibrations inside the guitar," he says. "That didn't work, so I ended up filling the body with eight Harley Davidson t-shirts. On top of that, I bought a Feedback Buster, which is a round, solid rubber gasket designed to cover the guitar's sound hole. It looks like a toilet plunger! Unfortu-



CLAIRE ARNAUD

Chaquico's cozy, compact personal recording environment.

nately, the sound hole on my Washburn is *oval*. I had to buy two of them, so I could fit one over the middle of the sound hole, and cut the other to fill in the spaces that were uncovered."

A signature of Chaquico's acoustic guitar sound is the way he employs delay to widen the stereo spectrum. The original guitar sound is typically panned in the center of the mix, while a stereo delay is panned to the extreme right and left, with each side of the processor's outputs set to a different delay time.

"I find that a lot of artists make great-sounding records, but the [audio] information is crammed in the middle," laments Chaquico. "I like to take total

advantage of the stereo field. One of my favorite processing tricks for widening the stereo perspective is setting the delays to about two repeats on each side, but not turning them up very loud. Ideally, a listener will only hear the effect during brief silent passages. So whenever the mix opens up for a second and there's some space, the ear will pick up a little bit of the echo and be drawn either to the left or right side. The subtle use of delay creates a shimmering effect that really exploits the stereo spectrum."

Chaquico's acoustic vistas are recorded onto his trusty Fostex B-16 ½-inch, analog 16-track deck. He prefers the sound characteristics of analog tape,



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The acoustic armada. (Some of Chaquico's gold and platinum albums hang at top right.)

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which is why the B-16 is still seeing action in the era of modular digital multi-tracks and hard-disk recorders.

"I've always been superstitious about analog tape," admits Chaquico. "I like the sound of tape compression and all the warmth that analog adds to a signal. However, I recently played on an album by my associate producer, William Aura, that was recorded on ADATs. My guitar went straight to [digital] tape and it sounded really good, so I may consider using ADATs for my next record."

The pristine resolution of the digital medium seems like a good match for Chaquico, because he is admittedly obsessed with clean audio. Just about everything goes through a Rocktron Hush IICX single-ended noise-reduction device to ensure quiet, hiss-free masters.

"I'm a real perfectionist when it comes to clean recording," says Chaquico. "Some of the guys I work with wonder why I'm so anal retentive about buzzes and hums. But the reason my records are so clean is because of all the effort I put into fighting noise."

FEELING GROOVY

Believe it or not, guitars aren't the only instruments on Chaquico's instrumental records. But recording an acoustic rhythm section is difficult in a small home studio, so Chaquico relied on drum machines for *Acoustic Highway*. On *Acoustic Planet*, however, he wanted a more human feel. Using a set of S&S drum pads, drummer Jim Reitzel was able to trigger drum and percussion samples and perform directly into Chaquico's sequencer.

"The S&S pads are shaped like actual drum heads and can be set up just like an acoustic drum kit," explains Chaquico. "A drummer can play them like a normal kit, so you can get the best of both worlds. The drummer can give you a real, live drum feel, and I can save the performance into *Performer* so that later I can call up any sounds I want. Even if I could record acoustic drums here, I'd use the trigger system.

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It's simply easier to edit sounds in the sequencer and work with them until they're perfect. With an acoustic kit, if you don't get the mic placement just right, you're stuck."

Chaquico also lucked into what he considers the ultimate bass samples when Jefferson Starship worked with producer Mutt Lange. The Lange samples complete Chaquico's rhythm section and allow him to record absolutely ripping grooves in his personal studio.

"Mutt was using these bass samples from an Akai S900 sampler that just blew me away," he says. "I've never heard these exact sounds anywhere else. You can't buy them, because he made them himself. I was able to get a copy, of course. I was really blessed to have this gift of bass sounds because, until then, it was really hard to get a believable bass sound out of my home studio."

HOME OF THE HITS

So you say it's impossible to make a "number one" record in a home studio? Well, Chaquico has logged two chart-

toppers, and these records weren't made in some rich superstar's splendorous facility that is as well-equipped as the Record Plant or the Power Station. Chaquico's home studio probably isn't any better equipped than the typical **EM** reader's. (And by the way, he is a long-time **EM** reader himself!)

"Sometimes I crack myself up when I think I did this whole thing in my house," says Chaquico. "My record has to go up against guys like Sting who have made albums in million-dollar studios with huge budgets. I've done these records for nothing and every piece of equipment I used can be purchased at most local music stores. It proves there's a way to make an album inexpensively and have it played on the radio right next to everyone else's million-dollar record."

"The reason this is possible," he continues, "is because a musician's emotions are what make a great song, a great lick, or a great record. I *have* recorded in those million-dollar studios, and expensive as they may be, they don't have a knob that can turn up the 'feeling.' If you can put passion into your music and get it on tape, it doesn't matter whether you record in a mega studio or your garage, it's the emotion that people respond to."

Greg Pedersen is editor-in-chief of the *Cal State Hayward Pioneer*.

CHAQUICO'S HOME BREW

Recording Gear	Fostex B-16 with 4050 autolocator, Sony TCD-D7 DAT
Monitor Speakers	Auratone cubes, Yamaha NS-10M
Amps and Preamps	Carvin FET 900 power amp, Carvin Quad-X tube preamp, Scholz XPR Rockman preamp, Soldano Series II tube preamp, Tascam MH-40 headphone amp
Signal Processors	Alesis QuadraVerb 2; BBE 402 Sonic Maximizer; dbx 160x, 161, and 163 compressors; Lexicon PCM-70; Rocktron Hush IIC and IICX noise-reduction systems; Roland SRV-2000; Sabine FBX-900 Feedback Exterminator; t.c. electronic TC1210 stereo chorus/flanger; Yamaha SPX90
Mixing Consoles	Carvin MX1688 (2), Mackie 1202, Rane SMZ 6 (2)
Sound Modules	Akai S900 sampler, Alesis HR-16 drum machine, Alesis SR-16 drum machine, Ensoniq TS-10, Roland D-550
Computers and Software	Macintosh Plus, Mark of the Unicorn <i>Performer</i>
Miscellaneous	Jim Dunlop volume and wah-wah pedals, Furman PL-8 power conditioner, S&S Squadron drum pads and triggers, Sabine AX-800 tuner, Sabine RT-1601 rack tuner, U.S. Navy Blue Angels dust cover

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MIDI fretboard controllers open a new world for adventurous guitarists.

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SIX-STRING SYMPHONIES



However, it's not as simple as connecting the MIDI Out from a guitar controller to the MIDI In on a synth. MIDI guitars have their own rules. In addition, many guitarists have not worked with MIDI sound sources, and the learning curve can be frustrating.

Many guitar controllers now include their own dedicated sound module, which makes them relatively easy to play right out of the box. But owners of these all-in-one models eventually want to play external MIDI sound modules and record performances into a MIDI sequencer from their guitar controller. So for all of you intrepid guitarists who want to venture into the realm of MIDI, here are some directions and shortcuts to ease your journey.

ON THE RIGHT TRACK

Perhaps the most important aspect of guitar synths and MIDI controllers is *tracking*. The most obvious element of tracking is the speed with which a note is recognized and transmitted to a connected synthesizer. However, tracking is more than pure speed. It also refers to the ability to accurately reproduce guitar-playing techniques, such as slides, string bends, vibrato, hammer-ons, pull-offs, and whammy-bar tricks. Tracking also includes the accurate re-

production of dynamics, which are critically important to expressive guitar playing.

Currently, there are two categories of guitar controllers: dedicated fretboard controllers and those that detect the pitches played on a standard guitar. By avoiding the constraints of standard guitars, several manufacturers have developed unique and interesting dedicated alternate MIDI controllers, such as the Suzuki Unisynth and Starr Switch Ztar, which have no strings at all. Other designs, such as the Beetle Quantar and Yamaha G10 (see Fig. 1), use ultrasonic scanning to detect the pitch of each vibrating string. Some controllers, such as the Synthaxe, Stepp, Zeta Mirror 6, and Peavey CyberBass (see Fig. 2), use detectors in the frets and elsewhere to determine which pitches are being played.

Dedicated controllers are often better at telling a synthesizer what notes to play, because they don't suffer from the delays inherent in pitch-to-MIDI conversion (discussed shortly). However, they are not real guitars, so they don't play like real guitars, and conventional guitar techniques are sometimes impossible. As a result, many players are not willing to learn these instruments, and many of them have been discontinued.

Standard guitars can also control synthesizers by installing a special "hex" pickup, which includes six independent magnetic-field or piezo poles that detect the vibration of each string. This information is sent to a pitch-to-MIDI converter, which then sends the appropriate MIDI messages to any connected synthesizer. Many companies have used this approach, including Casio, Gibson, Ibanez, IVL, Korg, Ovation/Takamine/Charvel, Passac, Photon, Lyrrus, Roland, and New England Digital. Unfortunately, most of these products are no longer available.

In fact, Roland and Lyrrus Systems are virtually the only viable guitar-synth companies left these days. The Roland GK-2 and new GK-



FIG. 2: The Peavey CyberBass includes detectors in each fret to determine the pitches you play.

2A (see Fig. 3) are magnetic-field hex pickups that can be mounted on your favorite electric or steel-string acoustic guitar without damaging the surface. If you want to control synths with a nylon-string acoustic guitar, you need a piezo hex pickup that is mounted on the bridge to detect the strings' mechanical vibrations. A company called Godin makes a custom nylon-string guitar with such a pickup.

Roland also makes dedicated guitar synthesizers, such as the GR-1 and GR-09, which can be played with a Godin acoustic guitar or any steel-string guitar with a GR-2 or GK-2A pickup. In this case, the signals from the pickup are not converted into MIDI messages. Instead, they control the synth directly, with less tracking delay (more in a moment). In addition, the patches in the Roland GR synths are optimized for guitar control, making it easier to play right away. Of course, these devices also include a MIDI Out jack, which lets you play external synths from your guitar controller.

Lyrrus Systems' G-VOX is a hardware/software package that directly links the company's pickup to a Mac or PC. The pickup attaches with suction cups to any guitar and feeds the G-VOX Belt Pack, which converts the notes into digital data. MIDI conversion is accomplished in real time with the company's *Bridge for Windows* software. A Macintosh version of *Bridge* is still under development, but non-real-time conversion can be accomplished with Lyrrus' *Midi* add-on utility.

The biggest advantage of pitch-to-MIDI technology is that it works on a



FIG. 1: The Yamaha G10 uses ultrasonic scanning to detect the vibration frequency of each string.

SIX-STRING SYMPHONIES



standard guitar. This results in a more natural feel and tracks guitar nuances such as bends and vibrato better than dedicated controllers. However, using a real guitar also has some disadvantages when controlling MIDI devices, particularly when tracking delay.

DELAYED GRATIFICATION

No matter which pitch-to-MIDI system you use, tracking delay inevitably rears its ugly head. Delay is the time between the moment you pluck a string and the moment the synth makes a sound in response. There are three contributing factors to tracking delay: the time it takes to determine the pitch of the note, the time it takes to convert this information into a MIDI message, and the time it takes the receiving synth to respond to the message and make a sound.

The first factor is limited by physics. As a string vibrates, the pitch-to-MIDI converter takes the time of at least one complete cycle to determine its frequency. For example, an open A string on a guitar vibrates at 220 Hz, so each cycle takes about 4.5 milliseconds (ms) to complete. The current generation of Roland GR guitar synths takes one full cycle to determine the pitch; older pitch-to-MIDI converters require two full cycles.

Once the frequency is known, it must be converted into a MIDI message, using several more milliseconds. Dedicated controllers that use buttons, ultrasonic scanning, or fret detectors exhibit no delay in this process, because the converter knows which note is being fretted before the string is plucked.

After a MIDI message is generated, it takes time to travel from the controller to the synth. For example, each Note On message takes 0.768 ms to transmit, so a 6-note chord takes about 4.5 ms. If you include Pitch Bend messages, this delay increases even further. Once the synth receives a message, more time is taken to process it and make a sound. For example, the E-mu Proteus takes 4 ms to respond to a single Note On message, while the Yamaha DX7 takes about 6 ms. If you call up a complex, multilayer patch that uses a lot of the synth's oscillators and play a 6-note chord on six different MIDI channels, it can take an instrument, such as the Korg M1 or Roland JD-990, as much as 20 to 30 ms to respond completely.

These final transmission and processing delays are common to all MIDI devices, but keyboard players are used to them; guitarists may have some trouble adjusting at first. With some practice and minor modifications to your playing technique, however, you can become accustomed to these delays. You must learn to play each sound for what it is. For example, don't strum a saxophone sound. Try to think like a player of the instrument you are emulating. In addition, you must generally play slightly ahead of the beat to compensate for delays. Don't lay back!

MIDI OUT

All MIDI guitar controllers send Note On and Note Off messages. Velocity information is derived from the initial amplitude of the string's vibration.

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GR-1 SETUP

The Roland GR-1 is one of the most popular guitar synths of all time. Use the following procedure to set up the GR-1's MIDI parameters for optimum control of an external sound module.

1. Press the SYSTEM button, then press the PARAMETER NEXT button two times to access the MIDI parameters.

2. Press the ENTER button to display the Basic MIDI channel on which the GR-1 transmits. Use the VALUE buttons to select channel 1.

3. Press the PARAMETER NEXT button again to access the MODE parameter. POLY mode transmits all six guitar strings on the basic MIDI channel, while MONO mode transmits data from each guitar string on different MIDI channels. You may need to alternate between these two modes, depending on your application. Do this with the VALUE buttons.

4. Press the PARAMETER NEXT button one more time to access the BEND parameter. A bend range of 12 should normally be used for controlling external synthesizers. A chromatic setting of 0 is used if you don't want the GR-1 to transmit bend messages.

These settings are global and do not need to be written into memory.

However, no information about the string's amplitude envelope is transmitted, so the controller sends a Note Off message when the vibration falls below a certain amplitude threshold. Of course, you can stop a note by damping the string, but if you let it ring, the controller will eventually send a Note Off whether you want it to or not. (Dedicated controllers without strings don't suffer from this problem.)

If the pickup is set to a low sensitivity, or it is too far from the strings, notes played on the guitar may not be detected. Even if they are detected, they don't last long. To increase the time a note can last, you must increase the sensitivity of the pickup. However, if you set the sensitivity too high, the controller will transmit lots of unwanted

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SIX-STRING SYMPHONIES



"ghost" notes at uniformly high Velocities. The proper setting usually transmits notes in the upper part of the Velocity range (the average value is around 100), and you must also find the appropriate Velocity curve in the receiving synth (discussed shortly).

Guitar controllers also transmit Pitch Bend messages to convey string bends, vibrato, slides, hammer-ons, and pull-offs. However, guitars have six strings, each of which can be bent independently. Moving the pitch-bend wheel on a keyboard normally bends all sounding notes by the same amount.

To solve this, most guitar controllers transmit in one of two modes: Poly and Mono. In Poly mode, all six strings transmit on the same MIDI channel. As long as you play single-note lines, Pitch Bend messages are sent as usual. But as soon as you play two or more notes simultaneously, most controllers stop transmitting Pitch Bend messages. Otherwise, the receiving synth would sound out of tune under a barrage of conflicting messages.

In Mono mode, each string's note and Pitch Bend messages are sent on a separate MIDI channel. You can still play chords in Mono mode, but this takes up several channels in the receiving synth. However, the controller

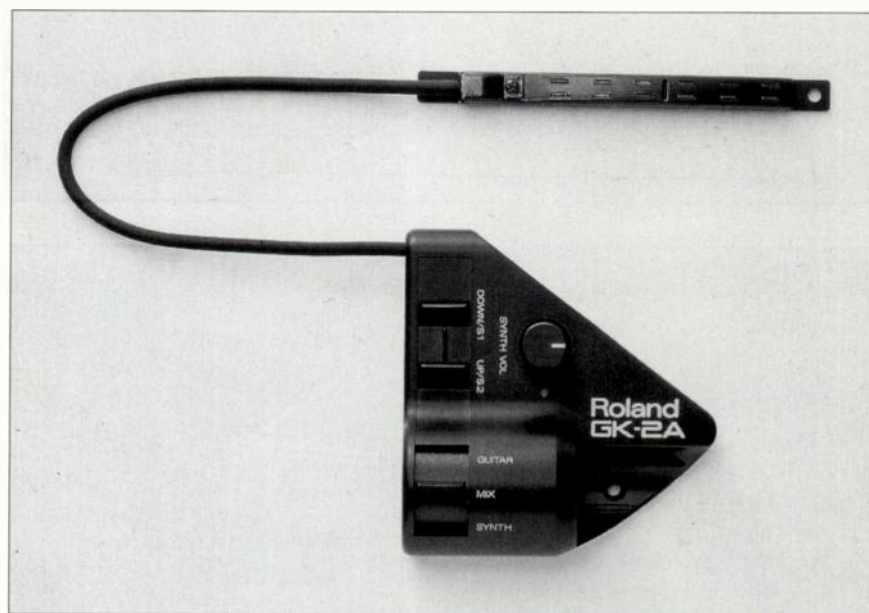


FIG. 3: The Roland GK-2A is a magnetic-field hex pickup that can be mounted on any electric or steel-string acoustic guitar.

plays like a normal guitar as long as the receiving synth is programmed to respond accordingly.

Another important controller parameter is pitch-bend range. Most synths have a maximum bend range of twelve semitones (one octave), while most guitars can bend as much as two octaves by sliding up and down the neck. It's important to set the controller's bend range to the same value as the synth's to avoid sounding out of tune. If you are playing a patch that uses no pitch bend, turn the controller's bend range off (set it to 0); this is sometimes called "Chromatic"

mode. (Sounds that use no Pitch Bend, such as piano and vibes, are good candidates for Poly mode.)

It certainly helps if the controller can transmit other messages, such as Program Change. This lets you select a synth patch from the controller itself, which is mighty handy.

MIDI IN

When selecting an appropriate synthesizer to use with a MIDI guitar controller, there are several things to consider. First, it must be able to play notes on six MIDI channels at once. This is not a problem if you have a recent model that offers at least 6-part multitimbral operation. Some older monotimbral synthesizers, such as the Roland D-50 and Oberheim Matrix series, can play the same patch monophonically on six consecutive channels if set to Mono mode with Omni on. (This is too complicated to explain in detail here; just set the appropriate parameters in the synth and have at it.) However, they still don't work as well as modern, multitimbral synths.

The second crucial feature is a maximum pitch-bend range of at least twelve semitones; 24 is even better. In many synthesizers, this is a global parameter for the entire unit, but in some cases, the bend range is memorized with each patch. It may take a while to adjust this parameter for every patch in the unit, but the flexibility it offers is well worth the time.

EM REVIEWS MIDI GUITARS

Electronic Musician has covered guitar controllers and synthesizers in a number of reviews and application articles. Back issues of **EM** are available from Mix Bookshelf; tel. (800) 233-9604 or (510) 653-3307; fax (510) 653-5142.

Reviews

Beetle Quantar	October 1988
Casio MG-500/510	January 1988
Casio PG-380	February 1989
IVL Pitchrider 7000 Mark II	October 1987
Peavey Midibase (predecessor to the CyberBass)	December 1992
Roland GK-1/GM-70	June 1987
Roland GR-50	October 1989
Roland GR-1	February 1993
Starr Switch Ztar	November 1994
Suzuki Unisynth XG1m	January 1988
Yamaha G10 ROM Update	November 1989



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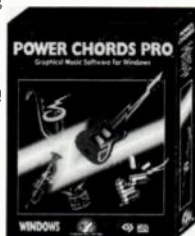
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SIX-STRING SYMPHONIES



The synthesizer should also offer programmable Velocity curves. At the least, it must have several preset curves. Select or program a curve in which the upper part of the Velocity range controls the widest possible range of volume levels.

Some synths offer two special response modes, which are often called Solo (or Mono) and Legato. In Solo mode, the synth plays only one note at a time. If you can assign Solo mode to each part in a multitimbral synth, it will respond to a guitar controller more like a real guitar. In this case, the controller should also be set to its Mono mode, which sends messages from each string on its own MIDI channel.

Legato mode is a variation of Solo mode. If the synth is in Legato mode and it receives two Note On messages without an intervening Note Off, it will turn off the first note and play the second note, but it will not retrigger the envelope generator. This lets you play smoothly from one note to the next without hearing the programmed attack. (If it receives the first note's Off message, it will behave just like Solo mode.) Legato mode helps the synth respond well to different playing techniques, such as neck slides, hammer-ons, and pull-offs. It also helps differentiate various articulations.

GIG'S OVER

Using a MIDI fretboard controller requires a solid understanding of the controller's capabilities as well as the capabilities of the responding MIDI sound module. There are also a number of variables unique to fretboard controllers. Unfortunately, the electronic-instrument market has more keyboardists than fretboardists, so most synths are designed to work with a keyboard. However, this isn't a problem if you take the time to learn everything you can about the gear you use, especially since the rewards for this effort are greater than you can imagine.

Scott Summers is a product specialist/clinician for Roland. Scott Wilkinson is the technical editor of EM.

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Riding the Air Waves

How to ensure your music makes a safe landing on the radio dial.

By Camran Afsari

The radio crackles, the DJ announces the next cut he's about to play, and you hear the first notes of your band's song. What does it take to get radio airplay? Like other pathways in a band's career, the road to radio airplay is a difficult one. Stations will naturally take into account their best interests when deciding what to broadcast, so a well-thought out plan is needed to get your music noticed among the hundreds of other

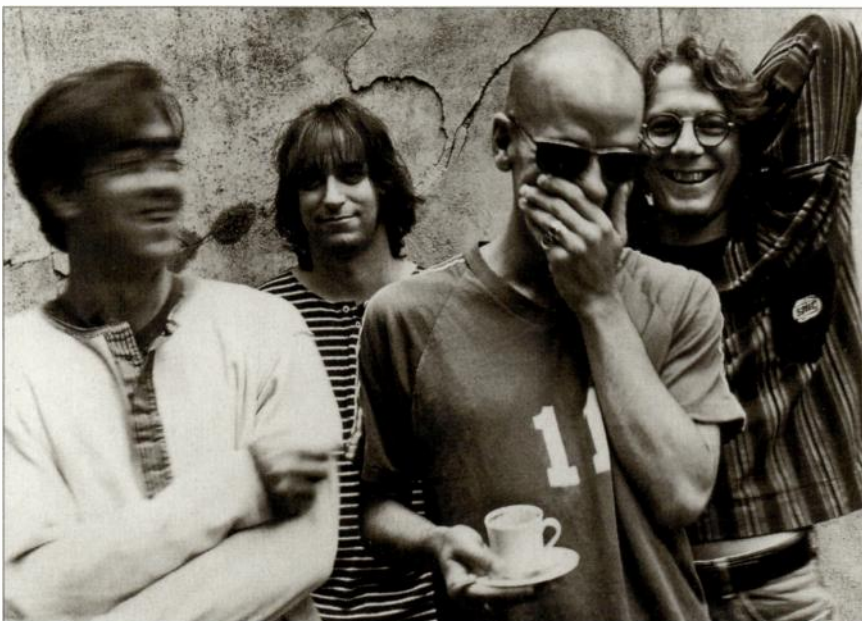
releases. But designing a basic strategy does not have to seem like an impossible task, as long as your songs motivate a reviewer, a radio music director, or anyone with the "privilege of influence" to steer events in your group's favor.

