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# Electronic Musician<sup>®</sup>

January 1999

## THE YEAR'S 22 HOTTEST PRODUCTS



*Electronic Musician*

1999

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CHOICE



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# VETERAN ENGINEER

## THE GROUNDSWELL OF HR824s

**E**verybody makes glowing claims about their monitor speakers. But only Mackie Designs' HR824 Active Near Field Monitors have gotten this amount of acclaim from credible outside sources so quickly.

Here are some verbatim comments gathered by our roving Mackie video crew on a recent visit to Nashville and Los Angeles (call us toll-free for a copy of the finished epic production), interspersed with recent review excerpts.

We know you're as serious about your creative product as these folks are. So why compromise with less than the best near field monitors? Visit your nearest Mackie dealer for a demo or call us toll-free for more info.



**"Mackie asserts that the HR824s are 'smooth from 39 to 20kHz ( $\pm 1.5\text{dB}$ )' and our tests corroborated the claim. This is no mean feat for monitors this size. The HR824s performed admirably, allowing us to distinguish very fine shades of tonal color and to establish subtle timbral and harmonic relationships between sounds. If you are in the market for a pair of compact active monitors and you are not afraid of the truth, do yourself a favor and give the Mackie Designs HR824s a critical listen."**

*"Very musical. Very accurate. We actually move them between our five rooms."*

**Glenn Meadows, TEC-nominated mastering engineer, Masterfonics**



*life. My next job is in Calgary, Canada. I'm bringing four Mackies."*  
**Brian Ahern, Engineering Legend**



*"The most balanced pair of speakers I've ever had. I haven't heard anything better. The Mackies bring the full spectrum of sound into my room. They bring the full scope*

*of the sound in an area that encompasses me AND my clients. You get subsonics — a terrific fullness of acoustic guitar, the lowest end of bass drum. When you have an upright bass you get low end that I normally don't get in a room like this."* **Stephan Oberhoff, independent L.A. producer/engineer/keyboardist**



*"When I was tracking for Robert Redford's The Horse Whisperer, I put a lot of low end musical instruments onto the tape. When it came time to mix, no way could I have thrashed it out without the Mackie speakers. They really saved my*



**"Performance, features and a cost-not-barred design at a retail price of \$1500 a pair\* make this product a very good value. In the**

**words of one person involved in these listening tests, 'I have a feeling that [the HR824s] will become the NS-10 of the late '90s and beyond' ...ubiquitous."**



*"I love the [HR824's] bottom end — it sounds real. You don't have to compensate or guess. It's nice to FEEL a speaker. Producers also say they feel really good."* **Stanley Smith,**

**feature films soundtrack composer, co-producer of Jordan Hill**

# EERS AND REVIEWERS CONFRONT REALITY.

## MONITOR RAVES BECOMES A TIDAL WAVE... AND OTHER MIXED METAPHORS.



**"HR824s give systems costing twice as much a run for their money in terms of sound quality... they deliver a solid low end that's surprising for their size and a flat transparent response across the spectrum."**



*"[HR824s] sound incredible — I was extremely surprised by the low end response.*

*Clarity, detail and reproduction in*

*reverb tails is real good."* Pat McMacon, Facility Director, Sony/Tree Studios



*"Very tight bass... clean mids... crystal*

*pristine highs. There's a truth to them once you hear you can't go back."*

Frank Serafine, Hollywood motion picture and television sound designer



**"Their treble output is detailed and**

**extended yet very smooth. Words like 'open' and 'silky' come to mind... and these adjectives apply to a**

**very wide sweet spot. The Mackies put out the kind of deep, warm bass normally considered the sole domain of huge drivers and subwoofers. I would consider these speakers a bargain at twice the price, but at list they are a steal."**



*"Very clean. Spectacular. Very impressive. You can listen to them for a long period of time. They work in a lot*

*of rooms. What we get on these speakers comes out when we take the tapes other places."* Milan Bogdan, General Manager, Emerald Studios (Billboard Magazine-rated "#1 Country Recording Studio")

*"On material I've mixed using another monitor brand, I'm now hearing things I missed. Imaging is wide and very even. The whole spectrum is equally represented.*

*Great frequency response... midrange is smooth... no low end hypiness."* Bill Smith, Grammy-nominated recording engineer



*"You can sit and listen to them all day long. You get exactly what you hear. They're to-*

*tally natural — I can't say the word enough — NATURAL."* Lee Roy Parnell, Grammy-nominated singer/songwriter/producer



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*By Alan Gary Campbell*

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*By Rick Weldon*

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*By Peter Miller*



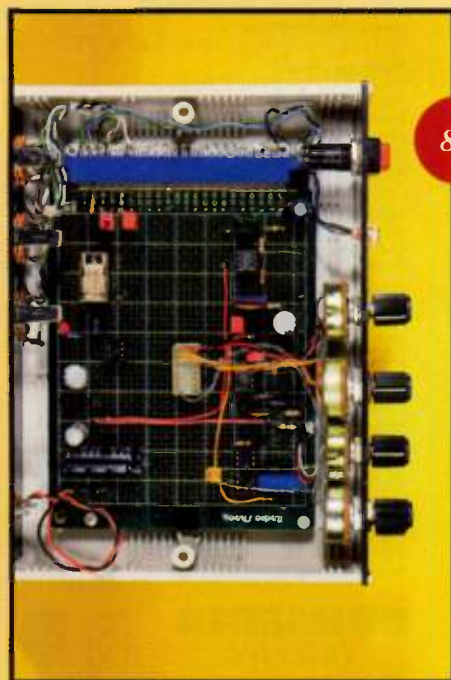
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## A Modest Proposal

Why not standardize MIDI device-editing profiles?

It is my belief that open technical standards create opportunities for everyone, leading to better products for musicians and more growth in our industry, especially if such standards contribute to better connectivity and ease of use. That's why I wrote about Cakewalk's new AudioX proposal last month and discussed standards for DSP plug-ins and for streaming-audio drivers in the March 1998 issue. This month, I'm going to float a trial balloon for another standard, one that doesn't exist yet.

Most of the time, when a new programmable MIDI product is released, there is a significant delay between the release date and availability of software editors for the product. In some cases, editors never become available, or they only become available as profiles in one or two editor/librarian programs.

You probably don't need me to tell you about the benefits of editor/librarians and sequencer control panels. If you have ever waded through pages of parameters in some sophisticated, MIDI-programmable device, you know why it's better to be able to see all the parameters on a nice, large computer monitor. Furthermore, controlling your devices from a sequencer control panel allows you to record your changes for real-time playback, to the extent that the device supports that capability.

But writing an editor/librarian profile is not easy, even assuming your ed/lib software allows it. Creating a custom control panel in your sequencer is no picnic either. If you use more than one sequencer and have a lot of MIDI devices, well, you get the picture. For much the same reason—programming time—hardware manufacturers are unlikely to support each new MIDI device with separate device profiles for every editor/librarian, not to mention virtual control panels for every sequencer. Many hardware manufacturers offer no software support.

But what if there were a standard, cross-platform, device-profile format for MIDI devices that worked like a MIDI plug-in architecture? As hardware manufacturers released a new device, they could release just one device-specific profile that would open in every editor/librarian and sequencer. This device profile would be preprogrammed with all the code for every editable parameter and real-time controller in the unit.

Manufacturers could charge a modest amount for these profiles or could bundle them as an added value. Because the manufacturer would have to write only one profile per device, it would be a manageable task. The profile could be easily updated to account for hardware OS updates.

I think that many musicians would regard the availability of a device profile as added incentive to buy the device. After a while, you would be able to easily control the parameters of all your MIDI devices from your computer, even when you changed host programs.

I have proposed this idea to representatives of several leading developers of sequencer and editor/librarian programs, and the general reaction was positive. That doesn't mean it's going to happen, of course, but they liked the concept. I'm very interested in getting responses to this idea. Please e-mail me your comments at [emeditorial@intertec.com](mailto:emeditorial@intertec.com).



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# CREATIVITY WITHOUT COMPROMISE

"BUT WHAT REALLY BLEW ME AWAY  
— UNQUESTIONABLY THE BIGGEST  
BARGAIN OF THE SHOW —  
WAS AKAI'S DPS12."

Mix Magazine  
1997 AES Report

The concept seems so obvious. Combine a digital disk recorder and a digital mixer in one convenient box. Eliminate complex interfacing and keep everything in the digital domain. Add optional internal effects. **Creative heaven.** But **up until now**, buying anything that you could afford meant settling for almost enough

tracks to record your music. Or a compressed data format that sounded almost as good as CD quality. Or a user interface that you could almost make sense of. **Now, finally**, the concept of integrated digital recording and mixing lives up to its promise with Akai's **DPS12** Digital Personal Studio. Designed for those

unwilling to compromise their creative vision, the DPS12 combines a 12-track random-access digital recorder (with professional-quality uncompressed 16-bit sound and powerful non-linear editing) and a 20-channel MIDI-automatable digital mixer in one compact, incredibly easy-to-use package. All at a price that is nothing short of spectacular. It's **creativity without compromise.**

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

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

### More Is Better

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



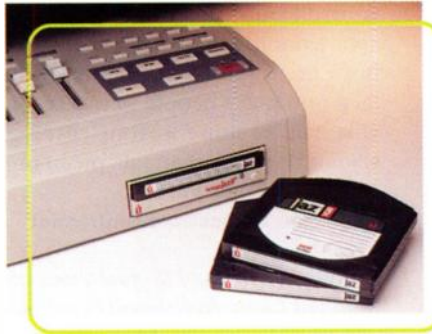
And speaking of more tracks, the DPS12 also lets you record a whopping 250 virtual tracks. At mixdown, you can assign any virtual track to any of the twelve physical tracks for playback. This gives you the freedom to compare multiple takes, experiment with alternative arrangements, even combine parts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



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

### The Wait is Over

Since the DPS12 is a random-access recorder, waiting for tape to wind is a thing of the past. The DPS12's locating functions let you move instantly to any of 12 quick-locate points and 100 stack memory points. The stack points can even be named, so you can identify locations by the part of the song (FIRST VERSE, CHORUS, etc.) or even by specific lyrics.

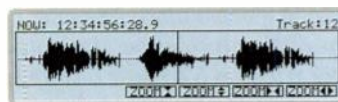


An optional internal JAZ drive allows quick access to all your work.

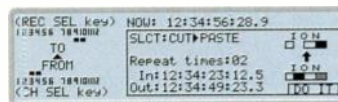
### Easy Editing

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

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



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



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

### Mix Master

The DPS12's digital mixer is a model of flexibility.



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



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

### Effects Inside

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

### It Wants To Be Your Friend

It's one thing to give you all the tools you need to do the job, but it's another thing entirely to make them useable. Here, the DPS12 really shines. It is, quite simply, **really** easy to use.

At the heart of its friendliness is its informative graphic display. Backlit and easy to read, it always gives you a clear picture of what's going on with your DPS12. Frankly, it's all so simple that most of you may never have to take the manual out of the box.

### Check It Out

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

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

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## LEERY ABOUT LINUX

**A**rgh! I keep referring people to your magazine as a good source for technical info. Yet it pains me when you print tripe like "...[Microsoft's] proprietary grip on the source code for that software, especially its Windows operating systems, makes it impossible for anyone who is not employed by the company to fix bugs or adapt the code for their own purposes." ("Tech Page: DIY OS," November 1998 EM.)

Categorically *false*. Please see the article from ZDNet, September 17, 1998, titled "Windows NT Now Open: Microsoft Jumps on the Open Source-Code Bandwagon." (You can find this article on the Web, at [www.zdnet.com/pcmag/news/trends/t980917b.html](http://www.zdnet.com/pcmag/news/trends/t980917b.html).) It discusses the reasons why Microsoft exposed Windows source code. Anyone who has the Microsoft Developer Studio compiler package gets the source code for all Microsoft Foundation Class (MFC) libraries, on which the OS is based. These tools allow developers to route around "buggy" OS libraries the same way Linux developers can.

Expecting technical support is idiocy if you try to "fix bugs" in software or adapt it for your own purposes. I cringe when I imagine a Sonic Foundry tech being asked to support *Sound Forge* running in some hacked-together NT "shell" written by a kid who's never written a software specification, much less planned, written, and tested an operating system.

Mr. Wilkinson's article parroted the "Rah rah Linux is an OS of the people, and everybody should write their own OS" line that is so popular today on usenet. Hey, rewrite the kernel, knock yourself out—just don't lie about the competition. I hope Linux does take off; it's a great idea. But please, just print facts and point people to real resources (like you've done in your coverage of CSound), rather than talk pie-in-the-sky.

**Bruce Bullis**  
brooce@concentric.net

*Bruce—You warn of the problems with unregulated Linux development by any number of more or less qualified programmers. As I pointed out in "Tech Page," however, Linux development is not unregulated. Proposed changes are routed through specific individuals who verify that the changes are valid and incorporate them into the "official" versions of the OS, which are then distributed via several vendors and the Internet. Of course, developers don't have to follow this procedure, but they risk creating an incompatible version if they ignore it.*

*In terms of support, it seems to me that a large community of technically savvy users is an excellent resource. Someone in this community will have probably encountered the same problem you are facing and be able to help, even if a manufacturer can't.*

*The ZDNet article about Microsoft opening the Windows NT source code appeared after my article went into production, so I had no way of seeing it before publication. It's interesting to note that the ZDNet article clearly implies that Microsoft opened the Windows NT source code in response to the popularity of Linux.*

*After reading that article, I contacted Microsoft's PR firm and discovered that the Windows NT source code has always been available—but only to a very select group of developers who must meet certain strict criteria. According to the PR firm, Microsoft operates under a very different business model than the one embraced by the Open Source Software community. (No kidding!) In a related note, some very interesting internal Microsoft documents regarding the OSS movement and Linux were recently leaked and are available on the Open Source Web site ([www.opensource.org/halloween.html](http://www.opensource.org/halloween.html)).—Scott W.*

## SIGNAL DELAY?

**Y**our reviews for digital mixers have recently included a new "signal delay" spec (usually about <2.5 ms), appearing in the product specifications tables. How does this delay in signal compare to that of an analog mixer or an ADAT-based system (with an analog mixer)?

**Jeff P.**  
jeffperrin@sprynet.com

*Jeff—Although we have just started to see this spec included in digital mixer literature, the signal-delay issue has been around since the dawn of digital technology. Inherently, all digital equipment—from multi-effects processors to digital audio workstations—is subject to this phenomenon, due largely to the conversion of analog audio into binary format (and vice versa). Generally, units with better designs exhibit shorter delays; in other words, the more you pay, the less delay.*

*When all is said and done, these delay times aren't really long enough to warrant concern—a 2.5 ms delay isn't even audible. True, it may be long enough to cause phase problems with higher frequencies (upward of 15 kHz) when monitoring the "processed" signal (i.e., through the mixer) along with the direct one. In reality, though, this circumstance will rarely present itself.*

*An analog mixer will not exhibit a delay, but an ADAT will. In order compare a digital mixer to an analog mixer/ADAT setup,*

**e** | musician

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## ● LETTERS

*you'd have to find out the signal delay of the ADAT's playback electronics—a spec that might be tricky to find.—Jeff C.*

### DON'T TREAD ON ME

I feel compelled to comment on a couple of points made in the article "Sounds Like a Winner" (October 1998 *JAM*) by Brett Ratner. I am a professional of 30 years having worked with several major artists in many major venues. Articles like this one may educate engineers, but they also widen the gap between engineers and musicians.

The article states, "It is wise for drummers to bring two or three snares...This gives the engineer the option of choosing the snare tone..." As a professional drummer and studio owner and engineer, I can appreciate the consideration of room acoustics. I firmly believe, however, that it is the engineer's job to capture the sound of an instrument. Only in extreme circumstances should a musician have to contour his instrument for the engineer.

Instruments have a wide range of tonal and psychoacoustic traits that good musicians spend their time and develop-

ment discovering. Don't handcuff them if you don't have to. Work with them.

As for the plea to drummers to sing loud or not sing at all, if a drummer is a great singer, find a way to let him or her sing. It's frustrating when engineers automatically place roadblocks in front of performers. There are many possible solutions (or at least improvements) for the singing drummer, including headsets, footswitch mutes, hypercardioid mics, and mic positioning.

I also object to this comment: "If you build a mix around the drums, the mix tends to be much louder." I'm sorry, but turn the drums down! A mix is only as loud as you make it. If someone is overplaying a room, then it is the engineer's responsibility to diplomatically approach the musician and explain it. If the musician won't listen to reason, perhaps the venue management must be brought into the situation. (Nothing like nonpayment to get a musician to turn down.)

My point is that engineering should represent music—not the other way around.

**Andy Peake**  
Nashville, TN

*Andy—As one who has been both a sound person and a professional musician, I agree with some of your points. However, let's look at the other side for a moment.*

*First, the point of bringing several snare drums to a gig—as explained in the article—is to get a good sound for the audience. Getting a good drum sound for the band is desirable but definitely secondary.*

*In a studio, you hear the same tracks that the engineer and the customer hear. But in a live situation, the band cannot hear what the audience hears; the engineer can. Like you, I have played major venues and shows, and I have found that the musicians I respect the most understand what the engineer is trying to accomplish and are willing to cooperate. If bringing a few snares and working with the engineer to pick the best one will result in a better sound for the audience, so be it.*

*On the other hand, I, too, was amazed and appalled that Mike Willemain advised drummers not to sing. I've worked with drummers who were superb singers, and I wrote vocal parts for them whenever I could. So I heartily agree with you on this point. Willemain is a reputable club engineer; he gave us his professional opinion, and we reported it. That doesn't mean we agree.*

*When he advises against building a mix around the drums, Willemain is simply offering practical tips on how to get a mix at sound check that will hold up in the heat of performance, even if the band kicks it into a higher gear. Drums are usually acoustically louder than anything else, and the engineer has less control over the drummer's stage sound than over most other instruments. Structuring the mix around the vocals—a relatively soft but vitally important element that usually needs to be on top of the mix—seems an entirely reasonable way to approach the situation.*

*Engineers and musicians must work together or neither can do their job properly. Neither exists merely as an adjunct to the other.—Steve O.*

### WE WELCOME YOUR FEEDBACK.

Address correspondence and e-mail to "Letters," Electronic Musician, 6400 Hollis Street, Suite 12, Emeryville, CA 94608 or [emeditorial@intertec.com](mailto:emeditorial@intertec.com). Published letters may be edited for space and clarity.

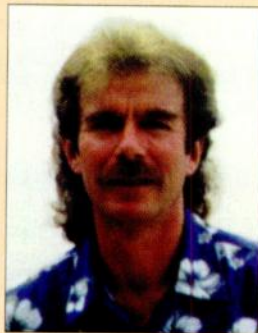
### MEET THE "ULTIMATE PERSONAL STUDIO GIVEAWAY" WINNER!

Congratulations to Frank Holden, winner of *EM*'s "Ultimate Personal Studio Giveaway"! Holden's name was drawn on October 15, 1998, as the winning entry for a prize totaling \$32,821 in home studio gear.

Holden is currently employed in electronics at the KECK Observatory atop Mauna Kea Mountain (the largest astronomical observatory on the planet, at 13,700-foot elevation), and he is a partner in Magical Island Sounds. He built his own hydrophones (submersible microphones) and preamps for recording to DAT. With this setup, he has produced two pure-nature CDs: *Celebration of the Hawaiian Spinner Dolphin* and *Council of the Humpback Whales*. His next step is to add music to his recordings. His dream is to present interspecies communication between dolphins and humans using the gear he won in this contest.

Holden's background is in low-noise preamp design, audio processing, and radio communications, and he was involved in developing the first medical ultrasound scanner. His other electronics-industry projects include mobile robots, wireless headsets, and hard drive engineering. Frank and Magical Island Sounds are located in Kailua-Kona on the big island of Hawaii and can be contacted at tel. (800) 341-3680; Web [www.magicisle.com](http://www.magicisle.com).

Congratulations to Frank Holden, and special thanks to all the participating manufacturers: Akai, Alesis, Audix, Audio-Technica, Beyerdynamic, Drawmer, Electro-Voice, Furman Sound, Lexicon, Neumann, Quantegy, Rane, Switchcraft, Tannoy, Tascam, and Yamaha.





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WRB



the new legend

# WHAT'S

# NEW

By Carolyn Engelmann and Rick Weldon



## ▲ OP CODE DATPORT

**T**he DATport (\$249) from Opcode is the first of the company's hardware products that is designed for use with Universal Serial Bus (USB) ports on PCs running Windows 98. (Apple, with technical help from Opcode, plans to release Mac drivers in early 1999.) Designed to simplify digital audio transfers to and from USB-equipped computers, the DATport lets you connect to USB ports without having to install cards or configure IRQs or DMAs within the system. In addition, it's unnecessary to configure I/O addresses, and you can install the unit without turning off or restarting your computer.

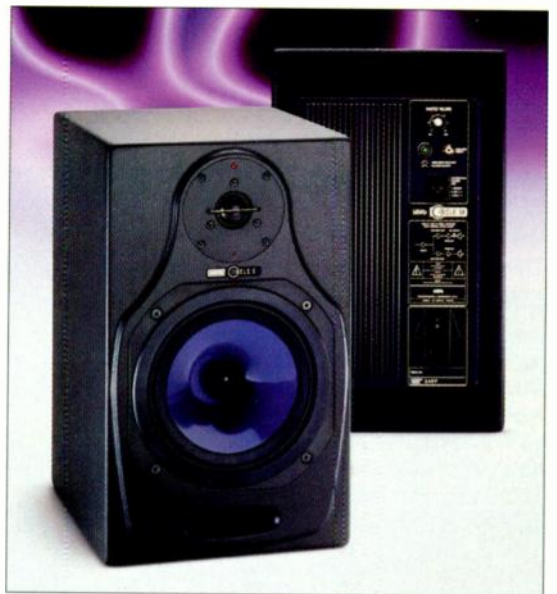
This 2-channel box provides input and output for S/PDIF signals via coaxial RCA connectors. You can connect several DATports simultaneously and select between multiple S/PDIF-equipped digital devices (with one device active at a time). Sixteen- and 24-bit resolutions are supported, as are 44.1 and 48 kHz sample rates. A 6-foot USB cable is included. Opcode Systems; tel. (650) 429-2400; fax (650) 856-0777; e-mail info@opcode.com; Web www.opcode.com.

Circle #401 on Reader Service Card

## ▼ HNB CIRCLE 5

**A**vailable in active and passive versions, HNB's two-way Circle 5 monitors (\$1,399 active; \$749 passive) incorporate a ferrofluid-cooled, soft-dome tweeter and an 8-inch, injection-molded polymer cone bass/mid driver in a rigid, seamless, nonresonant cabinet. The bass/mid driver, which varies in thickness across its diameter, is designed to reduce resonant frequencies that could add to low-frequency distortion. Its cone connects to a voice coil housed within a field-canceling magnet, shielding the monitor for use with computer and video monitors. Both the active and passive versions have a crossover set at 2.6 kHz, and each features a Polyswitch solid-state overload-protection circuit on the tweeter.

The active Circle 5s are powered by 120W RMS amplifiers for the low/mid driver and 70W RMS amps for the tweeters. Separate amps are integrated within each enclosure. The amplifiers are equipped with a large toroidal transformer and a heat sink located on the rear of the monitor. The active Circle 5 system also features Sallen and Key active filters to help minimize ringing in the



mid-range frequencies. These active filters are meant to reduce ear fatigue during long sessions.

HNB rates the frequency response for both versions at 48 Hz to 20 kHz ( $\pm 3$  dB). The active Circle 5's input is on balanced XLR and unbalanced RCA connectors (switchable); the passive version features binding-post inputs, which can also be used to accept 4 mm banana plugs. Suggested amplifier power for the passive monitors is 30 to 200W. HNB Communications; tel. (310) 319-1111; fax (310) 319-1311; e-mail sales@hnbusa.com; Web www.hnb.co.uk.

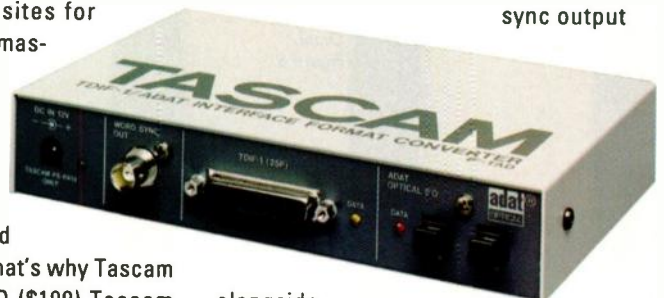
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## ▼ TASCAM IF-TAD

**M**igratory recording sessions have become commonplace in this digital age; it's easy to toss a digital recording medium into your bag and take it around to various sites for tracking, mixing, and mastering. Not all studios use the same recording format, though, and some facilities incorporate multiple types of tape decks and hard-disk recorders. That's why Tascam introduced the IF-TAD (\$199) Tascam TDIF to Alesis ADAT Optical (and vice versa) format converter.

The IF-TAD is a small (less than one rackspace), straightforward, no-nonsense unit that supports up to 24-bit,

48 kHz audio. The 25-pin TDIF-1 port and the ADAT Optical I/O each have an LED to indicate data flow. The converter can generate word clock from the ADAT port, and there is a word clock sync output



alongside the external power-supply jack. Tascam; tel. (323) 726-0303; fax (323) 727-7635; faxback (800) 827-2268; Web www.tascam.com.

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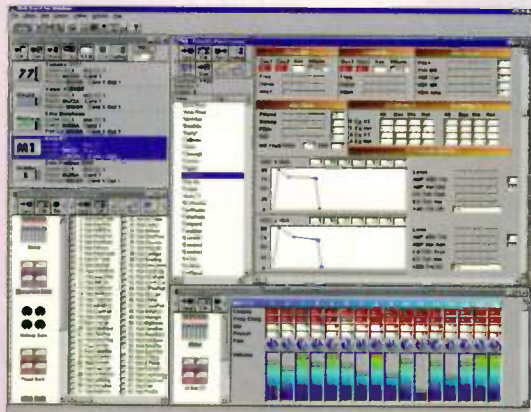
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# REV UP ▲ ▲ ▲ ▲



## ▲ SOUND QUEST

Sound Quest has released three new versions of the company's editor/librarian software for Windows PCs. Now shipping are *Midi Quest Universal Editor/Librarian*, v. 7.0 (\$249; upgrade \$79); *Solo Quest Individual Editor/Librarian*, v. 7.0 (\$99; upgrade \$39); and *Midi Quest Jr. Universal Librarian*, v. 7.0 (\$79; upgrade \$35).

All three programs feature new or enhanced support for more than 90 instruments, including Kurzweil's K2000- and K2500-series keyboard workstations; Korg's Z1, Prophecy, and N-series synths; Roland's JV-2080; Alesis's Nano-series synths and signal processors; Ensoniq's MR series; Kawai's K5000-series synths; and more. The new version

of *Midi Quest*, the company's flagship product, now supports more than 360 instruments altogether.

*Midi Quest* v. 7.0 also boasts enhancements and new features such as a Microsoft *Explorer*-style graphic interface, pop-up menus, enhanced search and sort functions with Primary and Secondary search functions, background processing (32-bit

version only), and import/export functions for SysEx messages. A new Parent bank lets you view the individual patches that make up combinations, and a Child bank lets you see which combination sounds are using a particular patch. Also new to the program is multiple undo, which is limited only by the host computer's processing power, for patch and bank editing. *Midi Quest* 7.0 comes with a collection of more than 57,000 patches, organized into Libraries and Patches.

Each of the new pro-

grams is available in 16- and 32-bit versions, and each will operate on PCs running Windows 3.1, 95, 98, or NT. Sound Quest; tel. (800) 667-3998 or (250) 478-9935; fax (250) 478-5838; e-mail sales@squest.com; Web www.squest.com.

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## ▼ EMAGIC

Emagic has released version 3.6 of its cross-platform *Logic Audio Gold* (\$499) and *Logic Audio Platinum* (\$799) digital audio sequencers. Registered users of version 3.5 can download the update free of charge from the company's Web site.

Both *Gold* and *Platinum* feature new support for Digidesign's Project II digital



## ▼ JOEMEER SC2.2

The SC2.2 stereo compressor (\$1,499) from Joemeek uses photo-electric compression to maintain accuracy and handle short attack times. With two linked channels on balanced Switchcraft XLR connectors, the 2U rack-mount unit can be used in stereo or mono.

The front panel of the SC2.2 features a VU meter that is switchable between

gain reduction and gain input level. A nonlinear Slope knob offers five compression ratio settings from 2:1 to 10:1. The amount of compression is controlled by the Compression knob, which also determines the amount of drive to the sidechain.

Additional rotary knobs control attack and release times and input and output gain, and a Bypass button is available

with two LED indicators to show whether the unit is in or out of bypass mode.

The SC2.2 can take a maximum input level of +28 dBu and has an input impedance that is 20 K $\Omega$  resistive; the maximum system gain is 20 dB. The unit's frequency response is 5 Hz to 30 kHz, with distortion rated at 0.004% (100 Hz to 10 kHz at all levels). The signal-to-noise ratio is >-94 dBu at 20 Hz to 20 kHz. Crosstalk is <-60 dB at 10 kHz. Peninsula Marketing, Inc. (PMI) (distributor); tel. (877) 563-6335 or (310) 373-9129; fax (310) 373-4714; e-mail themeekman@joemeek.com; Web www.joemeek.com.

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audio card, and *Logic Audio Platinum* offers support for the Digidesign Pro Tools MIX 24 core system. When used with Project II, *Logic* allows up to 32 tracks of playback, with 8 buses and 16 channels of input and output. Although 24-bit recording is possible only with the *Platinum* version, both *Gold* and *Platinum* can play back 16- and 24-bit tracks simultaneously. In addition, with version 3.6, you can open and play WAV files without having to first convert them, and you can mix and match AIFF, SDII, and WAV digital audio files in any given session.

On the Mac side, other new features include support for Bitheadz's *Retro* software synthesizer and for ASIO-compliant audio interfaces, including the MOTU 2408 and Lexicon Studio.

For Windows 95 and 98 users, version 3.6 supports Yamaha's DSP Factory and 01V digital mixer, offering up to 16 tracks of playback per card (Mac users can work with the DSP Factory when Yamaha releases ASIO drivers). Each track can use up to four equalizers as well as gain attenuation, phase flip, delay, compression, and more. Emagic; tel. (530) 477-1051; fax (530) 477-1052; e-mail infoemagic@emagicusa.com; Web www.emagic.de.

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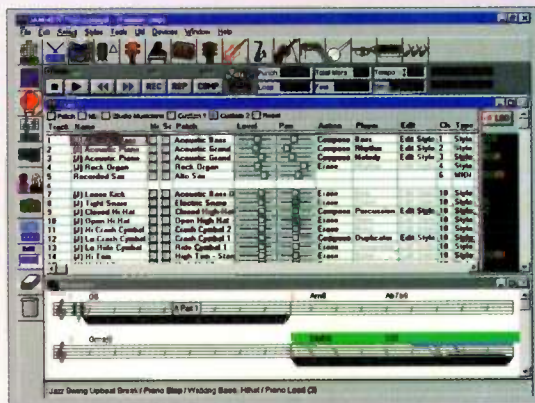
## ▼ SOUNDTREK

SoundTrek's *Jammer Professional* v. 4.0 (Win; \$129) features many new track editing and processing functions. In addition, version 4.0 of the MIDI auto-accompaniment/composition software adds support for format 0 Standard MIDI Files, allowing you to load songs from and save songs to a single track.

The *Jammer* now allows Piano Roll editing, so you can add, delete, or move notes; adjust start times and note durations; and change Velocity settings in real time while the program scrolls through your selection. There's also a new MIDI Controller editor, and a Controller Fill feature has been added to the Edit menu that allows you to add a stream of MIDI controller events to create effects such as panning sweeps and fades. With the *Jammer Professional's* new Event List editing, you can add, delete, and move note, Program Change, and Bank Select messages. In the Measures window, you can click on and drag chords to move or copy them.

New Velocity Compressor and Ex-

pander functions let you adjust the overall dynamic range of a selected track, and there are new quantizing and humanizing features, as well. A new Tempo Change feature lets you use multiple tempos within a single



song. You can make individual tempo adjustments or automatically insert a stream of tempo changes to simulate accelerando and ritardando.

The *Jammer* runs under Windows 3.1, 95, or 98 and requires at least 4 MB RAM and 9 MB free hard-disk space. SoundTrek; tel. (800) 778-6859 or (770) 623-1338; fax (770) 623-3054; e-mail sales@soundtrek.com; Web www.soundtrek.com.

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## ▶ CM AUTOMATION MOTOR MIX

For complete hands-on mixing control with your digital audio workstation, CM Automation presents the Motor Mix (\$995.99) automated fader control surface. The compact unit (10.5 x 12.5 inches) has a 40 x 20-dot LCD that displays all of your channel information, I/O assignments, effects parameters, and more, so your computer monitor is free for displaying other data from your DAW.

CM boasts the smoothness of Motor Mix's eight 100 mm motorized faders, which control mix levels, and its eight nondetented rotary knobs, selectable for panning, aux send levels, EQ, dy-

namics, and more. An LED shows your assigned rotary pot functions. A bevy of tactile



buttons outfitted with color-coded LED indicators control muting and

soloing, record ready, automation enable, and effects in/out.

MIDI In and Out ports are provided on the back panel. You can control as many channels as you want by grouping them, which you can do by using the Group and Banks switches on the top panel. CM Automation; tel. (888) LUV-MIDI or (818) 709-4732; fax (818) 709-4039; e-mail pmontes@cmautomation.com; Web www.cmautomation.com.