"The prospect of a band independently garnering radio airplay is very daunting," warns Seana Baruth, associate alternative-music editor at *The Gavin Report*, a San Francisco-based radio trade journal. "After you've built a reputation for yourself in your home town, after you've received local press and can get a gig in any local club, then radio airplay can help your band skip up to the next plateau."

CALLING ALL STATIONS

Radio stations fall into three categories: college, commercial, and public. Commercial-free college radio exposes mainly underground music or yet unknown bands. College stations occupy a space on the dial where bands can generate a loyal following well before enjoying any commercial success. Similar to MTV, college radio has seriously affected the trajectory of many careers. Bands can come up through the ranks on college radio, while being courted by small and major labels alike.

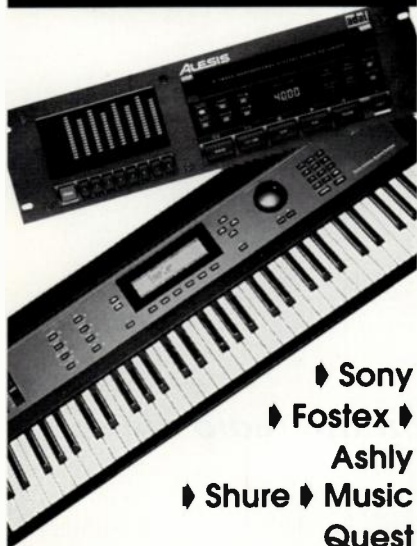
Every musical style is played on college stations, with emphasis on new material, which provides more opportunity for new artists than commercial radio. However, one side effect of all



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this diversity is that if listeners don't like the song, they turn the dial.

Commercial stations don't want their listeners to station surf. They are concerned primarily with ratings and the advertising revenues those ratings generate. Formats are usually homogeneous and strict on commercial radio, because DJs must play infectious hits (whether new or old) to keep listeners hooked for extended periods of time. Most bands graduate to commercial radio only after they've caused some waves in the realm of college radio.

Public stations are not typically commercially oriented and are therefore not governed solely by ratings. The likelihood of receiving airplay on public radio is better for unknown bands than on commercial radio. But the number of musical programs and outlets for artists is broader on college stations than on public stations.

FORMATS

Format selection is critical to your chances of getting played on radio. The combination of formats you choose for your release is often a function of your band's budget. You may want to budget for a dedicated radio-promotion format, such as CD or vinyl singles (12- or 7-inch), in addition to pressing a full-length LP or CD for press, retail, and mail order.

"We're still committed to vinyl, but well over two-thirds of our rotation is CD," says Jim Heffernan, music director for KUSF, the University of San Francisco's radio station.

Cassette tapes are rarely played, especially from unknown artists. The cassette format is hard to cue up, and DJs don't have time to search for songs as segues approach.

"If bands get their music together on

vinyl or CD, it's easier for us to play," suggests Heffernan. "At KUSF, cassettes require plugging in extra equipment at a special spot on the board. With that hassle, not too many DJs are willing to play them." The exceptions to this "rule" are specialty programs, such as demo tape shows, where cassette tapes are usually welcome along with vinyl and CD releases.

RESEARCH

Instead of indiscriminately sending your release to every station, first decide which ones are most receptive to your style of music. The radio-promotion budget of most unknown artists usually limits their promotional mailings to a specific list of stations. KUSF receives roughly 100 releases per week, but Heffernan says, "Many of those just don't fit into our format, so they don't get put into rotation."

This is where the radio trade journals come in handy. To compile your list of stations that play music that's similar to yours, get a copy of the trades such as *CMJ*, *The Gavin Report*, or *Billboard* (see sidebar). These publications are read by people who are serious about radio: music directors, DJs, radio consultants, and label reps who are curious if their releases are receiving any airplay. Radio stations report their playlists to the trades, and the playlists are subsequently compiled into national/regional charts. A station's playlist shows the rotation of a band's airplay, usually broken down into heavy, medium, and add. (Add refers to releases that have been recently added to the playlist and are not yet in heavy or medium rotation.) The charts in the trades are broken down by style of music, such as rock, rap, country, jazz, and alternative.

Keep in mind that some trades are

THE TRADES

Trade magazines are indispensable resources for determining which radio stations may be open to airing your music.

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The Gavin Report; tel. (415) 495-1990; fax (415) 495-2580

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more genre-specific than others. Depending on their format, specific stations report to specific trades, i.e. not all college or commercial stations will be found in any given trade. The trades also review new releases they like and sell radio-specific advertising to labels and bands. Depending on your budget, and especially if you are interested in national exposure on radio, you may want to take out an ad in one or more of the trades. A trade advertisement familiarizes music directors and DJs with your band's name, which helps set you apart from the hundreds of anonymous bands sending out releases.

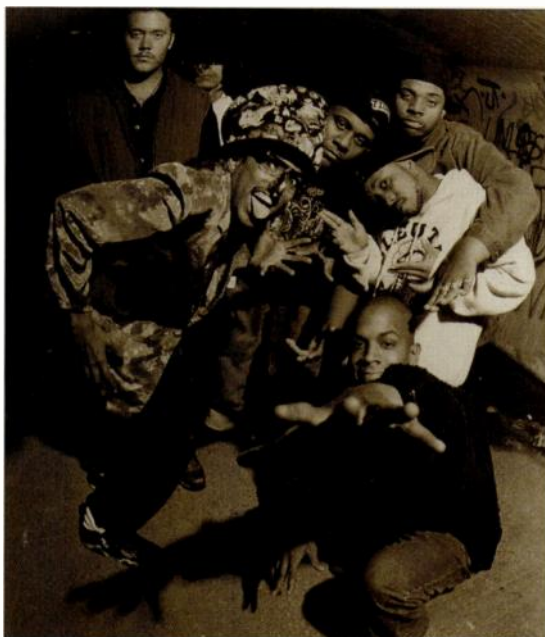
If you end up with more stations on your promotional list than originally expected, hone down the list using some basic demographics. You may want to focus on stations in your area for a local angle on airplay, or you may give preference to stations serving large metropolitan areas. Some trades include the music director's name and phone number for each station. Because college radio welcomes new artists, it's okay to call them and ask a few questions, such as: Can I get a copy of your pro-

gramming guide? Are you likely to play our kind of music? How many watts is your transmitter? What is your address, and to whom should I direct my release?

THE MAILING

After the elation wears off from receiving a box in the mail stuffed full with your new record, you'll notice that the box just sits there, as if chiding you, "Well, what are you gonna do with us now?" This is when you grab your new release, stuff it in a box, and send it off to the stations you think will play your band. But don't overdo it.

"People want to discover something cool, not have it shoved down their throats," says Gary Huswitt of Rockpress Publishing and author of books *Releasing an Independent Record* and *Getting Radio Airplay*. "Music directors get so many releases and so



Oakland-based Digital Underground achieved much notoriety and success after their song "Do Wutchu Like" made it big on local music stations.

much hype from hundreds of record labels each week, I think the antihype approach is probably better."

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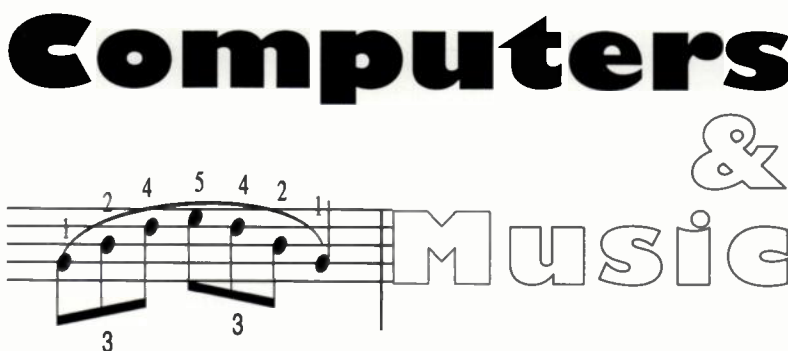
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● **WORKING MUSICIAN**

It sounds obvious, but above and beyond all other facts about a band, it's the music that gets them played. College radio music directors have no difficulty in deciding between a mediocre signed band that's opened for Pink Floyd and sends out a 10-page press kit, and a band with just a one page bio, but whose sound just blows them away. Heffernan adds, "We're college radio, if we like something, we play it. I try to judge each piece of music based on its own merit, regardless of its source."

Because college radio is staffed by students, many of them are gone during summer and winter breaks. Some smaller college stations close down altogether during vacations, so it's best to send your music during the spring or fall semesters.

Along with the record, include in your cardboard mailer a letter addressed to the music director with some information about your band. Do not list every band you've ever opened for, because the music director probably doesn't care. Suggest a song that you think is the most radio friendly. If there's one or two key (and preferably short) pieces of press about your band, include them.

Bounce-back cards are a good and inexpensive way to figure what happened to your package after you kissed it goodbye at the post office. These postcards are stamped and addressed back to you; they ask for the station's name, address, phone number, and the name of the person who listened to the record (or at least opened the package). Ask if the station liked the record enough to add it to their current rotation. Also, have the station list which trades they report to, because this is where you may see your band charting.

Even if your music is perfectly suited for a particular station, you still need to get the music director or DJ to see your mailing, pick it up, open it, and play it. Once your package arrives at the station, it is added to a pile of packages waiting to be opened. Use your creativity to draw the music directors attention to your record. Home-spun and handmade packaging can

often be a very effective eye catcher.

"Let's say your record is on 12-inch vinyl. You can go out to garage sales and buy a bunch of old records just for their sleeves," suggests Huswitt. "Then you can use personalized artwork—spray paint, crayons, pictures—whatever it takes to make your record stand out from the rest."

Try not to deluge people in radio with several copies of your release unless someone specifically asks you for extra copies. "There's something desirable about things that are hard to come by," says Baruth. "If I have just one copy of a release that I like, then it becomes all the more precious to me. But if I get loads of the same record, it seems like they're giving it away, as if it's worthless."

THE FOLLOW UP

After a few weeks, you should receive bounce-back cards from stations that cared enough about your release to respond. Try to maintain relationships with the music directors or DJs that gave the most favorable feedback. If your band can tour through the towns or cities where your band is most appreciated, then call those stations and ask which local clubs they recommend for a show.

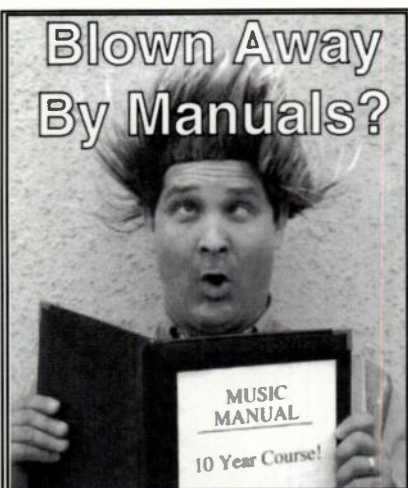
"If you send out 200 CDs to a select list of stations and make a hundred phone calls, you will get played at about 10 or 20 percent of them—even if you stink," says Huswitt. "If a few key stations really like your stuff though, many more stations will probably add it. Then a station or two may want to know if you're going to tour and offer to set up a radio interview and a local gig when you come through their town."

Of course, fate and luck play a huge role in getting your music heard on the radio, but your effort is the biggest factor. By mapping out a meticulous strategy to make sure your music is at the right station at the right time, you may be tuning your dial to your own tunes in no time.

Camran Afsari is a San Francisco-based freelance writer and recordist.

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A Digital Encounter

The *Daedalus Encounter* kicks CD-ROM audio into warp speed.

By Michael Brown

CD-ROM has become the distribution medium of choice for multimedia title developers. They're taking advantage of its massive storage capacity to stuff megabytes of high-quality graphics into their products, but when it comes to music, many of them still depend on MIDI tracks and sound cards.

Some game-music producers, however, are working hard to convince their clients to forgo MIDI in favor of

all-digital soundtracks. San Francisco's Her House Productions is in the midst of producing such a soundtrack for *The Daedalus Encounter*, a full-motion video, sci-fi adventure game from Mechadeus that will ship sometime in the first quarter of 1995.

"Mechadeus considered using MIDI," says Her House engineer and sound designer Jim Lively, "but if you go that route, you have to worry about the end users. Which sound card do they have? Which drivers have to be installed?"

"We produced the soundtrack for Mechadeus' earlier game, *Critical Path*, using digital audio, and one of the things that people liked most about the game is that it's so easy to set up. You just load it up and it works. I mean, *The 7th Guest* is a great game, but people tear their hair out trying to install it, and that's a shame."

Of course, digital audio consumes many times more space than MIDI tracks. It would be impossible to store such a soundtrack on a Nintendo or Sega cartridge game, or even a floppy-disk game, but with 650 MB of space available on each disc, storage is less of an issue with CD-ROM titles. Some publishers are even distributing their titles using multiple discs. *The Daedalus Encounter* is so big, it may be shipped on *three* CDs.

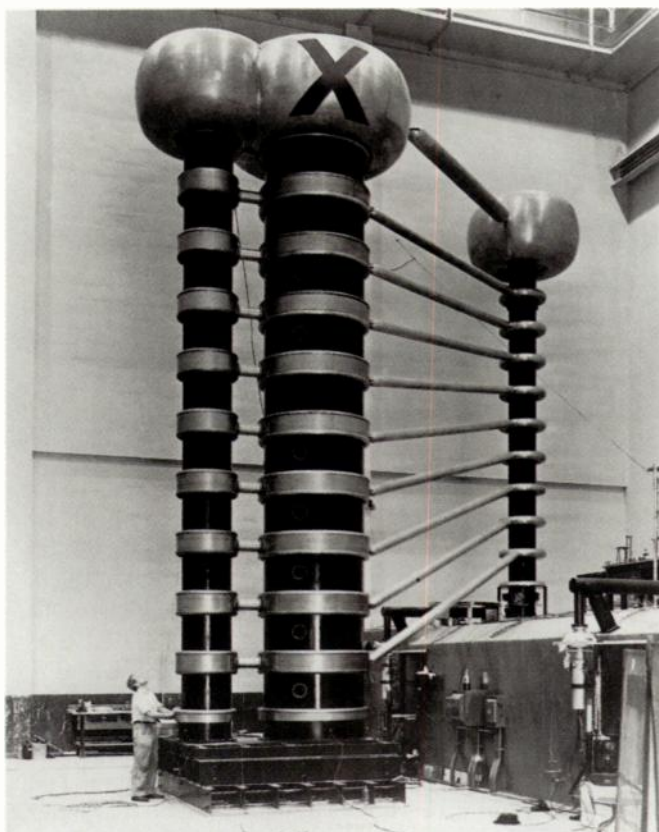
DUELING FORMATS

General MIDI aficionados like to point out that most computers and CD-ROM



FIG. 1: In *The Daedalus Encounter* you and your crewmates Zack (Christian Bocher, left) and Ari (Tia Carrere, right) explore the interior of an alien ship to the accompaniment of a digital soundtrack.

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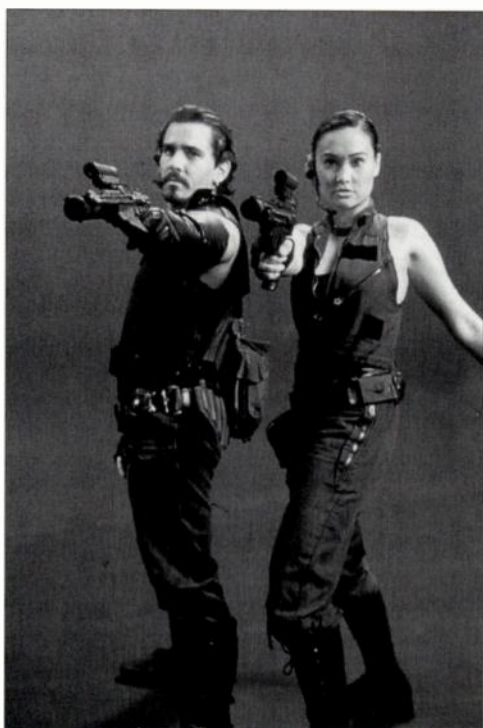
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please, be our guest. Go stand as close as you'd like. Take a deep breath.

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FIG. 2: The actors were filmed in front of a blue screen, so that their images could be superimposed over computer-generated graphics.

drives lack the horsepower and bandwidth to pull off both video and 16-bit, 44.1 kHz audio from a CD-ROM. Using a sound card and MIDI tracks requires much less in the way of system resources, and you can get higher resolution audio. Indeed, in the era of single-speed CD-ROM drives, many video games had just mono, 8-bit, 11 kHz soundtracks. Even under those conditions, however, a talented sound designer can do a lot; just check out Scott Scheinbaum's work on Cyberflix's *Jump Raven* some time.

"Mechadeus budgeted a lot of money for sound for this game," says Her House lead composer Bill Zelinski. "Some game producers say, 'Let's have one guy do all the sound effects, and we'll pay somebody else five bucks an hour to write the music. Then, we'll slap it on with a trowel and shove it out the door.' Even though it's only 8-bit resolution, you still want it to sound as good as possible."

The biggest advantage digital audio offers is that you can compose for and record any instrument you want. With MIDI, you're limited to whatever set of instruments is installed on the sound card, typically a collection of General MIDI instruments.

"People think General MIDI is the

be-all and end-all in terms of composing for multimedia," says Zelinski, "but it's not. I like General MIDI, too, but it's not the only answer."

IT'S STILL 8-BIT

Now that publishers are telling buyers they must have at least double-speed CD-ROM drives in order to use their products, audio producers are finding they have just a little more to work with. At Her House, they're digitizing the soundtrack for *The Daedalus Encounter* in stereo at 16-bit resolution and a 44.1 kHz sampling rate, but Mechadeus then down-samples the audio to 8-bit resolution and a 22 kHz sampling rate.

"Working with sound cards and MIDI is extremely limiting," says Lively. "With digital audio, you have as broad a palette as you want."

They're doing more than just writing and recording the music for the *Daedalus Encounter* at Her House, they're also designing and recording all the sound effects, doing all the Foley work, and digitizing and cleaning up the dialog tracks. The team uses music to set the mood for each segment of game play and sound effects to heighten the illusion that the game is taking place in an alien environment.

The Daedalus Encounter blends live-action video with computer-generated graphics and animation sequences. The actors in the game, Tia Carrere (Mike Meyers' girlfriend in *Wayne's World*) and Christian Bocher (roles on *Melrose Place* and *Another World*), were filmed in front of a blue screen (see Fig. 2). Special-effects artists then superimposed that footage over the graphics (see Fig. 1).

A TEAM EFFORT

Although each member of the team focuses on a different aspect of production, they each wear a number of different hats. Even Her House President Kirsten Turrigiano has literally contributed her voice to some of the sound-design efforts.

"If this were a real movie," says Zelinski, "you'd have a sound recordist, the sound editor, the ADR [Alternate Dialog Replacement] director, the Foley artist, and so on. You'd have twenty people doing all these specialized

things. Here, there's just the three of us, and we have to do all of it."

Her House has two weeks to produce the music and sound effects and clean up the dialog for each 10- to 20-minute segment of the game.

"We get video composites—in the form of *QuickTime* movies—that have most of the background graphics laid in," says Zelinski. "The important thing is that all the video editing is finished as far as timing is concerned. We also get the raw dialog track that's taken directly from the video shoot."

After they review the *QuickTime* movie, the team sets about writing and recording background music and designing and recording sound effects for the rooms, objects, and creatures that are in each scene. They digitize the actors' dialog from a 1/4-inch videotape and work with it separately.

"I have to see what I'm writing for before I can start working on it," says Zelinski. "Some people can write a song based on a verbal or written description of what's happening in a scene, but I can't work that way. I have to get a visual hit from the scene before I can decide what kinds of sounds are going to work."

While Zelinski sweats out the musical score on one side of the room, Lively is on the other, conjuring up sound effects. Occasionally, Lively decides that a musical motif will be more effective than a pure sound effect, and he turns to Zelinski for help.

"It's a collaborative effort with a lot of give and take," says Lively. "We work simultaneously. When Bill's got something ready, I'll do the mix and pop it over to the computer."

MOOD MUSIC

Considering the space theme that's central to the gameplay in *The Daedalus Encounter*, Zelinski says he wanted to avoid producing a lot of the usual rock-and-roll, which he dismisses as "typical video-game music." Instead, the score teems with ambient textures and eerie dissonance that complements Lively's high-tech sound effects. Zelinski was able to draw from a deep well of new and vintage instruments at Her House. His sonic toolkit includes the Kurzweil K2000S; the E-mu Morpheus, Proteus/1 Pop/Rock, Proteus/2 Orchestral, and Proteus/3 World synth modules; a Roland Sound Canvas sound module and R8 drum machine;

Oberheim Matrix 1000 and Matrix 6R synths; a MIDI-retrofitted Korg Poly 6; a Casio CZ-101; and more.

"We try to pace our music to produce a specific emotion, just like a film editor paces a film," says Lively. "We look for the textural support that will elicit a specific emotion. Music is really the only medium with which you can do that. You can put sound effects in for days, but they won't make anyone *feel* any different. But with a few bars of music, you can set the tenor of the game for the next fifteen minutes."

A former Atari user, Zelinski now produces his scores with Steinberg's *Cubase Audio 2.0* running on a Macintosh Quadra 800. The Mac is equipped with 16 MB of RAM and a 550 MB hard-disk drive. An external 1.5 GB Barracuda drive is used to shuttle soundtracks between Her House and Mechadeus. Hard-disk recording is handled by a Digidesign Audiomedia II card and *Sound Designer II* software.

"The Mac is really a necessary evil," jokes Zelinski. "The Mac version of *Cubase* doesn't seem as stable as the Atari version, but I was comfortable because I used it on the Atari for so long. I like it because you can run a little *QuickTime* movie in a window, so you can spot to picture. It's not perfect and it's not very accurate, but it gets you in the ballpark.

"But we've approached this project

almost like wild-tracking it in," continues Zelinski. "We write a piece of music, digitize it, and then load it into Adobe's *Premiere*. If it doesn't work there, we'll slide it over that way or this way. If it's too long or too short, we'll time-compress it or time-stretch it with Steinberg's *Time Bandit*. In the end, it all comes together in *Premiere*."

Thanks to the 99 stereo audio tracks in *Premiere* (see Fig. 3), Zelinski and Lively were able to exercise a great deal of control over each sound element in the production.

DESIGNER SOUNDS

The Her House team faced its biggest creative challenge when the time came to produce the sound effects and ambient sounds for the game. Mechadeus provided them with storyboards early in the development of the game, but after several episodes where the final video of a scene differed significantly from the advance storyboard, Zelinski and Lively decided not to design any more sounds until they had received the video.

"At one planning session," says Zelinski, "the game designers were telling us how the player would battle these evil creatures called the Krynn. They were going to be these big, flying creatures with huge, piranha-like mouths. So we spent hours creating these big sounds to go with them. But when we got the

video, these huge creatures had shrunk to the size of trout, and the sounds we had worked so hard on didn't fit at all." (See Fig. 4.)

When they redesigned the sounds to fit the new video, Zelinski and Lively recorded Turrigiano's voice, a second human voice, and several animal sounds from a sound effects library CD using the Audiomedia II card and OSC's *Deck* hard-disk recording software. Once they mixed these sounds into a single stereo track, they used an arsenal of outboard effects and sound-editing tools to fold, spindle, and mutilate the sounds into a fitting screech for the Krynn.

"You have to use tons of tools," says Turrigiano, "because there's no single tool that does it all. You have to warp the sound, really torture it, to make it sound interesting. Once you're satisfied with your new sound, you have to load it into *Premiere* and sculpt it to fit what's happening in the scene."

Some of the torture instruments Zelinski and Lively employed included Digidesign's *Sound Designer II* and *TurboSynth* software, Macromedia's *SoundEdit 16* sample-editing software, and Digidesign's Sample Cell II sample-playback card with 16 MB of RAM. They used an Audio-Technica AT4033 condenser mic to record the voices and other natural sounds that were used in the Foley and sound-design sessions. "That's a great all-around mic," says Lively. "Occasionally, we'll rent a more expensive mic and charge it to the client, but our budgets don't allow us to maintain an elaborate mic cabinet."

WHAT DID SHE SAY?

If sound design was the biggest creative challenge faced at Her House, cleaning up the recordings of the actors' dialog was their greatest technical challenge.

The only dialog tracks that were recorded were produced on the sound stage as the video was being shot. That meant Lively and Zelinski had to remove or mask unwanted noises ranging from air conditioners to the director talking over the actors' lines.

"They had a boom operator, a sound recordist, and an engineer on the set," says Zelinski, "and they did all that they could. But the actors weren't worried about the sound while they were doing their lines, so the volume levels would go up and down as they

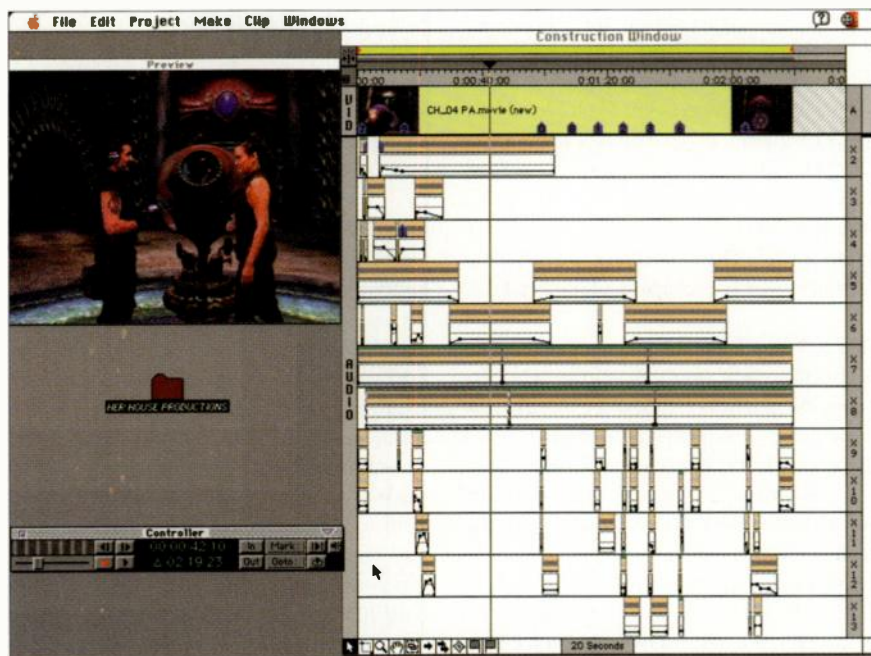


FIG. 3: The 99 independent stereo audio tracks in Adobe's *Premiere 4.0* video-editing software simplified the task of layering the music and sound effects.

turned their heads toward and away from the mic. We had to do a lot of reshaping. And it didn't help that they were wearing these elaborate costumes that made all kinds of noise."

One voice-over session was recorded during a torrential rainstorm, because it was the last day that Tia Carrere was going to be under contract to Mechadeus. The sound of the rain pounding the roof was unmistakable, according to Turrigiano.

"Jim had to EQ it to filter out the sound of the rain," she says. "There's probably some of it still in there, but we masked it with the music and other ambient sounds. It was pretty tough to maintain the quality of the sound without compromising the sound of the voices."

"We used a lot of EQ through the console," adds Lively, "and of course, we used a real good compressor." Talk about fixing it in the mix!

HOW'S THAT SOUND?

As engineer, Lively is responsible for the soundtrack's final mix. As you might expect, he produces his first mix

with conventional studio monitors (a pair of JBL 4301Bs), but he also checks out his mixes on a set of AppleDesign powered multimedia speakers before any final decision making.

"If the bass is muddy on the studio monitors," says Lively, "I know it's going to be absolute garbage when it's played back on a set of multimedia speakers. We've tried fourteen different pairs of speakers, and those AppleDesign monitors kick butt. There's nothing else out there that sounds better for this type of application."

Once everyone is satisfied with the soundtrack, the video material is deleted and what is now basically a digital-audio movie is delivered to Mechadeus on the external hard-disk drive. Once there, the audio and video elements are put back together again.

Between the music, sound effects, and dialog recorded for this project, Zelinski expects to have more than 15



FIG. 4: The screech of the evil Krynn was created by blending and "torturing" human-voice and animal-noise samples with outboard effects and waveform-editing software.

GB of sound archived for this project. Some sections of the game have as many of 40 tracks of audio. "We're lucky in that we can use Mechadeus' CD-ROM burner to back-up our tracks," he says. "Otherwise where would we put it all?"

DOWN-SAMPLING ISSUES

As stated earlier, all the original audio was digitized at 16-bit resolution and

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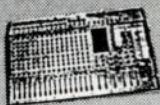
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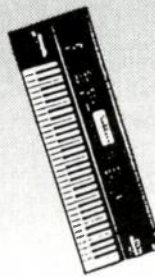
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a 44.1 kHz sampling rate, but when the game is in its final form, the audio will be reduced to 8-bit resolution and a 22 kHz sampling rate.

"Down-sampling is a really big issue in multimedia," says Zelinski. "A lot of different companies have incorporated down-sampling algorithms into their software, including Digidesign's *Sound Designer II* and Adobe's *Premiere 4.0*. We've tried all of them, and none of them are perfect. Some do a better job with dialog than they do with music, and vice versa, but it's a very subjective decision to pick a single program and say this one is the best. Having said that, Mechadeus is using the down-sampling algorithm in *Premiere* for this project."

According to Zelinski and Lively, you'll get the best results from down-sampling if your original recordings are clean and as free of tape hiss and extraneous noise as possible.

"You should be aware that interface noise is always a problem with internal sound cards," says Lively. "If you're lucky enough to work with an external system, like a Pro Tools setup, that's great. But if you're working with a tight budget and can only afford an internal sound card, you may have to deal with some noise."

COME ON IN! THE WATER'S FINE!

As we've heard from so many other audio professionals working in multimedia, Zelinski and Lively see plenty of opportunity for their colleagues in this burgeoning field.

"Anybody can do this," says Zelinski. "We didn't invent the tools we're using; we bought them off the shelf. You don't have to have a half-million dollar studio to produce music for these types of projects. The people I want to see get into this are the types who will stretch the medium; people who are willing to make this more than it is right now."

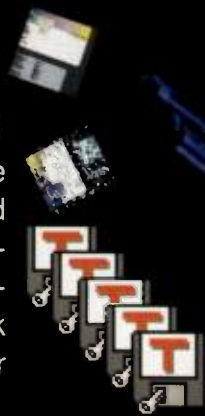
As far as the battle for supremacy between digital audio and General MIDI is concerned, the jury is still out. Both sides have good arguments: GM offers higher sound resolution, but digital audio doesn't restrict your sonic palette nearly as much. Perhaps the answer lies in a blend of the two technologies, a direction in which Apple may be headed with *QuickTime 2.0*, which now supports General MIDI in software. ☉

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Dynamic Duos, Part 2

We expound on expanders and demystify VCAs and sidechains.

By Scott Wilkinson

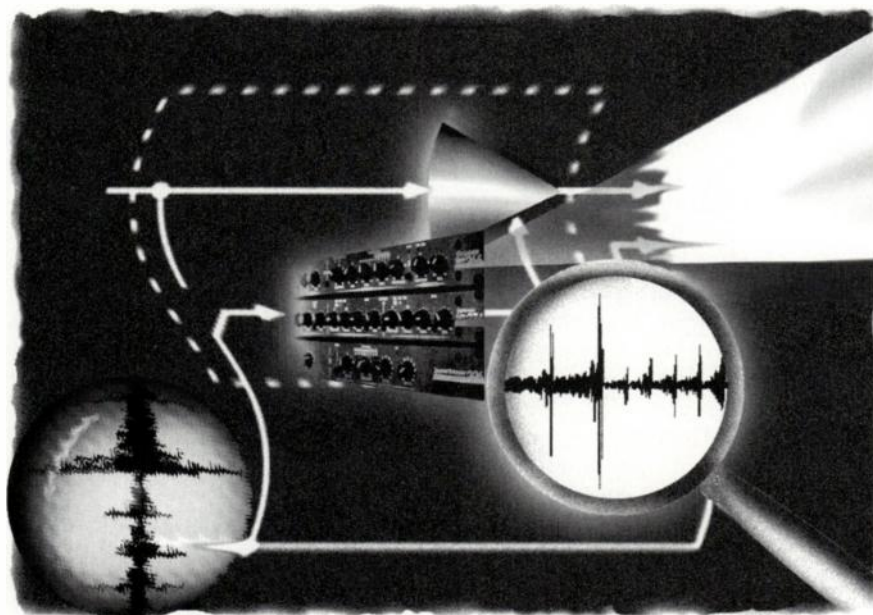
Imagine you are engineering for a singer who belts out a great take. After requesting a particularly loud headphone mix, however, the singer moves one cup of the headphones off the ear. When you solo the vocal track on playback, you can hear the drums almost as loud as the voice. The sound from the headphones bled into the vocal mic! Even worse, if you apply reverb to the vocal track, the drum sounds will also be affected, even when there is no active vocal part. What's an engineer to do?

If the singer is uncomfortable performing with both phones on, the answer lies in a specific type of dynamics processor called an *expander*. This device attenuates low-level signals, unlike a compressor, which attenuates high-level signals (see "Square One: Dynamic Duos, Part 1" in the December 1994 *EM*).

EXPANSIVE GATES

Expanders are similar to compressors in that they attenuate certain incoming signals. However, they operate at opposite ends of the amplitude range. When the input signal's level falls *below* the user-specified threshold in an expander, it lowers the signal's level even more. (In a compressor, the input signal is attenuated when its level rises *above* the threshold.) As you might surmise from its name, this type of processor expands the total dynamic range of the input signal by attenuating low-level signals.

An expander's parameters are much the same as those found on a compressor. The ratio parameter determines how much low-level signals are attenuated. For example, suppose you set the expansion ratio to 1:2. If the input signal is below the threshold and drops by 1 dB, the output from the expander drops by 2 dB. If the ratio is set to 1:4, a drop of 1 dB in the input signal will result in a drop of 4 dB in the output. (Compression ratios are



DMITRY PANICH

specified with the larger number first, e.g., 2:1, which is the opposite of expansion ratios.) If they are available, attack and release parameters also work in the same way as the corresponding parameters in a compressor.

The most common application of expanders is noise reduction. Let's refer back to our earlier example, in which the sound from the singer's headphones bled into the vocal mic. The unwanted sound is usually pretty low in level by the time it reaches the mic. If you set the threshold above the level of the headphone bleed, it will be attenuated to near inaudibility when no other signal is present.

This also helps when miking noisy guitar amps and recording vocalists who smack their lips or breathe loudly. When the intended signal is present, the expander lets the noise through as well. But the signal is generally louder than the noise, so the noise is masked.

Just as limiting is an extreme form of compression, *gating* is an extreme form of expansion. When the input-signal level falls below the threshold, the gate "closes" suddenly, shutting off all output. Gates are normally used to eliminate all noise when no intended signal is present. In most cases, however, I prefer to use an expander, which is not so abrupt; it's a kinder, gentler gate. What if the track includes a very soft passage? A gate might prevent some of the intended material from getting through at all. In addition, you can often hear the gate opening and closing. On the other hand, a gate is preferable with sharp, percussive sounds such as drums. An expander tends to soften the attack and reduce the punch of such sounds.

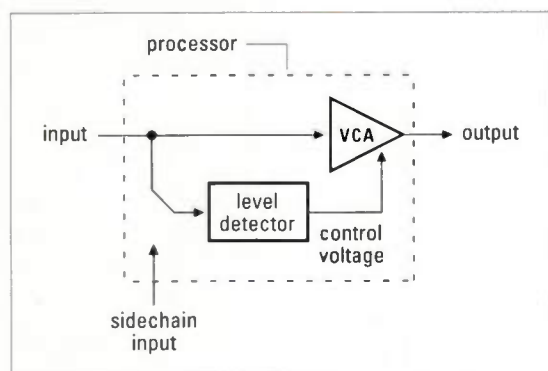


FIG. 1: In a dynamics processor, the input is split into two copies. One copy proceeds to the VCA's primary input, while the other copy is sent through a level detector, which controls the attenuation of the VCA.

Aside from noise reduction, gates are used to create the "gated snare" sound made popular by Phil Collins. To achieve this sound, send a heavily reverbed snare through a gate with a relatively high threshold and fast release time. You can also use an expander and gate together to tame particularly loud headphone bleed.

DUCKING OUT

At the heart of all dynamics processors is a circuit called a *voltage-controlled amplifier (VCA)*, which doesn't actually *amplify* anything in these processors, but rather *attenuates* signals from their full amplitude by various amounts. A VCA actually has two inputs: *primary* and *control*. The amount by which it attenuates the primary signal is determined by the voltage (called the *control voltage*) at the control input. As this control voltage changes, so does the amount of attenuation.

In a simple dynamics processor, the input signal is split into two copies (see Fig. 1). One copy is fed directly into the VCA's primary input, while the other copy is fed into a *level detector*, which reads the amplitude of the input signal. This amplitude tells the level detector what voltage to send to the VCA's control input, which determines how much the primary signal is attenuated.

For example, if the input signal's amplitude is below the user-specified threshold in a compressor, the level detector typically sends no control voltage (0 volts) to the VCA, which causes it to pass the signal at *unity gain* (i.e., the level of the output signal equals the level of the input signal). However, as the input amplitude rises above the threshold, the level detector sends higher control voltages to the VCA, which attenuates the signal accordingly. Similarly, as the input level falls below the threshold in an expander, the level detector sends increasing control voltages to the VCA, which

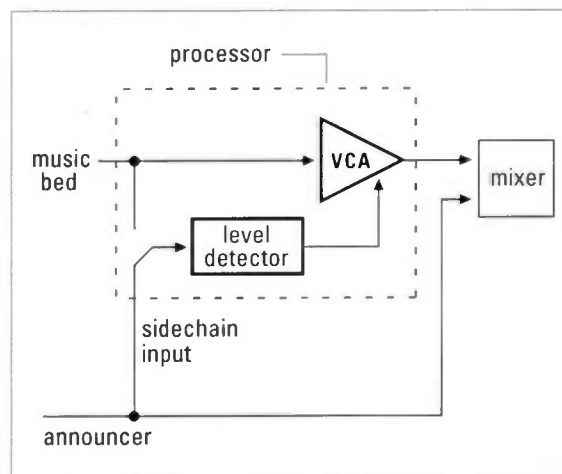


FIG. 2: If an external signal is connected to the sidechain input, its level controls the VCA's attenuation of the primary signal. In this example, the music bed automatically lowers in volume whenever the announcer speaks.

attenuates the signal further. The VCA attenuates the signal completely if the control voltage reaches its upper limit, which is usually 5 or 10 volts.

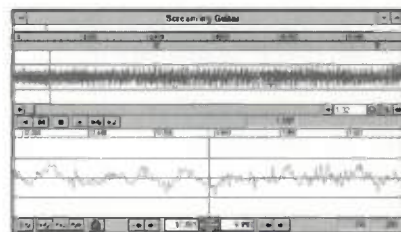
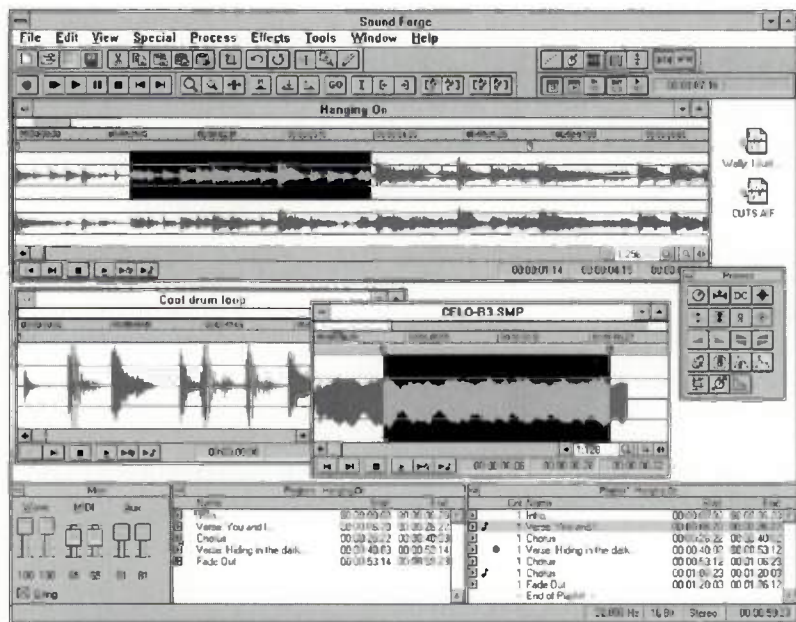
Many dynamics processors include a separate input called a *sidechain*, *control*, or *key* input (see Fig. 1). If nothing is connected to the sidechain, the processor behaves as previously described. However, if you connect an external signal source to the sidechain, the processor's input is disconnected from the level detector, so it no longer directly controls the VCA. Instead, the amplitude of the external signal controls the attenuation by telling the level detector what control voltage to send to the VCA (see Fig. 2).

One classic application of a compressor sidechain is called *ducking*. Often, you may want to lower the volume of the music in relation to a voice or lead instrument. For example, the background music in a public-address system should drop in volume during an announcement or page. If you are recording a commercial with a music bed and a voice-over announcer, you want the music bed to drop in volume when the announcer begins to talk about the product and return to the previous volume when the announcer is finished.

These situations are easily handled with a ducker. Simply connect the music to the compressor's primary input and the announcer to the sidechain input. Whenever the announcer speaks, the level detector sends a higher control voltage to the

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VCA, which attenuates the music. Set the threshold and ratio of the compressor to drop the music volume as desired. When the announcer stops speaking, the music automatically returns to its previous volume.

It's important to understand that none of the sidechain signal passes through the VCA to the output of the compressor. You must split the announcer's signal, sending one copy to the sidechain and the other copy to a mixer, where it is combined with the output from the compressor (see Fig. 2).

DON'T DIS A DE-ESSER

Many compressors also include a sidechain output, which lets you send the input signal to an external device before returning it to the sidechain input. The most common application of this technique is *frequency-dependent* processing, such as *de-essing*. As you may know, some vocal sounds are louder than others. This is particularly true of the *sibilant* sounds "sss," "sh," and "tch." These sounds are laden with high-frequencies in the range of 2 to 10 kHz. When these sounds appear in a vocal track, they can stick out like a sore thumb.

Of course, you can use the selective filtering of an equalizer to cut these frequencies, but then they are cut by the specified amount no matter how loud or soft they are. A better solution is to use a de-esser, which compresses the incoming signal only when the specified frequencies exceed the threshold. This is accomplished by sending the input signal from the sidechain output to an equalizer and returning the

signal from the EQ to the sidechain input (see Fig. 3).

Set the EQ to *boost* the offending frequencies and cut the other frequencies. Then, when the input signal includes excessive sibilants, the EQ boosts these frequencies even further before sending them to the level detector, which causes the VCA to attenuate the input signal only as long as these frequencies are present. The sound quality of the EQ doesn't matter, because none of its signal is ever heard; it's only used to control the attenuation of the VCA.

Most commercial de-essers include an internal, single-band EQ with a selectable frequency and threshold. These parameters are set according to the type of sound you want to reduce. For example, "sss" occurs around 6 to 8 kHz, while "sh" is somewhat louder and lower in frequency at about 2 to 3 kHz. In my current recording project with a female singer, I set the de-esser at about 7 kHz with a threshold of -5 dB, which gently reduces the "sss" sounds without affecting the rest of the performance. You can also use a de-esser to reduce the *plosive* sounds of "p," "k," and "t" and control other sounds, such as a boomy bass or guitar and ringing drums. If you use an external EQ, the compressor's attack time should be very fast to catch the beginning of the sound.

Another useful technique is *frequency-dependent gating*. When miking drums in the studio, you often hear the sound of the hi-hat bleeding into the snare mic. When the snare is silent and the hi-hat is played, you'll hear the hat clearly through the snare mic, complete with any reverb or other processing intended for the snare. (A similar problem arises with toms and crash or ride cymbals.) But if you simply remove the cymbal frequencies with EQ, you will probably color the drum sound unacceptably.