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▶ **YAMAHA FS1R**

Yamaha's new FS1R tone generator (\$999.95) combines two synthesis concepts to provide new possibilities in sound creation. Along with updated FM synthesis—based on the technology used in Yamaha's classic DX-series synths and TX-series tone generators—the FS1R employs formant-shaping (FS) synthesis capable of giving human vocal patterns to your sounds.

The FS1R synth engine comprises two eight-operator systems—one "voiced" and one "unvoiced"—that each digitally simulate the source (i.e., an oscillator or noise generator) and the formant filter. Controllable parameters include level, center frequency, and the width and shape of the filter's response curve. Ninety preset formant sequences are



provided for producing voicelike phrases or rhythm loops.

Modulation sources include two LFOs, a dynamic filter, and pitch and filter envelope generators. An effects section offers 3-band EQ in addition to three separate effects blocks with reverb, chorus, delay, and more.

The front panel of the FS1R features a large LCD screen that displays all parameters. The unit's four knobs may be used as attack, release, formant, and FM parameter controls; as data-entry controls; or as user-assignable real-time parameter controls.

The synth can read DX-series programs, and a complete set of 1,408 orig-

inal DX-series Voices is included. The unit also comes with 384 Performance presets, and memory is provided for 128 user-defined Voices and 128 programmable Performances.

The back panel of the FS1R presents two pairs of ¼-inch outputs: one pair is for left and right stereo; the other pair, labeled "individual output," allows you to send two separate Performance parts to different channels for separate processing or mixing. Of course, you get MIDI In, Out, and Thru ports. Yamaha Corporation of America; tel. (714) 522-9011; fax (714) 739-2680; e-mail info@yamaha.com; Web www.yamaha.com.

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▶ **CYCLING '74 PLUGGO**

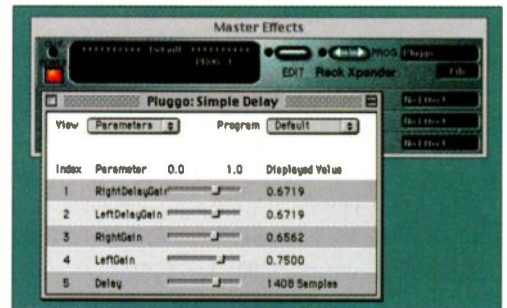
Users of Cycling '74's *MSP* can now create their own VST-format DSP plug-ins with Cycling '74's *Pluggo* (Mac; \$74). *Pluggo*'s interface offers a view of sliders showing the levels of all effects parameters. An alternate view shows the *MAX* interface, in which the user can directly tweak the patch's parameters. The latter view can be disabled if you want to share a patch without giving away your secret algorithm. Cycling '74 provides a *Pluggo*-of-

the-Month Web page to which users can submit their favorite *MSP* patches and download others'.

To use *Pluggo*, you need a Power Mac with Opcode *MAX3.5* or higher, *MSP*, and any VST-compatible host program. Cycling '74 offers *Pluggo* bundled with *MSP* for \$295; a superbundle will also be available with both *MSP* and *MAX* (price to be announced). Cycling '74; tel. (415) 621-5743; fax (415) 621-6563; e-mail info@

cycling74.com; Web www.cycling74.com.

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▶ **MCDSP FILTER BANK**

Colin McDowell's recently founded company, McDowell Signal Processing, boldly pronounces its new *Filter Bank* EQ plug-in (Mac: \$495 TDM/AudioSuite; \$195 AudioSuite only) to be "every great-sounding EQ ever made, in one plug-in." The basis of this

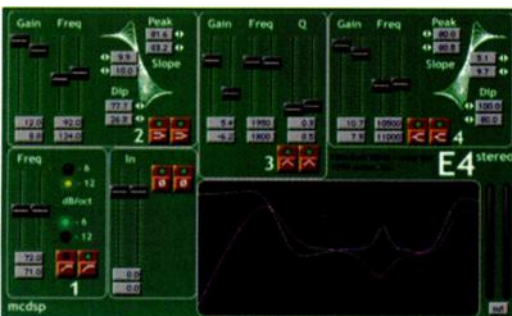
claim is the extensive control users have over all parameters. McDowell, the mind behind Pro Tools' MultiShell DSP processing design, programmed *Filter Bank* to have optimum processing power: it is able to run up to 24 EQ bands or filters per DSP Farm chip and up to twice that much on the new Pro Tools MIX cards.

*Filter Bank* offers a comprehensive list of filter types, including low and high shelving; lowpass and highpass with resonance; parametric with up to 5-octave bandwidth; bandpass; and band reject. All can be applied in stereo or mono and in two, four, or six bands. The plug-in comes with presets emulating a variety of tube-driven

and solid-state equalizers, and it allows customization of critical parameters such as peak, slope, and dip for shelving filters. It also lets you customize slope and resonance for low- and highpass filters.

Double-precision arithmetic is used for 48-bit processing, giving *Filter Bank* a noise floor at -144 dB (true 24-bit noise floor). Analog saturation modeling is applied to prevent digital clipping. The filters respond to a frequency range of 20 Hz to 21 kHz, and the shelving and parametric EQs offer ±12 dB gain. The plug-in supports Pro Tools and Pro Tools MIX systems; for control automation, *Pro Tools* 4.0 or higher is required. McDowell Signal Processing; e-mail fbinfo@mc dsp.com; Web www.mcdsp.com.

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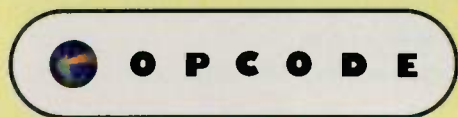
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## MICROPHONE CABINET ▲ ▲ ▲ ▲

### ▶ MARSHALL ELECTRONICS/MXL

**M**arshall Electronics, longtime purveyor of cables and connectors, has launched the MXL division to carry its new line of microphones. The first offering in this series is the 2001 (\$399), an affordable, large-capsule, gold-diaphragm cardioid condenser mic suitable for recording both vocals and instruments. According to the manufacturer, the microphone combines good clarity and presence with a warm, full tone.

The MXL 2001 features balanced transformer coupling to prevent signal loss through long cable runs. An internally switched highpass filter set to 6 dB/octave at 100 Hz makes this unit useful for close-miking applications. The case is made of machined brass and has a black finish.

The mic has an output impedance of 200Ω, takes a maximum SPL of 130 dB, and has less than 0.5% total harmonic distortion. The frequency response is 30 Hz to 20 kHz. Self-noise is 20 dB, and the signal-to-noise ratio is rated at 80 dB at 1pa (both A weighted). The MXL 2001 ships with a shock mount and custom aluminum road case. Marshall Electronics, Inc.; tel. (310) 390-6608; fax (310) 391-8926; e-mail [lmarsgo@ix.netcom.com](mailto:lmarsgo@ix.netcom.com); Web [www.mars-cam.com](http://www.mars-cam.com).

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### ▶ SHURE

**N**ew from Shure Brothers is the KSM32, a side-address cardioid condenser microphone designed for use with anything from vocals to brass to drum overheads, live or in the studio. The mic features transformerless preamplifier circuitry for linearity across the entire frequency range.

The KSM32 comes in a champagne-

colored finish (KSM32/SL; \$1,029) with an aluminum carrying case, a velveteen protective pouch, a swivel mount, and an elastic-suspension shock mount. It's also available in nonreflective charcoal gray (KSM32/CG; \$959), and this model comes with the swivel mount and a padded vinyl carrying bag.

The mic has two switches: one for attenuation of 15 dB to handle high-input SPLs; and a 2-level bass-cut filter for -6 dB/octave below 116 Hz or -18 dB/octave below 80 Hz. The capsule is protected by a triple-layer mesh windscreen for filtering pops and clicks, and it has an internal shock mount to minimize handling noise. The mic requires 48V phantom power.

With its embossed, high-compliance diaphragm, the KSM32 can handle low frequencies down to 20 Hz; frequency response extends up to 20 kHz. It has a dynamic range of 126 dB, with self-noise of 13 dB (A weighted). Maximum input SPL is 139 dB at 2.5 kΩ or 133 dB at 1 kΩ. Total harmonic distortion is less than 0.08% at 120 dB SPL. Shure Brothers, Inc.; tel. (800) 25-SHURE or (847) 866-2200; fax (847) 866-2279; e-mail [sales@shure.com](mailto:sales@shure.com); Web [www.shure.com](http://www.shure.com).

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### ▼ CTI AUDIO

**T**he VSM-1 large-diaphragm tube condenser studio mic (\$1,299) is the latest addition to CTI Audio's line of CAD professional microphones. Suitable for both vocal and instrument recording, the mic is designed with a servo-valve solid-state output stage to enhance frequency and transient response. According to CTI, the VSM-1



provides a warm tube sound while remaining transparent otherwise.

The VSM-1 has a single polar pattern (cardioid) and a 1.1-inch, gold-sputtered diaphragm designed to be resistant to humidity and temperature changes. It features a highpass filter switch for a 3 dB cut at 80 Hz and a switchable attenuation pad with settings for flat, -8 dB, and -16 dB.

Frequency response is rated at 10 Hz to 20 kHz, dynamic range at 118 dB, and THD at <0.5% at 132 dB SPL. Signal-to-noise ratio is rated at 79 dB and self-noise is 15 dB (A weighted). The maximum input level is 150.5 dB SPL.

The VSM-1 ships with an elastic-suspension shock mount, a power supply, and a 30-foot, professional-quality cable. CTI Audio; tel. (440) 943-0110; fax (440) 943-0104; e-mail [ctiaudio@suite224.net](mailto:ctiaudio@suite224.net); Web [www.cadmics.com](http://www.cadmics.com).

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# KEY CHANGES

**B**IAS has acquired *Deck* multitrack audio recording software from Macromedia. Version 2.6 (\$399) is now available, and BIAS has commenced development on version 3, which will include ASIO and VST support...**Emagic** announced that ASIO drivers for Audiowerk8 are available for download from the company's Web site, [www.emagic.de](http://www.emagic.de)...**Digidesign's** Toolbox for Macintosh bundle now includes BIAS' *Peak LE* and *SFX Machine Lite*...*Encore, MusicTime Deluxe, Master Tracks Pro, and Master Tracks Pro Audio*, which were originally products of **Passport Designs**, have been re-released by **G-Vox Interactive Music**...**TC Electronic** has slashed the price of its M2000 multi-effects processor to \$1,495, down from \$1,995. In other TC news, the company announced a new optional digital I/O daughterboard for the TC Unity effects plug-in card for the Yamaha 02R. The daughterboard features ADAT and TDIF connectors...**New Sensor Corporation** has acquired \$80 million in U.S. military JAN vacuum tubes. The selection includes models popular in guitar amps, such as 6L6s, 12AX7s, and 12AT7s, as well as subminiature tubes that can be used in tube mics and outboard gear. New Sensor has a complete inventory list on their Web site, [www.newsensor.com](http://www.newsensor.com)...For PC-based musicians, **AnTares** has released *AutoTune* as a DirectX plug-in (\$299)...**Metric Halo Laboratories** has announced support for **Digigram's** PCxpocket PCMCIA audio cards. This will allow Mac Powerbook users running MHL's *SpectraFoo* to use the analog and S/PDIF audio capabilities of the Digigram card...Portions of **Arboretum's** *Ray Gun* and *Hyperprism* applications have been licensed for inclusion in **Adaptec's** *Easy CD Creator Deluxe* v. 3.5.

—Rick Weldon

## ▶ ALESIS QS6.1

**T**he successor to Alesis's QS6, the new 61-key, 64-note polyphonic QS6.1 (\$999) represents the company's least expensive synth. The QS6.1's semiweighted keyboard responds to Velocity, Release Velocity, and Aftertouch, and it can be split into 16 zones. In addition to Pitch and Modulation wheels, there are four programmable data sliders and a volume slider. The unit also features a larger custom display and two new front-panel buttons: Transpose and Sequence Select.

Sounds on the QS6.1 are 16-bit linear, 48 kHz samples. There are 640 single programs and 500 multitimbral Mix combinations. Presets include a variety of digital and analog-style synths, brass, winds, guitars, drums, and the stereo Bosendorfer grand piano from Alesis's QS7 and QS8 synths. Each voice has a sweepable low-pass filter, three envelope generators (pitch, filter, and amplitude), three LFOs, and a programmable effects send with onboard reverb, chorus, distortion, delay,



rotary-speaker simulation, and more.

The synth ships with 16 MB of ROM, and two PCMCIA expansion card slots allow you to expand the onboard memory to 32 MB. These slots are also compatible with Alesis's QCard expansions and *Sound Bridge*, the included sample-transfer software for downloading and sequences and samples to 8 MB flash memory cards. A companion CD-ROM includes various free software, such as Steinberg *Cubasis* and MOTU *Unisyn*.

The QS6.1 has stereo Left and Right outputs on 1/4-inch connectors; a 1/4-inch headphone jack; MIDI In, Out, and Thru connectors; and a serial port for connecting to a Mac or PC. Alesis Corporation; tel. (800) 525-3747 or (310) 255-3400; fax (310) 255-3401; e-mail [alecorp@alesis1.usa.com](mailto:alecorp@alesis1.usa.com); Web [www.alesis.com](http://www.alesis.com).

Circle #415 on Reader Service Card

## ▼ AUREALITY BUILDING BLOCKS 1.1

**L**ike a MIDI Erector Set, *Building Blocks 1.1* (Win; \$29.95) from AuReality is a modular, multifunctional MIDI environment that gives you an array of bits and pieces that you can put together to produce many MIDI applications. You can select the functions you wish to combine, "wire" them together, and hear the results in real time.

You can begin by selecting an Input module to accept data from MIDI In messages or through your mouse or joystick and then route the information via MIDI Out messages. A number of mathematical operations are available, such as mapping, producing random values, and testing whether a pitch is in a particular scale. Sequencing functions are included, among them an arpeggiator, rhythm pattern sequencing, and record and playback structures. Timing modules provide functions such as MIDI Time Clock, quantizing, and delay, and you can also generate waveforms.

*Building Blocks 1.1* comes with a context-sensitive HTML help file, accessible with the F1 key and readable via your Internet browser, to assist you in building applications such as LFOs, controller maps, and autochord generators. The products you mastermind can be saved as Standard MIDI Files.

The program requires that you run Windows 95 or NT with at least 4 MB free RAM, and AuReality recommends that you have a Pentium 166 or faster. AuReality; e-mail [p.a.m.swennenhuis@rc.rug.nl](mailto:p.a.m.swennenhuis@rc.rug.nl); Web [www.midiworld.com/aureality/software/building\\_blocks](http://www.midiworld.com/aureality/software/building_blocks). ☉

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# PRO FILE

## Brave New World

Somatic's drum 'n' bass isn't heavy lidded.

By Rick Weldon

New York musician Hahn Rowe has applied himself to a variety of musical projects over the years. In the '80s, he tapped into the burgeoning alternative scene with his band Hugo Largo. Since then, he's produced tracks for David Byrne's *Feelings* and for the group Mimi (featuring Hugo Largo vocalist Mimi Goese) on the Luaka Bop label. His prowess on guitar and violin led him to work with underground musicians such as Jim Thirwell (aka Foetus) and indie supergroup Firewater. Rowe has also done music for PBS documentaries and independent films such as Lodge Kerrigan's *Clean, Shaven*. Now, newly incarnated as Somatic, Rowe turns his talents to the dance-floor stylings of drum 'n' bass with a fresh release entitled *The New Body*.

Somatic's studio, Barrio Chino, employs some personal-studio standards such as Yamaha NS-10s and a Mackie 24 8•Bus console. For instrumentation, Somatic relies mostly on samplers and synths—the workhorses of the drum 'n' bass genre. His synth arsenal includes, among other things,

the Waldorf Pulse, Roland MKS-50, Sequential Circuits Pro 1, and an ARP Odyssey modified by the company CMS. "The Odyssey is basically my hot rod," says Somatic. "CMS put a patch point on every module, which made it into kind of a mini ARP 2600. They also upgraded the filter and did a few other mods."

Though Somatic's background is experimental rock, the sonic staples of that genre are nowhere to be found on *The New Body*. "I've been obsessed with drum 'n' bass for the last four years, and I really wanted to follow a certain protocol in making this record. It's strange, because prior to this, I was always concerned about having original sounds. But now, to be legitimate, I feel like I have to use certain standard breaks, or at least portions of them. It's a way of showing your own twist on things."

Though Somatic downloaded some of his samples from the Internet, most were taken from vinyl using a Technics 1200 turntable. "I like a clear and punchy signal to work with," explains Somatic, "so I usually do a bit of EQ

or compression first, mainly to maximize my levels going into the sampler. From there on, I like to stay in the digital domain, using the EQ in Passport's *Alchemy* or my Roland S-760's compressor. When I boot up a song and load the samples, it's very close to being final. Even though the album sounds like there's a lot of production in it, most of it was recorded straight out of my sampler.

"But one thing I use extensively on every track is Steinberg's *ReCycle!* In fact, I would call *ReCycle!* one of my main instruments on this record. For instance, the song 'Knuckles' uses a very common break known as the 'Amen' break," continues Somatic, "which is basically what jungle music was built on. That break is from an old record by the Winstons called *Amen, Brother*. I *ReCycle!*d it down to the single-hit level. That way, I was able to individually pitch, filter, and put envelopes on every sound in the break. Yet when I play the parts in succession, the loop still has a 'playerly' feel. That ability to transform a familiar break is one of *ReCycle!*'s best features. If you're dealing with drum 'n' bass or jungle, you're bound to log a lot of computer hours, and for that, *ReCycle!* is indispensable."

For more information, contact *Caipirinha Records*; tel. (212) 766-1450; fax (212) 964-4075; e-mail [hrowe@att.net](mailto:hrowe@att.net); Web [www.caipirinha.com](http://www.caipirinha.com).



Hahn Rowe, aka Somatic



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## Kicking ASIO

*A new de facto standard for streaming audio.*

*By Scott Wilkinson*

As the new millennium approaches, it's clear that the audio functions of personal studios are migrating more and more into the domain of the computer. Processors are getting faster, mass storage is getting more capacious, and all computer components are getting less expensive. In addition, audio I/O hardware is becoming more sophisticated and higher in fidelity. Stereo interfaces are being supplanted with multichannel products that allow independent, simultaneous routing and processing of multiple audio streams.

Unfortunately, native audio support within the common operating systems has lagged behind recent developments in interface hardware. In particular, Windows and Mac OS include native support mainly for stereo I/O. In addition, these operating systems suffer from latency problems that make it difficult to synchronize simultaneous input and output audio streams.

Many companies have tried to address these problems by writing proprietary drivers for their audio hardware and software, but this approach doesn't help much when you want to use products from several different manufacturers. What's needed is a standardized audio-driver protocol that optimizes the communication between audio software and hardware within a computer, much like MIDI standardized the communication between synthesizers, comput-

ers, and other electronic music devices.

Among the most likely candidates for this important role is the Audio Stream Input/Output (ASIO) specification from Steinberg ([www.us.steinberg.net](http://www.us.steinberg.net)). This driver specification translates the basic capabilities of any given audio hardware into a common language for any audio software (see Fig. 1).

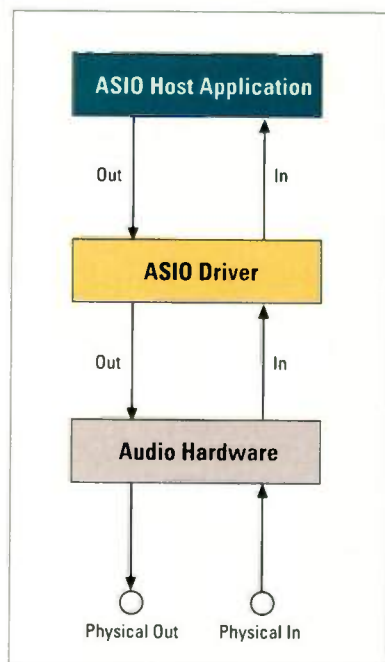
Chief among the goals of ASIO is to simplify the route taken by audio streams into and out of the computer. It bypasses the OS altogether, greatly reducing the latencies inherent therein. For example, the typical latency of native Windows MME sound-card support is as much as 750 ms; with ASIO, this is reduced to between 20 and 50 ms. The Macintosh fares even better, exhibiting latencies of about 5 ms under ASIO.

Another important aspect of ASIO is its support for multichannel audio. In fact, there is virtually no limit to the number of simultaneous audio streams that ASIO can support. (Actually, the limit is over 2 billion inputs and outputs, but who's counting?) The only practical limit is determined by the amount of data that can be accommodated by the audio hardware, CPU, and bus within the computer.

Steinberg makes the ASIO specification freely available to anyone, and as a result, it is gaining widespread acceptance within the computer-audio community. Many audio-interface manufacturers, such as Lexicon, Korg, Digidesign, Yamaha, Sonorus, and Event Electronics, are starting to include ASIO drivers with their products. On the applications side, Steinberg, MOTU, Opcode, and Emagic are among the

developers that support ASIO within their programs. There is even reason to believe that Apple is looking at incorporating ASIO into Sound Manager to provide multichannel I/O, but this could not be confirmed by press time.

The acceptance of a standard driver protocol is essential to the continued development of computer-based audio systems. By defining the simplest possible common interface between any host application and audio hardware, ASIO goes a long way toward meeting this need. And because it's completely platform-independent, ASIO is poised to become as important as MIDI in the realm of computer-audio hardware and software. ☉



**FIG. 1:** ASIO simplifies the connection between a host application and the audio hardware, bypassing the OS completely.

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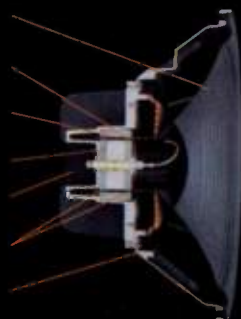


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# Web Weaving

By Alan Gary Campbell

Learn how to  
program your  
own web site  
and expose  
your music to  
the world.

**T**he World Wide Web is arguably the most powerful marketing tool yet developed for music. Nevertheless, musicians who routinely produce high-quality recordings and even CDs in their home studios often stop short of putting their music on the Web because they assume that they'll need complex software, an expensive commercial site, or a streaming server to do it. They don't.

If you have a fairly recent Mac or PC with Internet, audio, and MIDI capabilities, you're halfway there. Add to that some shareware or freeware and some basic knowledge of Web programming, and you're just steps away from having your music accessible by a potential audience of millions. With that in mind, let's take a look at how Web pages are constructed and how sound is added to a site.

## GETTING THE JUMP ON HTML

Pages on the Web are composed using a special tag-based markup language called HTML, or HyperText Markup Language. HTML uses tags enclosed in angle brackets to tell your browser—typically Netscape *Navigator* or Microsoft *Internet Explorer*—how the text, images, and links on your page should look. Tags often appear in pairs, to control the start and end of a format or function. For example, the following is a simple page coded in HTML:

html.









```
<HTML>
<HEAD>
<TITLE>A Simple HTML Page</TITLE>
</HEAD>
<BODY>
This is a simple page coded in
HyperText Markup Language.
</BODY>
</HTML>
```

The <HTML> tag tells the browser that this is a hypertext document. The pair of <HEAD> tags delimits the part of the document that typically contains the title (notice the pair of <TITLE> tags), copyright, or other information that doesn't go on the page itself. Similarly, the pair of <BODY> tags delimits the page code. The </HTML> tag denotes the end of the document.

In practice, you would probably add numerous other tags and tag attributes to your page to refine it. HTML is easy to work with because you can create and edit it with any text editor, such as *SimpleText* on the Mac or *Notepad* on the PC. There are many freeware and shareware HTML editors, too. In fact, if you're new to HTML, you should try to re-create the page above. Open your text editor and type in the code exactly. Save the file as a *plain text* file with the name "simple.html". (Microsoft Windows 3.x users can use the

shorter ".htm" extension.) Finally, open your favorite browser, and use the File Open command to look at your page.

If you want to get the jump on HTML basics before you try the examples in this article, there are countless HTML tutorials and reference sources on the Web (see the sidebar "Online Resources"). In addition, *Creating Web Pages for Dummies* and *The Complete Idiot's Guide to Creating an HTML 4 Web Page*, and *Creating Killer Web Sites* are helpful, commonly available self-tutorial books (see the sidebar "Further Reading" for other related books).

### GETTING A WEB SITE AND UPLOADING FILES

Most Internet services (even America Online and Prodigy) now provide a free individual Web site as part of their package. However, the space that such services offer is limited—sometimes to as little as one megabyte. If you can get along without the extra services furnished by AOL and others, you're better off getting an account with a provider that simply offers Internet dial-up service and a generic version of *Navigator* or *Explorer*. Some of these companies give 10 MB of space or more per individual account.

Your account or membership information should also supply details about how to access and maintain your site, and it may include special software to make uploading files easy. (*Navigator* version 2.0 and higher lets you upload files directly, if your provider is set up to accommodate this.) Generally, you'll send files to your site using a method called FTP, or File Transfer Protocol. You can also use a freeware or shareware program such as *Fetch* (Mac) or *WS\_FTP* (PC) for more control over site maintenance.

Your site will have an Internet address, or URL (Uniform Resource Locator), something like "http://www.myprovider.com/mydirectory/".

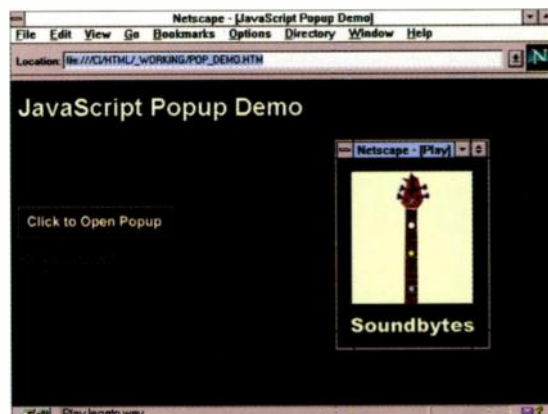


FIG. 2: Here is an example of a JavaScript-based multimedia pop-up.

The default file that the browser loads when this directory, or folder, is accessed is usually named "index.html" or "default.html", as required by your provider.

The full address of a file is called the *absolute URL*: for example, "http://www.myprovider.com/mydirectory/myfile.html". For an HTML document to reference files from the same directory, however, you can use the *relative URL*, which typically consists of the filename (in this case, "myfile.html").

### WEB SOUND FORMATS

Among the many multimedia formats used on the Web, four are important to the do-it-yourself Web programmer: Sun audio files (AU), Wave files (WAV), General MIDI files (MID or MIDI), and RealAudio files (RA or RAM).

Sun audio files are frequently encountered as 8-bit mono samples used for prompts, but the format will accommodate pro-quality stereo at 44.1 kHz and is the native file format for Java 1.x applets.

Wave files, familiar to Windows users, are typically 8-bit mono at low sampling rates. They are useful for short effects, greetings, and prompts, such as AOL's ubiquitous "You've got mail." However, they can also accommodate pro-quality stereo at 44.1 kHz and are more directly useful in creating Web sound files.

General MIDI files for the Web are comparable to those used for home recording. Although they are relatively small in size and download quickly, they depend on the quality of the user's sound-card electronics for good reproduction. A piano patch produced on a cheap FM-synth-based sound card



FIG. 1: Synttrillium's *Cool Edit* can convert files to RealAudio format.

# ULTIMATE SOUND MACHINES

## Gold Channel



### **DIGITALLY ENHANCED MIC PRE-AMP**

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

## M2000



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## M3000



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## Finalizer PLUS



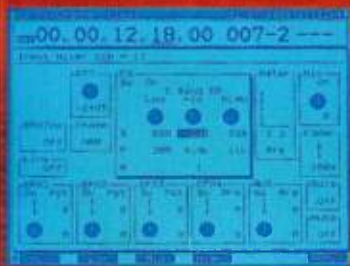
### **STUDIO MASTERING PROCESSOR**

The Finalizer Plus gives you the extensive and complete range of controls you need to add the finishing touches to your mix. Compared to the Finalizer Express the Finalizer Plus offers an even wider range controls allowing you to fine-tune every aspect of the mastering process.

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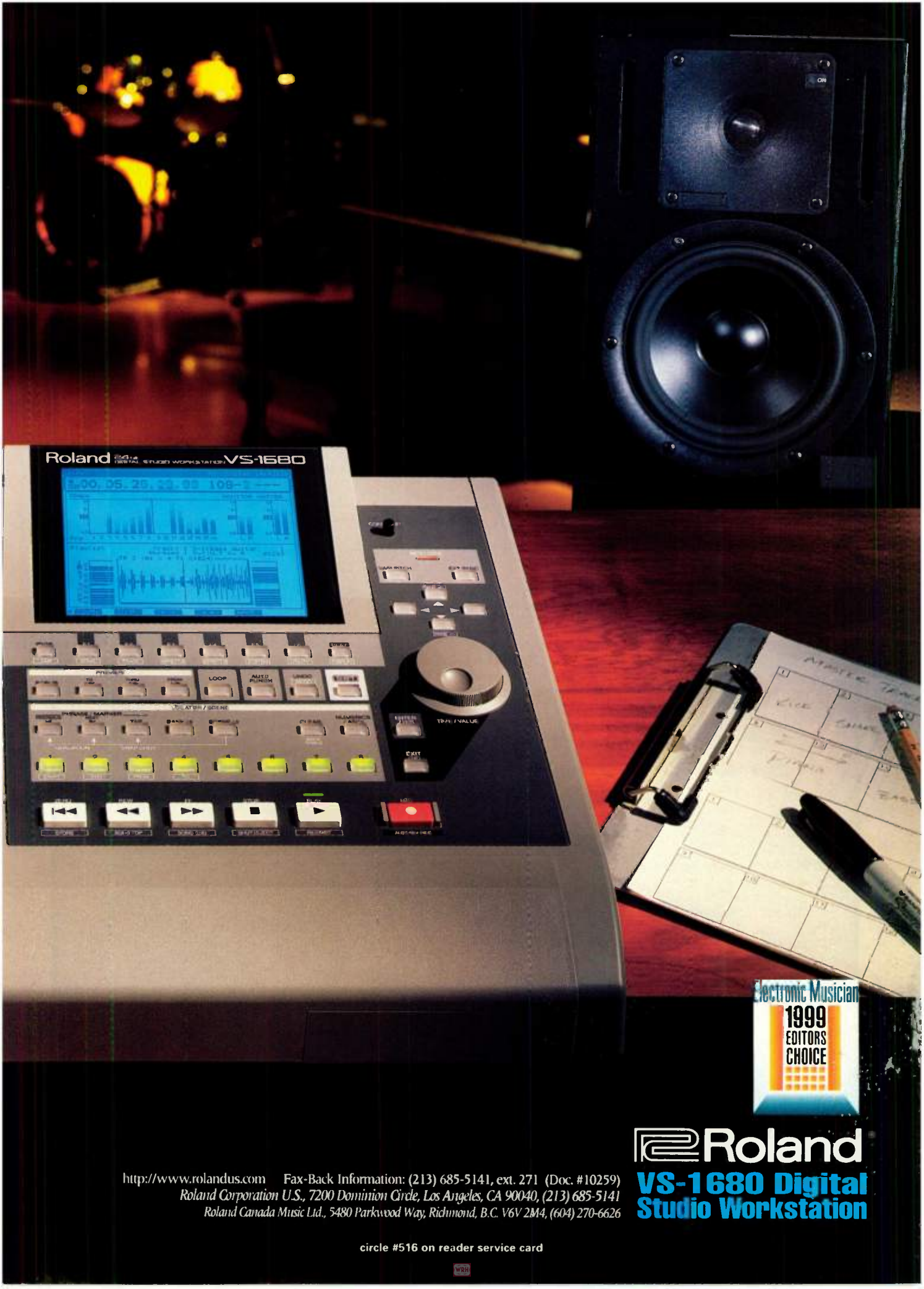


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can be practically unlistenable, while the same program produced on a wavetable-based card can sound quite convincing.

RealAudio format files are highly compressed audio files that sacrifice some sound quality for download speed. RealAudio files are intended to

be streamed to the user via a special server, so that—with a relatively fast Internet connection—he or she hears the music as it is sent, rather than having to wait for the entire file to download. RealAudio files can also be placed on a standard server in the same manner as a MIDI or WAV file. Substantial improvements have been made in RealAudio compression since its inception, and RealAudio players (plug-ins) come with the current versions of *Navigator* and *Explorer*.

### CONVERTING YOUR TUNES

Converting your tunes from cassette, DAT, CD, etc. to a Web-ready format is

a two-step process. First, you must get your finished master into your computer; then you must convert it to the desired format. You don't need to have a digital interface or a high-end sound card to accomplish this: you can create decent, Web-quality audio by recording through the analog inputs of a midlevel Sound Blaster card. For tests, I used a generic sound card purchased at a computer show for \$14; a Sound Blaster 16; and an Ensoniq Soundscape Elite. The Ensoniq card had superior fidelity, certainly, but the Sound Blaster and even the generic card were acceptable.