A common solution is to use a gate that opens when the drum is played and closes

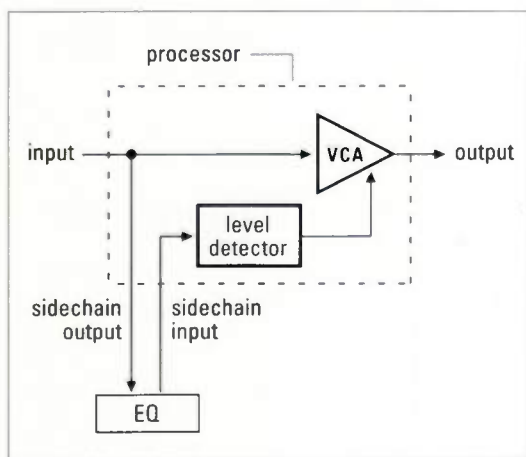


FIG. 3: Patching an EQ into the sidechain loop lets certain frequencies control the VCA's attenuation. Commercial de-essers include a simple EQ within the processor.

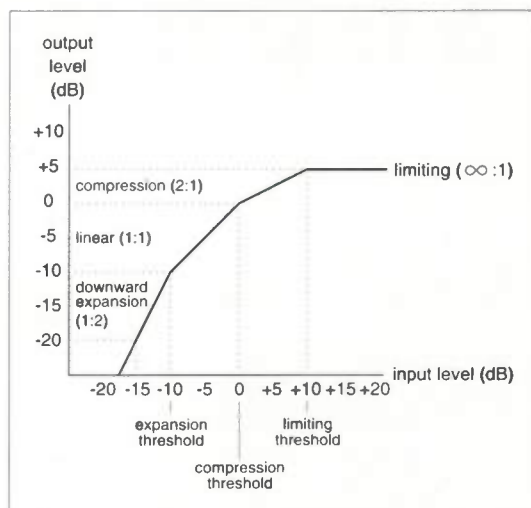


FIG. 4: A compressor/limiter/expander lets you apply all three types of processing.

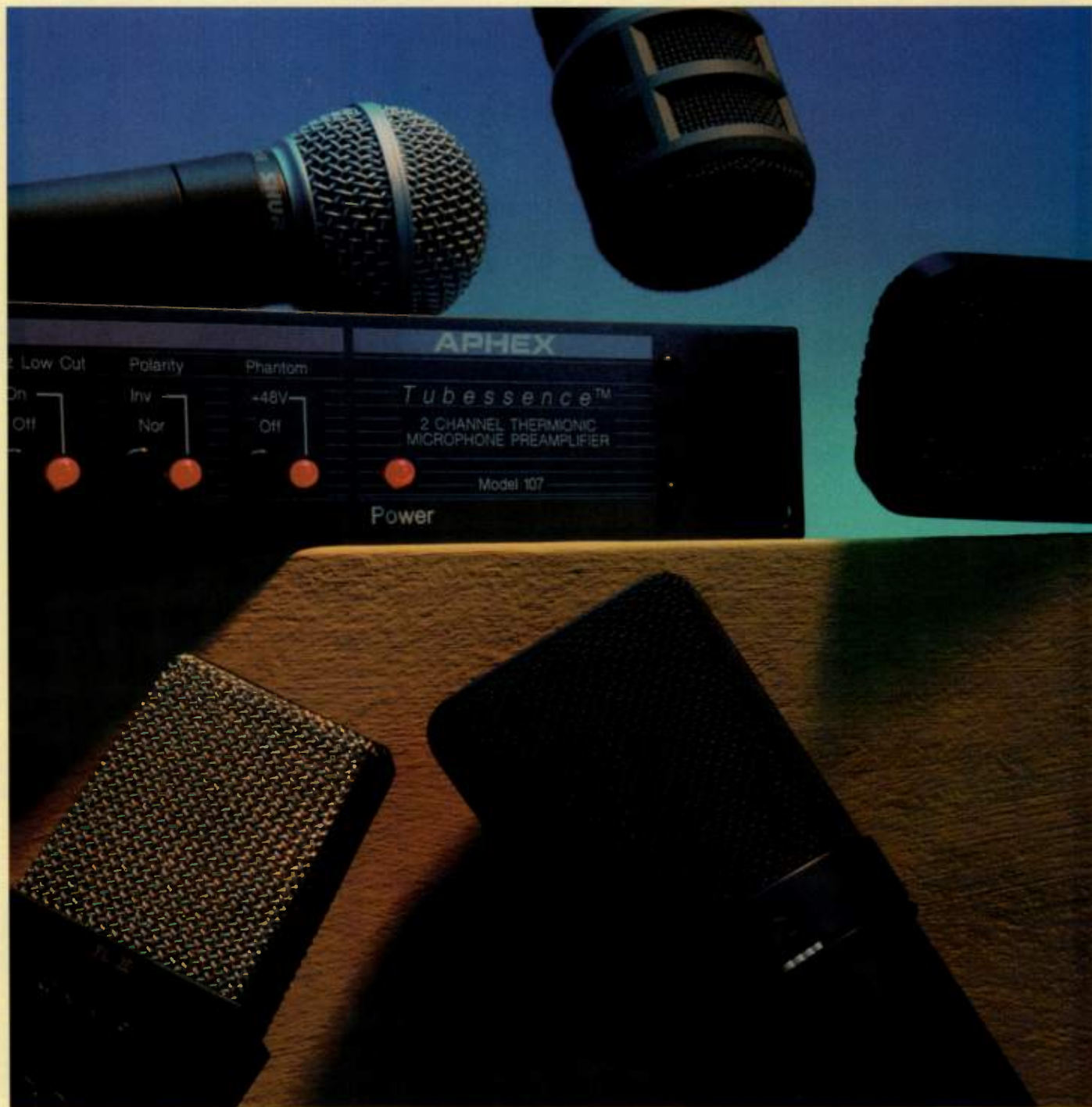
when the drum is silent, shutting out the cymbal. (When you play the drum, you'll still have cymbal bleed, but hopefully the drum will be loud enough to mask it.) To accomplish this, send the drum signal through a gate with a sidechain loop that is connected to an equalizer. Set the EQ to boost the drum frequencies and cut the cymbal frequencies. The gate opens when the loudest signal—which we've ensured will be the drum—reaches the threshold. If there is no drum sound, the gate closes.

GATE CLOSED

Most modern dynamics processors include a combination of functions in one device. A good all-around choice is a 2-channel, or dual, compressor/limiter/expander (see Fig. 4), in which the two channels can be linked to operate together as a stereo pair. This type of device is more expensive than a dedicated stereo unit, but it offers the most flexibility. If you want to process several tracks independently, there are 4-channel compressor/limiters that can also be linked into stereo pairs. Vocal processors often include a de-esser with standard compression, and multi-effects units sometimes include one or more types of dynamics processing.

In any case, dynamics processors are among the essential tools in any electronic musician's bag o' tricks. They can reduce or eliminate background noise while smoothing out the intended signal for a tight, professional sound. They also offer many creative possibilities, so don't be shy; give 'em a try. ☛

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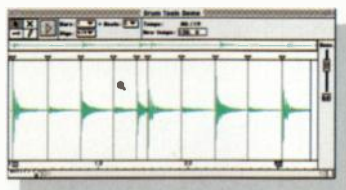
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Dinosaur Parts

Vintage synth parts are becoming as scarce as T-Rex bones.

By Alan Gary Campbell

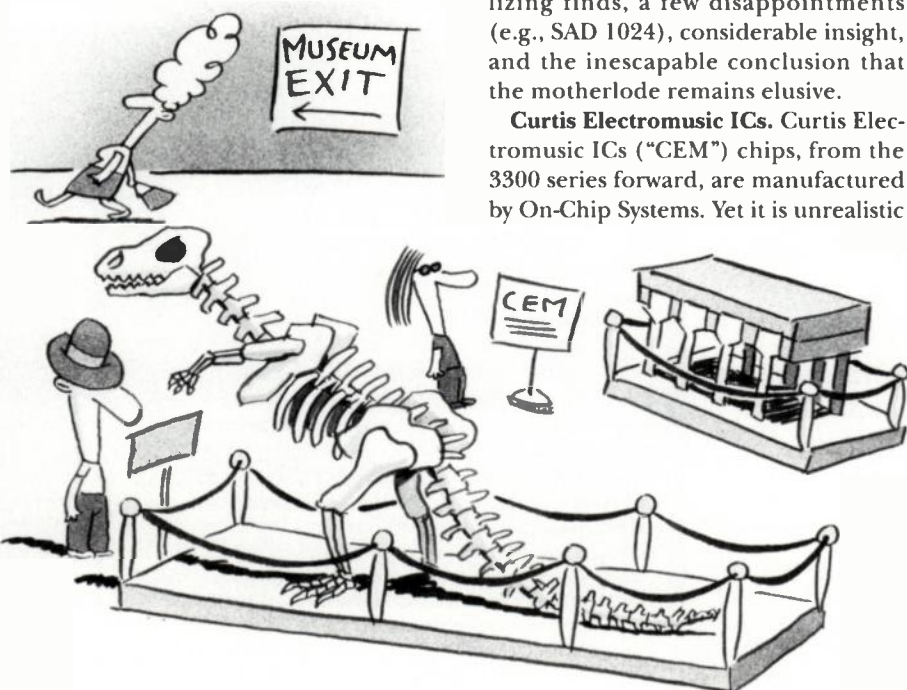
The quest to resurrect the dinosaur leads inevitably to desperate searches for vintage parts. Loyal "Service Clinic" reader Tony Pope put it eloquently. "I would have loved to find such and such a part was still made by the company that made it in 1974," writes Pope. "But there have been so many mergers, re-namings, and outright gone-out-of-businesses. The result is a real adventure and detective story." Earnest entreaties in this column produced some tantalizing finds, a few disappointments (e.g., SAD 1024), considerable insight, and the inescapable conclusion that the motherlode remains elusive.

Curtis Electromusic ICs. Curtis Electromusic ICs ("CEM") chips, from the 3300 series forward, are manufactured by On-Chip Systems. Yet it is unrealistic

for the hobbyist or repair technician to approach the manufacturer as a source. For one thing, On-Chip is not set up to vend small quantities; rather, they are structured to provide production runs of 10,000 or more chips at a time, to be sold to equipment manufacturers. In addition, CEM chips are produced only on demand, so any or all of the chips may be out of stock at any time.

Still, there are frequent inquiries from readers, especially about the older chips. To help to meet this need, PAiA Electronics is offering a significant subset of the 3300 series in small quantities. Prices are as follows: CEM 3310 VCEG \$19.50; 3320 VCF \$18.50; 3330 dual VCA \$19.50; 3340 VCO \$22.50; 3360 dual VCA \$17.50; 3379 VC signal processor (a VC "do-it-yourself kit") \$20. Contact PAiA for availability and ordering information. Some readers who encountered PAiA's prices considered them high, but these chip designs are over ten years old, production and inventory costs for limited runs are considerable, and the chips weren't cheap to begin with.

Solid State Microtechnology ICs. Later chips from Solid State Microtechnology for Music (SSM) are now manufactured by Precision Monolithics, Inc. (PMI). But PMI doesn't have the early chips dino-hounds seek, such as the SSM 2030 VCO and 2040 VCF. These chips have been out of



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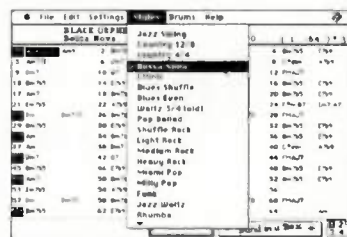
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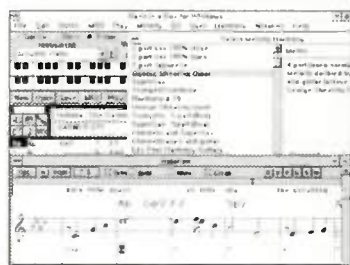


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NOTE to DOS/MAC/ATARI Users: We're developing Band-in-a-Box version 6.0 upgrades for DOS/MAC & ATARI users. They'll be ready in a few months.

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production for some time. Moreover, PMI, like On-Chip Systems, is not set up to vend to the consumer.

Wine Country Productions has a quantity of vintage SSM ICs, including the SSM 2020 dual VCA, SSM 2030 VCO, SSM 2040 VCF, and SSM 2050 Envelope Generator. Most are new, but some are salvaged from low-hours equipment. All SSM ICs are priced at \$45 each; quantity discounts apply. Also of interest are the Wine Country Vintage Synth Survival Kits. The Prophet-5 Survival Kit (\$99) includes several SSM ICs and a selection of special pots, knobs, and switches. Contact Wine Country for availability and ordering information.

I purchased a large quantity of 2030s (over a thousand) and 2040s (several hundred) from a surplus dealer in 1982, but was never able trace their source or determine their viability. Recently, I sent these to a dedicated and technically savvy colleague in the UK for evaluation. Whether a sufficient number are up to spec and worth selling remains to be seen. I will apprise readers in a future "Service Clinic."

Tel Labs Q81 Tempco Resistors. The SSM 2030 VCOs and many discrete VCO and VCF designs require external temperature-compensating ("tempco") resistors. RCD Components makes a tempco resistor that is a close substitute for the Tel Labs Q81 often specified. Their replacement is cataloged as AT5125, 1 k Ω , 1%, +3,500 PPM. RCD tempco resistors are available to service centers through industrial supplier Allied Electronics. These are special-order components; use the complete RCD catalog data, preceded by "840S-," to

order. Allied is not set up to sell to the individual, and the do-it-yourselfer can best obtain small quantities via a sympathetic service center. Service centers that support vintage gear may have the RCD parts in stock. Prices vary with quantity, but you should expect to pay \$10 or more each.

Reticon SAD 1024 Analog Delay ICs. EG&G Reticon and Matsushita continue to provide analog delay ICs with much-improved performance, but no current type is a direct replacement for the venerable, but obsolete, SAD 1024. At press time, PAiA still has some of its flanger kits, which include a 1024, but has no stock of individual ICs. Nonetheless, a lot of 1024s were sold to the hobby market over the years, and many of the parts are still out there.

Clairex Optocouplers. Surplus and hobby dealers sometimes have quantities of Clairex 6000-series parts, though reported sources had evaporated by press time.

Silonex, Inc. (not to be confused with Siliconex) manufactures optocouplers that, by spec, are close replacements for the CLM-6000 and 6500. Allied Electronics can supply both. As with the RCD tempco resistors, individuals should order these through a service center. The Silonex NSL-32 (Allied stock number 6995014, about \$2 in small quantities) replaces the CLM-6000; NSL-28 (Allied stock number 6995012, about \$4) replaces the CLM-6500.

Previous "Service Clinic" Indices

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Appeared In

January 1986 to December 1988	January 1989
January 1989 to December 1990	January 1991
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Direct inquiries to: "Service Clinic," c/o *Electronic Musician*, 6400 Hollis St. #12, Emeryville, CA 94608. Sorry, but we cannot provide personal replies.

Dual Pots. I have been amazed by the number of inquiries I have received over the years regarding the "Line Mixer Duo" article in the February 1991 *EM*. (If I had suspected it would be so popular, I would have asked for more money!) The most-wanted part is the dual, linear-taper pot. Decent-quality, affordable, dual pots (around \$2 each in small quantities) are available from Mouser Electronics. Contact Mouser for a catalog and ordering information.

Moog Vintage Cable Connectors. Classic Moog synths (such as the Mini-moog, Micromoog, Multimoog, and modular systems) use Cinch-Jones-type polarized plugs for switch-trigger and DC power connections and those odd, reduced-diameter Switchcraft type S phone plugs for footswitch and other special connections. Such parts frequently raise eyebrows at electronics suppliers, but both are standard.

Male and female, 2-conductor Cinch-Jones connectors, used with switch-trigger inputs/outputs, are available from Radio Shack, catalog numbers 274-201 and 274-202, respectively. Switchcraft S-type phone plugs are available from Mouser; the 2-conductor S plug is stock number 502-S-250, and the 3-conductor S plug is stock number 502-S-260.

Roland DCB Cables. Some readers have had trouble obtaining these from local dealers, but Roland still supplies them and has a considerable stock. The Roland part number is 2343571, and the list price is \$49. Cables can be ordered from Roland dealers or service centers.

For those who want to "roll their own," DCB cables use 7-conductor, shielded cable and some rather hard-to-find, 14-pin, Centronics-type connectors. Cable with extra conductors

PARTS RESOURCES

Digi-Key Corporation
701 Brooks Ave. South
PO Box 677
Thief River Falls, MN 56701-0677
tel. (800) DIGI-KEY or (218) 681-6674
fax (218) 681-3380

Mouser Electronics
2401 Highway 287 North
Mansfield, TX 76063-4827
tel. (800) 992-9943 or (619) 483-0165
(catalog requests only)

PAiA Electronics, Inc.
3200 Teakwood Lane
Edmond, OK 73013
tel. (405) 340-6300
fax (405) 370-6378

Wine Country Productions, Inc.
1572 Park Crest Ct., #505
San Jose, CA 95118
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M. Jackson, P. Gabriel, D. Bowie, M.C. Carpenter, L. Lovett, B. Idol, T. Tritt, Sade, C. Glover, et al.

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● SERVICE CLINIC

(e.g., 8- or 10-conductor) can substitute; the connectors are available from Digi-Key, part number T1501-ND (under \$3 in small quantities). Contact Digi-Key for a catalog and ordering information.

The DCB cable wiring diagram is given in the table at right. Pins 8 to 14, shown for completeness, are not used by the DCB interface and can be left unconnected. The cable shield connects to the plug housing at each end. Improper wiring can blow the thing up, so be sure you get the wiring right.

Also available from Digi-Key are quality computer cables (parallel printer, modem, RS232, etc.) and semicustom nickel-cadmium battery packs at reasonable prices. Their service is excellent.

Hunting for Parts. Inevitably, the dinosaur enthusiast is faced with the need to obtain a part that has no apparent source or substitute. I hold to the tenet that there is one of everything out there somewhere, and somebody wants to get rid of it! Readers who have shared their parts paleontology

Roland DCB Cable Pinout

Roland DCB-type cables use 7-conductor, shielded cable and 14-pin, Centronics connectors. Pins 1 to 7 are wired such that the cable is bidirectional. Pins 8 to 14 are not used by the DCB interface and can be left unconnected. The cable shield connects to the plug housing at each end.

Connector 1	Connector 2
1	5
2	6
3	7
4	4
5	1
6	2
7	3
8-14 (unused)	8-14 (unused)
shield	shield

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corroborate this: Classified ads and letters in electronics and music-technology magazines often reach individuals who have small quantities of needed parts. Several readers found SAD 1024s this way. Good hunting!

THE RETURN OF EMC?

Barry Klein's *Electronic Music Circuits* (EMC), later supplemented by Thomas Henry's *Build a Better Music Synthesizer*, was the standard do-it-yourself introduction (post-*ElectroNotes*) to dinosaur circuits. Klein's classic text was published by Howard W. Sams, but went out of print after a few years. Klein informed me that he is considering republishing the book on a small scale if there is sufficient interest. Interested readers can contact him at 32041 Pleasant Glen Rd., Trabuco Canyon, CA 92679.

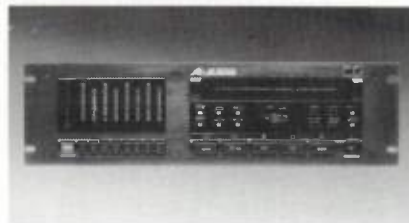
(Sincere thanks to D. Blondin, James Hardy, Richard J. Marshall, Tony Pope, and the readers and industry personnel whose ideas and information illuminated this month's column.)

In 1995, *EM* Contributing Editor Alan Gary Campbell celebrates the beginning of "Service Clinic's" tenth year. He ascribes the column's longevity to the heartfelt appreciation of its readers, the dogged stubbornness of its author, and the uncommon tolerance of its editors.

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E-mu UltraProteus

By Jeff Burger

**E-mu grafts the
Proteus and Morpheus into
a formidable synth module.**

E-mu's Proteus/1 Pop/Rock synth module has clearly taken its place in electronic music history as one of the most popular instruments since the DX7. After a few years, however, the sounds started getting stale due to overexposure, lack of real-time filters and onboard effects, and the absence of removable media for easy access to new patch libraries.

Moving forward, E-mu has discontinued the basic Proteus and replaced it with two units: the Proteus FX and the UltraProteus. (The Proteus/3 World is also history, but the Proteus/2 Orchestral lives on.)



E-mu's UltraProteus synth module implements filter morphing from the company's Morpheus synth and incorporates virtually all the samples from the Proteus/1 and Proteus/3 and most samples from the Proteus/2.

The price-busting Proteus FX (\$795) incorporates 8 MB of ROM samples based on those found in the Proteus/1 and Proteus/2 and adds a Proformance grand piano and 24 effects. At \$1,795, however, the aptly named UltraProteus adds much more than effects to this venerable family.

Like the rest of the family, the UltraProteus features 32-voice polyphony, 16-channel multitimbral operation, six

audio outs, and E-mu's MIDIPatch Real-time Modulation System. These features have been covered in past articles (see sidebar "EM Covers E-mu"), so I'll focus primarily on the new stuff. These innovations fall primarily in the category of expanded sample ROM, filters, effects, and sound access.

ROAMING IN ROM

For openers, the UltraProteus boosts the amount of sample ROM from 8 MB to 16 MB. This includes virtually all samples found in the Proteus/1 and Proteus/3 and most of those found in the Proteus/2. E-mu's sound designers made room for all this by down-sampling some of the Proteus/3 sounds to a lower sample rate, but the average listener won't be able to tell the difference.

This strong foundation is rounded out with an enhanced version of the Proformance piano, along with complete TR-808 and TR-909 drum machines and single-cycle waveforms from the Vintage Keys, for a total of 470 waveforms. You'll find most of the familiar pitched and unpitched instruments, plus some you'll have to look up in the encyclopedia.

Complex multisamples are provided for things such as latin percussion, TR-808, General MIDI kits, Proteus/2 string quartets, and ethnic combos. The attention to detail really shows on samples such as the Tabla, which consists of no less than nine distinct sonic variations that yield a good, playable instrument.

There are plenty of samples on the synthetic side, too. The series of raw harmonics, standard synth waveforms, B3 drawbar combinations, and synth pads can be added in various combinations, as separate oscillators and/or as program links. All in all, you'll be hard-pressed to name a basic sound that can't be found.

FILTER PHILOSOPHY

Perhaps the biggest news is the addition of filters, at long last. These aren't

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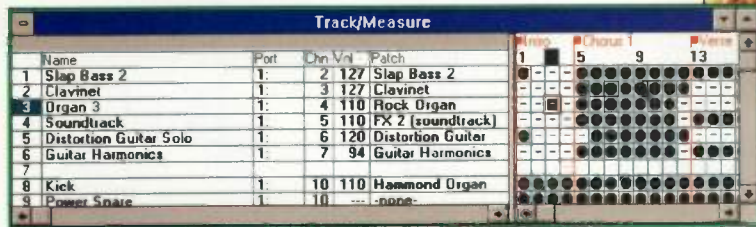
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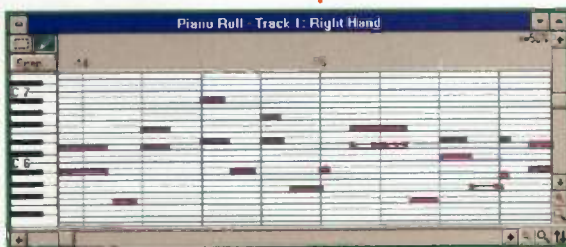
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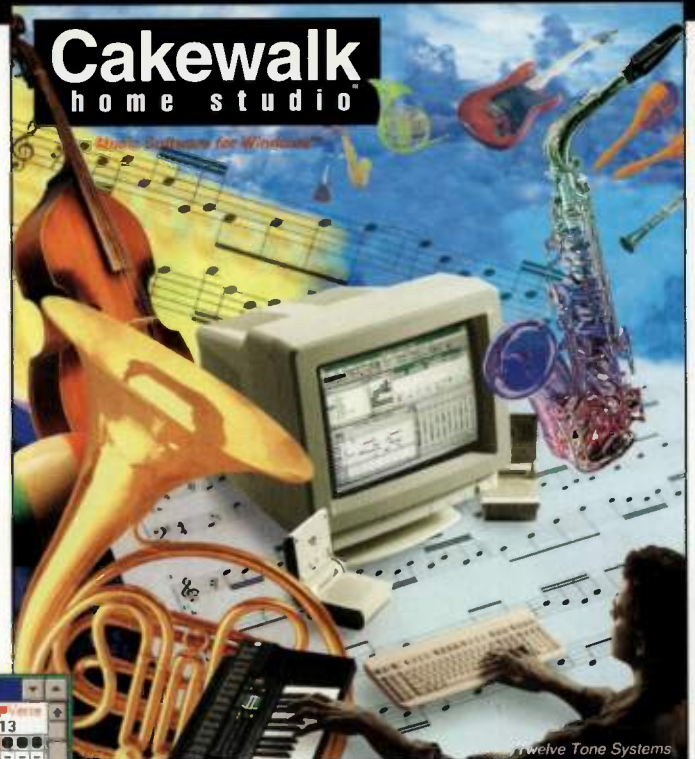


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- Drag-and-drop editing
- Event: Filters for criteria edits
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- Meter/key map
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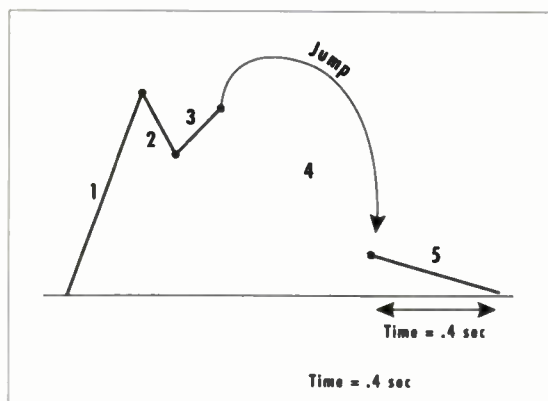


FIG. 1: UltraProteus function generators can have up to eight segments. In the example, Segment 4 has been skipped and a smooth transition made between Segments 3 and 5, altering the latter's slope. (Courtesy of E-mu Systems.)

just your garden-variety, lowpass filters, but the 14-pole, Z-plane filters with morphing inherited from E-mu's Morpheus. Each of the 32 voices has a 14-pole filter, configurable for each instrument as lowpass, highpass, bandpass, band-reject, parametric EQ, flanger, and more.

Because programming these puppies is tantamount to rocket science, the gang at E-mu has come up with 288 preset configurations, almost 100 more than in the Morpheus. Each filter has a minimum of four Frames, or sets of parameter states. A pair of Frames define the ends of the horizontal or X axis, which is typically assigned to track the keyboard. Another two Frames define the vertical, or Y axis, typically mapped to Velocity. Thus, a 4-Frame filter operates along two axes. The Z-plane concept comes in with Cube filters, which use a third, Z axis. This adds four more Frames, for a total of eight, forming a virtual cube.

The UltraProteus can continuously change, or "morph," between the filter settings on each of its three axes, providing complex, dynamic timbres. A combination of real-time controllers and Note On messages can modulate the change between filter settings on one or both instruments in a preset to derive new harmonic structures that lie between the Frames. (For in-depth

explanations of Z-plane and morphing, see the Morpheus review in the May 1994 EM and "Morphology" in the August 1994 issue.)

Although the potential combination of raw samples and filters in the UltraProteus borders on staggering, not all combinations are practical. The effects range from uncanny realism to the truly bizarre to completely unusable.

FUNCTION AT THE JUNCTION

Most of us were first introduced to function generators (FGs) on the DX7, which used four sets of rate and level controls instead of ADSR-style envelopes. In addition to AHDSR (Attack/Hold/Decay/Sustain/Release) envelopes, E-mu has included advanced function generators on the UltraProteus as a routable modulation source.

The function generators can have as many as eight segments, and each can have any of 63 different curves ranging from linear to exponential to zig-zag to random chaos. Levels can be specified as absolute or as deltas (relative changes). As if that weren't enough, you can also program conditional

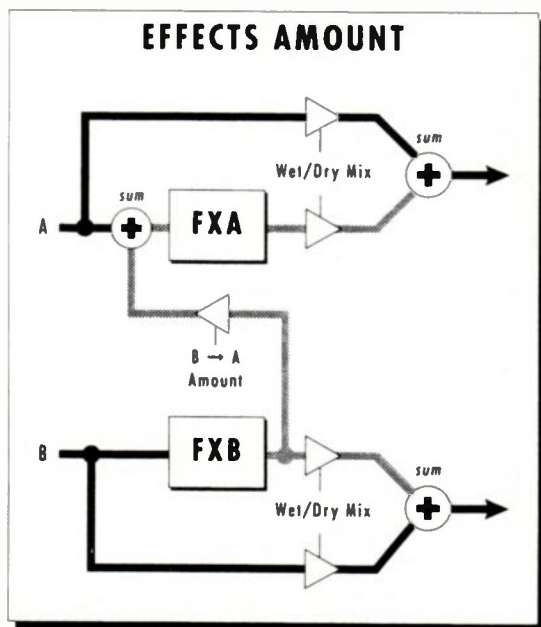


FIG. 2: The UltraProteus features dual effects processors with independent wet/dry mix controls. Effects B can be routed to Effects A for serial processing. (Courtesy of E-mu Systems.)

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EM COVERS E-MU

Electronic Musician has covered the UltraProteus' ancestral Proteus, Vintage Keys, and Morpheus synth modules in seven reviews and two applications-oriented feature articles. Back issues of **EM** are available from Mix Bookshelf; tel. (800) 233-9604 or (510) 653-3307; fax (510) 653-5142.

Reviews

Morpheus	May 1994
Proteus/1	October 1989
Proteus/2	December 1990
Proteus/3 World	August 1992
Proteus MPS	April 1992
Vintage Keys	May 1993
Vintage Keys Plus	November 1994

Features

"The Art and Craft of Using E-mu's Proteus"	March 1990
"Morphology"	August 1994

Note that in Clark Salisbury's "Morphology" feature story, the nomenclature is a source of potential confusion. In a traditional Cartesian coordinate system, the X axis runs horizontally, the Y axis runs vertically, and the Z axis is used to describe depth. Salisbury described the Morph axis as the Y axis and the Transform 2 axis as the Z axis, when, by convention, they would be the other way around. Although E-mu coined the phrase "Z-plane synthesis," the company does not actually correlate the functional axes to traditional nomenclature in its documentation.

jumps. The FG level jumps to a specified segment based on conditions such as whether the note is still on or off, a footswitch is depressed, Velocity is above or below a certain level, and so on. Segment 6, for example, might be programmed to jump back to Segment 5 if the note is still held, or to Segment 8 if the note is released (see Fig. 1). The function generator may be routed to a filter, LFO, DCA, you name it. This feature helps you create highly expressive sounds.

There's also a free-running function

generator available at the HyperPreset level that can be used to apply modulation to all contained presets. The UltraProteus function generators should be enough to keep even the most masochistic of programmers busy.

EFFECTS AND MIDIMAPS

Dual, stereo effects processors round out the UltraProteus sound chain. (It's about time.) Effects processor A consists primarily of various reverb classes, plus delays (including multitap), chorus, flanger, and phase shifter. Effects B includes the aforementioned nonreverb effects, with the addition of distortion and ring modulation. Each has a wet/dry mix setting, and a programmable amount of Effects B can be routed into Effects A for serial effects (see Fig. 2).

As you'd expect, each effect can be routed to the main outs, submix 1, or submix 2. I rate the quality and scope of the effects as about average for multitimbral sound modules of this genre. They get the job done just fine, but they're not high-end effects.

The effects are part of an overall architecture called a *MIDIMap*. You can think of MIDIMaps as presets for sequencing. Each nameable MIDI-Map consists of the following for each of sixteen channels: Program number, Volume, Pan, mix select (which determines whether the dry mix is routed to main, outputs, submix outs, or effects), MIDI enables, and Bank Select. In addition, it contains a Program Change map, effects selection, parameters for both effects processors, and related controls such as effects routing to the main and submix jacks.

MIDIMaps are a great idea, but E-mu's implementation has two noteworthy faults. To begin with, there are only sixteen onboard program locations available for them (with another sixteen accessible via RAM card). Although that's enough for most studio projects, it leaves much to be desired for live work.

In addition, effects can only be programmed globally, not into individual programs. That screaming guitar you programmed by running distortion from Effects B into a multitap delay on Effects A can only be recalled by bringing up the basic instrument program and its matching MIDIMap together. I'd like to program effects at the patch level.

GOING TO THE BANK

The UltraProteus organizes sounds into Banks. The first Bank contains 128 RAM presets that can be altered by the user, while the second offers 128 staples cast in ROM. There's also a Bank of 128 RAM locations for programming HyperPresets, which are combinations of up to sixteen presets in split/layer zones. A nice bonus is that the UltraProteus can accurately play patches from the Proteus/1, Proteus/2, and Proteus/3.

Zone parameters include Volume, Pan, Key Range, Velocity Range, Velocity Offset, Transpose, and Pitch. All are part of the standard bill of fare for most synths and are a welcome addition to the Proteus family. There's a new button on the front panel specifically for accessing HyperPreset menu functions.

A PCMCIA slot on the unit's front panel accepts RAM and ROM cards that add another 128 preset locations, 128 HyperPreset locations, and sixteen MIDIMaps. This is a welcome addition, especially because System Exclusive program dumps are still voodoo to many musicians. The card slot should increase the sound library for the unit considerably. RAM cards (\$149) can be used to store your own patches, and four ROM cards (\$99) with permanent presets are already available from E-mu.

PLAYING THE ULTRAPROTEUS

E-mu ships the UltraProteus with a removable sticker on the front panel reminding you to "Move The Mod Wheel."

Product Summary

PRODUCT:

UltraProteus synth module

PRICE:

\$1,795

MANUFACTURER:

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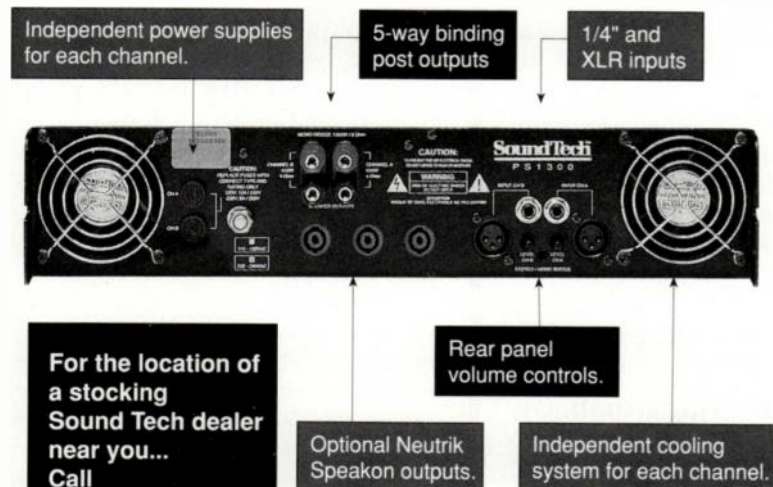
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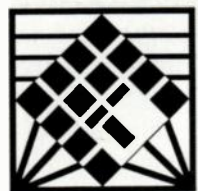
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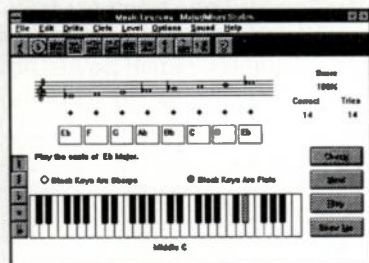
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● ULTRAPROTEUS

That's because the morph parameter is mapped to Modulation, the most common Control Change message sent by keyboards and other master MIDI controllers. If you want to reclaim the mod wheel, it's easy enough to reroute morphing to another controller.

The first thing most of us do is try to run through all the sounds. Unfortunately, E-mu's marketing department (like many of their competitors) took a shotgun approach to preset organization. The UltraProteus organizes similar sounds in increments of every sixteenth patch (more or less), with blocks of 64 from the Proteus/1, 48 from the Proteus/2, and 16 from



**Because programming
the filters is
tantamount to rocket
science, the gang at
E-mu has
come up with 288
preset configurations,
almost 100 more
than in
the Morpheus.**

the Proteus/3. E-mu's thinking here is to give the prospective buyer an impressive potpourri in the store, as well as have Proteus owners feel at home.

However, with the additional RAM Bank and ROM Bank, it's a royal pain to compare similar sounds for a given need. In addition, the relative octave transpositions of various presets are not uniform. For example, some synth patches, such as "Polysynth," are transposed an octave down relative to the piano and guitars. According to E-mu, this preserves sequencing compatibility with the Proteus line and keeps the orchestral instruments in their proper ranges. This second point, at least, is well taken.

My impressions of the UltraProteus presets are mixed. The addition of filters, effects, and HyperPresets makes

the original Proteus line seem static and plain. Some sounds, such as the twangy, chorused Strats, become hauntingly playable instruments, with mutes on low Velocity values, long decays on hard attacks, and picking position determined by Modulation. I didn't find an equally expressive bass preset, however.

The stereo grand is acceptable, but strikes me overall as being too bright. The multisample ranging from D#4 through G4 sounds much more electronic than the rest of the instrument.

The entire orchestral palette, primarily drawn from the Proteus/2, is robust and pretty darned authentic. Pitched percussion, such as marimbas, are crisp and rich. Organs are okay, but the Leslie simulation pales compared to the Vintage Keys. E-mu also seems to have left the good tine pianos, Clavs, and combo organs to the Vintage.

Sonically, the UltraProteus gets a good bill of health. However, you can detect a faint, high-pitched digital whine bleeding through on some presets, presumably from aliasing.

Overall, I would have liked to see more synth presets, both new and vintage. Although the Z-plane filters and morphing were used to provide some really interesting synth presets, greater attention could have been put on usefulness. Perhaps we'll see those presets in a future RAM card.

CONCLUSIONS

For the most part, E-mu has provided an entire palette of sounds one would need for composition in a single box. I was able to pull off pop, classical, and ethnic sequences with a great deal of authenticity. Given the implementation of effects into the MIDI-Maps, however, I'd rather use the unit for sequencing than for live performance.

The UltraProteus' potential for new synthesized sounds is matched only by the level of programming depth needed to create and refine them. It took me awhile just to figure out how to control the filters for a plain-vanilla, Moog-like bass. Fortunately, the documentation is pretty good by industry standards. Experimentation and study will yield satisfying rewards.

Should you buy an UltraProteus? My only reservations concern users who are mainly live players, and even these

can be surmounted. If you like to step through a lot of patches onstage, each with unique effects, the limit of sixteen MIDIMaps (hence, sixteen unique ways of setting up effects) could be a drag. There are workarounds, however. You could either load new MIDIMaps via System Exclusive, or control the effects parameters from a MIDI master controller that allows entry and exit values for each patch.

If you're the programming type, the samples, filters, morphing, HyperPresets, and function generators represent

a new sonic playground. Sequencing enthusiasts and those who loved the original Proteus will especially enjoy the new member of the E-mu family. The history-making Proteus family has come a long way.

Jeff Burger is the author of *The Desktop Multimedia Bible* and *Multi-media for Decision Makers*, both from Addison-Wesley. Owner of twelve synthesizers, he could really write that elusive *Number One* smash hit if he only had the new whatchamacallit.

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Genelec 1030A Active Monitors

By Rob Shrock

**Amazing sound
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As manufacturers up the ante on the capabilities of professional project-studio gear, weak links in the recording chain become painfully obvious. And one of the weakest links in a home or project studio is usually the monitoring system. Genelec's 1030A compact, 2-way, active, near-field monitors can forge that frail link into a solid bond.

For starters, all speakers and amplifiers are not created equal. If you use unpowered monitors, you not only have to buy a separate power amp, you have to test several amps to find the one that best matches your speakers. Some engineers prefer this approach, but unless you can try each amplifier in your environment, finding the perfect match is hard work.

With active monitors, the built-in power amplifiers are specifically designed for the speakers and cabinets. You don't always save money, but you

get a portable, optimized system.

The 1030A is the smallest of Genelec's nine monitor systems. Each cabinet houses a 6.5-inch polymer composite cone woofer and a 0.75-inch metal dome treble driver (tweeter). Each cabinet is biamped to supply 80W for the woofer and 50W for the tweeter.

SETUP

Hooking up the 1030As is simple. Each speaker has a detachable power cord and an XLR jack for a line-level input. A pot adjusts the input level from -6 dB to +6 dB.

Three DIP switches adjust the treble tilt, bass tilt, and bass rolloff. When all DIP switches are off, the 1030As are in the recommended position. You can tune the speakers to your listening environment by changing the treble tilt in 2 dB increments to +2, -2, -4, or mute (which defeats all signal output above the crossover). The bass tilt range at 100 Hz is -2, -4, -6, and mute, with the bass rolloff range from 0 dB to -8 dB at 50 Hz, also in 2 dB steps. No frequency was documented for the treble tilt, but it sounded like a subtle, broadband, shelving EQ.

MAKING TRACKS

I used the 1030As on three occasions: a rhythm-section recording session in a familiar commercial studio; a mixing session of the previous session after the overdubs were added; and a MIDI sequencing and ADAT tracking session at my home project studio.

The rhythm section consisted of drums, electric bass, and acoustic piano recorded to a Mitsubishi X850 32-track digital recorder. On the drum kit, I set up a pair of AKG 451 mics for overheads; a Neumann U-47 (padded) on the kick, with an E-V RE-20 on standby; a Neumann KM84i and Shure SM57 on the snare; an AKG 414 for hi-hat; and Sennheiser 421s on the toms. The Yamaha C7 piano was miked with a Neumann U-87 on the low end and a Neumann KM86i on the high end. Bass was input direct.

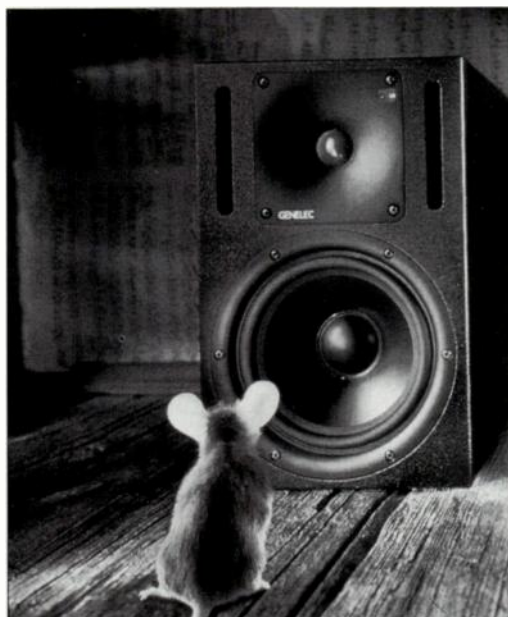
The first thing I noticed as I began pulling up the overhead drum mics was the clarity of the imaging on the 1030As. I was able to make small, but dis-

cernible, improvements to the overhead mic placement, which helped with balance and phasing. These changes were more apparent on the Genelecs than on the near-field NS-10Ms or the midfield JBL 4333s (the studio's main monitors).

I was able to listen to both the U-47 and RE-20 on the kick and the KM84i and SM57 on the snare. (The client and I preferred the U-47 and the SM57.) The difference in sound between the two snare mics was more apparent on the NS-10s than on the JBLs, while the opposite was true for the two kick-drum mics; but the Genelecs showed greater detail and contrast between mics than either of the other monitors. Although I could most accurately judge the low-frequency content on the midfield monitors, the 1030As clearly displayed the importance of mic choice and placement.

On this particular tune, there were some crush-stroke rolls near the top of the snare that were getting a little lost. A minor adjustment to the mic position solved that problem, a small detail that I didn't even hear until I was listening on the 1030As. I was becoming a convert.

The Neumanns sounded great on the piano, and finding the sweet spots for the mics was easy. Any problems with mono compatibility were easily perceived and corrected, but then Genelecs revealed a squeak in the sustain pedal we hadn't heard on our other sessions. A quick rollback to another tune from a previous session verified what I was already thinking: The squeak had been there all along. True, we



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could now hear it on the other monitors, but it wasn't as pronounced. The Genelecs made us aware of the problem. This is the kind of detail I want to be able to hear.

MIX IT UP

After overdubbing a nylon-stringed classical guitar, an electric guitar, percussion, background vocals, and a sax, I used the 1030As for a rough mix session. The first thing that surprised me when pulling up the vocal tracks was how much more recorded room sound I could hear. Once again, this type of detail just didn't come across as well on the other monitors. Mind you, these are pretty subtle differences, but

they're noticeable. I wasn't happy with that much room sound on the vocals for this song and would have changed mic positions had I been using the 1030As on the tracking session.