Midlevel and high-end sound cards

```
<HTML>
<HEAD>
<SCRIPT LANGUAGE="JavaScript">
<!--Start

if (navigator.appName == "Netscape") {
  var sFormat = "toolbar=0,location=0,directories=0,status=0,menubar=0,scrollbars=0,resizable=1,width=175,height=220"
}
else {
  var sFormat = "toolbar=0,location=0,directories=0,status=0,menubar=0,scrollbars=0,resizable=1,width=155,height=190"
}

function popUp() {
  if (navigator.appVersion.indexOf("Win") == -1 && navigator.appName == "Netscape" && navigator.appVersion.charAt(0) < 4) {
    myPopup = open("", "myPopupWin", sFormat)
    myPopup.location.href = "http://www.myprovider.com/mydirectory/mypopup.html"
  }
  else {
    myPopup = open("mypopup.html", "myPopupWin", sFormat)
  }
  if (myPopup.opener == null) myPopup.opener = window
}

<!--End-->
</SCRIPT>

<TITLE>JavaScript Popup Demo</TITLE>
</HEAD>

<BODY BGCOLOR="#000000" TEXT="#F8F8E0" LINK="#787878" VLINK="#787878" ALINK="#000000">

<FONT SIZE=6 FACE="Arial, Helvetica, Verdana"><B>
JavaScript Popup Demo<BR>
</B></FONT>
<BR>
<BR>
<A HREF="javascript:popUp()" onMouseOver="status='Click to open a multimedia popup.'; return true" onMouseOut="status=''; return true"><IMG SRC="graphic.gif" BORDER=0 HEIGHT=37 WIDTH=182 ALT="Click to open a multimedia popup"></A><BR>
<FONT SIZE=2 FACE="Arial, Helvetica, Verdana">
<A HREF="mypopup.html">AOL users click here</A><BR>
</FONT>
<BR>

</BODY>
</HTML>
```

FIG. 3: Above is the code for the main page shown in Figure 2.

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*"... breathes life back into the blighted world of General MIDI."*



**Roland UK's PowerOn Magazine**  
*"Phat•Boy connected to an MC-303 gives you back a whole new panel to access all the filters... will help you get loads more out of your Roland equipment without any effort at all."*

**Jeff Obee in EM**  
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are typically bundled with recording software, such as Voyetra's *WinDAT*, which you can use to record high-fidelity WAV files directly from your sound card's inputs. WAV files, however, are large: one minute of 8-bit stereo audio sampled at 11 kHz produces well over a megabyte of data, which is too big for most Web use. You can easily convert WAV files to compressed, RealAudio format with the free *RealEncoder* software from RealNetworks. (For more about working with RealAudio files and preparing audio for the Web see "Launching into Cyberspace" in the July 1998 issue of *EM*. Also, for a primer on audio file compression, see "Square One: Space Savers" in the same issue.)

*RealEncoder* is available for Windows 95/98/NT, Mac OS, Linux, and many other platforms. In addition, some edit-

ing packages can convert to RealAudio format directly. For example, Syntrillium's *Cool Edit* (available as shareware for the PC) can save files in more than 15 formats, including WAV and RealAudio (see Fig. 1). Adding some mild EQ and dynamic compression is advisable for Web sound, and you can accomplish this within the editing software. (*Cool Edit* is very handy for this.)

With high data-compression ratios, compressed files can be as small as 10 to 20 percent of the original file size. Therefore, it can be tempting to convert whole songs to RealAudio format. However, if the purpose is to generate interest in sales of recordings, and Web space is limited, short excerpts of several songs may be more effective.

#### LINKING TO SOUND FILES

Sound files in all formats can be uploaded to your directory and linked normally, as if they were hypertext documents or images. For example:

```
<HTML>
<HEAD>
<TITLE>Linking to Sound Files</TITLE>
</HEAD>
```

```
<BODY>
<A HREF="breaking.ra">Download
"Breaking Wind," the title track from our
new CD</A><BR>
<BR>
<A HREF="break_me.mid">Or download
just the groove tracks, in MIDI
format</A>
</BODY>
</HTML>
```

This is true even for RealAudio files, although there is a limitation: when RealAudio files are placed in a directory on a conventional server, they won't stream as effectively as they would with a streaming server.

When a sound-file link is clicked, the action of the user's browser will depend on the multimedia capabilities of his or her computer and the browser setup. Typically, a generic player or a multimedia helper application, such as *RealPlayer*, will pop up and play the file, or the browser will prompt the user for action to save or open the file.

#### OPENING A PLAYER AUTOMATICALLY

A special `<META>` tag in the HTML header can direct the browser to a new

```
<HTML>
<HEAD>
<TITLE>Play</TITLE>
</HEAD>

<BODY BGCOLOR="#000000" TEXT="#FFFFFF" LINK="#0000FF" VLINK="#0000FF" ALINK="#000000" onLoad=
"setTimeout('close()', '180000')">

<CENTER>

<TABLE BORDER=0 CELLSPACING=0 CELLPADDING=0>
<TR>
<TD>


<A HREF="legato.wav" onMouseOver="if(window.opener)opener.status='Play legato.wav.'; return true"
onMouseOut="if(window.opener)opener.status="; return true"><IMG SRC="top.gif" BORDER=0 HEIGHT=80
WIDTH=145 ALT="Play legato.wav"></A><BR>
<A HREF="slap-pop.wav" onMouseOver="if(window.opener)opener.status='Play slap-pop.wav.'; return true"
onMouseOut="if(window.opener)opener.status="; return true"><IMG SRC="middle.gif" BORDER=0 HEIGHT=38 WIDTH=145 ALT="Play
slap-pop.wav"></A><BR>
<A HREF="note.wav" onMouseOver="if(window.opener)opener.status='Play note.wav.'; return true"
onMouseOut="if(window.opener)opener.status="; return true"><IMG SRC="bottom.gif" BORDER=0 HEIGHT=75 WIDTH=145 ALT="Play
bass.wav"></A><BR>

</TD>
</TR>
</TABLE>

</CENTER>
</BODY>
</HTML>
```

FIG. 4: Pictured above is the code for the pop-up itself.





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file automatically. If this file is a sound file, it will pop up a player (or prompt the user, as described earlier):

```
<HEAD>
<META HTTP-EQUIV="REFRESH"
CONTENT="20; URL=break_me.mid">
```

*The rest of the user's HEAD code goes here...*  
</HEAD>

Basically, this code instructs the browser to load the file "break\_me.mid" 20 seconds after it loads the main HTML document that contains the META tag. Note the syntax and use of quotes; both are critical. This method works with both older and newer browsers. However, it has a drawback in that it loads the new file at a predetermined interval; there is no way to ensure that all the images and other elements on the main page have already finished loading.

Alternatively, you can use a JavaScript "event handler" in the <BODY> tag to achieve a similar result (I'll discuss JavaScript in more detail later):

```
<BODY BGCOLOR="#000000"
TEXT="#F8F8E0" LINK="#FF0000"
VLINK="#787878" ALINK="#000000"
onLoad="location.href='break_me.mid'">
```

This instructs the browser to load the sound file *after* the main page has fin-

ished loading. Only *Navigator 2* and *Explorer 3* or higher support JavaScript; older browsers will ignore the added code. Be careful to enter the combination of single and double quotes in the onLoad statement in the correct position and sequence.

### BACKGROUND SOUNDS

Background sounds play automatically when your page loads. Both *Navigator* and *Explorer* support background sounds but use different methods. You can use both methods on the same page; they don't interfere with one another. Background sounds can be MIDI or WAV files, but they are best reserved for short greetings and musical excerpts, which add initial interest, yet don't overstay their welcome. Unfortunately, the implementation of background sound capability is inconsistent across browsers and platforms. In general, *Explorer* handles this function more reliably, so much so that I often omit the *Navigator* background-sound code from commercial pages.

To add a background sound in *Explorer*, add the following code somewhere in the body of the HTML document:

```
<BGSOUND SRC="BACKGROUND.MID">
```

To add a background sound in *Navigator*, add the following code somewhere in the body of the HTML document:

```
<EMBED SRC="background.wav" HIDDEN>
```

As mentioned above, you can also use a Java applet to play sounds, including background sounds. This requires a Java-enabled browser and the presence

of the appropriate applet on your site, which is called with code such as:

```
<APPLET CODE="playaudio">
<PARAM NAME=SOUND value="greeting
.au">
<A HREF="greeting.au">Your browser is
not Java enabled. Click here to download
the greeting.</A>
</APPLET>
```

Note that tags other than <PARAM> will display only on browsers that are not Java enabled. This technique is covered thoroughly in the user-friendly *Instant Java* (see the sidebar "Further Reading").

### ADVANCED TECHNIQUES

You can also access multimedia files via a pop-up window, which provides a more sophisticated interface than a link, background, or META command. Pop-up windows are created and controlled in the JavaScript language that is built in to *Navigator 2.0* and *Explorer 3.0*, or higher. JavaScript began as a simple client-side scripting language designed to enhance browser interactive functions, but it has evolved into a powerful, object-based language. To use JavaScript functions, you add <SCRIPT> tags and associated code in the header and body of the HTML document. The browser does the rest.

Note that JavaScript is not a sublanguage of Java. JavaScript, developed by Netscape, was originally called Live Script. The name change reflects the compatibility of the two languages (e.g., JavaScript can call a Java applet) as well as an effort to unify product names. To make matters more obscure, the *Explorer* version of JavaScript, developed later, is called JScript and falls under the umbrella of Microsoft's ActiveX controls. With regard to simple functions, JavaScript and JScript are mostly—but not entirely—compatible.

A simple pop-up is defined by a JavaScript function in the HTML header and called via a link or button in the body. For example:

```
<HEAD>
<SCRIPT LANGUAGE="JavaScript">
<!--Start

function popUp() {
myPopup =
open("mypopup.html","popUpWin",
"toolbar=0,location=0,directories=0,
```

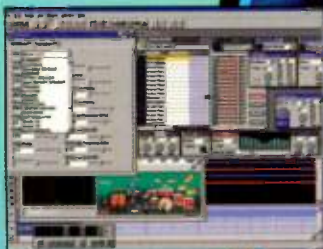
### FURTHER READING

- The Complete Idiot's Guide to Creating an HTML 4 Web Page*, Third Edition (w/CD-ROM), Paul McFedries, QUE, 1997
- Creating Killer Web Sites*, Second Edition, David S. Siegel, Hayden Books, 1997
- Creating Killer Interactive Web Sites*, Andrew Sather (Editor), Hayden Books, 1997
- Creating Web Pages for Dummies*, Third Edition (w/CD-ROM), Bud E. Smith and Arthur Bebak, IDG Books Worldwide, 1998
- Designing with JavaScript: Creating Dynamic Web Pages* (w/CD-ROM), Nick Heinle, O'Reilly, 1997
- Dynamic HTML for Dummies* (w/CD-ROM), Michael I. Hyman, IDG Books Worldwide, 1997
- Instant Java*, Second Edition (w/CD-ROM), John A. Pew, Prentice Hall, 1997

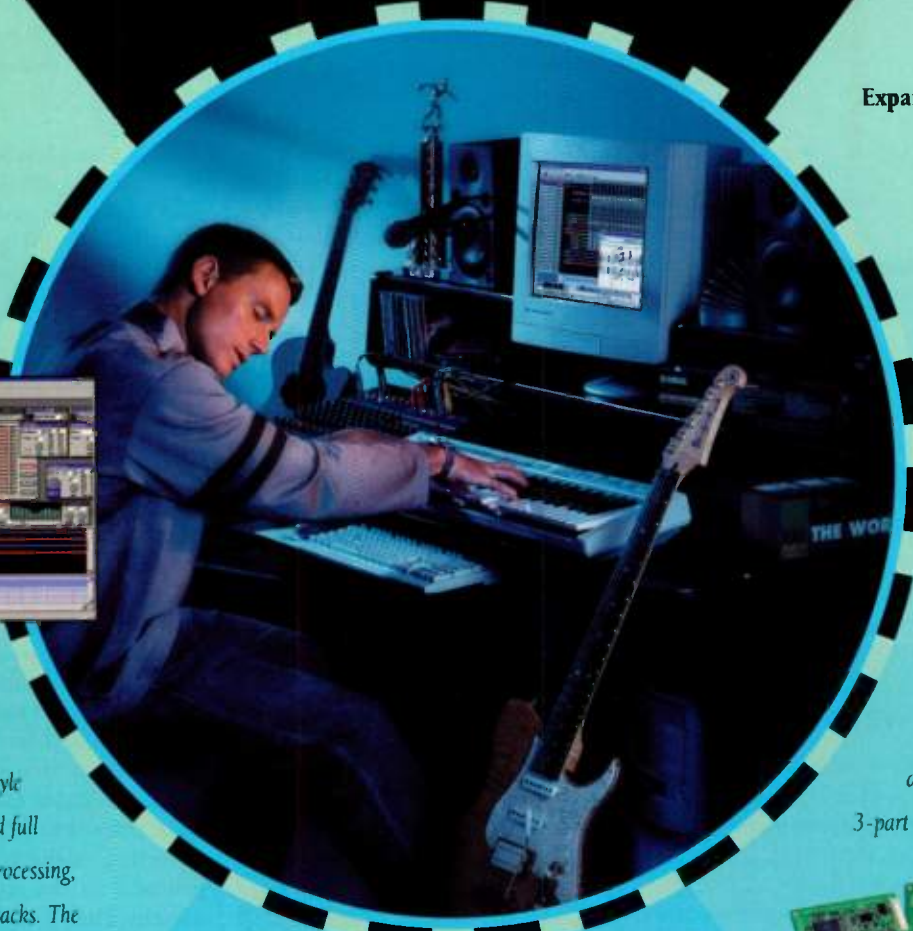
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```
status=0,menubar=0,scrollbars=0,
resizable=0,width=175,height=220")
}
```

```
<!--End-->
</SCRIPT>
```

The rest of the user's HEAD code goes here...  
</HEAD>

```
<BODY>
<A HREF="javascript:popUp()">Click for
popup</A>
```

The rest of the user's BODY code goes here...  
</BODY>

The "open" function is simply part of JavaScript. Pay close attention to the syntax, especially the "<!--Start" and "<!--End-->" tags, the mixed case of names, use of quotes, and absence of spaces. The "open" statement, starting

with "myPopup", should contain no extraneous spaces or carriage returns. The file "mypopup.html" is the file that will be opened inside the pop-up. This can be any filename you choose; just be sure that it resides in the root directory or folder (or use the absolute URL). The function name (popUp), variable name (myPopup), and window name (popUpWin) can also be anything you like; they should, however, be unique and applied consistently.

The final section of the "open" statement controls the size of the pop-up, in pixels, and the presence of menus, button bars, etc. (as associated with a normal browser window). Generally, it's best to make the pop-up as small as possible to accommodate the text and graphics that you choose. (Some browsers won't produce a window smaller than 100 pixels.) Disable the other attributes by leaving the entries set to "0".

The link that calls the pop-up uses a special JavaScript event handler, in the form HREF="javascript:xxxxxx", so that when the user clicks "Click for pop-up", the browser executes the referenced JavaScript code instead of jumping to another page. In addition to the simple text-link method above, you can call JavaScript with image

links and buttons. Use whichever method you prefer, but note that all images on a JavaScript-enhanced page must have their height and width attributes set:

```
<A HREF="javascript:popUp()"><IMG
SRC="graphic.gif." BORDER=0
HEIGHT=37 WIDTH=182 ALT="Click to
open a multimedia popup"></A>
```