I also was able to more accurately hear the differences in panning of multiple reverbs with the Genelecs, something I have always felt more confident checking with headphones than with most monitors. Again, the overall stability of the imaging set the 1030As apart from the Yamahas and JBLs.

The bass response is excellent, especially for a speaker this small. I could tell what was happening with low frequencies on the Genelecs much better than on the NS-10s. (I still relied on


the main room monitors for critical balancing of the very low frequencies, however.) The low end on the 1030As is smooth and balanced to a point, after which they start to sound a little tubby when pushed hard. This wasn't too much of a problem for me, however, because I like to mix at soft to moderate levels.

On this mix, I had the luxury of two other sets of monitors, which had some effect on the outcome, especially on low-end balancing. However, I used the 1030As most of the time, and I would feel comfortable doing a mix with only these monitors as a reference. The client and I were happy with the mixes from the session, which is one of the

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Above L to R (and unfortunately under our headline - sorry guys): Bob Furgo, Bashiri Johnson, Kahiani, Joe Baresi, Terry Wolman, Steve Welch.

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THE CLINCHER

I use Audix HRM-1s in my project studio and find them much less fatiguing to my ears than several other monitors I've used in the past. After setting up the 1030As on top of the HRM-1s and comparing them using my favorite CDs, I found the disparity in sound wasn't huge. The Genelecs had a much better bottom end, and the HRM-1s seemed to have more of an upper-mid accent.

I listened to some previously recorded ADAT tracks and was pleased with the fine detail I could hear in complex piano layers and synth blends. Having a nicely defined low end while selecting and sequencing bass and drum sounds was inspiring.

I regularly take an ADAT tape with stereo submixes of sequenced tracks to a commercial studio for overdubbing vocals, strings, and so on. I consistently have to add small amounts of lower mid-range and larger amounts of upper midrange to my submixes to make them sound good on the commercial studio monitor systems. The clincher was that the submixes I did on the 1030As sounded good everywhere: at the studio, on my HRM-1s, and in my car. I was sold.

There is very little to criticize in the 1030As. I would love to own a pair that I could use at home and carry to the studio. (Travel cases are available.) They're not as powerful or as tight-sounding as the large, more expensive Genelec 1031As or 1032As, and the bass response isn't perfect. But they blow away anything else I've heard in the under-\$2,000 price range, and the price includes the amps. Monitors are an investment, and the Genelec 1030As are a sound one.

(Special thanks to Al Priest of Studio Supply Company in Dallas and to Regal Studios.)

Composer and producer Rob Shrock is the keyboardist/arranger for Dionne Warwick and Burt Bacharach.

Dr. T's QuickScore Pro (Windows)

By Bob Lindstrom

This notation-based sequencer is an amazing value.

A funny thing happened on the way from *QuickScore Deluxe* for MS-DOS to *QuickScore Professional* for Windows: The program became twice as good for half the price. For less than \$70, Dr. T's Music Software has produced a notation-based sequencer that ranks as one of the best MIDI software values on the market. The new version includes three editing views, greatly expanded 16-track sequencing and notation, full support for Windows printers and sound cards, and an on-screen mixer that also generates and records controller events (see Fig. 1).

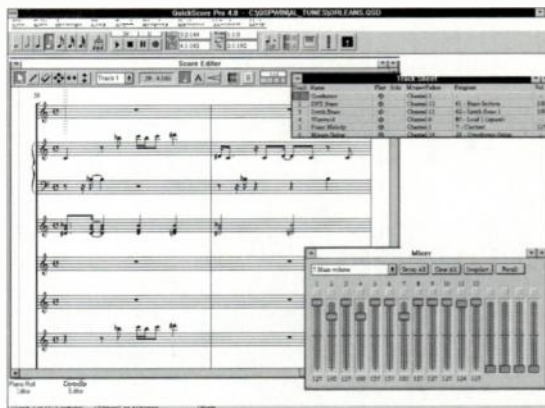


FIG. 1: Up to sixteen tracks can be displayed in the Score Editor. The Track Sheet offers a macro view of track names, channels, volume, and instruments, and the Mixer can be used to alter and record MIDI Volume and other controller messages in real time.

Considering that *QuickScore Professional* delivers a lot of performance for little money, it isn't really important that its features are no more "professional" than its low price. It still lacks quantization scaling by percentage, event-list editing, SMPTE synchronization, and many other features that you would expect in a truly professional sequencer. Even so, the program proves that you don't always get what you pay for. With *QuickScore Professional*, you get much more.

RELIVING THE PAST...NOT

In *QuickScore Deluxe* for DOS (reviewed in the January 1993 *EM*), the sole notation-based editing display provided somewhat limited access to MIDI data. Those limitations are history. In addition to its notation-based Score Editor (which handily switches between single-track and full-score displays), the sequencer includes a Piano Roll Editor and a graphic Controller Editor.

In the Score and Piano Roll Editors, there are three methods of note entry. You can record notes in real time or step time from an external MIDI instrument, or use the mouse in step time. You can also "draw" notes by clicking and dragging them from a note palette into a score, or by inserting note bars in the piano roll.

Recording in real time is relatively conventional. You specify a tempo, then select a track by clicking on it in either editing window or in the Track Sheet. Click the record button (or press Return on the computer keyboard), and the program counts off as many beats as you wish before it starts recording.

The program records with a variable resolution from 24 ppqn up to a theoretical maximum of 9,999 ppqn (if your Cray can handle it), with displayed durations from whole notes to 64th-note triplets. (Other tuplets are not available.) A Display Quantize feature cleans up the onscreen notation without altering MIDI playback. As in the earlier version of *QuickScore Deluxe*, you can experiment with different onscreen quantization settings to optimize the quality of the printed output without making any permanent changes to the MIDI data. You can also try different time signatures and tempo changes, and you can split a single staff into a grand staff.

Once you have recorded some notes, a palette of click-and-drag editing tools lets you alter start times and pitches, or select a block of notes and apply one of several editing options from a drop-down menu (see Fig. 2). Similarly, double-clicking on a single note summons the editing menu.

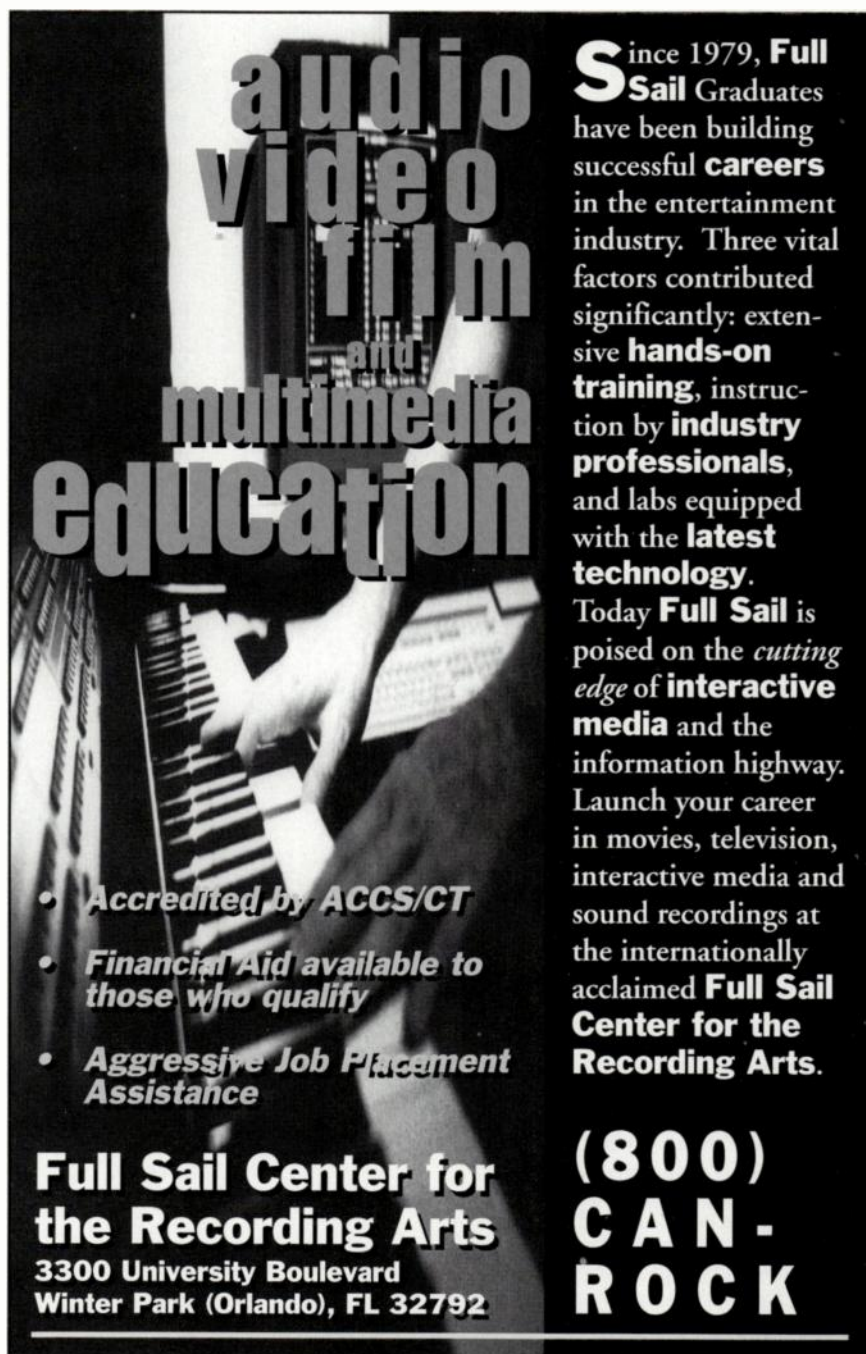
Although the program automatically quantizes notes in the score display, it cannot quantize the note data while you are recording. Quantizing must be done during the editing process. This keeps fumble-fingered musicians from leaning too heavily on quantization (a

crutch that Dr. T himself, Emile To-benfeld, warns about in the manual). Still, it might have been preferable to have a choice.

The MIDI Through [sic] function in *QuickScore Pro* makes you do a little extra housekeeping in the recording process if you have an older or inexpensive synth with limited MIDI capabilities. In most sequencers, you can automatically channelize the incoming MIDI data to the channel of the currently selected track. In *QuickScore Pro*, however, if you want

recorded data to be assigned to a different channel than the one on which your synthesizer is sending, you must change the track's channel in the MIDI Through dialog box or the Track Sheet. The incoming MIDI setup was designed this way to avoid confusion when recording multichannel tracks, but it can require a few extra mouse clicks when recording.

Using a combination of cursor keys, mouse clicks, pull-down menus, and keyboard hot keys, the Score Editor is about as fast and convenient as



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JANUARY 1995

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● QUICKSCORE PRO

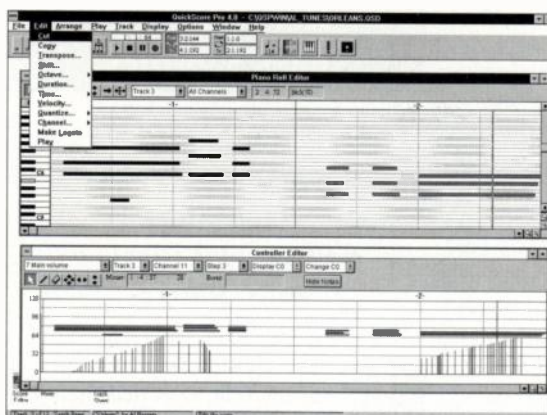


FIG. 2: *QuickScore Professional's* Piano Roll Editor (top) provides a useful selection of common editing options. A "shadowed" piano-roll view is included in the Controller Editor (bottom) to show the notes affected as you graphically edit controller messages.

notation-based editing can get. I found it extremely convenient to move around the score, moving and inserting individual MIDI events, or selecting a range of events for everything from quantization to controller thinning.

CHANGING THE PAST

Those of us who aren't one-take wonders will appreciate the addition of punch in/out to *QuickScore Pro*. Clicking on "From" and "To" boxes in the menu bar brings up a dialog box in which you can set the punch-in/out points down to the accuracy of a single clock pulse.

Another major plus is the ability to change data in real time. It's a real asset to be able to loop the playback for two or three measures, then fine-

tune pitches, tweak Pitch Bends, or shift start times or durations while you listen to the results. If you're not sure whether you like the most recent change, click Undo to toggle between the original and your current edit.

I also admire the way *QuickScore Professional* moves between the Staff and Score Views within the Score Editor. Clicking an onscreen button shifts from a full score to just the currently selected track. A separate, but similar, button in *QuickScore's* master window toggles between playing the full score or one track. This

feature makes it easy to view a track while you hear the full score, view the full score while you hear one track, or see and hear the same thing.

It took me a while to get used to *QuickScore's* block-editing design. Instead of using *Windows'* standard Control-X "Cut" and Control-C "Copy" hot keys, the program automatically drops down the Edit menu whenever you choose one or more events for editing. Because you're choosing from a menu, the Cut key is simply C and Paste is P. However, you can still use the Control-V Paste hot key to insert the contents of a buffer.

The Piano Roll Editor works much like the Score Editor, providing access to the same block-selection and editing tools. I particularly like the ability to synchronize the Piano Roll Editor and the Controller Editor windows. On a large-screen monitor, you can actually open all three editing windows and move freely between them, making changes in the one you find most appropriate.

LOOKING GOOD

As in its previous incarnations, *QuickScore Pro* does a good job of notating MIDI files, whether you enter them directly into the program, or import Standard MIDI Files. By experimenting with different display-quantization settings, you can achieve respectable no-

tation that requires very little, if any, editing.

An expanded palette of musical symbols (see Fig. 3) lets you add diacritical and expressive markings from a simple crescendo and other dynamics to dal segno, guitar tablature, articulations, and even fingerings. Text entry allows you to insert lyrics into your score, although the text dialog box will only accept 22 characters at a time. A master menu of score-formatting options allows you to choose the number of staves per page, the number of measures per staff, staff spacing, and staff indentation.

Using the standard *Windows* Print Preview function, you can see exactly what you'll get in hard copy. With the full-score/single-track toggle, you can print the full score or individual parts. And because *QuickScore* uses the *Windows* print drivers for its output, the print quality depends entirely on your printer and its driver.

IMPERFECTIONS

Overall, *QuickScore Professional* is one heck of a notation-based sequencer. On my 66 MHz, 80486 machine, the editing was fast and screen updates were swift, even when scrolling along with music playback. The program was solid, with

Product Summary

PRODUCT:

QuickScore Professional for *Windows* v. 4.0q

PRICE:

\$69.95

SYSTEM REQUIREMENTS:

25 MHz 80386 or better, hard disk, Microsoft-compatible mouse, *Windows* 3.1, *Windows*-compatible MIDI device, at least 4 MB of RAM.

MANUFACTURER:

Dr. T's Music Software
124 Crescent Rd.
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or (617) 455-1454
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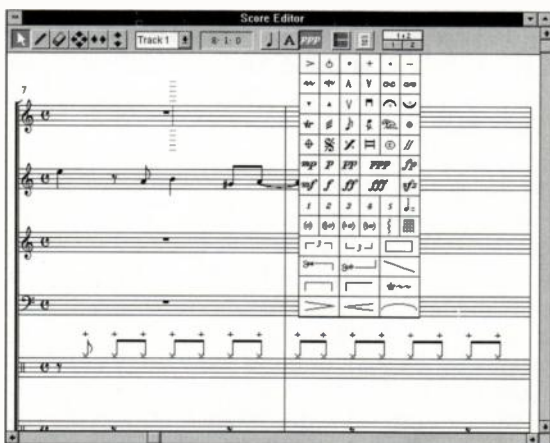


FIG. 3: Unlike its DOS-based predecessor, *QuickScore Pro* for *Windows* incorporates a large selection of musical symbols, such as mordents, tablature, and octave transposition. Also note the inclusion of a drum clef in the Score Editor.

EM METERS	RATING PRODUCTS FROM 1 TO 5				
FEATURES	●	●	●	●	●
EASE OF USE	●	●	●	●	●
DOCUMENTATION	●	●	●	●	●
VALUE	●	●	●	●	●

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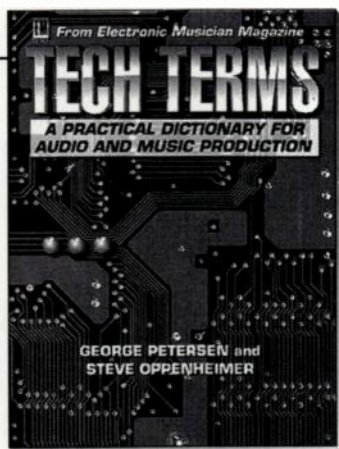
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● QUICKSCORE PRO

the exception of a single Windows crash during a file-save operation.

Still, I found a few unexpected quirks while using the program. In the review of *QuickScore Deluxe* for DOS, the author noted that the program would sometimes record and playback notes it failed to display in the Score Editor. Surprisingly, this anomaly also appeared—although rarely—in *QuickScore Professional*. Only twice in several hours of use, *QuickScore Pro* failed to display one note in the Score Editor, a note I recorded and the program played back. No amount of tweaking the display options would display that note. Unfortunately, Dr. T's has been unable to reproduce this phenomenon.

One of the Edit menu options—Legato—stretches the end of a note toward the start of the following note to smooth out the connections between them. When I tried to use this function on chords in the Piano Roll Editor, *QuickScore* refused to play all but one note in the second chord, even though all the notes appeared in the window.

THE HERE AND NOW

Let's add this one up. You have notation editing, piano-roll editing, controller editing, track editing, onscreen mixing, score and part printing, and sequencing all for under \$70. That's a tremendous value.

High-end sequencers will not be challenged by Dr. T's *QuickScore Pro*, because it still lacks SMPTE sync, algorithmic editing, sophisticated quantization options, and many other features that are standard issue in deluxe sequencing software. However, products ranging from *PowerTracks* at the low end (under \$30) to Midisoft *Studio* in the midrange (under \$250) now have a serious challenger. MIDI novices and serious musicians on a budget will be equally attracted to *QuickScore Professional's* impressive array of features and affordability.

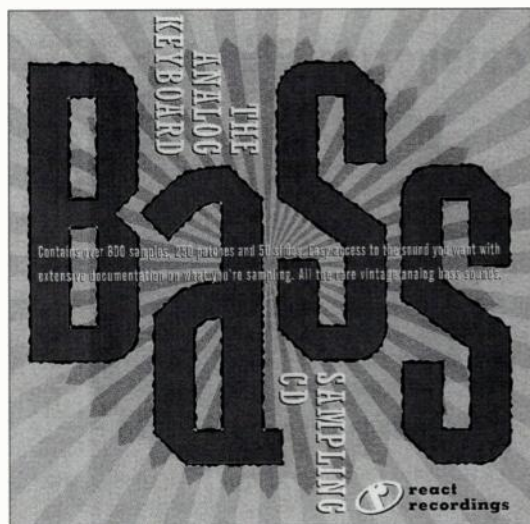
Bob Lindstrom is a former conductor and computer magazine editor who now tills the fields of CD-ROM multimedia as a senior producer at Activision.

React Analog Bass Samples

By Geary Yelton

Insufficient multisamples cripple a killer library.

I have good news and bad news about React Recordings' *The Analog Keyboard Bass Sampling* CD. First the good news: This audio CD includes a huge assortment of some of the punchiest synth-bass sounds on the planet. A list of sampled instruments includes such heavy hitters as the Minimoog, Oberheim Matrix-12, Roland Super JX, and Sequential Prophet-5



React Recording's *The Analog Keyboard Bass Sampling* CD has a large selection of well-recorded, classic synth-bass samples from the Minimoog, Matrix-12, Roland Super JX, and more. Unfortunately, the synths are only sampled once per octave.

(what, no Memorymoog?), as well as relative lightweights, such as the Roland SH-101, Sequential SixTrak, and Casio CZ-101. None of the sounds are played with vibrato, and each note lasts almost two seconds, plenty long enough to find good loop points.

Now for the bad news, and it's pretty bad. They recorded only one note per octave over three octaves. Three solid Cs for each timbre, and that's all. I'm sorry, but three notes just isn't enough to create a convincing multisample. It may have been enough back in the days

when samplers had a maximum eight seconds of sampling time, but not today. To make things worse, many tracks are indistinguishable from others. I'd much rather have at least four notes per octave than 75 percent of what's on this disc.

The problem with insufficient multisampling is that transposing a sample up by half an octave changes its attack parameters too dramatically, and these sounds are no exception. When I transposed a bass note from this disc up by half an octave, it got munchkinized to the breaking point. Playing just a semitone higher triggered the next sample, which sounded like it was in slow motion by comparison. This is a shame, because some of these sounds are really excellent. Although they're recorded in stereo, the left and right sides are close enough to being identical that stereo sampling would be a waste of sampler memory.

According to a flyer I received with the disc, the collection features 800 sounds. Unless you count each note as a separate sound, I counted fewer than 300. Does anyone really want to sample 300 bass sounds? Most analog synth-bass sounds differ by the amount of resonance, whether oscillator sync is engaged, the relative tuning of the oscillators, and so on. Let's face it, a triangle wave from an expensive analog synth isn't a whole lot different than a triangle wave from a cheap one.

I can find only one way to make these sounds useful: Sample the shortest possible snippet *after* the attack, just enough to capture the waveform. Then loop it and add your own envelope and

Product Summary

PRODUCT:

The Analog Keyboard Bass Sampling CD

PRICE:

\$99.95

MANUFACTURER:

React Recordings
9157 Sunset Blvd.
Suite 210

West Hollywood, CA 90069

tel. (310) 550-0233

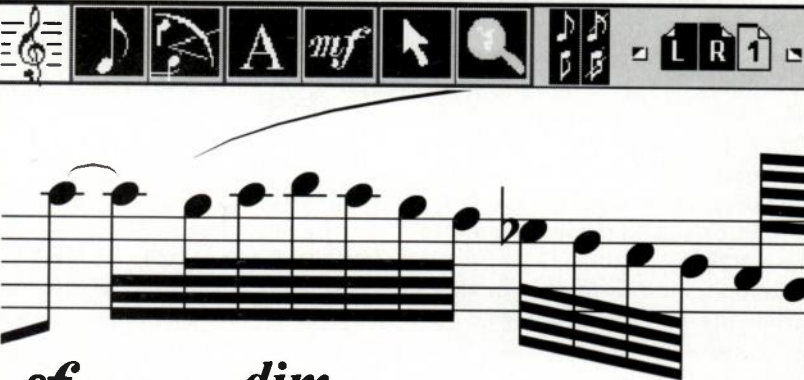
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● BASS SAMPLES

(if you're fortunate) resonance. By doing this, you avoid the problems of transposing envelopes up and down.

A lot of the track names are amusing, but not very descriptive. They're distinguished by every adjective its creators could think to place before the word "bass." These include gems like "Bud Bass," "Home Bass," "Floor Bass," "Drive By Bass," and the not-so-unusual "Unusual Bass." Fortunately, the documentation identifies the two or three instruments used for each track.

If this disc were re-released with fewer selections and more multisamples, it would be a killer addition to any samplemeister's audio CD collection. As it stands now, unless your sampler is suffering from a severe memory shortage, you may want to pass this one up. On the other hand, if you own an older sampler and can only spare enough RAM for one note per octave, you can take advantage of the collection's excellent sounds.

Geary Yelton is hanging on in quiet desperation—you know, the English way—in Atlanta.

Steinberg Cubase Audio DAE 2.01

By Eric Leach

**Continuing the quest
for the perfect digital-audio
sequencer.**

Like the knights of the Middle Ages, recording enthusiasts are on a quest. We seek a powerful, affordable system that will let us quickly and intuitively create professional-quality recordings with minimal hassle. To complete this quest, we must overcome obsolete computers, stiff financial demands, hectic schedules, and complex technology. Compared to these pitfalls, a pesky dragon doesn't sound half bad.

But don't despair, for just as Percival had Merlin Ambrosius, we have software wizards. The first to conjure up integrated, digital audio sequencers, at least two years ahead of the rest, was Opcode's coven, who cooked up *Studio Vision* for the Macintosh. But now,

there are four well-established, integrated, digital audio sequencers, all of which provide end users with versatile ways to make professional recordings. (These programs were compared in "All in One" in the April 1994 EM.)

Steinberg's *Cubase Audio DAE* 2.01 for the Mac is the latest version of the German developer's top-of-the-line program, integrating all *Cubase* 2.5 and *Cubase Score* features. Unlike its Macintosh-based competitors, the program is also available for *Windows* and the Atari Falcon030. Including "All in One," this is the sixth time EM has evaluated *Cubase* (see sidebar, "EM Covers Cubase"), so I'll focus on the new features.

NEW IN VERSION 2

Cubase Audio DAE 2.01 provides a host of powerful, new features, including full Digidesign Digital Audio Engine (DAE) support that lets it address any currently available Digidesign audio card. The new version offers up to sixteen channels of digital audio recording and playback with real-time equalization, multiple simultaneous record tracks, audio track delay, and scrubbing (except with Digidesign's Session 8 hardware).

The program also includes increased *QuickTime* movie support, new graphic tempo and waveform editors, graphic crossfades, and a brand new generation of the legendary Groove Quantize feature.

IN YOUR INTERFACE

Cubase Audio DAE 2.01 requires a Mac II or better with 8 MB of RAM, running System 7.0 or higher; a hard-disk drive for program and digital-audio storage; and some type of Digidesign audio hardware (Audiomedia I/II/LC, Sound Tools I/II, Pro Tools, or Session 8).

Of course, you also need a MIDI interface. *Cubase Audio DAE* supports all standard Macintosh interfaces, including Mark of the Unicorn's two MIDI Time Pieces and Opcode's Studio 4 and 5. Unfortunately for Opcode interface

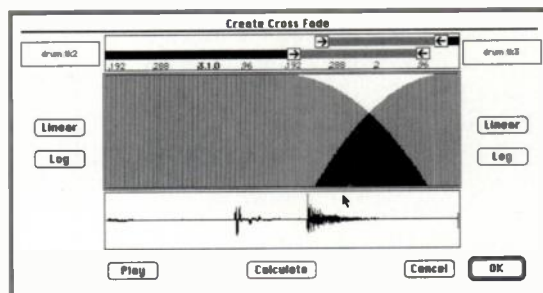


FIG. 1: You can create crossfades graphically by moving the handles and drawing in your fades, or you can let the program draw them for you.

users, the Studio 4 and 5 run in MTP Emulation mode, because Steinberg does not currently support Opcode's OMS. (Steinberg is planning to support OMS 2.0, which it is codeveloping.)

The MIDI Time Piece is fully supported, letting you simultaneously connect up to four MTPs for a total of 512 MIDI channels. *Cubase Audio DAE* treats each physical MTP MIDI Out as a separate, selectable output. This system worked fine after I learned that the *MTP II Console* software must be closed while running *Cubase*.

I ran *Cubase Audio DAE* fairly successfully on a Macintosh IIci with only 8 MB of RAM, although my screen updates were slow, and I was unable to open *Sound Designer II* directly from *Cubase Audio*. I highly recommend at least 12 MB of RAM.

THE PARTS DEPARTMENT

When you fire up the program, a file called "Autoload" appears in the Arrange window. This file can be customized so that your default settings are loaded automatically, providing a new song template. Although only one Song can be open at any given time,

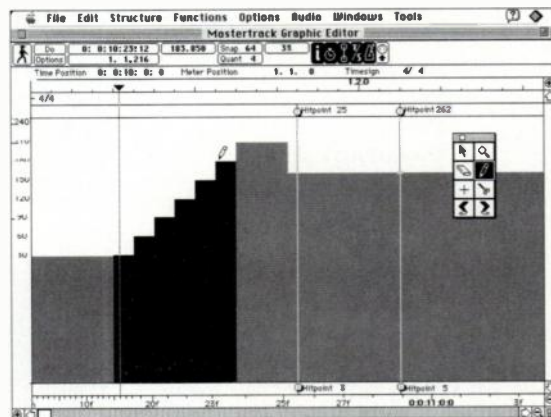


FIG. 2: In the Mastertrack Editor, you can create Tempo Maps graphically.

each Song can include up to sixteen Arrangements, a Setup, a Drum Map, up to eight Mixer Maps (loaded simultaneously), and a set of Grooves.

Arrangements are handy for creating various versions or "mixes" of the same Song. Parts can be named and saved as separate files. For example, you can create a "setup" Part containing all the MIDI configuration messages needed to start your Songs.

As a primarily linear sequencer, *Cubase Audio DAE* uses Tracks in the Arrange window to manage data appearing left-to-right as you record. Various track types include MIDI Tracks, Drum Tracks, Group Tracks, Mix Tracks, Tape Tracks, and Audio Tracks.

Parts are the actual chunks of data that appear as rectangles in the Tracks, and these Parts can be moved, copied, merged, cut, and pasted without leaving the Arrange window. "Ghost Parts" can also be created for both sequenced and audio Parts. (Ghost copies are virtual copies that include editing pointers, but no actual audio data. They come in handy when you want edits for one Part to affect all Parts that have been copied from it, for example, Velocity or Volume changes.)

Cubase Audio DAE handles entire files or parts of files as Segments, which are triggered by Events. This allows digital audio Parts to be edited in the Arrange window in the same manner as MIDI Parts, including quantization. Although several Segments can occupy a Track, only one Segment per audio channel will play at a time. This update allows as many as sixteen simultaneous channels (count 'em, *sixteen*) of digital audio, depending on your audio hardware configuration. (I got four channels with an Audiomedia II card.)

RECORDING FUNCTIONS

A movable Transport Bar controls the recording functions with tape recorder-style buttons. It also includes pertinent recording information, such as locator positions, song position, time signature, and tempo. Although it's functional, I found the Transport Bar to be cramped, and I generally relied on keyboard commands to control recording. A resizable window would solve this.

Like its competitors, *Cubase Audio DAE* records audio to disk, stored as sound files. After a screen update, these files appear in the Arrange window as Parts in the selected audio Track,

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which are routed to individual audio channels in the Track Inspector.

When you designate a hard-disk destination for the audio file about to be recorded, *Cubase* prepares a slot on your hard drive and designates it as a particular Take. When you record audio, the sound file is assigned to this slot, and another slot is prepared with a Take number incremented by one (Tk. 1, Tk. 2, and so on.). In this way, several recording passes can be made quickly and easily without stopping to name each one. These Takes are also conducive to assembling composite vocal or solo tracks, which *Cubase* does very well.

You can record multiple audio channels in one audio Track, which is perfect for handling stereo miking situations. These multiple Tracks are actually mono sound files that are phase-locked upon playback. If you're recording more than one instrument in stereo, you can record multiple channels to multiple Tracks. You can even simultaneously record digital-audio and MIDI data. This is great for capturing live performances with everybody tracking together.

A handy new Monitor window displays a graphic ladder meter calibrated in dB that lets you monitor both inputs and outputs. There's even a resettable clip indicator that keeps track of how many times you've driven your peaks into clipping.

JUMP IN THE POOL

The Audio Pool is where *Cubase Audio DAE* displays a list of the active Song's sound files and their related Segments. The Pool also provides various management functions to help you maintain an overview of the audio data. An Audio Pool setup can be saved as a separate file for use in another Song.

Sound files can be imported from a hard drive and automatically appear as one Segment in the Audio Pool when you record into the Arrange window or an editor. Pertinent sound-file and Segment information can be displayed along with a graphic waveform, letting you make both destructive and nondestructive edits. I found the Pool to be a good place for creating and naming various Segments of a sound file. Then I dragged the Segments into the Arrange window or one of the editors for more precise editing.

A pop-up Do menu lets you save a Segment as a Region. This command

STEINBERG ADAT COMPUTER INTERFACE

For the expanding tribe of Alesis ADAT users, Steinberg offers a hardware computer interface called, surprisingly enough, the ADAT Computer Interface (ACI). This small, unassuming box (rack-mounting hardware optional) provides 2-way communication between computer-based sequencers and ADATs.

The ACI translates the ADAT's proprietary sample-resolution time code into MIDI Time Code (MTC), providing accurate synchronization without requiring a tape track for SMPTE time code. The ACI also lets you control your ADAT's transport functions by passing MIDI Machine Control (MMC) messages from your sequencer to the ADAT. In order to read these MMC messages, your ADAT's firmware must be version 3.05 or higher.

In practical terms, this means you can use your sequencer software as a virtual remote control for your ADAT, integrating the ADAT into your sequencer/digital audio system. When you use the transport functions (e.g., Play and Stop), your ADAT follows right along, with all eight tracks available for recording and playback.

You can also use your sequencer's locate positions as ADAT locate points. Your sequencer probably provides a higher-resolution song position than the ADAT's minutes/seconds format. You can even locate your ADAT by entering the song position directly into your sequencer.

The SMPTE frame rate (24 fps, 25 fps, 30 fps, or 30 drop) can be selected remotely from your sequencer, or directly from the front of the ACI. The ACI can also convert ADAT time code into MIDI Clock messages.

If your sequencer lets you arm multiple tracks, you can record-

enable the ADAT directly from the sequencer. If you're recording single tracks, however, simply selecting a Track in your sequencer record-enables the corresponding ADAT track, so you must be careful not to accidentally record over one of your tracks.

Automated punches are a breeze. Set up punch points in the sequencer, and the enabled ADAT track (or tracks) faithfully punch in and out. Although I couldn't test it (*Cubase Audio's* cueing does not work), I would like to see sequencer cueing functions enable the ADAT's cueing function.

For ambitious programmers, the ACI provides computer access to all ADAT functions, including BRC functions, via MIDI System Exclusive commands. System Exclusive commands can be used to completely control advanced functions such as record-enabling, delaying, and bouncing tracks; pre- and post-roll; and formatting a tape.

Unfortunately, the first two ACIs I received refused to operate and failed the simple diagnostics test I ran. The third ACI, however, performed glitch-free and even came with "Read Me" files that provided valuable information concerning setup and use with *Cubase*, *Vision*, and *Performer 5.0*. It proves once again that you should always read "Read Me" files.

Although it's a moderately steep investment at \$399, the ACI provides a valuable link between a sequencer and an ADAT, along with several features not available on stand-alone ADATs. If controlling your entire system from a common set of transport controls is important to your recording style, the ACI is a worthwhile investment.

saves your Segment settings into their associated sound file. This is particularly useful when importing your sound files into another program that supports *Sound Designer II* files; all Segments will appear as *SD II* Regions.

Finally, the Pool offers an automated backup function and Prepare Master, a

file-consolidation feature. To my knowledge, *Cubase Audio DAE* is the only digital audio sequencer to offer these features.

THE FAST LANE

The Audio Editor is normally used for creating, splitting, and precisely edit-

ing audio Segments nondestructively and arranging their Events in a linear fashion. This editor displays Audio Events, which trigger related Segments, in a linear fashion on what *Cubase Audio DAE* calls "Lanes." Lanes correspond to Audio Tracks or virtual audio tracks. The order in which Audio Events appear along the Lanes dictates how Segments are triggered as a Song plays.

You can also view and graphically edit Volume Events, which appear directly below each Lane. A speaker icon lets you audition your edits as they occur.

Cubase Audio DAE uses "Q-points" to control the placement of Events into musically logical positions when moving, copying, or quantizing. For instance, place a Q-point at the first downbeat of a Segment; when you move the Segment, the Q-point "snaps" to the beginning of the appropriate bar or note value (quarter note, half note, etc.), depending on the Snap value you choose.

The theory behind this procedure is that audio, unlike MIDI, rarely uses the beginning of an Event as a musically appropriate position. Q-points, along with Snap values, are significant tools for quick and intuitive placement of Audio Events.

Audio Events can be grouped in a similar fashion to Tracks in the Arrange window, allowing them to be moved, quantized, deleted, cut, copied, and pasted as a single entity. I used this function quite often for handling drum kits or background vocals. When copying Audio Events (which also creates new Segments), you have a choice between creating actual copies or "Ghost" copies. As with MIDI Parts, all Ghost copies reflect any edits made to the original copy. This is helpful when changing a Segment in one verse that also appears in subsequent verses.

There are at least two good ways to match *Cubase's* MIDI Tracks tempo to recorded or imported audio. One involves the Mastertrack Editor, which I will discuss shortly. A simpler way is to open the Audio Editor and select the Event you want *Cubase's* tempo to match. Then, you simply drag the desired bar until its scale position matches that of your Segment, and *voila!* You are tempo-matched and ready to roll.

I used this feature to match some previously recorded sequences to an





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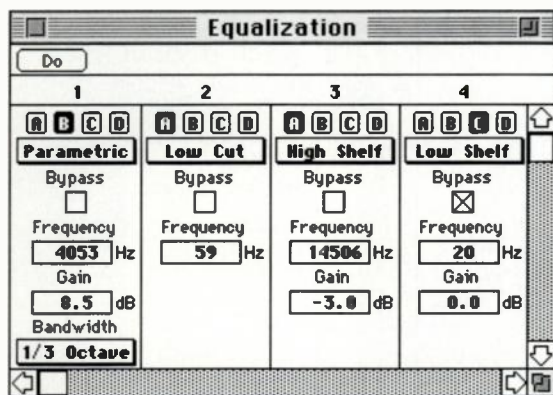


FIG. 3: *Cubase Audio DAE 2.01* provides real-time EQ with five selectable EQ types and four programmable memories per module.

audio groove recorded from an Alesis ADAT, and it worked like a charm. Digital-audio grooves rarely have perfect timing, however, so you must break your groove down into Segments small enough to facilitate matching with the sequence Part's perfect tempo.

One of the most important new features of *Cubase Audio DAE 2.01* is the new graphic Create Crossfade window (see Fig. 1). This approach to creating nondestructive crossfades uses moveable "handles" to define fade start and end points for both Segments. You can draw your own curve, or let *Cubase* insert a linear or logarithmic curve. After the crossfade is calculated, you can preview it (visually and audibly) and decide whether or not to apply it.

This is the most intuitive way to create crossfades I have ever seen. However, I would appreciate the ability to toggle back and forth between the Create Crossfade window and the Audio Editor so that I could nudge my Segments' relative positions as I create a crossfade.

There's also a new List Editor for Audio Events in version 2.01, where you can arrange and edit your Audio Segments in a playlist. If you're familiar with List Edit for MIDI data or *Sound Designer II*'s Playlist, you may consider arranging your Audio Events here as an alternative to working in the Audio Editor.

ENTER THE INSPECTOR

Although *Cubase* stores MIDI data with its relevant information (note numbers, MIDI channels, etc.), this data can be changed in many different ways at the output stage for both Parts and Tracks. In the Track Inspector, the

your bass notes in the Track Inspector, you hear longer notes, but the sequence itself is unchanged. The notes are still short when you view them in an editor.

This approach is useful for auditioning Part variations, but it can lead to some confusion when editing or storing your Song as a Standard MIDI File. Drum Tracks are especially confusing, because they are routed to a drum map that contains individual output port and MIDI channel settings, as well as individual In Note and Out Note numbers for note remapping.

To circumvent this, *Cubase Audio DAE* offers a Freeze Play Parameters function that embeds the output settings into a Standard MIDI File. If you have conflicting output assignments between Parts and Tracks or individual drums and Drum Parts, remember that Parts override Tracks and individual drums override Parts.

It would be nice if *Cubase* would gray out or otherwise make unavailable the assignment settings that are overridden. Of course, you can avoid this confusion if you simply ignore the Track Inspector and make your changes directly in one of the editors.

IT'S ABOUT TIME

The edit windows in *Cubase Audio DAE* are varied and powerful. Up to fifteen windows can be open simultaneously. *Cubase* also provides a set of Tools that vary according to the active window. These are useful for fast, intuitive graphic editing.

MIDI channel, Volume, Velocity, note duration, and output-port assignment can be changed. You can also compress the Velocity data (detailed shortly), delay the note data, and add Program Change and Bank Select messages. Audio Tracks can also be delayed in the Track Inspector; while this is memory-consuming, it proved to be a boon for doubling vocals.

However, the Track Inspector is basically an output filter/remapper. For example, if you lengthen

Steinberg has added some significant updates to the popular Groove Quantize feature. As with previous versions, you can apply a preset MIDI Groove to a Track, Part, or section of a Part (in an editor). *Cubase* quantizes according to the currently selected value, and the program stores up to 64 preset Grooves per Song.

However, creating your own Grooves is where the fun is. In this version, there is a Setup Quantize dialog box containing a section called "Micro Grooves." Here, you set the Groove's length in bars (up to 9,999), time signature, name, and the editor (Key, Drum, or List) in which you wish to work. You can also apply the Groove's Velocity value, which adds significantly to the feel. Clicking on Edit automatically opens the selected editor, where you can create your Groove. If creating a Groove from scratch is too time consuming, edit one of the presets.

One of the coolest additions in version 2.01 is the graphic Mastertrack Editor (see Fig. 2). A graphic representation of tempo events can be edited in conjunction with time-based and meter-based hit points for creating tempo maps, syncing the sequencer to live music tracks, cueing music to video, and so on.

Cubase can even match the tempos of meter- and time-based events. Suppose you want to match your sequenced music to a visual cue. First, you create time-based hit points at important reference locations, such as the beginning and ending of a scene. Add meter-based hit points at relevant timing points (e.g., the beginning and ending of a measure). Then let *Cubase*

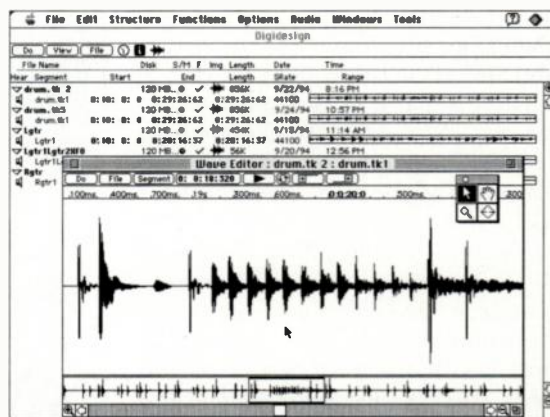


FIG. 4: The new Wave Editor allows sample-level, destructive editing without leaving the program.

automatically adjust the tempo of your sequenced music so it matches your scene. This is one of the program's best new features.

HOW DESTRUCTIVE

Previous versions of *Cubase Audio* (as well as other audio sequencer programs) forced you into *Sound Designer II* to perform destructive audio edits. Although this route is still an option, *Cubase Audio DAE 2.01* lets you perform these edits within the program via the Wave Editor. The audio waveform display resolution is high enough to allow sample-level edits. The editing view is conveniently controlled with a thumbnail view, which you can drag across a small, graphic display of the entire sound file.

"Scrubbing" is available here and in other areas of the program, but the operation of this feature is somewhat disappointing. Instead of using the mouse to "grab" the scrubber bar and directly control its movement, *Cubase* uses the speed and direction of the mouse movement to trigger playback, which doesn't allow precise control. Steinberg intends to update this feature to implement a grab-type scrubber.

PROCESSING AUDIO

In the new, real-time equalization section (see Fig. 3), the number of EQ modules (setups) per channel depends on your audio hardware configuration. (You can't use EQ with Audiomedia I and Sound Tools I.) Each module offers low-shelf, high-shelf, parametric, low-cut, or high-cut filters, and they can store four presets. Getting the right settings is easy: Start the music, open the EQ window, and listen to the changes in real time while adjusting the settings.

I used the parametric EQ to brighten up some live drums, with very clean results. It was also wonderful for notching out 60 Hz hum. It's not the warmest EQ I've heard, but that's digital processing for you.

LINKS AND PLUG-INS

The program offers links to related software applications, such as *Sound Designer II* and *Time Bandit*. The new Wave Editor (see Fig. 4) allows you to make destructive edits without leaving the program, but you can still work in the *Sound Designer II* editing environment if you prefer. Don't get too excited

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EM COVERS CUBASE

EM has evaluated *Cubase* in four reviews and one feature. Back issues are available from Mix Bookshelf; tel. (800) 233-9604 or (510) 653-3307; fax (510) 653-5142.

Reviews

<i>Cubase</i> 1.0 (Atari ST)	January 1990
<i>Cubase</i> 2.0 (Atari ST)	February 1991
<i>Cubase Audio</i> 1.01 (Mac)	December 1992
<i>Cubase Score</i> 1.0 (Mac)	July 1993

Features

"All in One" April 1994

(This face-off compares Steinberg *Cubase Audio* 1.2, EMAGIC *Logic Audio* 1.7, Opcode *Studio Vision* 1.7, and Mark of the Unicorn *Digital Performer* 1.41, all for the Macintosh. A sidebar discusses OSC's integrated Macintosh programs *Deck II* 2.1 and *Metro* 2.4.)

when you encounter the Harmonize and Time Stretch options, because you can't use them without *Time Bandit*, which runs another \$399.