```
<FORM>
<INPUT TYPE="button" VALUE="Click to
open popup" onClick="popUp()">
</FORM>
```

Note that a JavaScript button is a special case of a <FORM> input element, which uses the onClick event handler to call the "popUp()" function. Here, the <FORM> tag does not require the normal additional attributes.

#### A FULLY CODED POP-UP EXAMPLE

Figure 2 shows a complex pop-up that accesses three sound bites when you click on the fingerboard of a bass guitar graphic. Figures 3 and 4 show the code for the Web page, which includes additional JavaScript functions to provide more functionality and to address compatibility issues. Be careful when you type in your code: double-check for case errors, missing parentheses or curly brackets, and extraneous spaces.

Notice that in Figure 3 the "popUp()" function itself has been augmented. The pop-up format values are stored within a variable called sFormat, rather than referenced directly. This allows detection of the browser type and adjustment of the size of the pop-up to match. That's an important bug fix, because different browser types and versions on various platforms are highly inconsistent with regard to the pop-up size, relative to the defined height and width. In fact, it is desirable to check for all browsers and platforms, although here we check only for Navigator versus Explorer, to keep the sample code brief.

Note, too, that we check for older versions of Navigator on non-Windows platforms and open the pop-up first. We then direct it to the file (you must use the absolute URL here) and test for the presence of the pop-up window "opener" property. We then create a pseudo-opener if none exists. These are two other important bug fixes. (There are other ways to do these

### ONLINE RESOURCES

**The HTML Compendium** A thorough, tabular HTML reference database:

[www.htmlcompendium.org/mainfram.htm](http://www.htmlcompendium.org/mainfram.htm)

**Index Dot HTML** An easy-to-use, alphabetically indexed, and admirably complete reference to HTML and Cascading Style Sheets (CSS):

[www.blooberry.com/html](http://www.blooberry.com/html)

**Instant Java on the Web** The companion site to the book *Instant Java*:

[www.vivids.com/ij2](http://www.vivids.com/ij2)

**Killer Sites** The companion site to the book *Creating Killer Web Sites*:

[www.killersites.com](http://www.killersites.com)

**Web Coder** The companion site to the book *Designing with JavaScript*:

[www.webcoder.com](http://www.webcoder.com)

**RealNetworks RealEncoder/RealPublisher** freeware/buyware:

[www.real.com/products/tools/encoder/index.html?src=toolsmain](http://www.real.com/products/tools/encoder/index.html?src=toolsmain)

**Syntrillium Cool Edit** Shareware (Win 3.x/95/98/NT):

[www.syntrillium.com/cooledit](http://www.syntrillium.com/cooledit)

**HTML Assistant Pro** An excellent shareware HTML editor (Win 3.x/95/98/NT):

[www.brooknorth.com/products/pro3\\_trial\\_info.html](http://www.brooknorth.com/products/pro3_trial_info.html)

**Paint Shop Pro** A shareware graphics creation/editing package

(Win 3.x/95/98/NT):

[www.jasc.com/pspdl.html](http://www.jasc.com/pspdl.html)

**Fetch** Shareware FTP client (Mac):

[www.dartmouth.edu/pages/softdev/fetch.html](http://www.dartmouth.edu/pages/softdev/fetch.html)

**WS\_FTP** Shareware FTP client (Win 3.x/95/98/NT):

[www.ipswitch.com/downloads/ws\\_ftp\\_LE.html](http://www.ipswitch.com/downloads/ws_ftp_LE.html)

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Internet: http://www.generalmusic.com





things that are more efficient but beyond the scope of this article.)

Further, within the link code, mouseover events write and clear a text message in the browser status bar when the

user points to the graphical button. The text message can be anything, not just "Click to open". In addition, avoid single and double quotes and extended characters within the message itself, because they can cause JavaScript errors.

Also, an alternate link is provided for AOL users, which opens the pop-up HTML file as a new page in the main window. Unfortunately, this is necessary because there are bugs related to JavaScript pop-ups in both *Explorer 3* and *4* as used inside the AOL client software (the *Explorer 3* bug will actually

crash the AOL software, so it's a serious problem).

The pop-up itself, "mypopup.html" (see Fig. 4), consists of a graphic of a bass-guitar neck in three segments: "top.gif", "middle.gif", and "bottom.gif". A simple HTML table keeps the segments together. (An image map could have been used instead, but separate segments and their associated links simplify mouseover events and ALT tag coding.) Mouseover events provide interactivity via the status bar of the main window; again, each status bar message can be any text you desire. An onLoad event handler closes the pop-up automatically after three minutes (180,000 milliseconds), in case the user forgets to close it.

The user can "play" the bass (load WAV file sound bites) by clicking on the position markers. Try it!

#### GOING FURTHER

Working sample code for all of the above examples can be found at [www.newmusicjournal.com/e-musician/](http://www.newmusicjournal.com/e-musician/), along with some additional comments. To view the source code, wait until a page loads, then select View Source or the equivalent from your browser's View menu. The example files and their associated graphics and sounds are also provided in Zip format. (Bass-guitar graphic and WAV files are courtesy of Warrior Instruments: [www.warrior-wl.com](http://www.warrior-wl.com).)

As this article has gone into detail on code basics, space doesn't allow a discussion of visual design and Dynamic HTML features here; these elements are, however, equally important. *Creating Killer Web Sites* (see the sidebar "Further Reading") is the de facto standard print resource about site visual design. *Designing with JavaScript* is one of the few really useful JavaScript tutorials, and *Dynamic HTML for Dummies*, perhaps surprisingly, is one of the most lucid DHTML resources. These books also introduce the more advanced JavaScript multimedia functions of the 4.x-level browsers, especially *Explorer*.

With so many resources to guide you, you'll find that you can have your music popping up on your Web site in no time.

*Former EM Contributing Editor Alan Gary Campbell is currently developing a multimedia Web 'zine focusing on contemporary classical and experimental music at [www.newmusicjournal.com](http://www.newmusicjournal.com).*

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

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digital

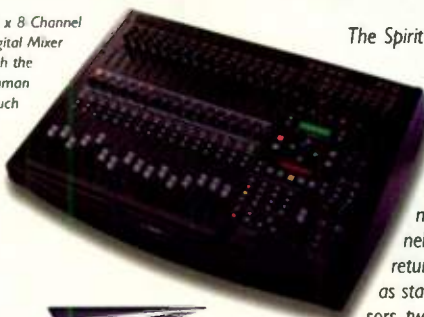
three two eight

Menus are for restaurants

Spirit's unique **E-Strip** avoids the need for tedious menus, so 328 is as easy to use as an analog desk

Now available at authorized Digital 328 dealers!

32 x 8 Channel  
Digital Mixer  
with the  
Human  
Touch



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by Soundcraft

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Tel: (916) 630-3960 • Fax: (916) 630-3950

The Spirit Digital 328 represents a refreshing departure in digital console design, retaining the ease of use of a conventional analog console, yet providing all the advantages of 24-bit digital. The 328 is nothing like a computer with faders. The key to the 328 is the unique "E-Strip", which avoids the need for tedious menus and brings instant access to all 16 channel inputs, 16 tape returns, auxiliary sends and returns, EQ and effects for each channel. Included as standard are two on-board Lexicon effects processors, two dynamic processors, Tascam TDIF™ and Alesis ADAT™ optical interfaces and a built-in meterbridge, with no hidden "options" to add to the cost. If you want the functionality of a digital console, but the common sense approach of an analog 8-bus board, you need to check out the Spirit Digital 328. It's a refreshing change!

**\$4,999.95 U.S. Retail**

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WRB

WE PAY TRIBUTE TO THE TOP NEW  
PRODUCTS OF THE PAST YEAR.





**F**rom across the office suite, you can hear the gnashing of teeth and the strained voices emanating from the editor's office:

Editor: "Sorry, your favorite multitrack audio program isn't eligible because it didn't get a major upgrade this year."

Associate Editor 1: (Sullen grunt of acknowledgment.)

Editor: "Hey, you reviewed all these things. You have to help me make a decision here!"

Associate Editor 2: "No, you're the editor, you make the decision. I like 'em all!"

Obviously, it's time to select the winners of our Editors' Choice Awards.

Each time we do this, we go through the same harrowing process in order to select those products we liked best that shipped during the past 12 months. First, we compile a list of everything **EM** has covered in reviews and in features for the year. Next, we add those products that we are currently reviewing. Then we establish our categories.

From that list, **EM**'s staff editors, contributing editors, and a selection of our top freelance authors make choices in those categories in which they have special expertise.

The results of this first round go to **EM** Editor Steve O., who considers all the choices but goes by more than just a strict tally to narrow down the list. The purpose so far is to highlight products that have created major excitement in the **EM** family.

The staff editors then wrangle over the final candidates and eventually pick the group from which the proposed winners are selected.

Even after we have agreed upon the proposed winners, however, we're still not out of the woods. We have to be sure that all the winners shipped within the eligibility dates, and a few nominees are always disqualified during this process. (This year's winners shipped between October 1, 1997, and October 1, 1998.)

One difficulty we have in giving these awards is that we consider only those products that we or our extended family have tested. That means we may pass over a lot of great products due to the simple fact that we can't test everything. So the products that receive our awards are those we have tested that have shipped within our eligibility period. Also, we considered software upgrades as eligible only if they were major ones.

This year, we have chosen winners in 22 categories. Rather than picking products in every category we established, we gave no award unless a product of a particular type really knocked us out. Furthermore, for practical purposes, we had to limit our number of categories and awards. But we also added categories when we thought it appropriate: for instance, you'll find separate dynamic and condenser microphone categories this year, whereas last year we gave an one award to only one mic.

So without further ado, let's find out which products were the cream of the 1998 crop.

THE ENVELOPE, PLEASE!

**BY THE EM STAFF**

PHOTOGRAPHY BY BILL SCHWOB

NEVER BEFORE HAS SO MUCH  
POWER BEEN SO AFFORDABLE.

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

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

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

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

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

Greg Ladanyi,  
producer/engineer

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

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

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



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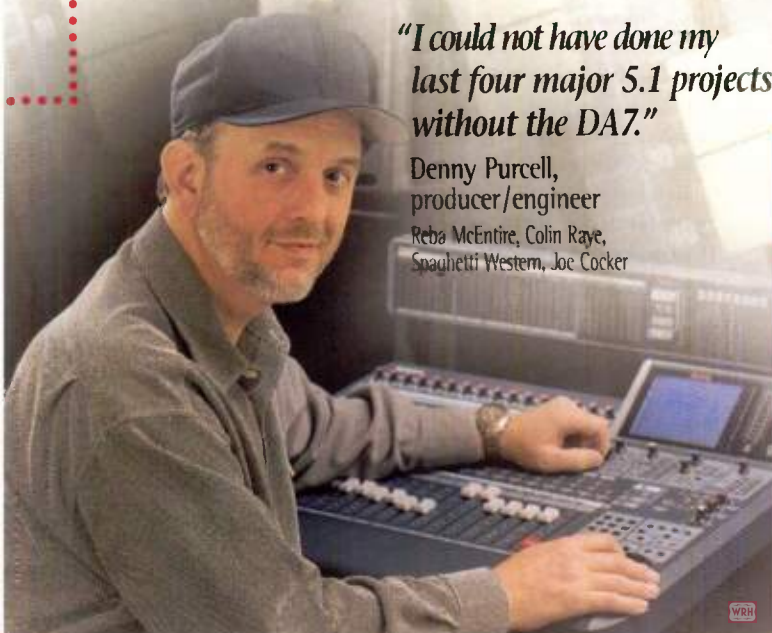
# THE DA7 DIGITAL MIXER.



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

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

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



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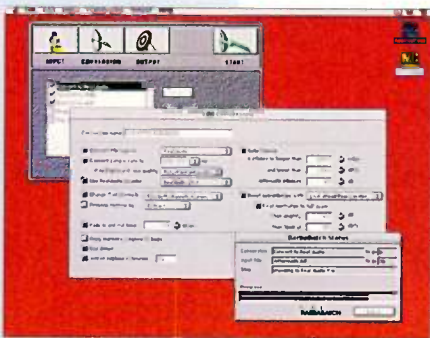
## Ancillary Product

### AUDIO EASE BARBABATCH 2.4 (Mac; \$395)

The Ancillary Product category is a sort of catch-all for specialized products, and for our purposes, batch processing fits that description nicely. These "specialized" products might not be quite as essential as recording systems and signal processors, but they nevertheless contribute greatly to productivity in the studio and to the quality of our recordings.

Whether working with multimedia and game developers or sending songs into cyberspace, today's desktop musician must contend with an overwhelming number of audio file formats. Converting from one format, resolution, sampling rate, and compression scheme to another becomes especially tedious when you're handling large numbers of files.

That's why having a high-quality audio file batch-conversion and processing program is a must for working professionals, and Audio Ease's *BarbaBatch* impressed us with its ability to quickly round up and straighten out the thorniest of conversion tasks. The program is versatile and produces great-sounding results. Furthermore, it can run more than one custom setup at a time in case you should need different versions of the same files.



*BarbaBatch* reads and writes more than two dozen Mac, PC, Unix, and other sound-file formats; handles sampling rates from 1 to 100 kHz; and supports resolutions up to 32 bits (with optional dithering). More-

over, the program reads and writes Sound Designer II markers, loops, and regions, and copies them into the files it creates. Multimedia producers will especially appreciate its QuickTime 3 support and its support for PureVoice and QDesign Music codecs (among others). Web developers will applaud *BarbaBatch*'s ability to encode music into RealAudio format, and sound designers will benefit from the program's ability to capture Red Book audio from a CD and convert it into other formats.

In spite of its prowess at converting and processing files, *BarbaBatch* is surprisingly easy to use. Its main functions take place in a single window with large buttons that guide you through the process. Our reviewer concluded, "It's the nicest batch processor I've used." We feel it deserves top honors.

## CD-R Software

### ADAPTEC JAM 2.5 (Mac; \$299)

Burning CDs has become an important task for many desktop musicians. As a result, Adaptec's *Jam* 2.5 has become an important tool for Macintosh users. The program is easy to use and has all the features a professional musician needs. It accommodates burn speeds of up to 4X without the use

of a duplicate sound file and supports an extensive list of CD-R drives, which substantially increases your hardware options.

Loading tracks into *Jam* couldn't be easier: just drag and drop audio files from the desktop onto *Jam*'s track list, or load any number of titles simultaneously using the Add Sound Items feature. You can simulate playback of the entire CD without interruption by triggering playback with the transport controls while locking out all other CPU-intensive activity with the Play Disc command. You can access many other important features with single commands, including automatic previewing of gaps between tracks. *Jam* gives you total control over gap lengths, index points, and other important disc settings. Whether you're making demo discs with large numbers of tracks or assembling plant-ready CD masters for duplication, *Jam* will get you there.



## Digital Audio Sequencer

### STEINBERG CUBASE VST/24 4.0 (Mac; \$799)

The Digital Audio Sequencer category was unquestionably the most difficult in which to single out a product for special recognition. All the major players in the field have released significant upgrades to their top-of-the-line sequencers that make them ever more powerful and more sophisticated. However, when the dust finally settled and the fat lady sang, the program that remained was *Cubase VST/24* 4.0. Although version 3.5 won this same award last year, we couldn't deny that Steinberg had pushed the envelope once again and stepped ahead of the technology curve to lead the way.

*Cubase VST/24* is truly a cross-platform program; just after our deadline (too late to test), Steinberg released version 3.6 for Windows, which is nearly identical to Mac version 4.0. Steinberg's leadership role has been essential in establishing ASIO streaming-audio drivers (as well as the VST plug-in architecture), and *Cubase VST/24* works with a wider range of audio cards than most competing programs. As its name suggests, however, the real news with this version is its move into the world of high-end audio.

Steinberg's flagship program now offers up to 96 tracks of 24-bit, 96 kHz digital audio using 32-bit floating-point internal processing. Its fully automated VST mixer includes up to four bands of Steinberg's newly improved EQ per channel. The mixer has been expanded to include four plug-in inserts per channel along with eight aux



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### MONTANA

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



### DAKOTA

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- \$649 estimated street price



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sends for addressing up to eight plug-ins or other effects in the Aux Effects virtual rack. Moreover, the timing resolution has been boosted to an impressive 15,360 ppqn to improve precision when cutting audio segments.

The MIDI Track mixer now features drag-and-drop editing of MIDI events and audio segments, and controller editing has been improved. In addition, a major upgrade has been made to the Scoring section, which now rivals many dedicated notation programs. Scoring enhancements include improved layout options, symbol palettes, new ways for inputting lyrics, choice of notation styles, and improved handling of chord symbols and rehearsal markings. The program can even extract multiple parts from a single staff. Whew! The list goes on and on, but you get the point. *Cubase VST/24* is one awesome piece of software, and it has "winner" written all over it.

## Digital Audio Workstation

### ENSONIQ PARIS (WITH MEC) (Mac/Win; \$3,895)

Digital audio workstations have become common products; so now, more than ever, new contenders in the market need to be affordable *and* really cool. Ensoniq's PARIS system is both. For the cost of a modular digital multitrack, you can equip your studio with 128 tracks of 24-bit digital recording;

some quality I/O; automated digital mixing; block editing; a hardware control surface; and a whole lot of DSP processing. If you have been hankering for a professional DAW but couldn't afford something like Digidesign's Pro Tools, PARIS provides an affordable, powerful alternative.

The best part about PARIS is its versatile I/O system. Breakout boxes are available for a variety of production and budgetary needs, ranging from the simple 20-bit, 2-channel Interface 2 A/D/A to the Modular Expansion Chassis (MEC), which provides nine expansion slots that accommodate 8-channel 24-bit A/D, 24-bit D/A, and ADAT Lightpipe I/O modules. (AES/EBU and Tascam TDIF I/O modules are promised for 1999.)

On the inside, all recording and processing duties are handled by a PCI audio card, so your computer is free to handle other system chores. PARIS operates in groups of 16 channels, which constitute a submix, and you can have up to eight submixes in a project. Four bands of parametric EQ are available to each channel, as are eight aux sends and five inserts.

The DSP sounds great, and you can really push it to the max: you can open five or six dynamics processors in addition to five or six multi-effects. The best part is that the DSP allocation doesn't affect

the channel EQs—all 64 are simultaneously available to each submix and aren't compromised by other engaged processing. In addition, the DSP available to one submix doesn't affect what's available to the others; just save a submix, and the DSP is freed up for the next group of 16 tracks.

Several key features make PARIS a comfortable work environment for those just getting into hard-disk recording. Two operating modes (Constrained and Free Form) allow it to function as either a complex or a basic recording system. Routing signals internally is as simple as drawing a virtual cable in the patch-bay window. Although the software is logical and elegantly designed, you'll probably want to spend most of your time working on the Control 16 hardware mixing surface, which provides 100 mm long-throw faders and all the essentials you'd expect from a digital mixing console.

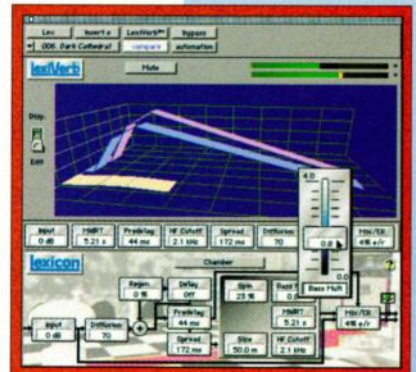
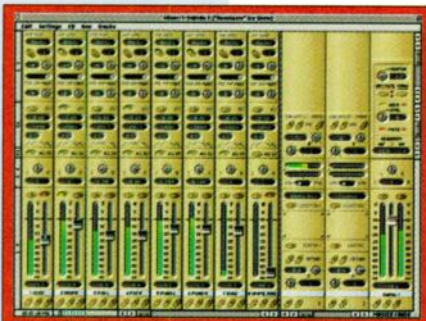
The block-editing features are easy to work with, yet they provide a surprising amount of control. For more elaborate waveform editing, PARIS comes bundled with Steinberg *WaveLab Lite* for Windows and BIAS *Peak LE* for Mac. Support has recently been added for the DirectX and VST plug-in formats, and software upgrades are ongoing. By debuting such a strong product right out of the gate, Ensoniq is practically ensured continued success with PARIS for years to come.

## DSP Plug-in

### LEXICON LEXIVERB (Mac TDM; \$699)

This has been a great year for plug-ins, and we were faced with an avalanche of terrific choices. We had a difficult time agreeing on a single selection, primarily due to the wide range and overall quality of the current crop of plug-ins and the numerous plug-in formats. Nevertheless, Lexicon's *LexiVerb* TDM plug-in for Pro Tools held its own against the crowd. It delivered a one-two punch by combining a fantastic user interface with the sound of a world-class reverb.

*LexiVerb* supports 24-bit DSP processing and works in mono-to-stereo and stereo-to-stereo modes. It offers four classic Lexicon algorithms: Chamber, Plate, Inverse, and Gate, along with 100 factory presets. The user interface is exceptional in terms of clarity and ease of use. The four reverb algorithms are displayed as a "wire diagram" (flow chart) with pop-up faders, so you can quickly and easily design your own reverbs. You can assign up to eight faders to a Soft Row for real-time parameter adjustments, and you can create up to six macro controls, each of which groups up to four controls, with individual scaling.





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That's powerful stuff indeed, but *LexiVerb* doesn't stop there. The main screen also includes a colorful frequency-response graph that shows the envelopes for the low-, mid-, and high-frequency bands. In our face-off of TDM reverbs ("Plug In, Turn On, Space Out," May 1998 **EM**), reviewer Mikail Graham praised *LexiVerb*'s design as "a breath of fresh air" and "as much fun to look at as it is to use." The sound was described as "rich and full-bodied." This plug-in also has excellent documentation and online help.

With its well-designed user interface, powerful editing functions, and great algorithms, *LexiVerb* is truly an award-winning plug-in.

## DSP Software

### CYCLING '74 MSP 1.0 (Mac; \$295)

Few programs offer the array of audio generating and processing options available in *MSP* from Cycling '74. *MSP*, which stands for Max Signal Processing, is an add-on to Opcode's *Max* programming environment that allows you to create complex synthesis and audio signal-processing patches directly within *Max*. You can trigger your *MSP* patches via MIDI, or you can build complex, *Max*-controlled patches that use incoming audio data to modify

parameters in real time.

Whether you're a beginning user or an advanced DSP programmer, you'll find much to like about this program. After all, many users have adopted *Max* as their "platform" for building unique

and unusual processes for controlling sound. But whereas *Max* focuses mainly on MIDI programming, *MSP* offers similar tools for creating and manipulating audio. And it does this as well as any program available today.

*MSP*'s library consists of more than 60 Objects with which to build your designs. As you patch Objects together, you can hear the results of your work instantly. That makes sound "programming" fun and experimentation easy, and who knows what types of strange and wonderful new sounds you'll discover with so many tools to use.

If, after reading this, you're still unsure about whether *MSP* is for you, download a free, full-working version of the program that allows you to use one audio patch per *Max* session. (You'll have to restart *Max* each time you load a different patch.) A free, unrestricted run-time version lets you play (but not edit) *MSP* patches created by others. The program comes with excellent documentation and dozens of tutorials that walk you through the patch-building process step by step. In addition, *MSP* is

well supported by its developer and through a large community of users known for their helpful suggestions and the sharing of their trade secrets.

Never known to rest on its laurels, Cycling '74 has just announced a new application for *MSP* patches that are plug-ins for *Cubase VST*. With Cycling '74's *Pluggo* utility, which will be included free with *MSP* around the time you read this, you can use your patches in any program that supports the VST plug-in format. We expect to see *Pluggo* patches appearing on the Internet in great numbers; who knows—maybe your patch will win next year's Editors' Choice Award.

## Dynamics Processor

### PRESONUS ACP-22 (\$399)

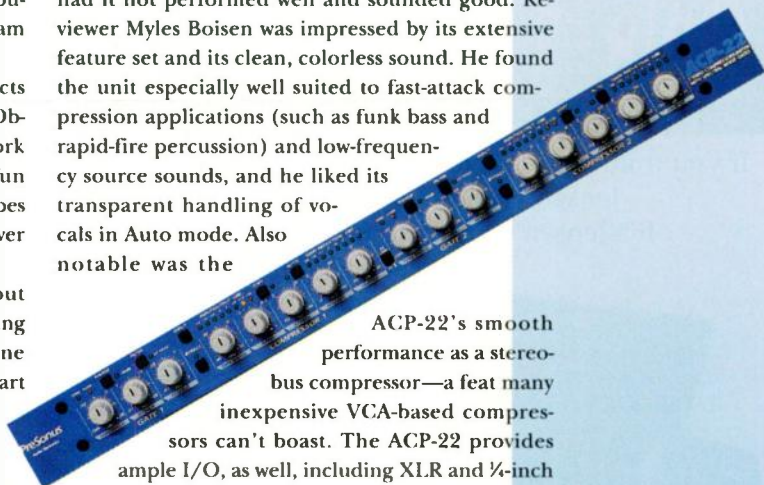
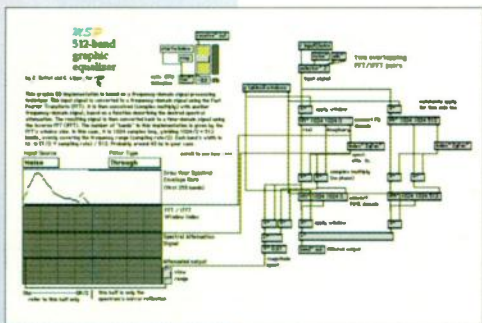
If you're looking for the largest amount of dynamics control for the least amount of money, look no further than the PreSonus ACP-22. With 16 knobs, 13 switches, and 46 LEDs occupying its 1U rack-mount faceplate, this dual-channel compressor/limiter/gate is a dynamics tweaker's dream come true.

Each gate provides separate threshold, attack, and release controls, as well as a Range switch that toggles between -6 dB (for soft gating/downward expanding) and -60 dB (for hard, on/off operation). The detection circuit includes a switchable Spectral Noise Gate lowpass filter that enables the gate to open only for midrange and low-frequency information—perfect for drum applications in which you don't want the gates to be triggered by high-frequency sources, such as cymbals.

The ACP-22's dual compressors are equally well appointed, offering separate controls for threshold, ratio, attack, release, and output, as well as separate switches for soft-knee/hard-knee and program-dependent (automatic) operation. The unit also provides switchable input/output metering, separate channel-bypass switches, and a Stereo Link mode.

Of course, this bounty of control notwithstanding, we would never have considered the ACP-22 had it not performed well and sounded good. Reviewer Myles Boisen was impressed by its extensive feature set and its clean, colorless sound. He found the unit especially well suited to fast-attack compression applications (such as funk bass and rapid-fire percussion) and low-frequency source sounds, and he liked its transparent handling of vocals in Auto mode. Also notable was the

ACP-22's smooth performance as a stereo-compressor—a feat many inexpensive VCA-based compressors can't boast. The ACP-22 provides ample I/O, as well, including XLR and 1/4-inch connectors, dual sidechains, and switchable operating levels per channel. It's obvious why the ACP-22 is an award winner.





**N1/NTR**

A great feeling, weighted-action synth that sounds simply awesome. Over 1700 sounds (including GM, and GS/XG soundmaps), 18MB of ROM, 64-voice polyphony, 4 knobs for realtime control, MIDI-syncable arpeggiator, 32-part multitimbrality, 2 dynamic stereo effects processors, computer interface...also available in a 1U rackmount package, the N1R.

LIMITED TIME FACTORY REBATE!

**Get \$100 back**

...when you buy an N1 or \$50 with the purchase of an N5.

Purchase between October 15, 1998 and February 28, 1999. See your dealer for details.



**free**

Every N1 is bundled with Mark of the Unicorn's Unisyn N1/N5 and Freestyle LE software—a \$490 value!\*

\*Not available with the NTR. Offer valid from July 1, 1998 through December 31, 1998 or while supplies last.

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## Effects Processor (Hardware)

### TC ELECTRONIC FIREWORX (52,195)

Most of us have been conditioned to be bargain shoppers; "more for less" is the consumer buzz phrase of the 1990s. Sometimes, however, "more for more" proves to be better advice. TC Electronic's FireworX might not be a bargain-basement buy, but it's worth every penny.

FireworX is a truly professional processor: its analog connectors are balanced XLR; its A/D and D/A converters are 24-bit; and AES/EBU, S/PDIF, and ADAT

Lightpipe I/O are provided. Using the same DSP engine as the company's acclaimed

G-Force guitar-effects processor, FireworX offers 38 effects algorithms that can be routed in almost any order imaginable.

The processor has 11 types of effects: reverb, chorus, delay, distortion, panning, pitch shifting, vocoder, dynamics, EQ, filtering, and formant filters—each of which is grouped into a dedicated Effects Block. The unit has 200 preset programs, with space for 200 user-defined patches, and it will accept any PCMCIA card for storing an additional 2 MB of programs.

The effects sound fantastic (did you expect anything less from TC Electronic?), but the place where FireworX really shines is in the control department. FireworX is laid out intelligently, with a large LCD, a number of dedicated buttons and knobs, and plenty of effects-editing pages. Comprehensive routing pages let you map out every stage of the signal path: where signals originate (right input, ADAT channel 4, etc.); how they are routed from one algorithm to the next (e.g., chorus L to reverb R and chorus R to mono delay); and where they wind up (any two ADAT channels, S/PDIF, etc.).

You can modify virtually every effect parameter through MIDI or with one of the three real-time controllers on the unit's face. Of particular interest is the Alpha Mod Wheel, which not only gives you assignable real-time control over multiple parameters and effects but allows you to customize the response curve for each instance. For example, you can have the wheel increase the level of a distortion while it simultaneously decreases the decay of a reverb. You can also connect up to eight external modifiers for controlling a plethora of parameters. Pretty wild stuff! If you're serious about audio production, you need to check out this unit.

## Integrated MHDR/Mixer

### ROLAND VS-1680 (53,195)

Two years ago, we gave Roland's VS-880 the Editors' Choice Award for personal modular hard-disk recorders. We distinguished between that unit

and professional-caliber MHDRs because the VS-880 had only four audio inputs and lacked various pro features. Still, it was a tremendous value with lots of features and great sound at a very reasonable price.

We're not making that distinction between "personal" and "pro" this year, though. The 16-track VS-1680 not only has twice as many tracks as the VS-880, but it is a more professional unit all around. Our review is still in progress, but freelance writer Rob Shrock has had the VS-1680 in the field for some time now, putting together recording projects for several acts while on the road. Shrock needed a portable workstation that could give him professional results, and so far, it looks like true love.

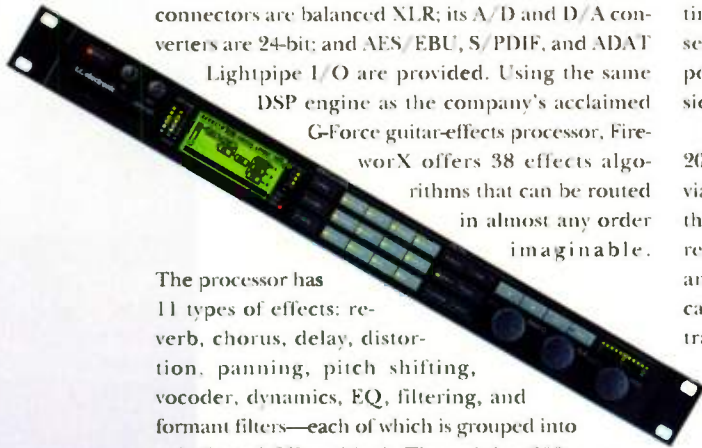
For one thing, the VS-1680 records and plays back 20-bit audio via its 20-bit analog I/O and 24-bit audio via the optical and coax S/PDIF digital I/O. Now that's professional. And although recording 16 tracks requires data compression, its compression is kinder and gentler than the VS-880's. Furthermore, you can record without compression and still get eight tracks—not to mention up to 256 virtual tracks—and you can record eight tracks simultaneously.

That means you can record as many uncompressed simultaneous tracks of 20-bit audio as you can with a Type II ADAT (such as the XT20), but you have a heck of a lot more features.

The VS-1680's 26-channel mixer has stereo aux and mix buses plus four effects buses that you can route to outputs or to the two optional effects cards (\$395 each). The effects are impressive, so if you get a VS-1680, be sure to get the optional cards, too. The channel EQ includes sweepable high and low shelving and parametric mid, and most effects programs include additional EQ, so you have plenty of ways to tweak your tracks. You get nondestructive, cut-and-paste editing, with 999 levels of undo, 1,000 markers, and 64 locate points.


One of the biggest improvements over the 1997 award winner is a large (320 × 240-dot) LCD that displays waveforms for editing, level meters, play lists, EQ and effects settings, and more. The new EZ Routing function lets you save recording, mixing, track bouncing, and other settings for later recall. In fact, almost everything in the unit can be automated. The VS-1680 also reads VS-880 files, and you can cascade up to five VS-1680s and VS-880s.

Features like these put considerable distance between the VS-1680 and its fellow 1998 newcomers.



# PLX Amplifiers

## For louder bass stick your head here.

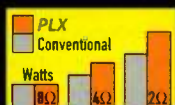
For High Impact Bass we give you PLX. A line of amplifiers with unmatched performance, thanks to our exclusive PowerWave™ technology.  PowerWave is an innovative, low-impedance switching power supply that converts 60Hz AC to 115 kHz, which recharges the audio circuit's DC rails some 2000 times faster than a conventional supply. The result — chest pounding bass, more headroom and consistent crisp,



clean sound. And because the PowerWave power supply is so stiff, PLX gives you more power at two ohms compared to a

Model	Watts per channel *		
PLX	2Ω*	4Ω	8Ω
1202	600	325	200
1602	800	500	300
2402	1200	700	425
3002	1500	900	550

conventional amp.



Best of all, PLX's are guaranteed reliable — their PowerWave technology

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

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

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And we haven't even discussed its sync and MMC features, or the internal 2.1 GB drive, SCSI port, optional CD-R, and, well, you get the picture. Other ministudio-type modular hard-disk recorders pale in comparison.

## Microphone (Condenser)

### NEUMANN TLM 103 (\$995)

Of the dozen condenser microphones we tested last year, the Neumann TLM 103 rose to prominence for its audio quality and its versatility. In fact, during a head-to-head comparison of eight cardioid condenser mics (see "Attack of the Cardioids" in the September 1998 issue of *EM*), the TLM 103 quickly emerged as our benchmark microphone. ("Yeah, that sounds pretty good, but how does it sound next to the Neumann?")

To begin with, the TLM 103 is notable for being Neumann's least expensive large-diaphragm condenser microphone to date. Priced below \$1,000, this mic clearly strengthens Neumann's position in the personal studio market. The TLM 103 is also the quietest Neumann mic to date (7 dB self noise, A weighted), if not the quietest large-diaphragm condenser ever assembled. Admittedly, it has no special features to speak of: it provides only one polar pattern (cardioid) and has no attenuation pad or low-cut filter. This lack of amenities renders the mic less versatile than, say, the venerable U 87 (a full-featured mic from which the TLM 103's capsule was derived). But hey, at this price, who's complaining?

The bottom line is that the TLM 103 sounds great. This mic has a big, open, natural sound with tight, detailed lows; rich, warm mids; superior resolution and dimensionality; and a distinctively Neumannesque presence boost that yields a delicious, intimate quality. Although it proved especially well suited to vocals, acoustic guitar, and drums (as an overhead), we loved how the TLM 103 sounded on almost every instrument at which we pointed it. As with all other Neumann mics, it comes in a lovely, cherry-stained, wood jeweler's box with brass-plated hinges.