Cubase Audio DAE 2.01 also comes with several off-line, plug-in applications for audio processing. Fade lets you select one of several different fade types. Invert Phase is useful for stereo recording. Normalize is a handy "quick fix" for audio that was recorded at a low level. However, it also raises the noise level, so it's preferable to re-record at a more appropriate level.

Other tools let you cut the level of recording in half, reverse the audio waveform, and replace audio with absolute silence. I used the Fade and Reverse applications together for some interesting "rush-in/fade-out" effects.

Attention software hackers! The specifications needed to develop *Cubase Audio DAE* plug-ins are in the public domain and available from Steinberg/Jones. If you want to write your own, have at it!

GOOD STUFF

Make no mistake about it: *Cubase Audio DAE* is a *very* powerful and flexible program. A creative user can find interesting ways to make things happen. For example, when programming drums, a lot of keyboard players don't perform with a consistent upper and lower Velocity. I didn't want the drum Velocities all over the place, so I used a form of MIDI Velocity compression with a threshold to keep the Velocity in a usable range.

To accomplish this, I duplicated the drum Part and used the Logical Editor to delete all notes above a specified Velocity value (my threshold) for one Part and all notes below this value for the second Part. I then used the Transpose/Velocity Function to compress the Velocity of the second Part's notes and merged the two Parts back into one.

The ability to open several screens simultaneously is extremely cool. I used three separate monitors and directed the Arrange window to one, edit windows to a second, and Mixermaps to a third. Talk about a virtual studio!

Cubase Audio DAE 2.01 also has increased *QuickTime* movie support, making it a usable feature. You can open as many *QuickTime* movies as your system allows and synchronize them to your MIDI and Audio Tracks. Each movie has a storable offset with a controller for off-line editing, including cut, paste, and copy.

Other features that deserve press include a MIDI Remote Control Option and automated Mixermaps with programmable controls for setting up and storing onscreen control panels for your gear. These Mixermap controls can be grouped, and they respond to external MIDI controllers. They can even "learn" what they're supposed to do from your MIDI gear.

Product support is extremely important for a complex program such as *Cubase Audio DAE*. I called for support several times without identifying myself, and the help I received was gen-

erally courteous and always technically sound. Good job, people.

NOT-SO-GOOD STUFF

On the down side, I found a few inconsistencies between purported features and actual implementation. Cueing (monitoring the sound during fast-forward or rewind) is described in the manual, but it does not work. You can't select multiple Parts and double-click to open an editor. I also ran into a few screen lockups.

High on the wish list, I would like the ability to select additional Parts from an edit window, and I would love to see *Cubase* utilize a color monitor (as do all three of its major Macintosh sequencer competitors). Steinberg/Jones says these updates are on the way. I also found the lack of key-on recording (which automatically triggers recording when a MIDI note is received) puzzling, especially from a feature-packed program such as *Cubase Audio DAE*. However, you can more or less accomplish the same thing with the Punch feature in Cycle Record mode.

The two owner's manuals had some inaccuracies, but generally they were helpful, considering the amount of information that must be covered. There is no online Help, which is a real drag.

Product Summary

PRODUCT:

Cubase Audio DAE 2.01

PRICE:

\$799

SYSTEM REQUIREMENTS:

Mac IIci or better with 8 MB RAM (12 MB recommended) and System 7.0 or later; Digidesign audio-recording card (may have additional requirements); hard drive; MIDI interface

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VALUE	●	●	●	●

IT'S A WRAP

Many home/project studios use digital audio sequencers as the heart of their systems, and it's not hard to understand why. *Cubase Audio's* Arrange window provides centralized control of MIDI data, random-access audio, and multitrack tape decks, each with their inherent advantages. It's a best-of-all-worlds situation. As the cost of hard-disk storage comes down, current problems such as running out of disk space for audio will fade.

Some cool new features are promised



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when you
encounter**

**Cubase's Harmonize
and Time**

**Stretch options;
you can't**

**use them without
*Time Bandit.***

for *Cubase Audio DAE 2.1*, including support for color monitors and *OMS* (with *Galaxy* patch names). The new version will also include enhanced notation features, such as 32 tracks and staves per page, mixed tuplets, grace notes, and guitar tablature. Finally, it will almost certainly be the first digital audio sequencer to run in native code on a Power Macintosh.

I was not a *Cubase* user in the past, but I am now. *Cubase Audio DAE 2.01* certainly deserves its spot among the upper echelon of digital audio sequencers.

(Thanks to Rob McClain's testing site and the Middle Tennessee State University Recording Industry program in Nashville, Tennessee.)

Eric Leach is an MTSU recording instructor, MIDI squirrel, and his wife's favorite writer.

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Fostex RD-8

By Michael Molenda

The ADAT format gets a big head.

The modular digital multitrack revolution seems poised to turn into another 30-years war. (Remember your European history?) The Alesis ADAT and Tascam DA-88 were the first techno-warriors to step onto the field of honor, Alesis armed with its S-VHS format and Tascam raising the Hi-8 mm flag.

Alliances were imminent, of course. Monumental battles have a habit of spreading into other kingdoms. In fact, at press time, there were rumors that another manufacturer would soon take up the Hi-8 mm cause. If true, that will be welcome news to DA-88 standard-bearers, because Fostex has been shipping their ADAT-compatible RD-8 for a few months now.

In many ways, the RD-8 can be described as an ADAT in Fostex clothing. If you open the RD-8 up and look inside, it's like trying to find subtle contrasts in identical twins. The record/playback electronics, digital converters, and tape transport are the same used by Alesis. However, there is an important difference: The RD-8 boasts sophisticated synchronization and control features that make it a more powerful tool than a lone Alesis ADAT *sans* BRC controller. For audio post-production engineers, who must constantly sync to picture, and recordists with fully integrated MIDI studios, the RD-8 is the Big Gun of the S-VHS format.

In addition, the RD-8 sounds—surprise!—every bit as pristine as an ADAT. Master tapes recorded on Alesis MDMs played back on the RD-8 without any discernible audio coloration, digital distortion, or phase problems.

JOB DESCRIPTION

Because the RD-8 offers sophisticated control features, it is well-suited to be the command center of a multiple ADAT studio. You could use it in place of the Alesis BRC remote control and

link it to your ADATs with the same D9-sub connector used to synchronize two or more Alesis MDMs. Of course, the RD-8 doesn't *have* to rule the roost; it can also be used as a slave deck.

As a master deck, however, the RD-8 offers variable sampling rates (44.1 kHz or 48 kHz); onboard SMPTE chase-lock, reading, and generating for 24, 25, 29.97 (drop-frame and nondrop-frame), 30 (drop-frame and nondrop-frame) frame rates; MIDI Machine Control; MIDI In/Out ports (the RD-8 also outputs MIDI Time Code for syncing to MIDI sequencers); word and video sync capabilities, including an RS-422 control for interfacing with video editing equipment; multitrack machine offset control; programmable pre- and post-roll times; and memory storage/recall for 100 location points. In addition, the RD-8 utilizes a separate subcode track for its time-code functions, so you don't have to sacrifice a valuable tape track to record SMPTE. When the RD-8 is synched to another RD-8 or Alesis ADAT, you get the full benefit of all sixteen available audio tracks.

Any tape recorded on an Alesis ADAT is 100 percent compatible with the Fostex RD-8. Maximum recording time can be increased from 40 minutes to 53 minutes by activating the RD-8's T-160 mode. The RD-8 also lets you "track slip"—that is, delay an individual track—by up to 170 ms. As stated earlier, the RD-8's innards are essentially the same as the Alesis ADAT, so I won't review the basic operations of the ADAT MDM or the characteristics of the S-VHS format. If you want the

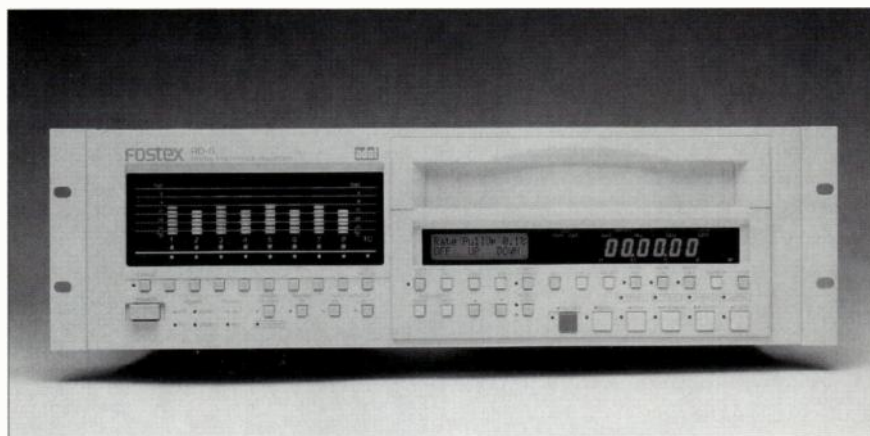
ADAT story from the top, check out my review of the Alesis ADAT in the October 1992 *EM*, or purchase George Petersen's book, *Modular Digital Multitracks: The Power User's Guide* (available from Mix Bookshelf; tel. [800] 233-9604 or [510] 653-3307; fax [510] 653-5142).

RD-8 ARMOR

Whereas the Alesis ADAT front panel offers familiar controls in a spartan configuration, the RD-8's control surface is button heaven. Given the fact that the user is getting many of the functions of a BRC integrated into the recorder, the number of buttons isn't surprising or oppressive, just a mite daunting at first look.

The transport controls (Record, Play, Rewind, etc.) are smaller and grouped closer together than the wide and sturdy targets offered by the ADAT. I wouldn't want to initiate a difficult manual punch-in from the RD-8's front-panel controls. The Model 8312 remote included with the unit is comparable to the Alesis LRC and is a better tool for manual operation. The remaining RD-8 control buttons are also tiny and exhibit a cheap, plastic feel (and jiggle) when touched. However, all buttons are clearly labeled, and a generous helping of status LEDs keep the user abreast of the machine's operations.

The rest of the front panel is comprised of the tape-loading dock; a large, red LED for time-code display; an LCD screen for operational data; and eight LED record/playback level meters. For anyone who fills up their track sheets



Fostex's RD-8 advances Alesis' ADAT concept by including onboard sync functions and adding such features as Track Slip and the ability to switch in or out of Record mode on some tracks while recording on others.

with recording notes, the RD-8 accommodates your habit with its "user bits" function. This feature allows you to display take numbers and brief text (up to eight characters) on the LCD screen. The information is embedded with the time-code track.

The RD-8's rear-panel I/O is a mob scene. The +4 dBu analog inputs and outputs are on separate D25-sub multipin connectors. If you, like me, already have a supply of ELCO connectors prewired to your patch bay to facilitate a multiple Alesis ADAT studio, Fostex's choice of a different connector will cause a few grumbles—that is, unless you enjoy soldering new cables, or don't mind buying additional prefab connectors.

The situation is the same with the RD-8's -10 dBV analog connections. Fostex uses RCA phono jacks, while Alesis MDMs utilize 1/4-inch jacks. If you're just putting together your MDM studio, the lack of I/O collaboration isn't a big deal. Just buy (or make) the cables you need and start recording. However, pros who have already developed wiring and patching systems for their MDM studios can't integrate the RD-8 as easily.

The rear-panel party continues with Alesis ADAT-format fiber optic, digital in and out ports; MIDI In and Out; time-code in and out (on balanced XLR connectors); the familiar 9-pin sync input/output jacks for connecting other ADATs and RD-8s; 1/4-inch jacks for the Fostex Model 8312 remote control and an optional punch-in/out footswitch; a 9-pin output to

Product Summary

PRODUCT:

RD-8 modular digital multitrack

PRICE:

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Alesis' optional RMB meter bridge; a BNC video input for locking to VITC (Vertical Interval Time Code); BNC jacks for word sync in/out; and a 9-pin RS-422 interface that allows you to run the RD-8 transport from a video editing controller. Whew! There's no lack of I/O options here.

CLINICAL OPERATIONS

Invoking the RD-8's myriad control functions isn't as hard as you might think. A 2 x 18-character LCD window—just like the display on the Alesis BRC—allows reasonable viewing of parameters and operational data. And also like the BRC, any session data displayed in the RD-8's LCD window can be saved on the Data section of any ADAT tape. (The Alesis BRC was reviewed in the November 1993 EM.)

The Main Menu is split into nine pages, with two functions available on each page. Parameters are selected by using three Function keys, and parameter values are set with increment/decrement keys. Pretty simple.

I found every function and parameter on the Fostex machine with a minimum of keystrokes, which is certainly a boon when a session is under the deadline gun. (Few things can freak out a harried ad executive faster than an engineer saying, "Excuse me for a minute or two while I edit some parameters.") Nothing the RD-8 front panel threw at me was confusing or vague, and a peek at the unit's concise user's manual cleared up any operational mysteries. It would be nice to have a more comprehensive remote (hint, hint), but until one is available, "power MDM user" and *Mix Editor* George Petersen recommends the JLCopier CuePoint autolocator (\$799.95; described in the February 1994 "What's New" column).

When using the RD-8 as the master controller in a 24-track ADAT system, the lockup time between machines was consistent with that of BRC-controlled setups. You still get that frustrating 4- to 8-second lag before tracks 9 to 16 and 17 to 24 catch up with tracks 1 to 8.

On the other hand, Fostex has made valuable improvements over the ADAT's recording functions. For example, the Alesis MDM locks you out of the recording process once you've armed your tracks and started recording. You can't punch out of individual tracks, or punch *into* other tracks while the tape is running. You can only stop the

tape or punch out of the track (or tracks) already armed.

This is tragically inconvenient in the post-production world, where multitasking and quick decision-making are part of a sound editor's DNA. When synched to picture, an Alesis ADAT prevents a sound editor from punching in a sound-effects cue while the music underscore is being recorded. Aarrgh! Even outside of a post-production suite, I like being able to erase mistakes on some tracks while simultaneously



The RD-8 is the Big Gun of the S-VHS format.

recording a guitar solo on another, or punching in background vocal parts while the lead vocalist is wailing.

However, the RD-8 allows you to go into, or out of, Record mode on some tracks while recording continues on others. This feature is a major boon to the RD-8, because the lack of it is one of the big bummers about recording with Alesis ADATs. Thanks, Fostex!

END BITS

For putting what amounts to a BRC into a dedicated MDM, you can only give Fostex kudos, and we did! The RD-8 won a 1995 Editors' Choice Award in the Modular Digital Multitrack category (see "Editors' Choice" on p. 28). In addition, allowing recording on all tracks at all times is a major benefit for *all* recordists, whether they use the RD-8's more sophisticated features or not.

Basically, what you have here is an improvement on the original Alesis ADAT. Multi-MDM studios, post-production suites, and integrated MIDI/digital-audio facilities will probably be the main beneficiaries of the RD-8's increased power, but high-level home users should also be chomping at the bit to get one. There really isn't a whole lot more to say about the RD-8. It sounds great, gets along wonderfully with its kin, and improves on the ADAT concept. So, I'll just finish by offering Fostex my personal congratulations on their Editors' Choice Award. Bravo!

Michael Molenda is editor of EM.

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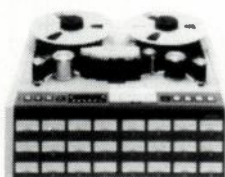
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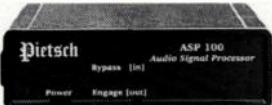
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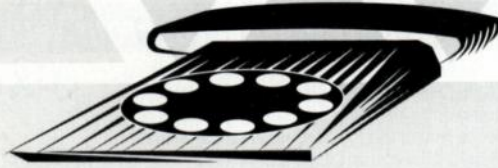
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TECH PAGE

With the growth of the multimedia industry, it seems odd that hardware and software are cobbled together in a hodge-podge of video cards, sound cards, and graphics accelerators using different data buses in one computer. This makes it difficult to integrate and sync audio, video, and computer graphics.

Among the companies trying to address this problem is Brooktree Corporation (tel. [800] 2BT-APPS), which has more than ten years of experience designing and marketing mixed-signal integrated circuits for computer graphics, multimedia, and communications applications. Brooktree recently announced a breakthrough in multimedia integration: the MediaStream accelerator package for computers ranging from 33 MHz 80486 machines to high-end Pentium systems.

MediaStream uses Brooktree's MediaPacket architecture to organize audio, video, and graphic data into "packets" that are merged and controlled on the PCI or VL bus. This offers many benefits, including a significant reduction in host CPU overhead. For example, audio data is no longer carried on the ISA bus with its CPU-intensive interrupts and direct memory access. It also allows audio and video events to be more tightly synchronized than before.

The MediaPacket architecture is im-

Gently Down the MediaStream

Integrating audio, video, and computer graphics.

By Scott Wilkinson

plemented in a chip set that includes three primary ICs. The MediaStream controller replaces conventional Windows accelerators and uses a 1 MB data buffer that stores all types of packets. The AudioStream audio controller provides I/O for mics, line-level devices, and Yamaha FM chips, as well as AES/EBU and S/PDIF ports. A custom DAC, called a PACDAC (Packetized Data DAC), rounds out the basic chip set and includes graphics and video mixing capabilities. An optional VideoStream decoder chip captures video signals from any NTSC, PAL, or S-video source.

Included with the package is a suite of software drivers that provides full MPC Level 2 compliance. The company has also developed several mini applications to perform video capture, computer-to-video output, and audio control.

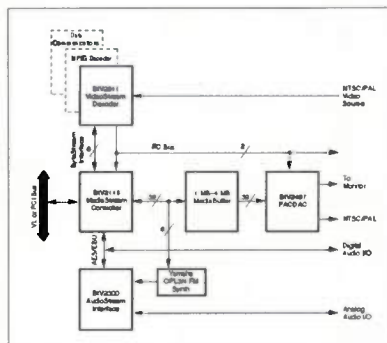
Brooktree believes the next big development in PC multimedia sound will be digital-audio I/O, which led to the inclusion of AES/EBU and S/PDIF ports that operate at rates up to 48 kHz. This lets the computer exchange audio data directly with DATs, CDs,

and "digital" speakers. MediaStream can also record and play separate stereo audio signals simultaneously or play two WAV files at once, and it's fully compatible with the Sound Blaster sound card.

Another audio innovation is Brooktree's WaveStream software-based, wavetable synthesizer. This concept is not new (see "Tech Page: Virtual Synthesizer" in the November 1994 EM), but it is becoming increasingly important. The WaveStream application is compliant with General MIDI Level 1 and offers 32-voice polyphony. It is implemented as a custom DSP algorithm running on the host CPU using 16-bit samples.

MediaStream can display full-motion, full-screen video at 30 fps using the CIF video format, which is standard in consumer VCRs and other video equipment. Images start at a resolution of 320 × 240, which is then scaled up to as much as 1,280 × 1,024, using interpolation to calculate the correct intermediary pixels. Enhanced chroma keying allows video and graphics to be merged more effectively. MediaStream also offers software-based MPEG playback, although full MPEG playback and the WaveStream software synth require a Pentium to operate simultaneously.

Brooktree expects to see third-party cards selling for about \$350 by spring 1995, and computer systems with their technology should appear by late summer. MediaStream represents a quantum leap in the integration of audio, video, and computer graphics that is bound to have a big impact. ☉



The Brooktree MediaStream System.

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Version 3 Software introduces AFMS (Advanced File Management System) which allows you to load and save selected objects and create powerful file-management macros. There are also helpful backup and copy utilities, and more. Version 3 Software's 32-track sequencer performs functions usually found only in advanced computer-software sequencers, like automated mixdown, input quantization, and triggering sequences from the keyboard.

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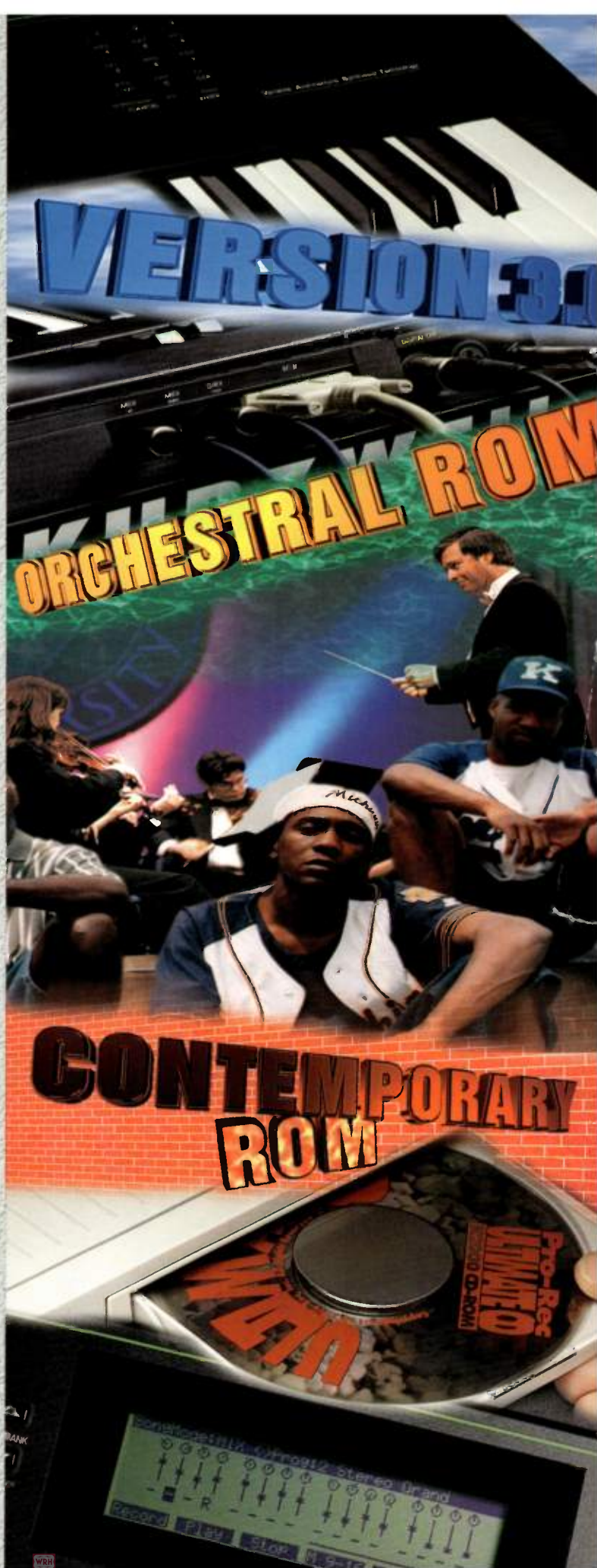
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