Obviously, the arrival of an inexpensive large-diaphragm microphone from Neumann is occasion for excitement among studio owners at every level; the TLM 103, however, should prove a particular enticement to personal studio owners in search of a critical upgrade. For the money—less than half the cost of a U 87—we know of no better way to improve the quality of your recording path than by investing in one of these mics.



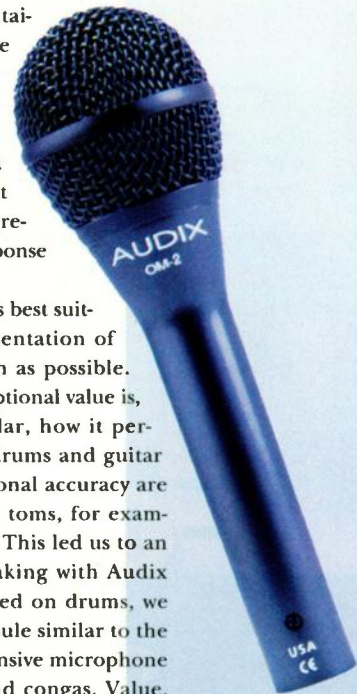
## Microphone (Dynamic)

### AUDIX OM-2 (\$149)

In our June 1998 cover story "Is the SM58 Still King?" we compared six inexpensive new dynamic microphones with the mic that has ruled the roost since the mid-1960s. Not surprisingly, we learned that no single mic works best for all vocalists. But when we opened up the tests to include drums and guitar amps—common applications in the typical microphone-challenged personal studio—one microphone stood out for its versatility and superior sound.

The Audix OM-2 is our pick of the litter because of its ability to accurately capture a variety of source sounds. This is not a microphone tailored to "enhance" a singer's voice with seductive low mids and other hype, nor does it excel at concealing plosives and other dynamic anomalies. Rather, the OM-2 is a revealing mic with a remarkably flat and accurate-sounding frequency response. Moreover, its transient response is second to none.

Singers will find that the OM-2 is best suited for giving an accurate representation of the voice with as little coloration as possible. But what makes the OM-2 an exceptional value is, again, its versatility—in particular, how it performs with instruments such as drums and guitar amps, where both dynamic and tonal accuracy are paramount. On snare drum and toms, for example, the OM-2 sounded first-rate. This led us to an interesting discovery: while speaking with Audix about how well the mic performed on drums, we learned that the OM-2 uses a capsule similar to the one in the Audix D2, a more expensive microphone designed specifically for toms and congas. Value, quality, and versatility are prime considerations in the personal studio, and the OM-2 hits the mark.



## MIDI Controller

### KEYFAX PHAT.BOY (\$249)

This handy little gadget is easy to use and easy to love. All we're talking about is a box with 13 knobs that send preprogrammed MIDI control messages and a 14th knob for setting the outgoing MIDI channel. Not exactly rocket science, right? You bet, and that's the point: Phat.Boy is a simple device that makes life in the MIDI studio easier.

Phat.Boy operates in any of three modes. In the first two, its knobs send the appropriate messages for editing the 13 most commonly used parameters of XG, GS, and Sound Blaster-compatible synths. Anyone who has edited XG/GS modules from the front panel, paging through a diminutive display to find sometimes craftily hidden parameters, or who has tried to tweak a sound card synth using a mouse, will testify that real-time, tactile control is the answer to a prayer.

For manufacturer information, please see Contact Sheet, p. 163.



The third mode is a great example of how a deceptively simple concept can lead to a flexible, even inspirational device.

In Mode III, Phat.Boy's smooth-moving knobs send MIDI Control Change numbers 1 to 13, which means you can use it to control, in real time, any MIDI device—not just synths—that

can support these messages. Use it to access hidden sections of effects, computer programs, DAWs, and digital mixers that have more parameters than controls. The more powerful your MIDI studio, the more you can control with these knobs. Dynamic parameter changes that you might not have considered doing or that you might not have been able to do in real time become part of your bag of tricks.

MIDI faders are fine for level control and can be an important part of your controller toolkit. But sometimes you want to twiddle knobs. Well *now* you can.

### Modular Digital Multitrack Tape Recorder

#### ALESIS XT20 (\$2,599)

Over the years, we've come to expect gear prices to drop as technologies are perfected. One area in which this is evident is ADAT technology, and the Alesis XT20 is here to prove it. The XT20 has 20-bit ADCs and 24-bit DACs, and it records eight tracks of 20-bit digital audio. That's a 16-fold increase in resolution over the earlier 16-bit ADATs, at a price that's \$900 less than the ADAT-XT and an amazing \$1,400 less than the original "blackface" ADAT.

The XT20 is backward compatible with earlier ADAT machines and operates in either 20- or 16-bit mode. When you insert a tape, the XT20 automatically recognizes whether it has 16- or 20-bit data on it. Need to make a 16-bit digital copy of a 20-bit tape for use in an older ADAT? No problem: the XT20 lets you do this by adding dither to the 16-bit output when making the transfer. On top of all that, the XT20's sophisticated onboard editing features allow you to work without leaving the XT20 environment, and without needing an Alesis BRC remote control.

Clearly, Alesis has made major improvements to an established winner. In fact, the XT20 is one of several



hot new ADATs this year: Alesis also released the lower-cost LX20 and the higher-end M20, both of which are worth checking out. But the XT20 has important features that the LX20 lacks and is much more affordable than the M20. When it comes to performance and features for the money, the XT20 is our choice.

### Monitor Speaker

#### HAFLER TRM8 (\$2,400/pair)

Although the price tag of Hafler's TRM8 powered monitors may be intimidating at first, it's put in perspective when you hear their sound: these monitors belong in a league with high-end speakers costing far more. And when you consider that the TRM8s have built-in Hafler Trans•Nova amplifiers—not just any old amplifiers, to be sure—you'll quickly realize that you're getting a lot for your money.

Overall, the TRM8 has an even sound that's easy on the ears during long sessions. The Rockford Acoustic Design speakers paired with Trans•Nova amplifiers give the TRM8 its smooth highs, punchy mids, and round low end. Frequency response is a comfortable 45 Hz to 21 kHz. The tweeter is housed in Hafler's proprietary waveguide horn, which gives you a wide sweet spot thanks to its unique high-frequency dispersion.

Rear panel DIP switches let you tune the TRM8 with low- and high-shelving filters, attenuate the input sensitivity from +4 to -11 dB, and mute the input of each speaker's amplifier. A nice touch is the rear-panel Exoport that allows low-frequency air pressure to escape from the back rather than the front. The enclosure is solid and well designed.

If you have always wanted top-flight powered speakers but have been unable to afford them, the TRM8s could help you build your sound-field of dreams.



### Most Innovative Product

#### SONIC FOUNDRY ACID 1.0 (Win; \$399)

As the song says, "rock 'n' roll is here to stay," and so are the usual suspects when it comes to music software for desktop studios. When Sonic Foundry introduced *Acid*, however, it caused more than a few of us to shake, rattle, and roll our eyes in amazement. Apparently, we're not alone; *Acid* has quickly garnered an enthusiastic following, and it's easy to see why. This



loop-based music-production tool offers an exciting and easy way to create compositions from a wide range of audio files, regions, and snippets.

The program employs a familiar-looking multi-track user interface onto which you can drag loops of just about any length, from single hits to entire phrases. The *Acid* CD contains hundreds of ready-to-use loops in various musical styles, including techno, rock, rave, country, hip-hop, funk, and industrial. An assortment of instrument sounds and sound effects rounds out the collection, and other CDs are available from Sonic Foundry. In addition, you can import your own WAV and AIFF files or record your own loops and add them to the mix.

What makes *Acid* such a standout is how easy it makes combining loops from different sources—even when they have mismatched pitches and tempos. *Acid* lets you preview a loop before you use it, and once you drag and drop the loop into the mix, the software automatically stretches or transposes it in real time to match the pitch and tempo of the current project. You can also add volume, pan, and effects changes to each track and move loops around while you listen to the mix. Furthermore, *Acid* supports DirectX plug-ins and



allows you to have as many as eight real-time effects working at once. Add to that a few more goodies—such as the Snap-to-Grid feature, SMPTE time-code support, unlimited undo/redo, 16- and 24-bit audio support, and support for multiple sound cards—and you have a powerful composition tool. You can even transfer your finished mix directly to Sonic Foundry's *CD Architect* and burn a CD on the spot. It's enough to get us "all shook up"!

## Multitrack Recording Software

### SEK'D SAMPLITUDE 2496 5.11 (Win; \$799)

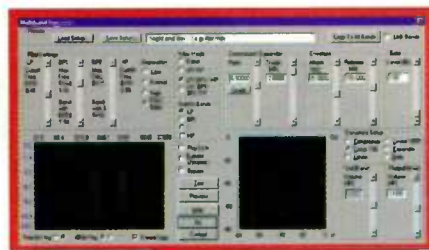
We've seen lots of multitrack audio programs come on the market, but few match the power of *Samplitude 2496*. SEK'D's program was the first major multitrack editor to support 24-bit audio at sampling rates up to 96 kHz. With more and more audio cards appearing that support those rates, along with high bit-rate external recording devices, you'll have all the tools you need to work with the audio formats of the new millennium.

*Samplitude 2496* has so many features and user-configurable options that you'll discover new ways to exploit its power for some time to come. It supports DirectX plug-ins, but thanks to the generous number of high-quality internal effects bundled with the program, you'll be able to save your money for other purchases. Its many tools include a multiband

compressor, a stereo enhancer, dehisser, and a very powerful filter designer, all of which let you shape your sound with exacting control. You won't need to buy a stand-alone program for burning your audio tracks to CD, either: *Samplitude 2496* has its own professional CD-burning features. You don't even need to mix your tracks down to stereo before burning, because all mixing is done in real time as you record the CD.

Another feature we love about the program is its ability to process external audio in real time. Simply route the outputs of your mixer into *Samplitude 2496*, and process the audio without actually recording any data onto your hard drive. If you need to adjust the speed or length of an audio file, you'll love the real-time speed control that lets you make your changes using beats per minute or percentage of original tempo increments.

If *Samplitude 2496*'s all-in-one capabilities aren't inspiration enough for you to buy the program, there's yet another enticement: *Samplitude 2496* has come down in price by nearly half since we first looked at the program, making it an even better deal than we originally believed. So sample the power of *Samplitude 2496*. It's one of the most comprehensive and useful programs we've seen in a long time.



## Preamp/Processor

### AVALON DESIGN VT-737 (\$2,195)

You know you're onto something hot when everyone's talking about the same piece of gear. This year, when we asked our editors, authors, and friends about their favorite instrument preamp/processor, the overwhelming choice was the Avalon VT-737.

Listen to this unit and check out its features, and you'll know immediately why we chose it. Let's start with the features. The VT-737 is a single-channel, vacuum-tube, class-A processor that combines a tube mic preamp, instrument DI, compressor, and 4-band parametric EQ. That's a lot of gear in a single 2U rack-mount box, not to mention that it contains the detailed design and superb circuitry for which Avalon is well known.



# Real words from a Reality™ user



## “Most of my shows...

...are pretty heavily dance oriented. I do the break beats with Reality™ and also throw in a lot of samples, like different vocal samples and weird, B-movie, sci-fi samples. I can do break beats on top of slow beats on top of weird, sort of eerie, background ambience on top of vocal samples. I've done gallery openings and fashion shows where I have done more ambient-type stuff.

“I have a rather portable computer with an LCD screen and stripped-down Windows 95. I run Cakewalk™ with Reality. Cakewalk can loop, so when I do live shows, I have it loop and I mix live by muting and un-muting parts of the song, using Reality as the synthesizer.

“Reality is very straightforward. Having had even minor experience with other synthesizers, you pretty much know what everything is. The filters are really responsive—that's another good thing. You can get the resonance up real high. I use Reality primarily as a sampler, just because it works so well that way. I use a set of MIDI sliders with it.

“Recently I have been getting into making a lot of weird atonal sounds, pushing the FM stuff as far as it will go. You can get some really insane sounds out of that. The frequency response with [Reality] allows you to do stuff that is pretty complicated and textured, but still sounds good.

“With a lot of the digital synths, when you try and do a hefty bass, you don't get it. I have never run into that with Reality—I've been able to get really enormous bass sounds.

“At shows, I let people see what's going on. A lot of people are into break beats and they sound a lot more complex than they really are, so they want to see how I'm doing it. Having it on the computer screen, you can see everything. You get to see where everything is. It also makes it much easier to manipulate it, set the different sliders to different things. When you're dealing with Reality, it's all sitting right there.”

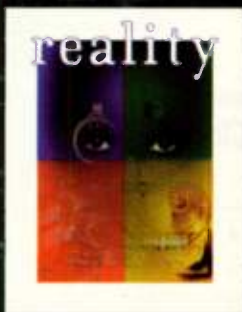
For more information about Seer Systems or Ethan, visit our website at [www.seersystems.com](http://www.seersystems.com) or call us toll-free at 888.232.7337.

## Reality 1.5 Now Available

Reality turns your Pentium® PC into a flexible synthesizer powerhouse with five types of synthesis: sampling, analog, FM, modal, and numerous physical models, using Microsoft® DirectSound™ for compatibility with the widest range of audio cards possible.

## Reality 1.5 Features Include:

**SeerMusic™ Authoring:** High-quality, lightning-fast interactive audio for the Internet. **SoundFont 2.0 Support:** Import thousands of sounds available in SoundFont format. **Flexible Filtering:** Low-pass, high-pass, notch, and resonator filters with selectable slopes from 2- to 16-pole.



Compatible with all major MIDI + audio sequencers



301 South San Antonio Road, Los Altos, CA 94022



Audition the tube mic preamp. It's both clean and transparent, and it gives you headroom to spare. Add to that a 1/2-inch input on the front panel so your guitars and basses can take advantage of the VT-737's clarity.

Fancy some flavoring? The 4-band parametric EQ, with its eight knobs and four switches, lets you tweak frequencies ranging from the subaudible to the "air" bands: 15 Hz to 32 kHz. The bass and treble bands are passive, which gives them a smooth, natural sound. The low-mid and high-mid bands also are nice but have a different quality. Avalon squeezes even more out of the unit by adding a full-featured compressor that you can insert before or after the EQ with the push of a button.

But ultimately, the sound of this box is what won us over. When you're ready to take your sound quality to the next level, you won't go wrong with the Avalon VT-737.

## Mixing Console

### PANASONIC/RAMSA WR-DA7 (\$5,000 base)

Digital consoles have long been considered the future of the industry, and over the past few years, we have finally begun to have a nice selection of quality boards from which to choose. This year, the Panasonic/Ramsa WR-DA7 takes the cake primarily because its design is obviously the work of a veteran audio engineer with lots of session experience, and because it is extremely well suited for the MDM- or DAW-equipped personal studio specializing in music production.

The DA7 is a 32-channel, 8-bus digital mixer with six aux sends and returns; all channel inputs, bus outputs, and main outputs are 24-bit, as is the S/PDIF and AES/EBU (switchable) digital I/O. Clearly, we're talking pro audio quality. You get extensive dynamic and scene mixdown automation and complete real-time MIDI control, as well as a variety of sync capabilities. So far, so good.

The stock console provides eight XLR mic/line inputs and eight 1/2-inch TRS mic/line inputs, which address channels 1 through 16. But to get the most out of this board, you need to install 8-channel expansion cards in any of its three slots. At the moment, you can add 24-bit analog I/O, 24-bit ADAT Lightpipe, Tascam TDIF, and AES/EBU. You can link two DA7s by installing a cascade card in the third slot of each console. A fourth card equips the mixer to accept SMPTE time code on an XLR connector and to receive a composite video signal (NTSC or PAL) on a BNC connector. If you fully expand the board, you'll spend at least another \$1,500 on top of the list price, but you'll have a console with the power and flexibility of digital boards that cost much more. We found that very impressive.

What really grabbed our attention is the DA7's ergonomic design. Musicians will appreciate the console's assignable channel strip, which features dedicated knobs and buttons for controlling EQ,



routing assignments, and various other processing. The console offers 16 dedicated channel faders, four bus faders, and a stereo master fader. All faders (except the master) can be assigned to one of four "fader layers" with the push of a button. The first three layers give you access to the channels and the aux sends and returns, which is a good start. The fourth layer lets you custom-configure each fader independently and can be used to send MIDI messages on any MIDI channel, which is especially useful in the often MIDI-centric world of the personal studio. The DA7 boasts a large LCD screen that displays a ton of information, including a comprehensive metering system.

Although it doesn't include multi-effects, the DA7 nevertheless offers some impressive signal processing. Each channel features a dedicated delay processor, a 4-band parametric EQ, and a dynamics processor. All eight buses and the master outputs each have a dedicated parametric EQ and dynamics processor. The dynamics processors can be positioned pre- or post-EQ and can be used as either an expander or a compressor/gate. Furthermore, the compressor and gate can be used simultaneously, unlike their equivalents on some competing digital boards. The DA7 also boasts full 5.1 and LCRS surround-sound capabilities, which will be increasingly important in the future.

Personal studio owners will also appreciate the little things, like the assignable talk-back system, the 1/2-inch punch-in/out footswitch jack, and the space for a tape strip just below the trim pots. These details are clear evidence that someone at Panasonic has engineered a lot of sessions. Overall, the console is easy to learn and a joy to work with: almost every function is less than three button clicks away. For the personal studio owner looking to upgrade to a digital mixer, the DA7 is a smart bet.

## Software Synth

### NATIVE INSTRUMENTS GENERATOR 1.5.3

(Win; \$298)

Imagine, if you will, a set of tools so powerful that you can build any type of sound or audio process imaginable. Now add an attractive graphic interface that makes this task easy and offers sliders and knobs to modify your sounds as they play back. If you're



# The best is now the quickest.



## BASF's new Formatted ADAT Master saves you time and head wear.

Now you can get the world's best-performing ADAT Master already formatted—saving you time in the studio and wear and tear on your ADAT recorder head. BASF's new Formatted ADAT Master lets you record to ADAT immediately, without having to format a master tape.

**PLUS,** get all the benefits of an ADAT tape designed for ultimate performance:

- consistently lower error rates than any other major brand on the market;
- specially constructed ABS shell providing precision tracking, virtually eliminating dropouts caused by static or dirt;
- convenient sliding erase-lock tab offering a simple means to safeguard your masters.

Available in 40- and 60-minute lengths. Compatible with all ADAT Type 1, 16-bit recorders.



EMTEC Magnetics

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by EMTEC

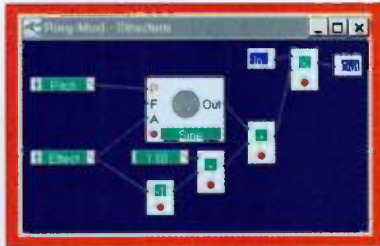
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getting the picture, you'll understand what Native Instruments' *Generator* is all about. This year's award-winning software synthesizer provides nearly 200 sound-generating or processing modules that can be "patched" together to create amazing sonic networks. These designs can be totally synthetic or can include preexisting audio samples.

*Generator* offers a vast number of functions, including oscillators, filters, delays, and envelope generators, and it lets you use them in any combination. It's especially useful for creating sounds with subtractive, FM, and additive synthesis, and it gives you the option to control your sonic designs using any number of sources, including MIDI, audio signals, or random functions.



As with other software synths, the amount of polyphony depends upon the speed of your CPU and the complexity of the sound you design. But *Generator* does a great job in helping you tweak your system for optimal

performance. You'll also appreciate being able to use *Generator* as a DirectX plug-in with some of your favorite programs. (Check the manufacturer's Web page for a list of supported software.) That's an extra bonus that gives you even more ways to use the program.

Reviewer Zack Price was impressed with the clarity and thoroughness of *Generator's* manual, and although we won't say it's easy to build complex sounds that evolve over time, you'll find several good tutorials to get you started, as well as a wide range of example sounds included with the program. With so many ways to build unique sounds, *Generator* may be one of the most powerful synths you'll ever buy.

## Sound Card (with Synth or Sampler)

### E-MU AUDIO PRODUCTION STUDIO

(Win; \$699)

A digital audio workstation is great for audio recording and processing, and maybe even MIDI recording (if you include audio cards with digital audio sequencer front end). But if you want MIDI-controllable synthesis and key-mapped sampling in the same product, you must look to the modern descendants of the good old Sound Blaster-type sound card with bundled software. Now E-mu has provided the next generation of this breed with its Audio Production Studio (APS).

At a price comparable to that of a mid- to low-cost sound module, the APS offers a comprehensive work environment. You get two 32-voice software synths, a full-duplex digital recording system, four channels of analog and digital I/O (including two mic-level inputs), onboard DSP, a digital mixer, and lots of quality sounds.

At the heart of the APS are two sampling synth engines. The system uses your computer's RAM to store sounds, which are saved in SoundFont format. What's really significant is that the APS is the only available product that supports version 2.0 of the SoundFont standard, which allows user-configurable, real-time modulation of sounds through continuous MIDI controllers. Although most SoundFont-compatible sound cards can upload only a megabyte or two of sound at a time, the APS can accept 32 MB simultaneously.



The system comes with nearly 400 MB of sounds—everything from Latin percussion to barking dogs—most of which were derived from E-mu's Proteus line of modules. External MIDI devices may also be connected to the system via the provided gameport cable.

The APS digital mixer window is flexible and serves as the main work area for the system. Four inserts are provided on each channel, and there are four stereo aux buses. MIDI submixing is available, and you can route signals through external processing units—although the onboard DSP sounds pretty darn good.

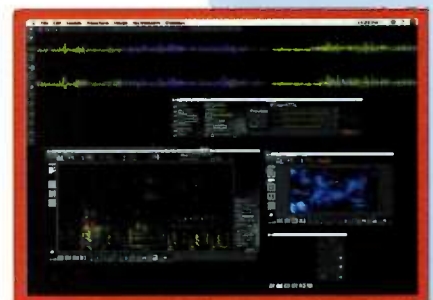
APS should be examined as a package product: yes, the core hardware and software are the primary focus, but the ancillary goodies make this an especially sweet deal. The APS is bundled with several third-party programs, including *Cakewalk Express Gold*, *Creative Labs Vienna SoundFont Studio*, *SoundFont Bank Manager*, and *Sonic Foundry Sound Forge XP*. In other words, if you have a MIDI controller and a mic, you're ready to produce projects with APS as soon as it's installed, performing every task from waveform editing to sound generation.

## Sound Design Software

### U&I SOFTWARE METASYNTH 2.1 (Mac; \$249)

If sound design is your game, then U&I Software's *MetaSynth* is the name. We can't think of any other software that offers as many unique ways to create sound as *MetaSynth* does, and you'll be amazed at how quickly you'll get great results from the program.

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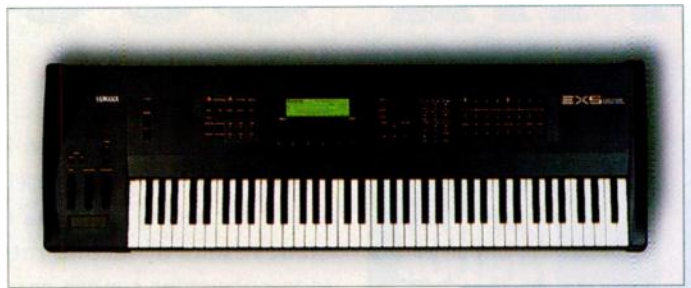




and 16 MB of built-in ROM. In addition, the EX5 sports three sequencers and a sampler, which is based on the company's A3000. The stock workstation comes with a 1 MB memory, which can be expanded to 65 MB using the optional SIMM memory modules. A SCSI option allows you to store data on external drives, and 8 MB of Flash memory become available when two optional memory boards are installed. One of the most impressive things about the EX5 is its sound-generation technology. In addition to wavetable subtractive synthesis, four other types of synthesis are employed: VI-style physical modeling, analog-emulation physical modeling, sampling, and Formulated Digital Sound Processing (FDSP)—which essentially generates sound from scratch using polyphonic, DSP-based synthesis. There are ten kinds of FDSP, some of which use physical modeling.

On the sequencing side, the EX5 contains a 16-track song sequencer, an 8-track pattern sequencer, and a 4-track arpeggiator. The EX5's sampler lets you sample sounds from a microphone or line-level source, or directly from the internal EX tone-generator system. The samples can then be used in constructing voice elements or in mapping to individual keyboard keys.

You get two system effects (reverb and chorus) and two insert multi-effects processors, which run the gamut: chorus, overdrive, amp simulation, auto



wah, and EQ, to name a few. All are useful and sound great.

The EX5's user interface is ridiculously easy to learn—any page is less than three button clicks away—yet comprehensive, providing an unparalleled amount of control. There are six soft knobs for controlling assignable parameters, a pitch bend wheel, two assignable modulation wheels, and an x-y pad. One very cool feature allows you to customize the pitch-bend wheel so that movement up performs a separate task from movement down (e.g., you can bend a semitone up and an octave down). The key-mapping features are comprehensive and several split-keyboard modes are available.

But this workstation's sounds are what will sell you on it. Go to your local dealer and hear it firsthand—you won't be disappointed. ●

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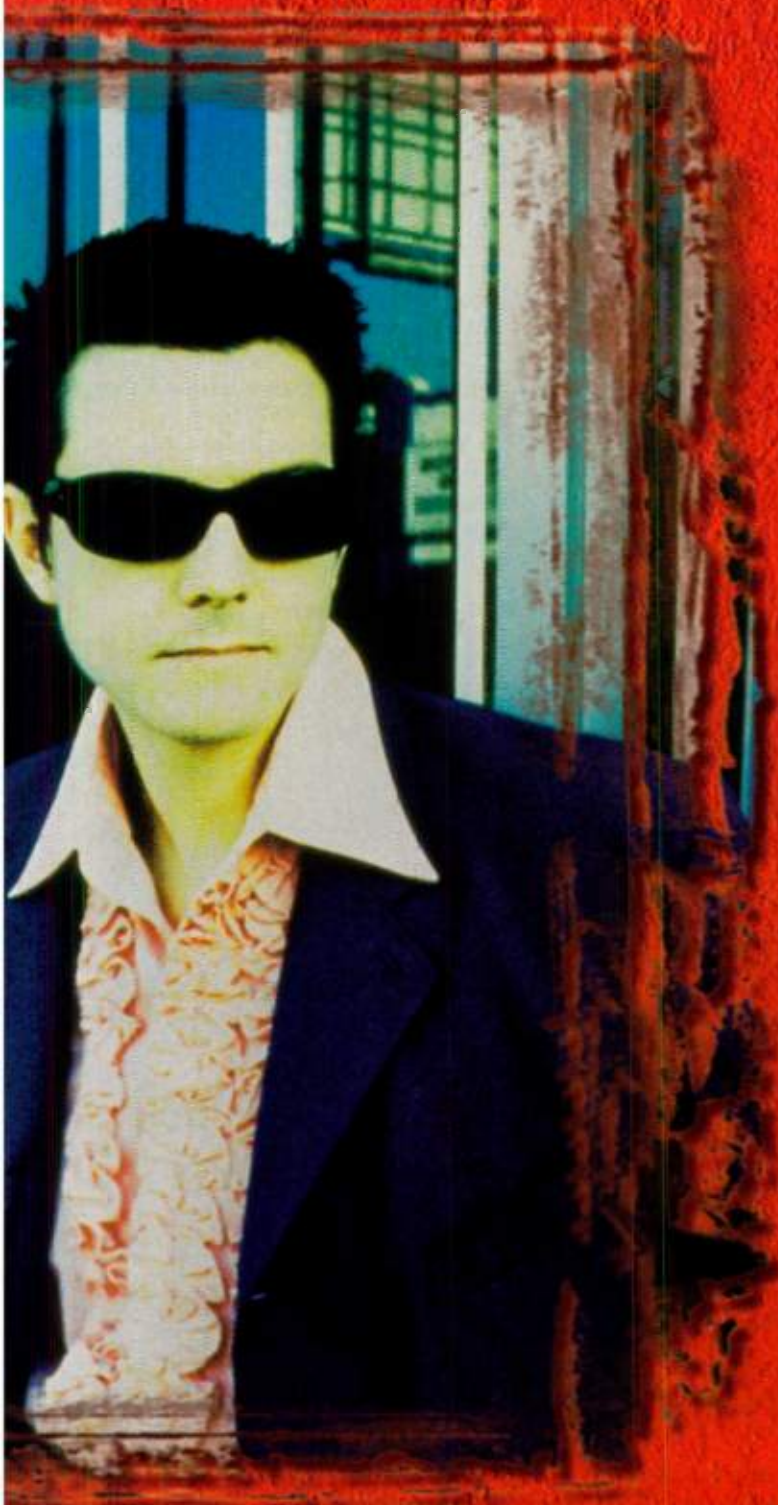
# From Bauhaus



These groundbreaking musicians are still leading the way after two decades.

Photo By Howard Rosenberg

# To Acid House



Almost 20 years have passed since Daniel Ash, Kevin Haskins, and David J blasted onto the music scene. It was in 1979 that the former art students, along with singer Peter Murphy, formed Bauhaus and released their debut album, *In the Flat Field*. That group's literate and nihilistic vitriol, set to mood-swinging music, came during punk's heyday but always stood apart. This past summer, Bauhaus made a splashy return to the limelight with a well-received tour, quickly selling out halls to rabid fans on little more than word of mouth. But although the band has secured its members a place in history, it has hardly been their only musical outlet over the years.

Singer-guitarist Ash, drummer Haskins, and singer-bassist David J founded Love and Rockets after the dissolution of Bauhaus in 1983 and began to hone lushly produced, neopsychedelic pop songs that stood in opposition to the stark lyrics and harsh sonics typical of their former band. Other notable side projects include the lo-fi, protodance music of Ash and Haskins's Tones on Tail and David J's collaborations with fellow Briton the Jazz Butcher. All three also spin records in clubs throughout Los Angeles. But they have always come back to Love and Rockets, which provides a comfortable forum for them to express their current musical interests. The band's new album, *Lift*, is a pleasing mix of swirling guitar pop—a Love and Rockets mainstay—and the heady electronics that have crept into their repertoire over the past few years.

I talked with the band members and their producer, Doug DeAngelis, about what Love and Rockets is accomplishing in the '90s and how they went about recording the new album. I found that the process of making *Lift* is indicative of the way many bands record today, using a little of everything gear-wise and taking a "mobile studio" approach. At the same time, the careers of DeAngelis and the band are representative of how many musicians stay busy, by being as active in the clubs as they are in the studio or on stage.

By Rick Weldon

## From Bauhaus To Acid House

### How did you start working together?

**DEANGELIS:** I had come out from New York to Los Angeles to do the song "Resurrection Hex." *Lift* followed after that; we had a good connection and just kept right on going.

### What was the setup for tracking?

**HASKINS:** I had my own studio setup at home. All the samples and weird noises came from my Akai S1000. I'm still using C-Lab's *Notator* on the Atari to sequence, and more often than not, Doug would do the final programming on his stuff. When Doug came in, we often scrapped the original stuff but kept the feel and the tempo. Some things stayed, a guitar or a drum part here or there. Also, when we were tracking, we set up as a band, so we could record basic tracks together if we wanted.

**DEANGELIS:** *Lift* was tracked in part on my equipment, which I brought to Swinghouse, a soundstage in Los Angeles. Swinghouse is big—the size of a gymnasium. Up above, looking down into the soundstage, is a small control room that they use for 16-track recording. We basically gutted that room, taking all the gear and furniture out of it. Kevin had his setup, and I lugged all the stuff that I had brought out from New York City up a couple of flights of stairs: my Akai DR16 hard-disk recorders, my synth racks, my Akai MPC3000, my computer. We locked that space out, and it was the best recording environment. Those guys are real night owls, Danny in particular. Once it got dark outside, with the windows and the lighting in that space, it was just one of the coolest rooms I've been in. We would generally start by taking some things off their demos, and then wind up going back and redoing the parts. I think only a guitar track or two ever stayed through to the end.

Kevin said that he would bring in his basic drum sequences, and that you would listen to and work through them, then come up with a new version of the

sequence on your setup. What did you use for the drum sounds?

**DEANGELIS:** I'd load samples from Kevin's S1000 into my MPC. I recorded the live stuff on my Akai DR-16s, and all my synth stuff is in *Logic Audio*. I have those two connected, *Logic* and my DRs, so I can bounce the tracks in and out, edit things, and bounce them back. After I loaded a song, the band would give me a few hours to get something going, then they'd come in. They're a dream to work with, because they give you space to work on something, then they come in and work on it very aggressively with you.

### Where did you get the samples for the MPC3000?

**HASKINS:** We took everything off vinyl. We each brought boxes of stuff from our record collections and went through them, trying different things. Doug was looking to use a lot of sounds from the '80s.

**DEANGELIS:** That was great because they have such terrific record collections. When we started, the Chemical

Brothers' record was really big, and I wanted to get away from the breakbeat stuff. I didn't want to come out with a record a year later that had the same kind of sped-up breaks. Love and Rockets have made too many records to follow a trend. All the groove stuff on "Resurrection Hex" is based on Adam and the Ants—that's the era I wanted to go with. So we decided our goal would be to bring in records from that time period.

### How did you process the drum samples in general?

**DEANGELIS:** I use a Roland GP-100 guitar processor. I use it more for vocals and drums than for guitars. I apply a lot of weird flanging and delays, like the vocal effects on the track "My Drug." My turntable feeds through the GP-100 to my MPC, and it also feeds directly to the console. So, as we're working, I can put up records and then listen through the MPC, because I want to be able to hear the drums while I'm doing it. I'll take a direct line, find things that I like, and then start working through the processors. The GP-100 is



Kevin Haskins, David J, Daniel Ash, Doug DeAngelis, and Luscious the dog relax in the control room at Network in New York City.





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## From Bauhaus To Acid House

great because it has a string of everything in it. There's distortion; you can use that or turn it off and just get phasing, flanging, and chorusing effects—whatever you want. A lot of the drum samples have light flanges on them.

I've used the Roland for about three years now, so it's filled with programs for drums. I listen to the sample, and, if the drums are dry, certain things work well; but if the samples are roomy, other things work better. At this point, I know what works.

Also, the four of us were totally committed to what we were doing. We became pretty good at knowing what to keep and what to throw out, without having to deliberate for hours. That's good because it keeps the creativity flowing.

### How did you get the guitar sound?

**DEANGELIS:** Danny used a Fernandes guitar and a lot of EBow. He used his Gretsch guitar for rhythm parts. I usually layered that with a Les Paul or something that had a bigger bottom-end sound. On occasion, we'd use the GP-100 to layer the sound. We miked a lot with a Sennheiser 421. Often, I would put a pair of 421s out in the middle of the room, back to back, and flip them out of phase. Sometimes I would use a Shure SM57, too, or another 421 up close.

**ASH:** The EBow is a great bit of gear. I have shares in the company, and they're doing quite well, thank you very much. *[Laughs.]* My Fernandes guitar is called the Sustainer, and it works on the same principle as an EBow. You hit the strings, and they go on forever. You can sustain the primary note, or the third or fifth harmonic. It's a great invention that nobody's heard of. The other thing I used for guitar sound is a Casio DG-20, one of those plastic guitars. It's like a kiddie thing, really, with a little built-in drum machine and a built-in speaker and all kinds of corny sounds. The nylon strings on it are very floppy, so you have to hit them very gently.

When we're working stuff out in the studio, we often end up using notes or chords or even arrangements where we messed up and the song starts to wander. On "Deep Deep Down," for example, I was just searching for the chords to play, messing with the wah pedal. I'm a firm believer that that's the subconscious at work. When you're not thinking about it, that's when the really good, creative stuff comes out. The conscious part is good for arrangement, when you're going for an end product.

### How about bass and vocals?

**DEANGELIS:** We use synth bass on the title track, "Lift," but it's mostly David's



The classic Love and Rockets logo graces the cover of *Lift*.

fretless through the Tech 21 SansAmp. It has a great low-end boost, and on a fretless bass, it's really nice. David's whole vibe is that dub bass thing. I would just roll down the top end, and roll up the sub bass. I also sometimes used a Roland JP-8000.

For vocals, I would get a lo-fi sound occasionally with a PZM stuck on the wall, and I'd get Danny to stand back about three feet and sing at it. Danny writes lyrics five minutes before he sings. Even if it's a demo they wrote a year ago, they rewrite it five minutes before they sing it—if not while they're singing it.

**Were there places in which Doug played synths or did programming collaborations? Did you come up with arrangements or structures together?**

**DEANGELIS:** I'd usually snag things off the demo, take a loop, and use it to write with. Then, once I had a sketch of the drums, bass, and synth things, I'd lock up with Kevin, and we'd bring back the things I liked from the demo, move them around, change sounds—whatever we needed to do—and then we'd get into putting guitars and stuff back on. That was the flow of nearly every tune.

"Lift" was an interesting track. It started as an acoustic track, and I wanted to work it into an electronic piece. This was when we were back in New York. I had David on a mission to go outside and find things to bring back to the studio. He returned with not one, but several bags full of junk. We stereo-miked

### THE MUSIC MAKERS

On *Lift*, Love and Rockets and engineer Doug DeAngelis used quite a few analog and analog-emulating synths, as well as analog filters, drum triggers, and samplers. Here are some of the units they used throughout the album.

Access Virus

Akai S1000

Akai MPC3000

Akai DR16

Boss SE-50

Casio DG-20

C-Lab *Notator*

EDP Wasp

Emagic *Logic Audio*

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## From Bauhaus To Acid House

the live room and filled it with the stuff. He and Kevin played fetch with my dog, Luscious, throwing a ball across the room for her. She ran through the live room, which of course was knee-deep with the junk from outside. It was fall, so there were all these leaves and sticks, all kinds of stuff. Luscious was dragging stuff behind her and running in circles around the room. The original track of that is the last cut on the record. We also sent it to DJ Keoki, whom Kevin had met at a party, and he put a groove underneath it. His mix is the first cut on the record.

### Tell me about the Luscious Jackson track.

**ASH:** Getting Luscious Jackson was Doug's idea. We wanted to get the Spice Girls, but we couldn't afford them. [Laughs.] Luscious didn't know the arrangement, and they hadn't heard the track, so we just played parts of it. We wanted to see what sort of angle they would come up with.

**DEANGELIS:** On "Holy Fool," Luscious Jackson came in and cut their tracks in an hour. My goal was to give them a half hour without ever hearing the lyrics of the song and let them flow out vocals and instrumental ideas. I knew them well enough to know that what they liked would click. I didn't want them to overthink it; it needed to be more of a complement. So we put up a mic and gave them a half hour.



DeAngelis brought his own Akai DR-16 hard-disk recorders into the studio, and they were essential for capturing live tracks.

We figured that if they were tuned in to the vibe of the song, there'd be no problem. If they weren't, we'd put David's vocals on, and we'd do it the intelligent way. As it turned out, Jill [Cunniff] came in and did her vocals in one take.

### Sounds like a pretty good working situation.

**DEANGELIS:** Actually, the eight months that they spent writing probably could have been spared altogether. They gravitate toward writing, capturing it, making it into a song, and moving on. Four months is normal for me; this recording took about six months, but we also didn't work the kind of hours I'm used to working. I usually start around noon, and I work until around four or so in the morning. We didn't work that kind of schedule in L.A. The guys deejayed at night, so we'd usually wrap up at ten or eleven o'clock in the evening. And because we were in Swinghouse, we weren't pressured with \$200-per-hour studio costs. We were in a really relaxed environment.

With Love and Rockets, everything has to be a natural: whatever's flowing, that's what works. In New York, we were a little more analytical. We spent more time separating ourselves, thinking about things, and working on them until everyone was happy.

Of course, sometimes an evening would be hectic. One night while I was working on a song called "Ghost of the Multiple Feature," the guys had left, and I kept working. I'd started from

scratch on the MPC, taking various things off records and working on the grooves. It was about two o'clock in the morning when one of the guys from the studio came into the room and said to my assistant engineer, C.J. Buscaglia, "Is Kevin still here?" C.J. said no, and the guy pulled the plug out; it turned off everything in the control room. I



Haskins's Akai S1000 figured prominently into the recording of *Lift*, processing samples and generating all manner of "weird noises."

hadn't saved it, and I knew that I wouldn't remember it the next day. So I knew I had to reconstruct it right then and there. I had all the records out and knew where all the pieces came from. A friend came by to pick me up, and I had to tell her, "I'm not ready." She offered to help me, and we stayed until six in the morning finishing it.

### What kind of monitors do you use for mixdown?

**DEANGELIS:** I prefer using Auratones. I also use two pairs of Genelecs: a pair of the 8s and a pair of 6.5s. Most of the time, I use the 6.5s. I use an Auratone in mono. I like to mix in mono for levels and balances, and then I go back and forth from there. When I work on my Genelecs, sometimes I'll make a change that's too subtle for its own good. Those speakers are so clean and the imaging so clear that you can make a change, and when you hear it on the radio, it's half of what you wanted it to be. Whereas, when you listen in mono on a little speaker, you can really tell how people are going to hear it.

I used to work with a mixer named Jason Corsaro when I was an assistant. Jason's theory on mixing was that if you're going to do it, do it. Make it clear what you're going for, because people aren't going to hear minor changes. If you know Jason's records, like the Power Station's, you know he's an extremist.

### Tell me about the mixes you farmed out to Deep Dish.

**DEANGELIS:** "Resurrection Hex" was originally supposed to be an underground, white-label record; it wasn't even going to be on the album. That's why I had Deep Dish do the mixes on it, to keep it really dark. Generally, a remixer has to deliver two versions to a record company: an underground and

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## From Bauhaus To Acid House

a commercial mix. With the commercial mix, you spend a lot of time in the studio, and no one ever hears it. Then you spend two hours doing an underground dub version. The DJs will keep those and make acetates.

The DJ thing is a really tight network. They pass the acetates back and forth to each other of what, really, is the best stuff. So I told the remixers, "Look, just skip the commercial release and give me the one that you'd normally give to your friends. Save the five days of working on the other mix, I don't need it." It made for a great 12-inch.

### When did Love and Rockets become interested in making more dance-oriented music?

**ASH:** In about '89 or '90. We were listening to the Happy Mondays, the Orb, and Spiritualized. Also, Kevin's been using drum machines for quite a while now, and I used one in *Tones on Tail*. It was an extremely crude, \$35 drum machine. From about '85 to '89, we worked in the normal way of bringing songs in and working them out with bass, drums, and guitar. Then, after a two-year break, we started working on *Hot Trip to Heaven*, and we deliberately went in without any guitars so that it would be something new and novel for us.

### What other projects have you done recently, aside from Love and Rockets?

**HASKINS:** I've done some remixing on a Gene Loves Jezebel track for Cleopatra Records. I just did one for Bow Wow Wow, "C30, C60, C90 Go," and before that, I worked with Jane's Addiction, sampling and sequencing for their last album, *Kettle Whistle*.

**DEANGELIS:** I do quite a bit of producing and mixing. I've done a lot of remixes, some on my own, some with different remixers in New York. I've worked with Roger S., Danny DeNaglia, and the guys from Deep Dish. When I first arrived in New York in the early '90s, I met people like Roger, who had just done some underground stuff with a band called Strictly Rhythm. On oc-

casional, he'll get records like a Michael Jackson single, where it's a dance mix but it needs to be a radio crossover. Another good example is a single I did for Ultra Nate, called "Free," that came out this year. Mood II Swing brought me in to do a mix, and the idea was to make it into a club record that sounds like a pop record. That's what those guys call me for now. I also did remixes for the Pet Shop Boys and New Order with Daniel.

**DAVID J:** I did the music for a performance piece called the *Grand Egyptian Theatre of Marvel*, narrated by Alan Moore, who wrote the *Watchmen* graphic novels.

"I use a Roland GP-100 guitar processor, but I don't use it for guitars as much as I do for vocals and drums."  
—Doug DeAngelis

It's interesting that Love and Rockets' working style parallels the DJ work that they've been doing lately.

**DEANGELIS:** Which is really good. Plus, I'm a huge early-'80s fanatic. That's the music I grew up on. It's fun for me to work with a band whose record collections are all vinyl, all of that era. And those guys are very bohemian in their approach to things. It's earthy. If it feels good, we keep it; if it doesn't, we immediately move in a different direction. These guys each have something that they're great at; it takes a few songs to figure out what that is, and then it becomes a pattern.

For instance, David's always the guy who comes in, does his bass tracks, and spends most of his time writing lyrics and thinking about the big picture. He gets very into the message of the song. At the end, he'll always walk in and deliver some beautiful synthesizer or guitar line, some melody line on top that

you can't live without once it's there.

Daniel is the voice. He's a complicated one to explain. He's constantly pouring out ideas, mostly guitar or vocal work. When you're working on hybrid records like this, you have electronic parts, which takes time. You do a lot of programming, a lot of sampling, and stuff that must feel—to somebody who isn't doing it—like the most tedious work. So, with Daniel, who is a fountain of vocal ideas, backing vocal ideas, and guitar stuff, you always have to keep mics up and have things ready for him. At any point, you might have to stop what you are doing, turn the focus to him, and get the ideas on tape quickly; then you can go back to what you were doing and have his idea on tape for later on.

Kevin has an introverted demeanor in the studio. He's there from the minute the switch goes on to the minute it goes off. He also has a good sense of whether something's working or not. He spends most of the time with a pair of headphones on, and you have no idea what he's doing; then, at the end of the day, he has six or seven things that are complete genius. It's great, because he listens to what you're doing all day while he's doing his thing, so he has something that complements what you've done all day.

Like on "Deep Deep Down," where Kevin produced a slightly woozy orchestral break.

**DEANGELIS:** That's a string sample, a little slowed down. That's an example of what happens when he puts headphones on for the day. At the end of the day, you go, "What have you been doing, Kevin?" and he plays it for you, and it fits right into the break. That's a perfect example of Kevin at work.

**DAVID J:** You know the Mekon? It was a comic-strip character in '50s and early '60s in England. He was a little green alien with an atrophied body, and he had a big head and little beady eyes. His brain was huge, but he had no use for his body, really. He couldn't move physically, so he got around with a sort of scooter and just used his brain. Well, that's Kevin when he's in the studio.

**EM Editorial Assistant Rick Weldon is a member of anywhere from 15 to 20 barely existent bands, all of which are really, really good.**

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# Distortion Box



PHOTO BY RON MILLER



## The last project by Charles R. Fischer that you will ever build.

By Peter Miller

Charles R. Fischer's byline first appeared in **EM's** pages in February 1987 with his "Build a Slide Pot Ribbon Controller" do-it-yourself project. Between that first contribution and his final offering, "Build the **EM** Optical Theremin" (May 1995), he produced a steady stream of **EM** reviews, applications articles, and especially do-it-yourself projects. His "Build the **EM** Fingerdrum" (March 1992) and "MIDI! Mods for Your Minimoog" (September 1989) show Fischer at his DIY best; to appreciate the appeal of his articles is to understand the early roots of *Electronic Musician*.

The Spectra Distortion Generator was Fischer's last invention before he died of a heart attack in July 1996, and he was convinced that its unusual Spectra control would make it his most popular. He had originally intended to market the product to an established manufacturer, but illness prevented his doing so.

# Distortion Box

## Distinctive Design

This cleverly designed guitar-distortion box uses the 5534 op amp as its basic building block. (See the sidebar "Parts List" for specs on all components.) One 5534 is used as the input buffer and initial gain stage. A digital inverter is used as the "spectra tone generator," and an adjustable current regulator powers the IC governing the spectra tone. The second 5534 is a combined tone control and output buffer. The Treble control lets you soften the distortion a bit, and the Master control governs the overall output level.

First, we need an input buffer to isolate the guitar from the circuit. The input buffer (A1) uses one of the 5534

op amps (see Fig. 1), which is configured to work with a single power-supply voltage by applying a bias to the op amp. The bias is set so the output of A1 is at a DC potential of half the supply voltage. Resistors R10 and R11 divide the power supply voltage, and capacitor C8 filters this bias voltage, which is applied to the noninverting input of A1.

Trim pot VR1 is in the feedback loop of the amplifier and therefore sets the gain of the input buffer to match your guitar rig. It has a gain range from unity to 10X. Capacitor C9 is used to block the DC component and pass the audio to P1, which is the front-panel Drive control that feeds

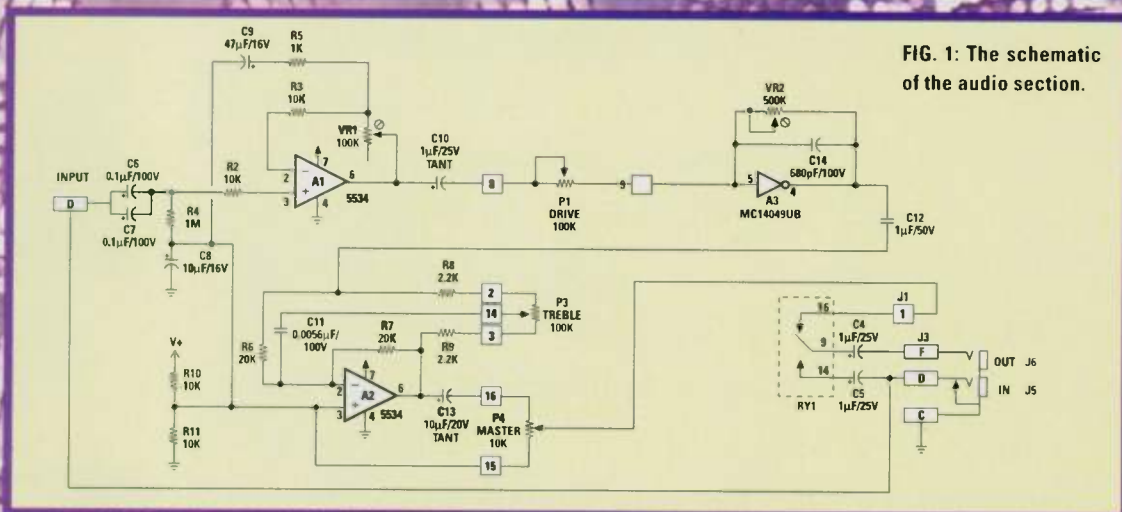


FIG. 1: The schematic of the audio section.

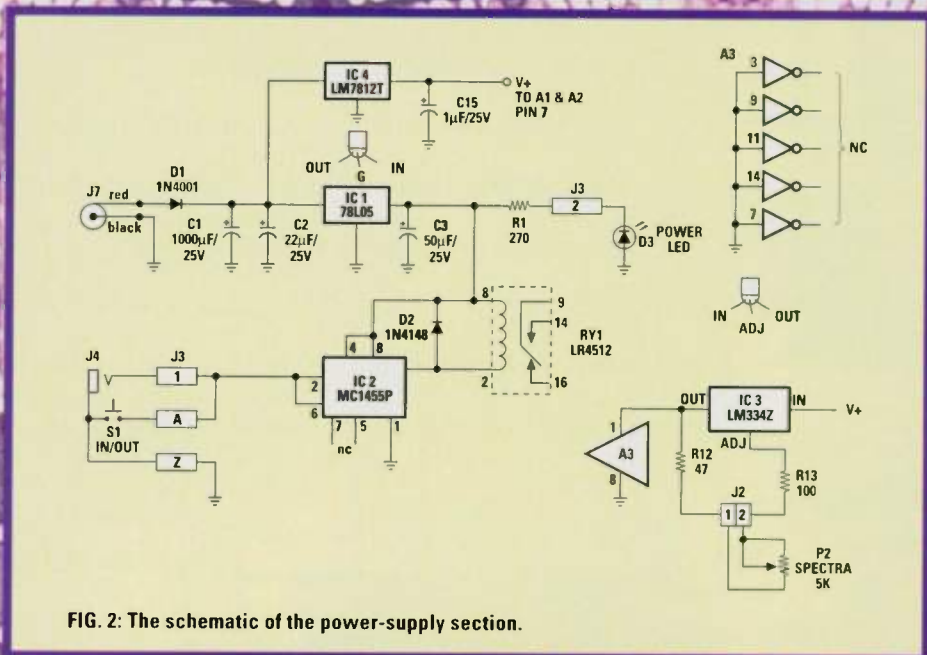


FIG. 2: The schematic of the power-supply section.

the right amount of signal into the spectra circuit.

Fischer used an MC14049UB digital CMOS inverter IC chip (A3) to amplify the audio. Normally, this IC only knows how to speak digital (i.e., ones and zeros), but Fischer used internal trimmer VR2 to bias the inverter into a somewhat linear mode of operation. The feedback is adjustable, giving you some control over the harmonic content. Capacitor C14 limits the high-frequency response to a reasonable cutoff point. Like C9, C12 blocks the DC potential and passes the audio to the tone-control circuit.

In addition, the spectra circuit is juiced up with an adjustable current

regulator (IC3) that powers the inverter (see Fig. 2). Don't confuse this with a voltage-regulator chip; IC3 is an LM334Z current regulator. Front-panel pot P2 is the Spectra control, which sets the amount of current fed to A3. This limits the power-supply current, which produces a funky little compression effect.

The second 5534 op amp (A2; see Fig. 1) is used as the tone control/output buffer. The tone control is a simple circuit that employs a pot (P3) and capacitor (C11) to vary the frequency response of this stage. One end of the pot is connected to the output of the op amp, and the other end is connected to the Spectra stage. The wiper goes

through C11 to the inverting input of the op amp.

When the pot is set to one extreme, the capacitor bypasses the input resistor at higher frequencies; at the other extreme, the capacitor changes the compensation in the feedback loop of the op amp, thus changing the high-frequency response of the amplifier. This topology yields a wide range of tone adjustment. Pin 6 of the output buffer is connected through C13 to the Master pot on the front panel for setting the overall output level.

The Spectra Distortion Generator has a true hardwired bypass that uses a small DIP relay (RV1) to switch the distortion out completely. This relay is

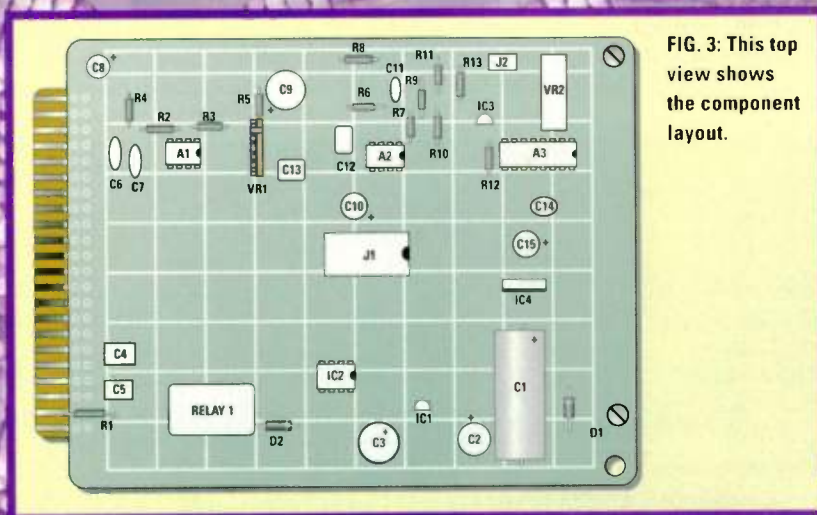


FIG. 3: This top view shows the component layout.

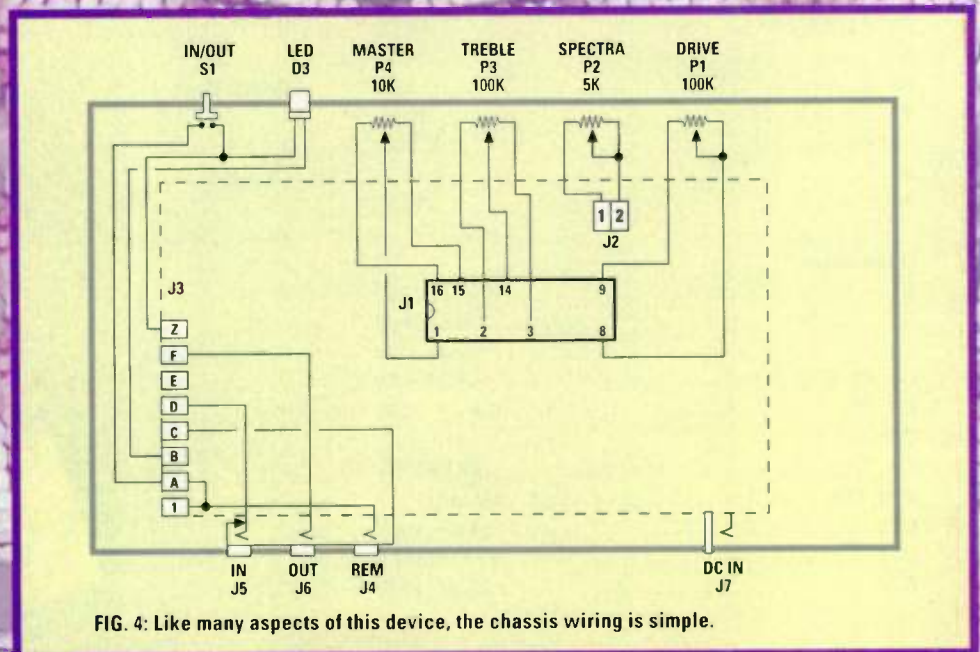


FIG. 4: Like many aspects of this device, the chassis wiring is simple.

# Distortion Box

controlled by means of a Motorola MC1455P timer chip (IC2; see Fig. 2). This is a clone of the 555 timer IC with a few extra bells and whistles. Fischer configured it as a simple relay driver; the precision timing features of this chip are not used here. A front-panel switch (S1) and a ¼-inch phone jack (J4) for a footswitch let you control the relay-driver circuit that switches the effect in and out. A 78L05 +5V low-power voltage regulator (IC1) powers the relay-bypass circuit and the LED power indicator (D3).

This project requires a high-quality, regulated power supply for the audio

portion; Fischer selected an LM7812T 3-terminal voltage regulator (IC4) for this purpose. It takes the unregulated voltage from a wall-wart power supply (15V to 25V, 200 mA) and maintains a fixed output of +12V, which is required to operate the circuit. When configuring the wall-wart connector (J7), make sure to get an adapter with the correct polarity (tip = negative). Diode D1 protects the circuits from reverse polarity, and C1 and C2 smooth the incoming power.

## Straightforward Construction

Fischer used a RadioShack 276-188 prototyping board with 44 edge-connector fingers, 22 on each side of the board. These connections are labeled with numbers on one side and letters on the other. In the accompanying schematic diagrams, the rectangular boxes call out the appropriate edge-connector pins. The card also has

foil traces on one side, which are used to supply DC power and ground paths.

The board unplugs from the chassis (J3) for repairs or modifications. A connector for the front-panel pots was made from a header-plug ribbon wire and a 16-pin IC socket (J1). In the accompanying schematic diagrams, the square boxes indicate the pin numbers of this connector. The components of the circuit are mounted by inserting the leads through the board and soldering them to the foil traces and pads (see Fig. 3). Jumpers are used on the component side to make connections between traces in order to form the whole circuit.

Note that RadioShack has discontinued the 276-188 board and offers no replacement. However, you can substitute the Vector 3677-2 prototyping board from Allied Electronics (tel. 800/433-5700; Web [www.allied.avnet.com](http://www.allied.avnet.com)).

The enclosure is a plastic prototyping case. I found some suitable cases in the

## PARTS LIST

### Integrated Circuits

A1, A2	NE5534
A3	MC14049UB
IC1	78L05 (package code TO 92)
IC2	MC1455P (Motorola)
IC3	LM334Z
IC4	LM7812T
RY1	LR4512 relay

### Resistors (¼W, 5%)

R1	.270Ω
R2, R3, R10, R11	.10 kΩ
R4	.1 MΩ
R5	.1 kΩ
R6, R7	.20 kΩ
R8, R9	2.2 kΩ
R12	.47Ω
R13	100Ω

### Capacitors

C1	1000 μF, 25V
C2	.22 μF, 25V
C3	.50 μF, 25V
C4, C5, C12	.1 μF, 50V
C6, C7	.0.1 μF, 100V
C8	.10 μF, 16V
C9	.47 μF, 16V
C10, C15	.1 μF, 25V tantalum
C11	.0.0056 μF, 100V
C13	.10 μF, 20V tantalum
C14	.680 pF, 100V

### Potentiometers

P1	100 kΩ audio
P2	.5 kΩ linear
P3	100 kΩ linear
P4	.10 kΩ audio
VR1	100 kΩ trim pot
VR2	.500 kΩ trim pot

### Diodes

D1	1N4001
D2	1N4148
D3	Red LED (package code T1 ¼)

### Connectors

J1	16-pin IC socket
J2	.2-pin (AMP)
J3	.44 ckt PC card edge connector
J4	Switchcraft #11 (Remote jack)
J5	Switchcraft #12 (In jack)
J6	Switchcraft #11 (Out jack)
J7	2.5 mm (Power jack)

### Miscellaneous

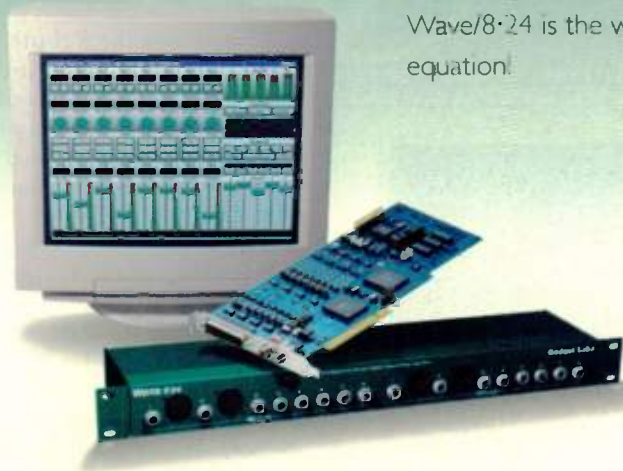
S1	SPST push on/push off
PWB1	PC board (Allied Vector 3677-2)
Case	Jameco or equivalent



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# Distortion Box

Jameco catalog. The controls and jacks are positioned as shown (see Figs. 4 and 5).

## Metal Shredding

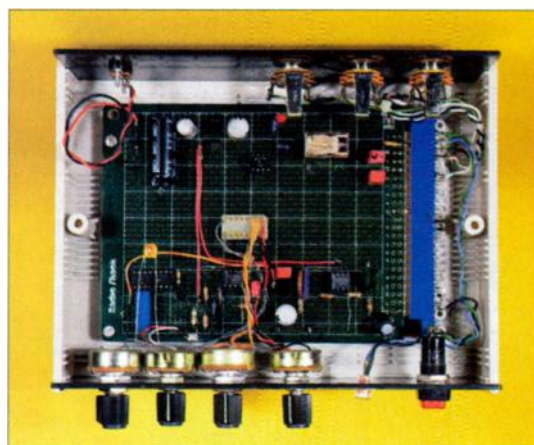
Like any other guitar-effects box, the Spectra Distortion Generator can be placed in the signal chain at the beginning (i.e., between the guitar and the input of the amplifier) or in an effects loop. However, line-level loops will overdrive this unit, and it won't sound right, so use it only with guitar-level signals.

I invited some guitar players to evaluate the sonic qualities of the Spectra Distortion Box. A typical comment was "It has a fairly wide range of solid-state-type distortion textures, very reminiscent of 1970s styles. Depending on the settings, you can get a sound similar to the MXR Distortion+. Other settings make it sound like the old Sunn Beta amplifier." This

makes a lot of sense, because Sunn also used a digital IC biased for linear operation in its overdrive circuits.

The really cool departure from these traditional distortion sounds is the Spectra control. By setting just the right amount of Drive and Spectra distortion, you get that MXR Distortion+ sound with a funky compressor built in. It reminds me of the Neil Young tune "Hey Hey, My My," but Fischer's Spectra Distortion Generator has qualities not available in any of my stomp boxes.

What's going on to produce this effect? When the digital chip is driven to draw enough current from the power supply, it causes the regulator chip to start limiting the current. In addition to changing the waveform in some unique ways, it also limits the amplitude, thus compressing the signal at the same time. Of course, as is usually the case, you can have too much of a good thing. We



RON MILLER

Fischer built his Spectra Distortion Generator using the now-discontinued RadioShack 276-188 prototyping board. The Allied Electronics Vector 3677-2 is a good substitute.

found some settings that are not very usable in our application, but the Fischer Spectra Distortion Generator is definitely worth experimenting with.

## Don't Hold Back

If you know nothing else about Chuck Fischer, just keep in mind that he was a stubbornly independent man who refused to follow the crowd. He even insisted on having his middle initial in his byline—Charles R. Fischer—just because he didn't want to be confused with another electronics writer named Charles Fischer, whose work he disliked.

This determination to follow his own muse, come what may, was at the root of Fischer's creative talent, as well as his wisecracking, irreverent personality. (His San Francisco Bay Area "country" band was once booked into a quiet town festival, and once onstage, unveiled itself as the loud, protogrunge Jim Jones and the People's Temple, throwing packs of Kool-Aid to a stunned audience!) It should come as no surprise, then, that he preferred to invent gadgets with unusual twists, like the Spectra Distortion Generator.

So enjoy building this legacy from one of EM's classic authors—then crank it up and let 'er rip! If you don't send the dog and cat running for cover and freak out your roommates and neighbors, you haven't gone far enough.

Peter Miller has specialized in the repair of electronic musical instruments for more than 30 years. He has owned CAE Sound since 1980 and has designed custom audio electronics for groups such as Tuck and Patti, Counting Crows, and the Grateful Dead.

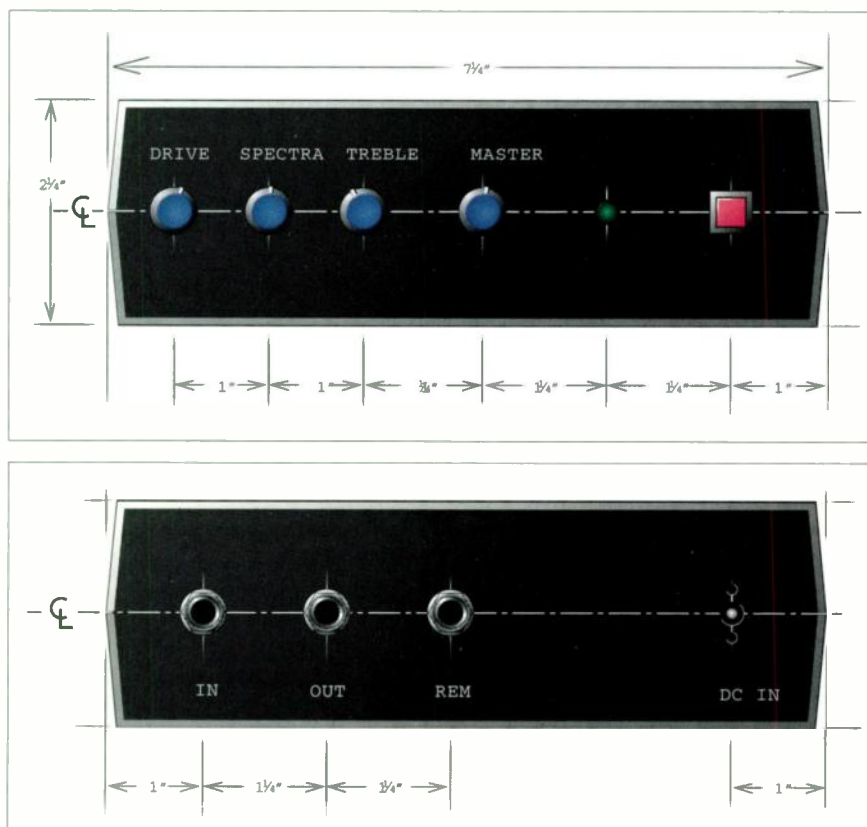


FIG. 5: The Spectra Distortion Generator has just a few controls, but one of them—Spectra—provides an unusual way to change the harmonic content of the sound. The rear panel is about as basic as you can get: an audio input, audio output, footswitch jack, and DC power-supply jack.

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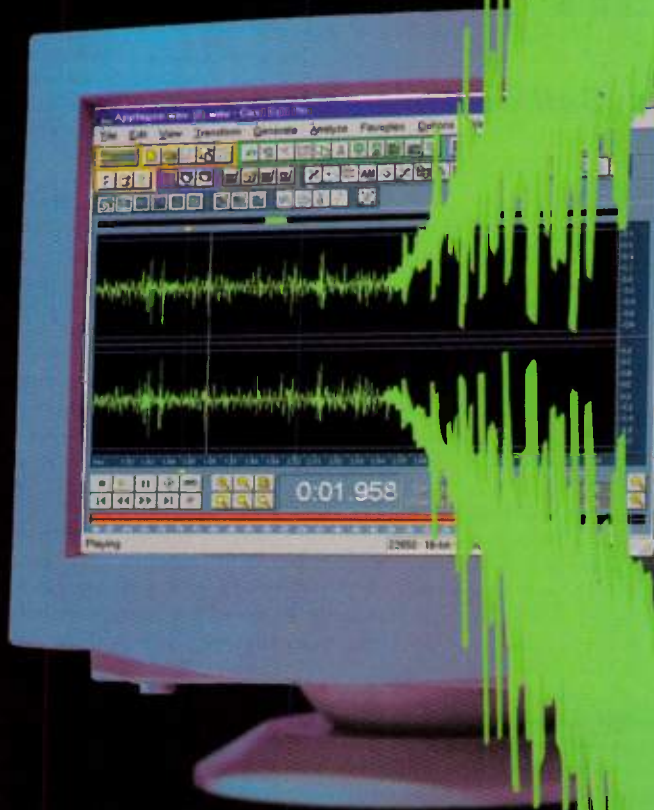
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- Electronic Musician, August 1998

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# The MPEG Audio Craze

**Forget CDs. Sell your music over the Net as digital audio files.**

By Scott R. Garrigus

Over the past few years, the Internet has become an indispensable tool for advertising and distributing the output of independent musicians. Development of World Wide Web sites has made global promotion easy and inexpensive. But the distribution side of the formula still presents some problems. Sure, you can sell CDs over the Web, but the expense of duplication, printing, packaging, and shipping can be a burden for budding musicians and low-budget independents.

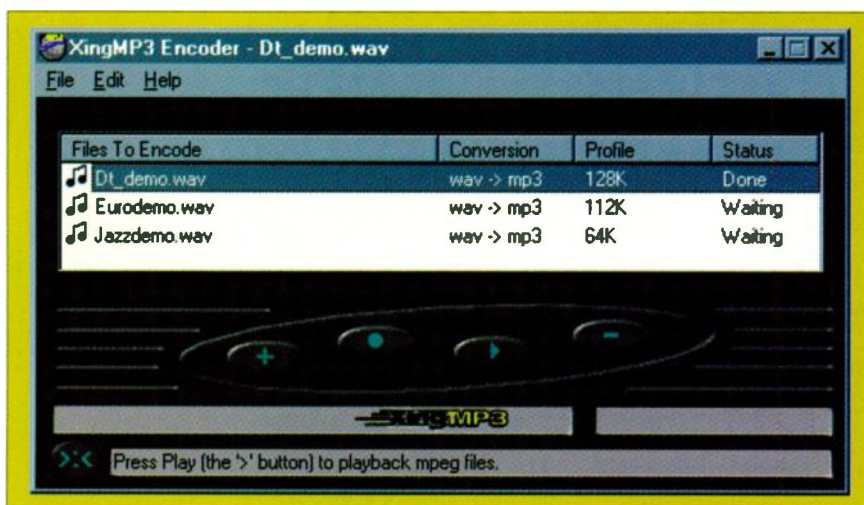
Furthermore, with today's ever-increasing demand for instant gratification, Web surfers want to purchase a

tune on the spot if they like what they hear. But downloading CD-quality audio files can take forever, even with a fast modem. Nevertheless, musicians from all over the world are selling their music on the Web in the form of digital audio files. How are they doing it? With a popular compression technology called MPEG.

## WHAT'S MPEG?

MPEG stands for Moving Picture Experts Group, a gathering of scientists and engineers who work under the joint direction of the International Standards Organization (ISO) and the International Electro-Technical Commission (IEC). The members of MPEG are responsible for establishing standards for the digital coding of moving pictures and audio. Because our concern lies with audio, we'll talk about the encoding standard called MPEG-1 Layer III (MP3).

MP3 is a *perceptual encoding* scheme; it works on the principle that when two sounds are played at the same time but with different volumes, the louder sound *masks* (hides) the quieter one. For example, let's say you have your TV playing at a normal volume in your living room. If you go into your kitchen and turn on your blender, you no longer hear the TV when the blender starts. If you make a recording of this scenario and save it as a CD-quality WAV file, the sound of the TV will still



**FIG. 1:** With Xing Technology's *XingMP3 Encoder*, you can create great-sounding MP3 files in several bit-rate formats, and it's one of the fastest encoders on the market.



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FIG. 2: Winamp is a popular MP3 player utility for the Windows platform.

be present in the sound spectrum. But because the TV sound is masked by the sound of the blender, it's no longer needed and can, therefore, be "safely" eliminated. In technical terms, this unnecessary data is called *irrelevant*. (This is similar to, yet different from, other types of file compression in which unnecessary data is termed *redundant*.)

MP3 technology can break your recording down into its frequency components, and—using psychoacoustic algorithms for encoding—compress it into a much smaller file size with almost identical sound quality. Of course, this is an oversimplification of the technology, but you get the idea. If you've ever listened to a MiniDisc, you know what compressed audio sounds like. The MiniDisc format, however, uses an encoding technique that compresses a file to only about one-fifth its size, whereas MP3 reduces a file's size to as little as one-twelfth—and MP3 audio even sounds better.

### WHAT DO I NEED?

To create your own MP3 files, you need an MP3 encoder. Because MP3 is an open standard, an abundance of free MP3 encoding software is available for most computer platforms (see the sidebar "MPEG Audio Resources"). One popular free encoder for the Windows platform is *CDex*. Mac users are particularly fond of *Mpecker Encoder*. (Yes, that's its real name.)

You may also want to spend a little money on a commercial MP3 encoder. Why? Because not all encoding software offers the same performance and quality. Although there are some excellent free-ware encoders available, their commercial competitors often produce better-sounding files in a shorter amount of time. A commercial encoder will also let you create files in all the available *bit-rate* formats, from 28.8 to 320 kilobits per second (kbps). (The bit rate is the number of bits per second used to encode the

audio.) Many free-ware encoders are set to work at only a few of the available bit rates, which limits your options.

I especially like *XingMP3 Encoder* (Win 95/98/NT) from Xing Technology (see Fig. 1). For \$19.95, *XingMP3 En-*

*coder* enables you to create any type of MP3 file. That also includes streaming MP3 files for use with Xing's free *StreamWorks* MPEG audio server. The quality of *XingMP3's* output is excellent, and the encoder is one of the fastest on the market for the Windows platform. Naturally,

encoding speed depends a lot on your computer's processing power. With a Pentium 150/MMX, a CD-quality, WAV file of four minutes and 26 seconds took just over two minutes to encode. As long as you have some type of Pentium processor (if you're using a PC), then you won't have to worry about waiting all day for your computer to complete its encoding chores. If you have anything less than a 100 MHz CPU, though, you may have to take a coffee break or two.

### HOW DOES IT WORK?

Most MP3 encoders don't work in real time. In other words, you can't record directly to an MP3 file. Therefore, you must first create a WAV or AIFF file with your favorite audio recording

## MPEG AUDIO RESOURCES

You can find all the tools and information you need to work with the MP3 format at the following World Wide Web sites:

#### CDex Home Page

[www.geocities.com/SiliconValley/Sector/8563](http://www.geocities.com/SiliconValley/Sector/8563)

You can learn about and download *CDex* at this site.

#### Diamond Multimedia

[www.diamondmm.com](http://www.diamondmm.com)

Find out more about Diamond Multimedia's Rio portable MP3 player.

#### Moving Picture Experts Group

[www.cseit.stet.it/mpeg](http://www.cseit.stet.it/mpeg)

This is the official MPEG Web site, which provides information about all of the available MPEG standards. You can also purchase copies of the MPEG specifications.

#### MPEG Audio Web Page

[www.tnt.uni-hannover.de/project/mpeg/audio](http://www.tnt.uni-hannover.de/project/mpeg/audio)

A good source for general MP3 information.

#### MP3 for Beginners

[www.mp3.com/dummies.html](http://www.mp3.com/dummies.html)

This is MP3.com's beginner guide to MPEG audio, which provides basic information about encoding and playing files as well as where to find encoding and playback software for a number of different computer platforms.

#### Nordic Entertainment

[www.nordicdms.com/MPman](http://www.nordicdms.com/MPman)

Find out more about Saehan's MPman portable MP3 player.

#### Winamp Home Page

[www.winamp.com](http://www.winamp.com)

Web site for one of the most popular MP3 players for the Windows platform.

#### MacAmp Home Page

[www.macamp.com](http://www.macamp.com)

Web site for one of the most popular MP3 players for the Mac platform.

#### Official Mpeckers Web site

[www.anime.net/~go/mpeckers.html](http://www.anime.net/~go/mpeckers.html)

You can learn about and download *Mpecker* at this site.

#### Xing Technology

[www.xingtech.com](http://www.xingtech.com)

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software. As is the norm, it's best to start with high-quality source material, typically 16-bit, 44.1 kHz stereo audio.

Encoding files with *XingMP3* is easy. (The procedure varies a little with other encoders but is generally the same.) First, select a file to encode. *XingMP3* lets you create a list of files, so you can batch process your entire collection at once. Next, select a bit rate, which in *XingMP3* is called an Encoding Profile. There are Encoding Profiles for a number of bit rates, including 28.8, 64, 112, 128, 192, and 320 kbps. All the bit rates maintain the source file's 44.1 kHz stereo qualities after it has been encoded, except 28.8 and 64 kbps. A file compressed using the 64 kbps setting has its sampling rate reduced to 22.05 kHz, and at 28.8 kbps, the file is reduced to 16 kHz, mono.

To maintain the CD-quality sound of your source file, use the 128 kbps setting. It's the standard bit rate for distributing MP3 files over the Net because it gives the best sound-quality-to-size ratio. For example, the four-

minute, 26-second WAV file that I mentioned earlier had an original file size of 47 MB. After encoding it with the 128 kbps bit rate, the file was reduced to a mere 4.07 MB. This may still seem like a large file to download, but compared with 47 MB, it's quite an improvement. And remember, the sound quality of the file remains virtually identical. It's barely possible to tell that it has been changed at all, unless you do a strict comparison in a noise-free environment. If you want to shrink the file size even more, the 112 kbps bit rate still yields good results; its final output retains a 44.1 kHz sampling rate, but it is also easier to tell that the file has been compressed.

Once you've selected your desired bit rate, choose the program's Encode function. After the process is complete, you'll find your new file saved to disk with its original file name and an MP3 extension. At that point, simply click on the program's Play button, and *XingMP3* lets you listen to your new MP3 file. Not all encoding programs come

with a playback function, however, so you may need to get a separate MP3 file player. As with the encoders, MP3 player software is widely available for free download. Some of the better ones are shareware. The two most popular Windows and Mac players are *Winamp* and *MacAmp*, respectively (see Fig. 2). In addition to basic playback, these programs provide several other options, including a playlist feature and a built-in graphic equalizer. For a measly \$10, it's worth it to grab one of these.

### WHAT'S THE DEAL?

Once you've created your MP3 files, you can use them as excerpts to entice your listeners to buy your CD, or you can sell them directly. Why would anyone want to buy an MP3 file? Because with virtually no overhead, you can afford to charge very little for them. And because their quality rivals that of a regular CD-quality track, the consumer is getting virtually the same merchandise for a much lower price. The typical price of a single MP3 file is around 25 to 75 cents.

### THIS JUST IN

As this column was being edited, a sudden turn of events galvanized the MP3 community. The Recording Industry Association of America (RIAA) has drawn new battle lines in its ongoing war against music piracy by seeking an injunction against Diamond Multimedia to prevent the release of Diamond's new Rio PMP300 portable music player.

The association claims that it "strongly supports the development of new technology," but that it has been disturbed by the recent development of portable MP3 devices because, in the RIAA's words, "they capitalize on and are likely to exacerbate the problem of illegal MP3 music files." The RIAA also contends that it is "doubtful that there would be a market for MP3 recording devices but for the thousands and thousands of illicit songs on the Internet." It has, therefore, taken legal action against Diamond Multimedia, because it feels that the Rio MP3 player violates the 1992 Audio Home Recording Act (AHRA) and consequently "encourages consumers to infringe on the rights of

artists by trafficking in unlicensed music recordings."

As you might expect, Diamond Multimedia and several major MP3 distributors strongly disagree with the RIAA's position. Ken Wirt, Diamond's vice president of corporate marketing, asserts that the Rio doesn't violate the AHRA because the Rio "is a playback-only device and does not record. Rio simply holds audio content that is already stored on a computer's hard drive and plays back that content." The company further points out that it does not in any way condone the unauthorized distribution of unlicensed music and has publicly supported antipiracy efforts.

Diamond, Xing Technology, and several MP3 distributors also challenge the RIAA's assertion that portable MP3 devices such as the Rio would not exist if there weren't such a prevalence of illicit MP3 files on the Internet. Michael Robertson, president and CEO of Z Company, which owns the popular MP3.com Web site, points out that "nearly 800 artists have signed up to use MP3, including artists like

the Beastie Boys and labels such as Hollywood Records." He adds that "the growth rate of people downloading legal content on the MP3.com Web site is 45 percent a month, indicating a large and legal market for MP3." Other research by the company supports this view.

The feelings of many independent artists are perhaps best summarized by Wirt when he states, "Upcoming musicians, numbering in the thousands, are using the Internet to their advantage to create awareness in a cost-effective manner, which is clearly a threat to the major record labels' current distribution model."

As of this writing, the U.S. Central District Court of California in Los Angeles has denied the RIAA's request to temporarily halt shipments of the MP3 player, so Diamond will be allowed to sell the unit. You can read the full text of the RIAA's press release at [www.riaa.com/promo/releases/1998/mp3rel.htm](http://www.riaa.com/promo/releases/1998/mp3rel.htm). You can read Diamond Multimedia's press release at [www.diamondmm.com/products/misc/rio-riaa.html](http://www.diamondmm.com/products/misc/rio-riaa.html). — David Rubin

# Finally, A Sequel That's Actually Better Than The Original



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**I**t doesn't usually happen this way. Sequels are supposed to be boring and derivative.

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# ALESIS

## ● DESKTOP MUSICIAN

Another advantage is that listeners can choose the songs they want to buy rather than having to purchase a whole CD.

The disadvantage of selling your music as MP3 files is that the files are easy to copy. In fact, that's the biggest problem the MP3 market faces today. Because the encoding and playback software is so readily available, a number of people have begun creating MP3 files from commercially available CD tracks (using a type of utility called an audio CD "ripper") and making them available for free download on the

Web. This is not only illegal but also detrimental to the future of online music sales. Of course, the record industry and music licensing companies dislike the situation and are adamant about trying to stop it. In some cases, they are suing the owners of Web sites that offer illegal content.

Fortunately, a number of legitimate sites on the Net enable musicians to showcase their work. One such Web site is MP3.com, which allows anyone with MP3 material to sign up for a free promotion page that lists the band's

name, descriptions of its music, concert dates, press releases, personal Web site links, and more. MP3.com also lets you upload your MP3 files to its server to make the files available for sale to site visitors. In exchange, the company keeps 50 percent of the profits from each sale. This may seem steep on first glance; after all, you could easily set up your own Web page and sell your own files. But when you consider that MP3.com gets nearly 2 million visitors per month, the deal sounds more appealing.

### WHAT'S AHEAD?

Even if you already have a CD on the market, MP3 files provide yet another way to get your music heard and distributed. Once the MP3 market gets bigger, you may even decide to go totally digital and dispense with pressing CDs altogether. Don't laugh; it could happen.



**With virtually no overhead, you can afford to charge very little for MP3 files.**

In fact, with the recent introduction of portable MP3 players, such as Saehan's MPman and Diamond Multimedia's Rio, you no longer have to hang around your computer to enjoy your MP3 files. (Diamond Multimedia is currently embroiled in a dispute with the RIAA over the Rio player. For more information, see the sidebar "This Just In.")

These palm-size players (which transfer files from your PC) are to MP3 files what the Sony Walkman is to cassettes. At roughly \$200 to \$300, they're still somewhat expensive, and it will be a while before listening to MP3 files on-the-go becomes commonplace. In the near future, however, it will become much more popular. So get your act together and start making your own MP3s. Otherwise, you could be missing out on potentially profitable exposure for your music.

*Scott R. Garrigus has fallen in love with the MP3 format. If you'd like to hear some of his files (or even buy a few), surf on over to his Web site at [www.garrigus.com](http://www.garrigus.com).*

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# Keeper Vocal Tracks

*The singer's best effort deserves the recordist's best shot.*

By Brian Knave

A common strategy used by folks producing their own records is to record scratch vocal tracks first, as a reference for other musicians and future overdubs, and then, once all the instruments are recorded, to rerecord the vocals. The advantage of this approach is that vocalists get to sing their parts over a fully realized, and hopefully grooving, arrangement of the song, giving them heightened inspiration and a sense of realism.

The disadvantage is the pressure. Once the other tracks are “perfected”—perhaps after many thousands of dollars have been spent on musician and studio fees—the singer is on the spot. Vocalists are not only expecting the most from themselves, but they are also expecting the engineer to deliver the best possible recording of their voices. Ultimately, of course, the quality of the performance distinguishes a “keeper” track from a scratch. But woe unto the engineer who records a magical performance, only to discover upon playback that the sound is screwed up.

To help you avert that awful fate, this month we'll look at techniques and considerations for recording premium-sounding vocal tracks. Whether you're recording your own album, helping a friend record hers, or working for hire, your duty is to ensure the sonic quality of the finished tracks.

## POSITIONS, PLEASE

In the November 1998 “Recording Musician” (“Gearing Up for Critical Vocals”), I outlined a procedure for determining the best-sounding signal path for recording a specific vocalist. Although painstaking—it is essentially trial by elimination—it enables you to sort out which gear to use on a critical vocal session.

Of course, after you've selected the most complementary components of the signal path (and rendered the



DEBRA HANEY

Allen Anthony and Kennie Ski of the soul/R&B group *Christión* perform overdubs in Studio C at Music Annex, Menlo Park, California. The tilt of the microphone, a Neumann U 47 FET, helps produce a warmer, less strident sound.



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## ● RECORDING MUSICIAN

recording space sufficiently quiet and dead-sounding for recording), there's still plenty of room for error. Even the best gear in the world can be used badly, resulting in lame-sounding tracks. Fortunately, good recording technique goes far in compensating for less-than-premium equipment or compromised recording environments.

One important element of getting a great sound is mic placement. You have two issues to consider, either of which can affect the sound considerably. One is the position of the mic in the room. (I will assume that when you were treating the room's acoustics, you also figured out the best part of the room to record in.) The other is the position of the mic relative to the singer.

Regarding the second issue, two primary factors affect the sound. One is the distance between the mic and the singer, and the other is the angle of the mic capsule relative to the singer. For a mic in cardioid pattern (the most commonly used pattern for recording lead vocals), the closer the singer is to the mic, the more the bass frequencies are enhanced. This is called *proximity effect*, and experienced studio singers often use it to their advantage by moving closer to or farther from the mic, depending on the mood of the passage.

### CLOSE TO YOU

A good starting position for a singer using a cardioid condenser mic is six to eight inches from the capsule. From there, if the voice sounds too thin, bright, or frail, have the singer move closer to the mic. But be careful: moving in only two or three inches will increase bass response and fullness of sound dramatically. Conversely, if the sound is too big or warm, have the singer move back a bit.

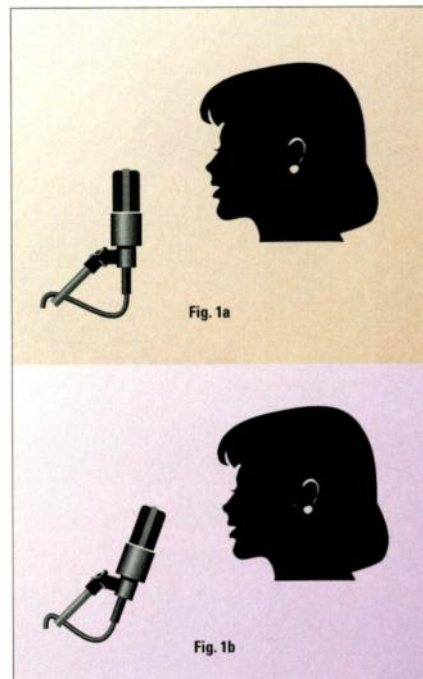
If the mic is omnidirectional (or is set to the omni pattern), there will be no proximity effect. That is, bass frequencies will not be enhanced as the singer moves closer to the mic, although the mic will still register the sense of distance from the capsule. This polar pattern is the most natural-sounding, and if the room is quiet and dead enough, I often prefer it.

An omni pattern is especially useful for singers who move around a great deal as they perform, or for inexperienced studio singers who can't seem to stand still. However, because an omni mic hears all parts of the room

equally, it is not always a viable option, particularly in one-room studios filled with noisy gear (not to mention a living, breathing engineer hunched over the board). Just the same, thorough preparation includes auditioning each polar pattern available on the mic that you've selected.

### RIGHT ANGLE

The other factor that affects the sound is the angle of the mic in relation to the singer. This varies from mic to mic, of course, and also depends on the type of mic. Condenser mics, for example, sound brighter and harsher when the capsule is positioned directly on-axis with the singer's mouth (see Fig. 1a). As the capsule is tilted forward (see Fig. 1b), the sound gets warmer, darker, and less strident. This is both because the sound hits the capsule less directly and because the capsule captures more of the singer's chest resonance. (To attenuate harshness and highs without increasing chest voice, tilt the capsule slightly to one side or toward the ceiling.) An off-axis tilt can also help reduce sibilance and popping caused by plosives. You



**FIG. 1:** A large-diaphragm condenser mic positioned with the capsule pointed directly toward the singer's mouth (1a) will yield the brightest, most focused sound but may sound harsh and "spitty." Usually, a slight downward tilt will make the same mic sound warmer, darker, and smoother (1b), while reducing susceptibility to plosives.

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can further minimize popping and sibilance by positioning the mic slightly above or below the singer's mouth.

For dynamic mics (at least those with cardioid patterns), the opposite is usually true: on-axis response is warmer and fuller, whereas off-axis response sounds thinner and less articulate. For that reason, when you record vocals with a cardioid dynamic mic, have the vocalist sing directly into the mic.

Armed with this information, and assuming that you have selected a complementary mic for the singer, you should be able to get the sound you want without resorting to EQ. Indeed, let your mantra be "No EQ whenever possible."

Finally, be aware that the slightest change in the position of either the mic or the singer can alter the sound drastically. This fact becomes obvious as soon as you start punching in. Therefore, when tracking vocals (especially with a directional mic), ask the singer to make a mental note of his or her distance and position relative to the mic, and then to maintain that position. For an additional reference, put a strip of tape on the floor just at the edge of the singer's toes.

### LES ACCOUTREMENTS

One of the most helpful tools for recording vocals is a pop filter, so called because it helps filter out pops or plosives. Trust me, this is one item you can't do without. All it takes is one mic pop (usually caused by a word beginning with *p* or *b*) to ruin an otherwise perfect take. Once recorded, a pop is virtually impossible to get rid of; usually, the only solution (short of some slick digital waveform editing) is to rerecord the section that contains it.

Pop filters are available commercially, but it's relatively easy, and inexpensive, to make your own out of panty hose and an embroidery hoop. (For instructions on how to build a pop filter, see "DIY: Build the EM Pop Filter" in the October 1998 issue.)

A foam windscreen can also be useful when recording vocals, both for taming

plosives and for attenuating sibilance. However, it is less effective than a pop filter, at least for reducing plosives. Furthermore, a foam windscreen can reduce high-end response significantly, sometimes to the point of making the mic sound muffled. I therefore avoid using windscreens in the studio (where, after all, there is no wind).

Other helpful accoutrements for studio vocal recording include a sturdy boom stand and a shock mount for the microphone. When mounting a heavy microphone on a lightweight, tripod-base boom stand, position the mic directly over one of the legs to increase stability. If you only have a round-base stand, stabilize it by slipping one or more barbell weights over the base.

Why are studio vocal mics commonly positioned hanging upside down, bat-style, in front of the singer? One reason is to make room for music stands and lyric sheets. Depending on the mic and shock mount, it can also make positioning easier. And, of course, it looks cool.

### GREMLINS

Any number of little things can spoil a vocal recording. One is the early reflections from anything nearby: for example, a music stand positioned close to the mic. For this reason, whenever a music stand is required, I opt for the cheap, foldable type rather than an orchestra stand with the solid metal back. If you use the latter, angle the stand so the reflections bounce away from the mic. You can also place a towel over the metal to reduce reflections.

Noisy jewelry or clothing can ruin a great take, so watch out for those, too. For a singer who doesn't want to remove an armful of bracelets (or for bracelets that simply won't come off), wrap a towel around the noisy arm and tape it there. In case someone happens to wear a noisy (as opposed to loud) shirt to the session, I keep a few clean T-shirts nearby. This happens more often than you might think. It's also a good idea to have a pitcher of drinking water nearby to help minimize lip smacking and other unwanted mouth noise.

### HOT TO TAPE

Now that everything's set up and ready to go, it's time to set levels. But first, here's some good advice: push the record button from the get-go, even if you're still setting levels and the singer thinks it's just a practice run. Sometimes those first takes are the best (and invariably they are, if you don't have the record button on!).

First, set the gain control on the mic preamp. Then, if necessary, apply dynamics control. Be gentle, though. For a compressor, start with a 1.5:1 or 2:1 ratio. In general, avoid going higher than 4:1, with no more than 8 or 10 dB of gain reduction on the loud passages. You can always compress more, if necessary, at mixdown. Also, engage the soft-knee setting if the compressor offers it, as soft-knee compression is generally smoother sounding on vocals than hard-knee.

If you use an expander to keep down unwanted noise, set the threshold low enough so that no words or breaths get muffled. And if you must use a peak limiter (not advisable, but sometimes necessary for digital recording), set it at the highest possible level before you start to get digital distortion.

Finalizing settings for a particular song should take one or two passes, at most; from then on, resist the urge to change them. That way, if the singer has to punch in, the new part will sound consistent with the rest of the track and composite tracks will be easier to assemble.

### DAILY MONITOR

Full-enclosure headphones are typically best for vocal tracking because they minimize leakage; however, some people have a hard time singing in tune when using them. That's why you'll sometimes see musicians with one headphone on and the other off. If your singer is having difficulty keeping the pitch, suggest that he or she remove one headphone. Then, pan the mix to the ear that's still in the can, and make sure the other headphone is positioned snugly against the singer's head, to quell leakage of



The dbx 1086 microphone preamp provides a potpourri of precision dynamics control (which can be used separately from or in tandem with the mic pre), including an expander/gate with variable threshold and ratio, a compressor, a de-esser, and a peak limiter.

any signal that remains in the unused headphone.

The quality of the monitor mix can greatly affect how well the singer performs. Singers don't always realize that the mix can be customized to their tastes, so I take an active role at this point, asking specific questions such as, "Do you want more vocal? Or less? Is that enough guitar? Bass? Kick drum? Snare drum? Is the overall mix too loud? Not loud enough?" Don't be alarmed, though, if the mix that works for the singer doesn't sound optimal to you. After all, you're not the one performing.

Although most singers will want to hear some vocal reverb or delay in their monitor mix, don't overdo it, as too much effect can negatively influence pitch and even timing. Here's another effects tip: if the instruments are mixed down dry to a single track (e.g., to open up more tracks), you can use chorus with a short delay (no more than 30 milliseconds) to enliven and spread out the mono track in the stereo field. Simply pan the dry mono mix to, say, ten o'clock and return the chorus effect to two o'clock. Apply as needed.

### PROGRESS REPORT

After the levels are properly set, and you've recorded a track or two, listen to the recording. If you're tracking in one room, turn on the monitors and listen through speakers rather than headphones. (Remember to mute the mic first.) Solo the vocal track and listen for any problems. This is the time to make any final tweaks, whether to the microphone position, the compressor, or whatever. Again, actively solicit the singer's opinion, especially if he or she is the reticent type.

Once you have your sound, don't be afraid to tweak it, if need be. Although I strive to find the path that lets me record the sound I want sans EQ, I'm certainly not above, say, boosting the highs a bit if it clearly improves the sound going to tape. Ultimately, there are no absolutes; rather, do whatever it takes to get the best sound you can. (Here's a related tip: to add sheen to a dull-sounding mic, patch in a spectral enhancer first, rather than reaching for the EQ.)

### DOPPELGÄNGER

If you have the tracks to spare, the old trick of double tracking can increase

the appeal of a vocal part, making it sound fuller, richer, and more powerful. The success of this technique, however, depends largely on the singer's skill. Frankly, I've heard few musicians capable of pulling it off as well as someone like John Lennon or David Bowie.

If you are fortunate enough to work with someone who can double well, a neat trick is to vary the singer's distance from the mic with each successive pass. For example, if the first track is recorded at 6 inches from the mic, record the second one at 12 inches, making sure to



**Wrap a towel around  
the noisy arm and  
tape it there.**

increase the preamp gain so the track levels are the same. Got another track? Then try a third pass two feet away. When combined at mixdown, the tracks will create a magical sense of depth. The extra tracks also provide more creative options for the mix engineer, who might, for instance, choose to process them differently.

### BEST OF BOTH WORLDS

When all is "sung and done," of course, it's the performance—not the quality of the gear or perfection of the recording—that makes a vocal track worth keeping. George Benson's vocal on "This Masquerade" (from the album *Breezin'*, Warner, 1976), for example, was recorded with an inexpensive, handheld-style dynamic mic. Yet the song earned him a Grammy Award for Best Jazz Vocalist of the year and stayed at number 10 on the *Billboard* Top 40 chart for 11 weeks. The vocal track, a live first take, was intended to be a scratch. "But when we listened back," explains engineer Al Schmitt, "it felt so good that we just left it."

Hopefully, the tips and techniques in this article will help ensure that any killer takes you record are keepers, too. After all, art is only enhanced when it coincides with good technique and technology.

Brian Knave is an associate editor at EM.

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# Entertainment Accountants

*Accountants can help you treat your royalties like royalty.*

By Michael A. Aczon

Imagine a bunch of kids gathered in a garage, planning their assault on the world of rock and roll as they claim their respective roles in their would-be band. "I wanna play the guitar!" "I'll play drums!" "I'm going to sing lead vocals!" "I'll be the accountant!"

The *accountant*? Well, why not? In the get-rich-quick-and-then-lose-it-all world of entertainment, one of your most trusted allies in the industry is—or at least should be—your entertainment accountant.

You don't have to be earning megabucks in the industry to start planning financially. Once you commit to a career in music, the time is right for getting at least some preliminary advice on your finances. And if you are about to experience an infusion of cash in royalties or advances from an industry deal (such as a publishing or recording deal), hiring an accountant becomes even more important.

Often perceived by musicians as "bean-counters" or tax preparers, entertainment accountants are in fact a specialized group of professionals who can help you get the money you earn in the industry and keep it. While researching this article, I spoke with Todd Gelfand, the managing partner of Gelfand, Rennert & Feldman, who helped shed some light on the intricacies of the profession. Gelfand, Rennert & Feldman, a division of PricewaterhouseCoopers LLP, is one of the leading firms in entertainment accounting, bringing with it years of experience to the field.

## BEYOND BASICS

The duties of the entertainment accountant go far beyond the basic bookkeeping and filing of income tax returns associated with accounting in many other businesses. Entertainment accounting firms often break their practices down into specialties, including royalty examination and business management.



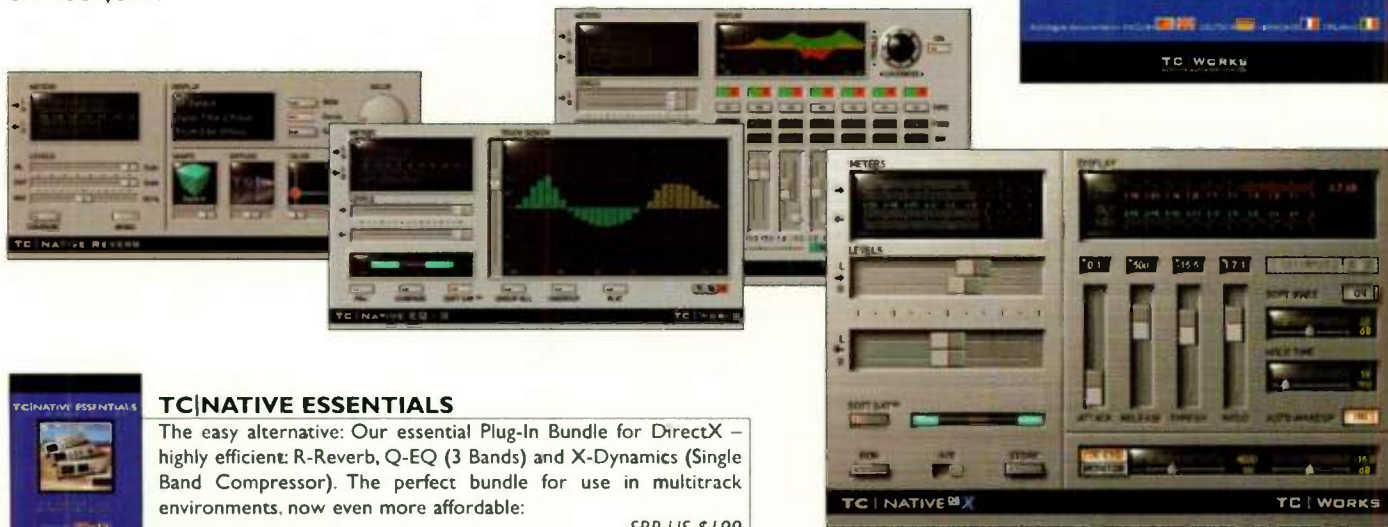
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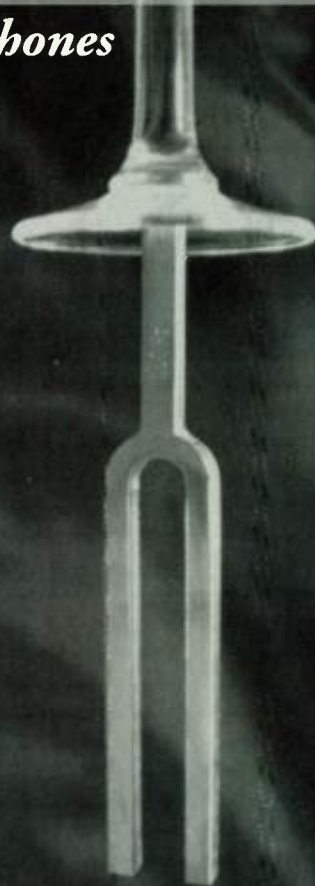


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## ● WORKING MUSICIAN

"Our royalty examination department does entertainment industry audits," says Gelfand. "Entertainment clients have a number of different sources of income, including record, songwriting, and publishing royalties.

"We also practice business management," he continues, "which includes but is not limited to budgeting for albums and videos, overseeing tour budgets, obtaining foreign tax clearances, and dealing with other foreign tax matters. The taxation of entertainers requires specialized knowledge. No single set of rules applies throughout the world, and our firm has experience in many territories." Gelfand further emphasizes that financial planning is essential for entertainers, especially regarding matters that many artists fail to consider early in their careers, such as insurance and tax planning.

### CHECKING THINGS OUT

The temptation to spend like crazy is strong for the musician who suddenly strikes it big. Oftentimes, artists who have experienced financial hardship don't think of saving, and they end up

spending their hard-earned entertainment dollars indiscriminately. Thinking that every nickel can be written off on their tax returns as a "business expense," they end up sadly and unwittingly owing the IRS, banks, and music equipment stores lots of money.



**Make sure that  
your talent  
keeps paying off  
long term.**

How do accountants deal with a client's newfound wealth? "The entertainment industry is a business unlike many others, in that it sometimes results in overnight success," says Gelfand. "Lots of decisions need to be made up front by the manager and the artist so the artist can reinvest in his or her career but balance that with future planning and savings."

Consider the case of a producer who, after one quick success, suddenly feels the need to upgrade his recording setup. It's surprising how regularly the need for a Neve recording console coincides with the arrival of that first big royalty check. "We like to be involved in that type of business decision, too," says Gelfand, "whether it's buying or leasing equipment, or simply renting a commercial studio."

### FINDING YOUR ACCOUNTANT

Finding an entertainment accountant involves calling connections, obtaining referrals, and doing some extra legwork. Pulling out the Yellow Pages and scrolling through the Accountants section probably won't find you the right person or firm. Seek out referrals from musicians, as well as from their managers, lawyers, label representatives, and other industry contacts.

Choosing an accountant means entrusting that person with crucial financial matters, so be sure to interview several candidates. Ask what services they offer, and try to get a feel for which accountant or firm suits you.

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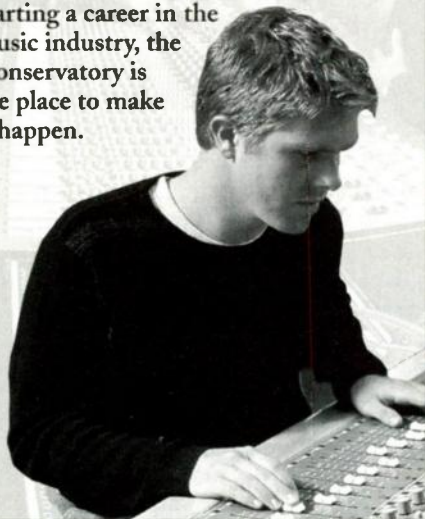
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### ● WORKING MUSICIAN

Gelfand thinks that it's beneficial for the entertainment accountant to have a direct relationship with the client, without having to go through a manager, lawyer, or other go-between. This personal contact is especially important when the client is making a purchasing decision such as buying a house or a car. "The direct relationship between the entertainment accountant and the artist helps the artist assume more responsibility for his or her money," Gelfand says.

### PAYING THE PIPER

As with other professional services in the entertainment business, accounting will cost you. Fees are typically structured by the hour, depending on the scope of the work to be done and the experience of the accountant doing the work. Less-experienced accountants may charge less than \$75 per hour, and partners in major accounting firms could charge well into the hundreds of dollars per hour.

Due to the uncertainty of earnings—particularly in the infant stages of an artist's career—paying the accountant a percentage of earnings is sometimes preferable. The industry standard is 5 percent of the artist's gross earnings. "This a win-win situation," says Gelfand of this type of arrangement. "Relative newcomers to the business can get all of our services in the beginning stages of their careers without sacrificing a lot of up-front fees. We go by the theory that some of the decisions we make with a client early on will have an impact later in the game."

### THE BOTTOM LINE

Many people are involved in an artist's career, but not all of them have the artist's best interests in mind when it comes to what the artist should do with his or her money. The music business is unpredictable, so it's imperative that the money you earn during more lucrative periods sees you through the dry spells. The idea is to make sure that your talent keeps paying off long term. To that end, the services of an entertainment accountant could prove a sound investment.

*While writing this article, entertainment lawyer and music educator Michael A. Aczon opened bank accounts for his kids so they could deposit their allowances and babysitting earnings.*

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# REVIEWS

## E-MU SYSTEMS

AUDIO PRODUCTION STUDIO  
(WIN)

*A powerful PC-based  
audio/MIDI  
production system.*

By Allan Metts

As more companies develop hardware and software for computer-based recording, two things are happening to the market: product prices are getting more competitive, and feature sets are becoming more impressive. E-mu is the most recent company to jump on the bandwagon with its Audio Production Studio (APS), a product that provides a comprehensive production solution at a competitive price.

The APS comes with audio and MIDI sequencing software, real-time DSP effects, a 64-voice software sampler/synthesizer, a digital mixer, a CPU-mounted I/O module, and a full-duplex digital audio recording system with support for eight sample rates between 8 and 48 kHz. With the APS, all you need for producing professional-quality projects are your computer, a MIDI controller, and a microphone.

To top it off, the system is easy to use and designed for plug-and-play without much installation fuss. The documentation does a reasonable job of describing the APS system and how best to use it. (You're referred to online documentation for Cakewalk *Express Gold*, Sonic Foundry *Sound Forge XP*, and Creative Labs *Vienna SoundFont Studio*,



E-mu's Audio Production Studio consists of the E-Card PCI audio card, which also houses two synths; the E-Drive I/O module, which fits into a front-loading drive bay; and bundled software. A MIDI bracket provides MIDI In and Out ports on a 15-pin connector.

110	E-mu Audio Production Studio (Win)
122	Keyfax Phat.Boy
130	Native Instruments <i>Generator 1.5.3</i> (Win)
142	BSS Audio DPR-944
150	TC Works <i>TC Native Essentials</i> (Win)
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**FIG. 1:** E-mu's *E-Control Mixer* software lets you route audio and provides access to the effects. In the program's Mixer Control window, the analog input strips are marked "A," and the S/PDIF inputs are marked "D." The "Midi" strips accept signals from the onboard synths and feed the main MIDI input strip.

which are bundled with the system.) The printed manual gives you a good start, and you can find comprehensive technical data and a user-support page on E-mu's Web site.

## THE HOOKUP

On opening the APS box, you'll find the E-Card PCI audio card, which houses two 16-channel MIDI synth engines and a DSP engine; the E-Drive I/O module, which fits into a front-loading drive bay; and two CD-ROMs containing the APS software. Also included is a MIDI bracket, which provides MIDI In and Out ports on a 15-pin, game port-style connector. This bracket requires an opening on the back of your PC but does not occupy an expansion slot.

Installation is simple: just plug in the E-Card, mount the E-Drive and MIDI bracket, and connect a couple of cables. I was surprised that there were no mounting screws for the E-Drive.

The E-Card has two channels of balanced analog I/O on ¼-inch TRS connectors, and stereo S/PDIF I/O on RCAs. These analog inputs are intended for line-level signals, with input gain controlled through the software.

The E-Drive connections are more accessible because they appear on the front of your computer. There, you have another S/PDIF I/O pair, two more balanced analog inputs (again on ¼-inch TRS connectors), and a ¼-inch headphone jack with an associated volume knob. Interestingly, the APS can mix the digital inputs from both S/PDIF pairs, even if the inputs have different sample rates; everything is automatically converted to 48 kHz.

Each E-Drive analog input has a dedicated gain control and mic/line switch; unlike the E-Card, the E-Drive's input-gain settings are not controlled through software. Each mic input can be configured for balanced or unbalanced operation. Phantom power is activated by switching a jumper inside the E-Drive—and that can be a nuisance, especially if you forget to set it before installation. You can't easily switch between a condenser mic that requires phantom power and a

dynamic or battery-powered condenser mic that does not use phantom power.

If your computer's CD-ROM has a digital audio output, you can connect it directly to the E-Card; however, there is no connection for analog CD-ROM audio. I consider this a wise move on E-mu's part, because these analog connections are notoriously noisy. (Using the internal CD-ROM connection automatically disables one of the S/PDIF inputs.)

## DISTANT VOICES

The APS contains a sampling synthesizer with 64 voices. It has two 32-voice synthesizers, Synth A and Synth B, each of which operates on its own MIDI port, making the system 32-part multitimbral. (The external MIDI interface adds another 16 channels.)

There are no sounds stored in ROM; instead, the APS uses up to 32 MB of computer RAM to store sounds. This all-RAM configuration is nice because it affords you complete control over every sound. For example, instead of being stuck with a weak-sounding bank of General MIDI sounds, you can load a higher-quality GM bank. If you prefer, you can fill all 32 MB with several banks of your favorite samples.

Sounds are stored in Creative Labs' SoundFont format, which is rapidly growing in popularity. The Creative Labs Sound Blaster AWE64 series and E-mu's 8710 PCMCIA card also use this format (Creative Labs is E-mu's parent company), and third-party SoundFont sounds and conversion utilities are already available for the APS. One exciting collection is E-mu's Module Mania series, which includes one bank of

sounds from the Proteus 1, 2, and 3; Vintage Keys; and Planet Phatt. Example sounds from this collection are included with the APS.

The APS is the only product that supports version 2.1 of the SoundFont specification, which adds support for user-configurable, real-time modulation of sounds using MIDI Control Change messages. Most SoundFont-compatible sound cards let you load only a megabyte or two of RAM-based sounds at a time; having 32 MB of sounds available to the APS is a real gas. In fact, I wish E-mu hadn't stopped there: RAM is cheap, and I would have loved to have access to 128 MB (or more) of samples with this system.

## SOFT GOODS

The APS comes with lots of software, which is all easily installed from the CD-ROMs. Windows NT doesn't support the system, so I had to reconfigure my machine for Windows 95. But after that it took only minutes to load up my computer with the APS software, plenty of SoundFonts, SoundFont editing and auditioning tools, *Express Gold* for MIDI sequencing and hard-disk recording, *Vienna SoundFont Studio* for creating SoundFonts, and *Sound Forge XP* for audio editing.

From a software standpoint, the centerpiece of the system is *E-Control Mixer* (see Fig. 1). This application lets you route audio and provides access to the effects. You won't be able to automate your mixes with this tool, but you can save mixer configurations to disk.



**FIG. 2:** The APS comes with a variety of onboard effects. This figure shows the Edit window for the reverb.

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When you first open *E-Control Mixer*, two channel-input strips and a master-output strip appear. There are separate faders and LED meters for the left and right channels of the master mix—the faders can be locked together for easy operation—and level and source controls for hard-disk recording. You can route the master mix to any set of APS outputs, and the recording source can be set to use the master mix or any of the four aux buses.

Of the two input strips that appear at startup, one brings WAV file audio

into the mixer and the other carries the sound from the APS's two synths. You can insert additional input strips for each physical input in the APS system, adding up to six more faders on your screen (four mono analog and two stereo digital).

On first thought, it seems inflexible for all 32 channels and 64 voices from the APS synths to appear on one input strip. However, you would typically use MIDI Control Changes to mix the individual MIDI channels anyway, and, like most sound-card mixing applica-

tions, *E-Control Mixer* uses CC 91 and CC 93 on each MIDI channel to control the amount of signal sent to the DSP effects. So if you're designing sound that will be played back on PC-based sound cards, you'll appreciate the APS's ability to operate like a typical Sound Blaster (albeit with much better sound).

Even so, E-mu recognized that some users will want more control over their MIDI mixes. To this end, *E-Control Mixer* includes MIDI submix strips that look and act like audio-input strips. You can add up to five MIDI submix strips to the mixer and specify which MIDI channels (from either APS synthesizer) will appear on the strip. The MIDI submix strips are routed to the main MIDI input strip. I found this arrangement to be flexible and powerful.

#### MIXING MASTERY

Each input strip has level and pan controls with numerical readings; mute and solo buttons; and a user-definable name. If you want to move several faders at once, you can link them together (relative positions are maintained), although only one group can be created at a time. You can also select the input source of each strip, but only the S/PDIF inputs can appear in more than one input strip.

If you choose one of the E-Card's analog inputs as the source, an extra input-gain control appears on the input strip. Although I appreciate the ability to adjust the input gain independently of the mixer channel's level, I wish that there were signal-present and clipping indicators, too.

*E-Control Mixer* has four stereo auxiliary buses, each of which can be routed to one effect. You can choose any two of these buses for use by each input strip. You can specify auxiliary bus send levels (postfader) in each input strip; return levels for the effects are also provided. Each input strip has an insert point that can accommodate a chain of effects routed in any order.

#### EFFECTIONATELY YOURS

The APS's onboard effects include reverb, chorus, flanging, delay, envelope following, pitch shifting, and distortion. In addition, the channel inserts can take advantage of the APS's compressor and EQs. Unfortunately, it has no noise gates or expanders. My guitar has cheap pickups, so these would have been welcome.

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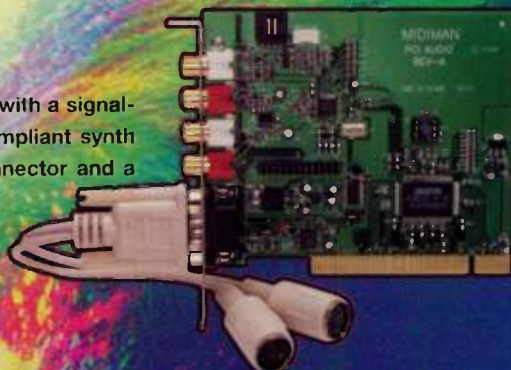


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Each effect can be used only once within *E-Control Mixer*. For example, if you use the reverb on a strip's insert, you can't use it on an effects bus. Because you're likely to need EQ on several input channels, E-mu thoughtfully furnished multiple instances (four of each) of the parametric and shelving EQs. Obviously, it would be nice to have multiple instances of the other effects, especially the compressor, but E-mu's scheme ensures that the effects in use never exceed the capabilities of the system's DSP engine.

Every effect has its own dedicated control panel (see Fig. 2). What's more, useful presets are one click away, and you can save your own effects settings as Effects Snapshot files. The APS's control panels get the job done, although they're not as flashy as some others I've seen. For example, the compressor has no input/output graph, and the EQs don't display an image of the boost or cut across the audio frequency range.

For the most part, the quality of the effects is good. The reverb, flanger, and chorus all sounded smooth, and the EQ, compression, and delay were quite usable. I didn't have much use for the distortion or pitch shifting, however; to my ears, the distortion was buzzy and brittle, and the pitch shifting generated an odd tremolo effect.

If you have an outboard effects processor, you can patch it into *E-Control Mixer*. Each auxiliary bus can be routed to one of the S/PDIF outputs or to a pair of analog outputs. You can return the signal through the input strips or bring it back in to the aux bus as an effects return. Generally speaking, each APS input and output can be used only

once, so setting up an external effect prevents you from routing other signals through it.

Unfortunately, the channel inserts can't connect to the APS inputs and outputs. Because of this limitation, and because the input-strip aux sends are only postfader, you can't create an "all-wet" signal on an APS channel with an external effect. Unless you send the entire master mix through the desired effect, your mix is destined to include some of the dry input signal.

### AUDIBLE AUDITIONS

Nearly 400 MB of SoundFont sounds come with the APS. In theory, you can have 128 banks of sounds loaded at once; practically speaking, you'll probably exceed the 32 MB memory limit before you load this many. Fortunately, E-mu has included *SoundFont Bank Manager* for managing and auditioning these sounds (see Fig. 3).

*SoundFont Bank Manager* allows you to put any SoundFont file into any APS bank. As you do this, you can track the available memory and audition the sounds using the onscreen controls. (You can also use an external MIDI controller for this.) After loading the APS with the sounds you want, you can store the configuration as a SoundFont Bank Snapshot file for later retrieval.

The APS automatically stores a bank of General MIDI sounds (including the Roland GS extensions) in bank 0. You don't have to leave it there, but doing so ensures sound compatibility



FIG. 3: *SoundFont Bank Manager* lets you load SoundFont files into any APS bank. You can also use this tool to audition the sounds in each bank.

with other multimedia PC applications. Using *SoundFont Bank Manager* you can choose between a 2 MB and an 8 MB version of the GM sounds and decide whether MIDI channel 10 should be a dedicated percussion channel, as it is upon startup (following the GM specification). Multimedia developers will appreciate this flexibility because it lets them approximate how their creations will sound on different sound cards.

The included *Express Gold* has some of the same capabilities as *SoundFont Bank Manager*. If you open a Standard MIDI File, *Express Gold* automatically loads a SoundFont bank file of the same name. And when working with native *Express Gold* files, you can specify the SoundFonts to be loaded into each APS bank. The next time you open your *Express Gold* song, the program will configure the APS with just the sounds you need and will make each bank's preset names available to the program. Now that's sweet.

### SOUNDS ABOUND

The APS comes with a wide variety of sounds. A search of my hard drive revealed 157 SoundFont files installed on my computer. Even better, each file can hold many different sounds. I found the system's 14 Multi Banks the most useful. Each one contains 20 to 40 sounds that are logically grouped. There is a "Church Combo" with plenty of bells, organs, and choirs; a "Pop Combo" with all the basics for your next Top 40 tune; and my favorites, the "Orchestral

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Analog Outputs	(2) balanced ¼" TRS
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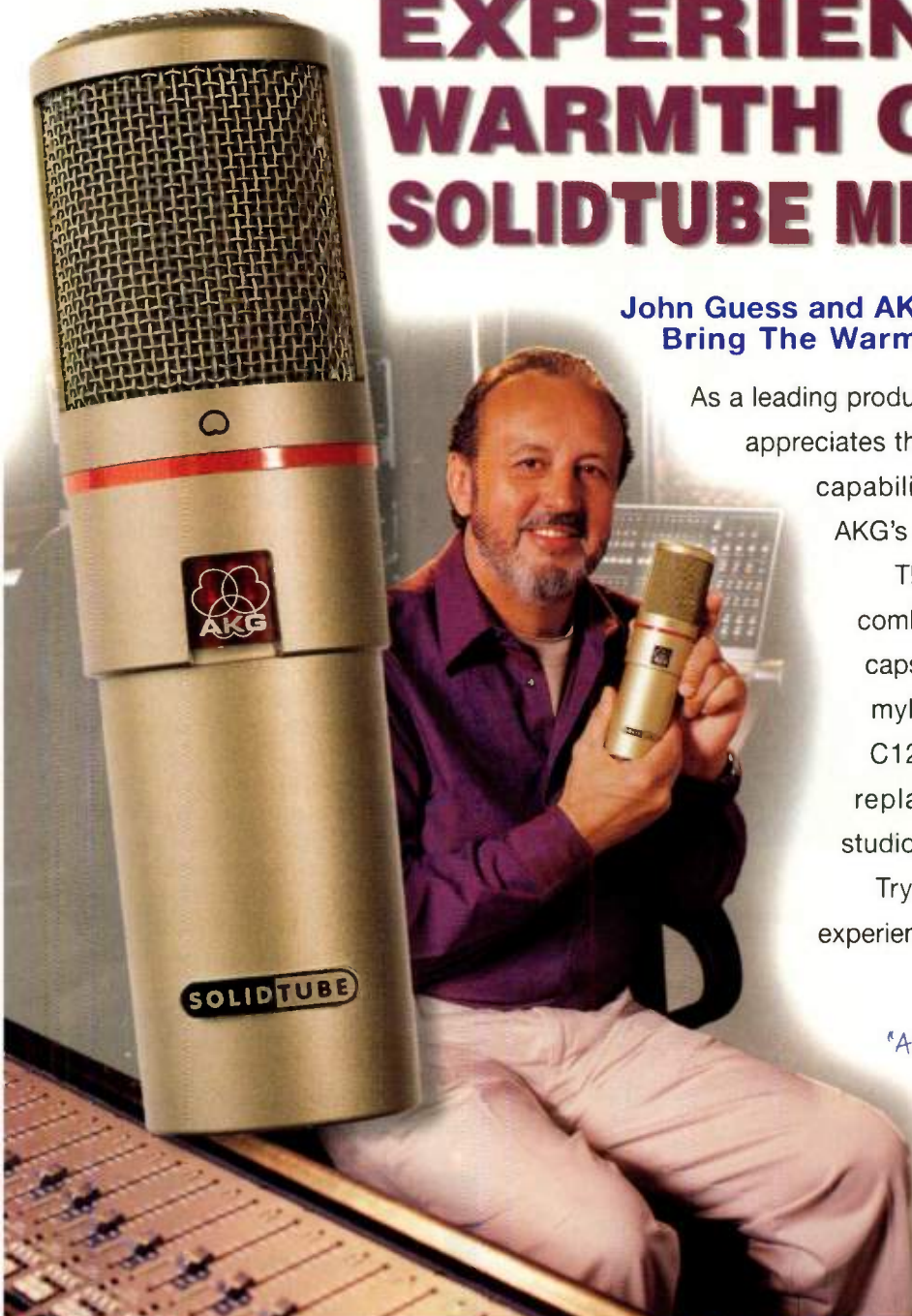
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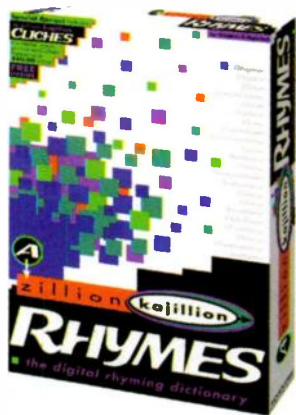
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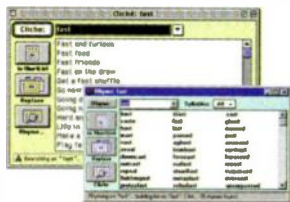


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Combo" and "Symphonic Combo," which contain high-quality brass, woodwind, string, and orchestral percussion sounds.

Sixty-one of the SoundFont files are sound effects, most of which contain only one sound. The spectrum ranges from snorting dogs to forest ambience. There are 11 files in the Groove and Beat category, each containing sampled grooves that you can assemble in various ways. I usually don't do much with sampled grooves, but these sound-effects pretty good to my ears.

Fifteen SoundFont files accompany the demo songs, and five more are included to entice you to buy E-mu's Module Mania collection. You'll find some good sounds in here if you dig around for them, but these files aren't organized to facilitate quick access. The remaining SoundFont files provide individual instrument sounds (e.g., dulcimer and alto sax) or sounds within a small class of instruments (e.g., Latin hand percussion and Indian ensemble).

Although the collection has a huge variety of high-quality sounds, I was

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**CONS:** No Windows NT support. Grand-piano patches aren't convincing. No gates or expanders.

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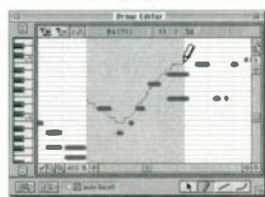
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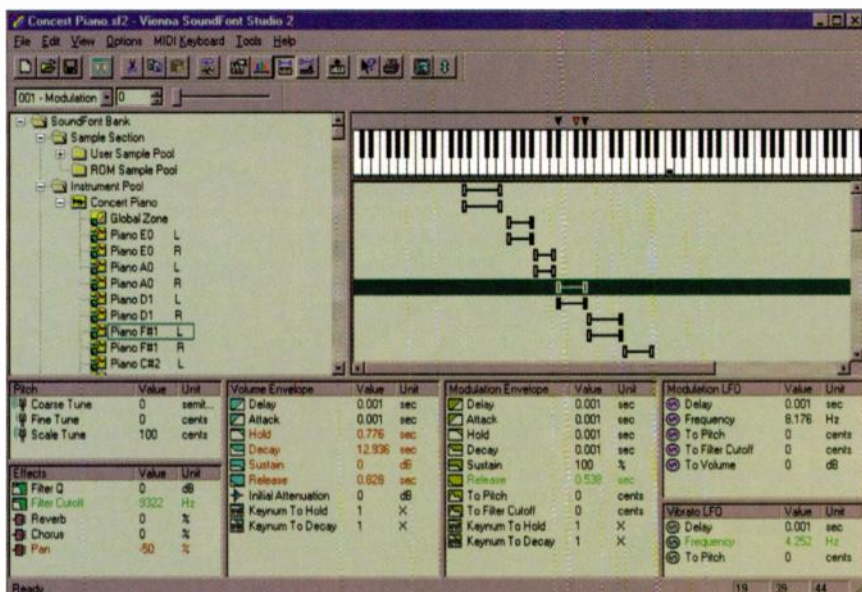


FIG. 4: Vienna SoundFont Studio enables you to create your own SoundFont files. The program's exceptional use of color and graphics makes it quite easy to use.

disappointed in the grand pianos: they sounded overly electronic to my ears. Additional E-mu and third-party SoundFont sounds can be downloaded from the company's Web site; hopefully, some better grand-piano sounds will become available there.

### CREATE-A-SOUND

A basic librarian is included to help you rearrange the presets within and between SoundFont files. Making changes is as easy as dragging the sounds around with the mouse. But if you want to create a SoundFont file, you'll need to use Vienna SoundFont Studio (see Fig. 4).

Not unlike a hardware-based sampler, the SoundFont format is multi-layered. Multiple samples are mapped across the keyboard and across key Velocity ranges to create Instruments. Multiple Instruments are mapped across the keyboard and across key Velocity ranges to create Presets. Two six-stage envelopes (with Delay, Attack, Hold, Decay, Sustain, and Release) and two LFOs are available per synthesizer voice. These can modulate pitch, amplitude, or the APS's resonant filters.

Using Vienna SoundFont Studio, you can manipulate Sample, Instrument, and Preset settings to your heart's content. You can create Sample and Instrument mappings with ease using your mouse or MIDI keyboard, and you can specify pitch, filter, amplitude, envelope, LFO, and effects settings at both the Instrument and Preset levels.

The APS provides everything you need to create interesting and useful sounds. I'm particularly impressed with Vienna SoundFont Studio's ability to display almost all the sound-editing information on the main screen. Thanks to good use of color and intuitive graphics, the program is remarkably easy to use.

Vienna SoundFont Studio falls short in just one area, and that is its sample-looping capability. You can specify only loop start and end points (expressed in sample numbers), and there are no tools to help you find potential loop points. There is also no loop-crossfade capability to help smooth out pops and clicks. Sound Forge XP is included with the APS package, but this version doesn't have the Loop Tuning features found in the full version of Sound Forge.

### ONE APS, PLEASE

I can't think of a package that comes closer to being a "studio in a box" than this one. I'd like to see Windows NT support, and I'd love to see a version with more elaborate I/O. But at this price, it's hard to find much to complain about. If you have a PC and you're looking to take your first serious leap into home recording, check out this system. Even if you already have a well-equipped studio, you'll appreciate the APS's excellent sounds, powerful capabilities, and ease of use.

Allan Metts is an Atlanta-based musician and software and systems designer.

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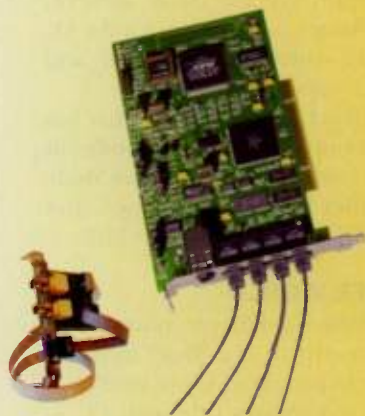
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# AUDI/O



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# KEYFAX

PHAT.BOY

## Why didn't someone invent this controller years ago?

By Jeff Obee

Anyone who likes to edit synth and signal-processor parameters in real time faces several choices, none of which are consistently appealing. You can control parameters from the synth's front panel, but not necessarily in real time, and you might have to dig through pages of parameters. Mousing around in a sequencer's controller window is neither comfortable nor precise. Footpedals are clumsy for creating precise rhythmic changes in a sound, and faders, while fine for level control, are unwieldy for many types of edits.

On the other hand, knobs that feel really good are versatile and provide superior tactile control. They make rhythmic interplay and many other types of real-time control easy and fun.

That's why Keyfax introduced its Phat.Boy MIDI controller—a simple, easy-to-use box with knobs that are pre-programmed to control the synth parameters and Control Change messages you most often need. What we have here is a multipurpose, real-time control surface with myriad uses for just \$249.

If you're as frustrated with the aforementioned alternatives as I was before I discovered the Phat.Boy, you should be getting pretty excited right about now. Because this device is so handy and user-friendly, it is a wonder someone didn't invent it long ago.

### WINKIN', BLINKIN' & KNOBS

The Phat.Boy is an unassuming little gadget. Its glossy black metal casing is slightly raised at the rear for easy tabletop use. Rubber feet keep it from sliding away from you, which is good because you're sure to twist the device's knobs aggressively. The logo screams at you in cartoonish golden-yellow letters.

The back panel has a jack for a 9-volt wall-wart power supply, MIDI In and Out ports, and a switch that toggles between the three preset operating modes. A small Reset/Snapshot button at the upper-right corner of the front panel gives you basic undo and parameter-saving features. That's it!

Fourteen firm rubber knobs, arrayed

in two rows, adorn the front panel. The first 13 knobs send predetermined Control Change messages for editing synth parameters, and the final knob selects the active MIDI channel. (You cannot change the assignments.) Although the knobs don't turn quickly, they turn smoothly, with just the right amount of tension; they don't stick or feel sluggish. Labels indicate the MIDI Control Change (CC) message number and associated function for each knob.

### IN THE MODE

The Phat.Boy has three operating modes (which you select with the rear-panel switch), each designed for controlling a different type of synth. The first two modes are for specific synth types: Mode I allows you to edit 13 commonly used parameters on Roland GS and Yamaha XG General MIDI modules. Mode II is for editing Creative Labs Sound Blaster AWE-series sound cards and compatible devices. I'll explain Mode III shortly.

The XG, GS, and Sound Blaster synths are standards, of course, so numerous other instruments use the parameter messages provided in Modes I and II. For example, some Generalmusic and Korg synths work with Mode I (XG/GS); and because Turtle Beach and TerraTec sound cards are Sound Blaster compatible, you can edit them in Mode II.

With one exception, the Phat.Boy's knobs control the same synthesis parameters in Modes I and II, but in some cases they send different messages to accomplish this due to the parameter-mapping differences between XG/GS and Sound Blaster synths. In Modes I and II, knobs 1 through 9 control Filter Cutoff, Resonance, Vibrato Rate, Vibrato Depth, Vibrato Delay, Reverb, Chorus, Attack, and Delay. Knobs 11, 12, and 13 control Release, Pan, and Volume, respectively.

Knob 10 is the only control that has different functions in each mode: in Mode I it controls Portamento, in Mode II it handles Sustain (Envelope), and in Mode III it controls Pan (CC 10).

### THE FREE WORLD

Mode III follows a different concept than Modes I and II. It is a "free" mode in which the 13 parameter knobs send Control Change messages 1 through 13, respectively (i.e., knob 1 sends CC 1, knob 2 sends CC 2, and so on). Although it is designed for use with synthesizers that



Keyfax's Phat.Boy MIDI performance controller was designed primarily to provide a real-time, easy-to-use front panel for XG, GM, and Sound Blaster-compatible synthesizers. This affordable little box also allows you to accomplish unexpectedly powerful sound sculpting with a variety of synths and other MIDI-controllable devices.



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are not GS, XG, or Sound Blaster compatible, you can use it for any MIDI device that responds to CC 1 to 13.

The usefulness of Mode III, then, depends on the depth and flexibility of your MIDI device's support for these Control Change messages. In the best possible scenario, your MIDI device lets you map CC 1 through CC 13 to whatever parameters you like; you can then use the Phat.Boy for serious custom editing. (If you're a Kurzweil K2000/K2500 owner, think FUNs!)

Admittedly, this arrangement is a tad confusing at first because some knobs control different parameters in Mode III than in the other two modes. For example, knob 7 controls Chorus in Modes I and II but sends Volume (CC 7) messages in Mode III. And as noted earlier, knob 10 has different functions in all three modes. However, Mode I and II parameters are marked on the faceplate, and if you can remember that in Mode III, knobs 1 to 13 send CC 1 to 13, you'll be fine.

### TRY, TRY AGAIN

The Snapshot/Reset button serves two functions. Reset is simple: when you hold down the button for more than three seconds, the Phat.Boy undoes your edits and restores the sound's original settings. To accomplish this in Modes I and II, it sends Non-Registered Parameter Numbers (NRPNs) with a value of zero. After I mutilated a patch on the Sound Canvas, I pressed Reset, and the patch immediately returned to normal. However, with the non-XG/GS synths in my system, it did no such thing; because this feature uses NRPNs, it works only with synths specifically supported in Modes I and II.

In Mode III, the Reset button sends a Reset All Controllers (CC 121) message. This works fine on most modern synths but not on those that predate the addition of CC 121 to the MIDI Specification. Of course, the Phat.Boy was designed primarily to control modern synths; nevertheless, it would have been nice if Keyfax had programmed the Reset button to send zero values for CC 1 to 15 to help control the venerable older beasts.

### TAKING A CHEAP SHOT

If you press the Snapshot/Reset button for less than three seconds, the Phat.Boy takes a snapshot of the current controller settings and sends the data to your sequencer or other MIDI data recorder. Many GM modules and sound cards have no onboard sound storage, and this feature allows you to record your parameter edits very easily. That means you don't have to buy editor/librarian software or program a control screen in the sequencer. One of the Phat.Boy's greatest features is that it simplifies things.

By the way, don't forget to send a Program Change message along with the CC messages. That way the sequencer can recall the correct patch along with your parameter changes.

### WHAT SOUNDS PHAT?

I tested the Phat.Boy with a Roland SC-50 GS synth module and found that I could change virtually every parameter that is accessible from the SC-50's front panel. (The SC-50 has hidden parameters that can be accessed only via SysEx; the Phat.Boy can't deal with those.)

The control device's simplicity and ease of use dovetailed well with my work

approach. I like to record a basic sequence without controller messages, then record CC data on another track (or tracks) that addresses the same instrument and MIDI channel. That way I have a variety of approaches to my original track when I mix. The Phat.Boy allowed me to do my tweaks in real time while the sequencer played a repeating line. Now, that's what I call fun.

For instance, I experimented with the SC-50's steel-string guitar patch, adding a little chorus in real time (tasty) and turning the Reverb knob slowly to introduce that effect. I turned the Vibrato knobs periodically to add realism and enhance the sound, then manipulated the envelope parameters and completely changed the texture of the sound, all on the fly. Working the Filter Cut-Off and Resonance knobs, I transformed it into a strange-sounding, staccato patch that barely resembled the original mellow guitar. Doing all this in real time, without having to mess around with the SC-50's front panel, was great. I might not have bothered with some of these ideas if I had had to do it the hard way.

When you use the Phat.Boy, I suggest that you start with the knobs turned to their zero setting (far left) and then nudge them slowly to the point where you want them. The sound you hear will then be accurately represented by the knob positions.

I didn't have access to a Sound Blaster-compatible instrument, so I can't testify to the Phat.Boy's effectiveness with those products. It is a basic machine, though, with no hidden programmable pages, so not much could go wrong.

### REAL PHUN

The serious hoopla began when I used the Phat.Boy with my Oberheim Matrix-12 and Kurzweil K2000RS. I went into my favorite custom patches, set the Phat.Boy to Mode III, and assigned the MIDI controller's knobs to various parameters in my synths.

For example, I took a Matrix-12 patch called "Godpad" (a huge, detuned texture) and assigned knobs to control Filter Cutoff and Resonance. When I turned the knobs, this powerful, thick pad underwent entrancing changes.

I assigned a knob to control Oscillator Frequency Modulation and synched the oscillators, assigning another knob to control the pitch of Oscillator 2. Those familiar with analog synthesis know that

## Phat.Boy Specifications

<b>Connections</b>	MIDI In and Out
<b>Modes</b>	(3) XG/GS, AWE, Control Change
<b>Mode I and II Controls</b>	Filter Cutoff, Resonance, Vibrato Rate, Vibrato Depth, Vibrato Delay, Reverb, Chorus, Attack, Delay, Portamento (Mode I only), Sustain (Mode II only), Release, Pan, and Volume
<b>Mode III Controls</b>	MIDI Control Changes 1-13
<b>Power Supply</b>	9 VDC adapter
<b>Dimensions</b>	9" (W) x 4.25" (D) x 1.75" (H)
<b>Weight</b>	1 lb. 8 oz.

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when you do this, the sound and texture of the patch change, sometimes dramatically. When I added the analog Oscillator FM, the soundscaping possibilities were astounding—the patch took on wondrous dimensions. Suffice it to say that the Phat.Boy breathed new life into this classic synth.

When used with the Kurzweil K2000, the Phat.Boy's potential boggles the mind. I assigned knobs to the parameters of the numerous algorithms, controlling internal effects and panning. I loaded in a bank of Roland TR-808 samples, assigned knobs to different drum sounds, and went to techno heaven.

As if that weren't enough, I assigned knobs to the four local controllers available in my DigiTech TSR-24 effects processor. I looped an eight-bar line while using the Phat.Boy to control Flange Depth, Flange Rate, Delay On/Off, and Delay Time. I had a ball creating soft flanging effects that rhythmically moved in and out of the musical line, then moved to extremely wild, excessive flanges, and then to vocoderlike talking effects, all in real time.

**MANUAL AND MIDI PHILES**

The Phat.Boy comes with a CD jewel case that contains the manual and a floppy disk where a CD would normally be. The floppy disk contains 22 folders full of Standard MIDI Files (SMFs) from the Keyfax *Twiddly Bits* collection.

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**CONS:** Reset feature doesn't work with older synths. No CV inputs (e.g., for footpedals).

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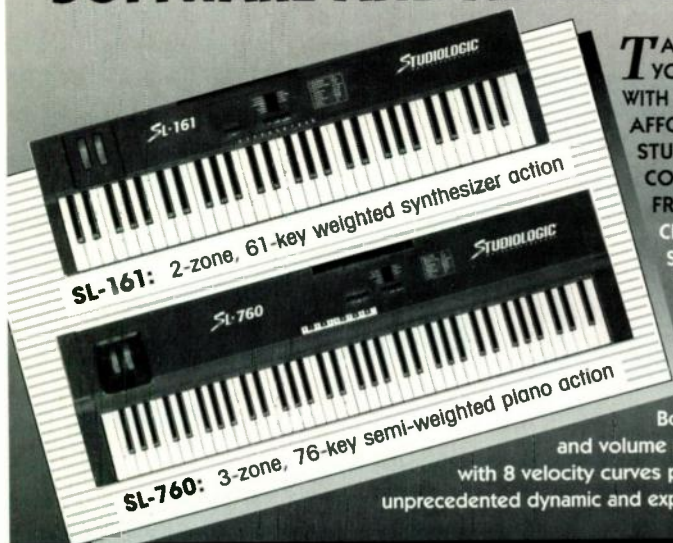
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I played with PHATJAM1.MID for more than an hour and had immense fun doing remixes on this house-dance ditty. With a GM module, the SMF loads the appropriate patches and other data in the first two bars, so you're set to go.

The Phat.Boy's documentation is good and covers the bases pretty well, especially for the instruments supported in Modes I and II. It doesn't answer every question that you may have about other setups, however. Those who have more elaborate systems will have to do some fiddling about.

## PHINAL VERDICT

This is a killer product that is elegant in its simplicity. The price-to-usefulness ratio is outstanding; you'll get so much creative satisfaction from the Phat.Boy for your \$249 that the price will seem a mere pittance.

I suppose that one could ask for a few more features—I've mentioned the reset messages for Mode III—but a good part of the device's usefulness stems from the fact that the manufacturer showed sensible restraint. In this case, less is more.

I can't imagine that this little box couldn't joyfully be used in anyone's MIDI studio or live rig. Aside from synthesizer applications, a sound person with the MIDI-controllable signal-processing gear could use the Phat.Boy in extraordinary ways. DJs and rave artists will find endless applications for doing live remixes and creating spontaneous new sounds. Furthermore, the Roland GS sounds are built into QuickTime 3, which could make this box handy for people doing multimedia production.

Sometimes a product comes along that is timed just right. The one thing I needed to round out my studio was a MIDI controller with lots of knobs that would allow me to tweak my instruments in real time. Presto! Problem solved. The folks at Keyfax are going to have trouble wresting the Phat.Boy from me—this little phatty is staying right here.

*Jeff Obee plays the fretless bass and synthesizer and is addicted to knobs.*

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# NATIVE INSTRUMENTS

## GENERATOR 1.5.3 (WIN)

*Build your synth,  
and they will come.*

By Zack Price

For many of us, the term *modular synthesizer* conjures up images of the '70s, when keyboard wizards stood before massive walls of oscillators, filters, and envelope generators that were interconnected by a labyrinth of patch cords. Although these wizards and their machines looked and sounded impressive, everyone realized that modular synths were difficult to transport and configure. No wonder synth makers worked so hard to develop more portable instruments with easier programmability and patch storage.

The resurgent interest in classic electronic instruments is making modular synthesizers popular once again. Unfortunately, hardware-based modular systems are still expensive, regardless of whether you buy vintage modular synths or newly manufactured systems. Moreover, they are neither lighter nor simpler to operate than they were back in their heyday.

Thankfully, with the release of Native Instruments' *Generator* 1.5.3 modular synthesis software, there is no longer any reason to lug around banks of oscillators and filters. Now you can cram a wall of oscillators, filters, and patch cords into your Windows desktop or laptop computer without straining your

back—and at a price (\$298) that won't break your piggy bank.

### WHAT YOU'LL NEED

Your computer system must meet some specific requirements before you can use *Generator*. First, the CPU should be a genuine Intel Pentium. Other processors, such as the AMD K6, will work but will perform more slowly than the Intel. (The Cyrix 6x86

does not work properly with *Generator*, due to the chip's inadequate floating-point performance.) The new Intel 300A and 333 Celeron processors should also work, because they include the required L2 cache; earlier models did not. Keep an eye on Native Instruments' Web site for the most current information about compatible CPUs.

The minimum processor speed required is 100 MHz, but faster is better, especially if you intend to use *Generator* with sequencing and digital audio software on the same platform (more details on that later). Your computer also should have an onboard 256 KB pipeline-burst cache, which comes standard on most personal computers today.

*Generator* works with any sound card that is compatible with Windows 95/98 or NT 4.0, and it also includes a special driver for Emagic's Audiowerk8 card. Although the driver for this card supports additional software, you can't run *Generator* simultaneously with other applications when using the Audiowerk8.

You can achieve acceptable levels of performance using sound cards with MME drivers, but *Generator* will perform better with DirectX cards. I used a Sound Blaster AWE64 Gold (an ISA-based card) with DirectX drivers and got satisfactory results.

However, if you want even faster response and less strain on your computer's system resources, use a PCI-based card with DirectX drivers. And make sure you've installed DirectX 5.1 or higher on your system so you can run the plug-in version of *Generator*, if you want to, even though that option has a few problems (more details later).

One more note about

sound cards: a number of newer cards load a software synth as part of their installation. For example, the AWE64 Gold includes Creative Labs' *WaveSynth/WG*, and some Turtle Beach cards use a software Yamaha XG synth. Turn these off in Windows' Control Panel before you use *Generator*, because a second software synth can strain your system or even prevent *Generator* from functioning altogether. (This advice also applies to other software synthesizer programs, such as Seer Systems' *Reality*.)

### WHAT YOU'LL GET

As with any software synthesizer, the performance that you get on your system depends on several factors. Besides the clock rate and type of CPU you use, the complexity of the instrument structure you design has a major impact on polyphony. Some of *Generator's* modules are more processor intensive than others, often significantly so.

Another factor affecting performance is the amount and type of MIDI messages you send to a patch in real time. Numerous Pitch Bend and Aftertouch messages can generate an enormous amount of MIDI data, which can affect any sound's responsiveness. The best way to keep your *Generator* sounds playing smoothly is to send only limited amounts of MIDI information to the program. Furthermore, if you record the MIDI information into a sequencer, you should use the Thin Controls tool (or your sequencer's equivalent) to thin out the potentially huge volume of messages for subsequent output. Fortunately, *Generator's* manual has some good recommendations on how to set up your system to achieve its maximum performance capabilities.

### LEVELS OF EXISTENCE

*Generator* is a virtual version of a modular synthesizer, and like the modular synths of old, its sounds are built by "wiring" together sound-generating or processing modules in any arbitrary fashion. The program provides nearly 180 modules for this purpose and supplies dozens of example designs that use the modules to help you get started.

*Generator's* modular networks are organized hierarchically. The highest level, called the Ensemble, is a top-down, encapsulated view of the components in the current working environment. Figure 1 shows the Ensemble and the components it contains

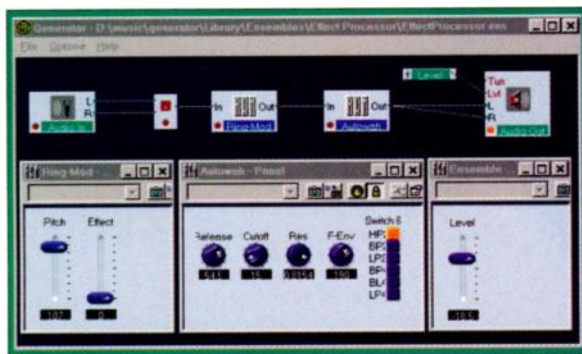


FIG. 1: *Generator* uses modular designs that can be configured by the user. The Ensemble shown here will process live audio that is sent into the system in real time.



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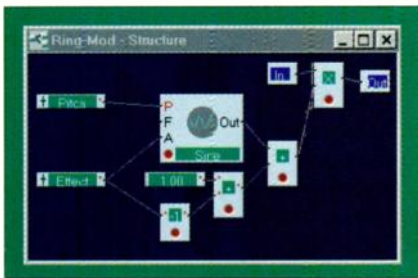
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**FIG. 2:** Many of *Generator*'s modules have their own internal Structure. The Structure of the Ring Modulator module from Figure 1 is revealed here.

for a synth design that will process stereo audio input. The top portion of the screen shows the structure of the sound, and the bottom portion shows the panel controls used to alter the sound in real time.

Notice that this design begins with stereo audio input that is summed, then gets patched into a Ring Modulator, then goes to an Autowah effect, and finally arrives as the input to the stereo Audio Output module. The Audio Out is fed by a master gain (Level) control. Two of the modules, Ring-Mod and Autowah, are in a class of modules called Instruments. Instruments contain their own internal Structures, which can be quite complex. Figure 2 displays the Structure of the Ring Modulator module. I'll talk more about Structures later.

Each Instrument in the design has a Panel window, which you can access by clicking on it. Panel windows contain an icon-based toolbar for performing various functions. For example, the Camera icon in the Autowah panel shown in Figure 1 is used to take a "snapshot" of the current control settings in the Panel. Snapshots can be named and saved, then reused simply by selecting them from the text window in the upper-left portion of the Panel window. You can recall the first 128 of these settings via Program Change messages if you've activated Program Change Enable in the Instrument's Properties dialog box.

The MIDI icon to the right of the Camera activates the MIDI Learn feature, which provides a quick way to assign various MIDI data parameters, such as Aftertouch, Volume, and Sustain Pedal, to specific controls in the Panel window. The Lock button next to the MIDI icon locks the controls into place once you've arranged the Panel

display to your satisfaction. Locking prevents the various knobs, switches, and faders from accidentally sliding out of place when you click on them with your mouse.

The Structure icon, located to the right of the Lock button, opens up the Structure window associated with that Panel. Structures are at the heart of any synth you create and contain the various signal-processing modules and control devices. Modules themselves perform relatively simple tasks, but when they are connected in specific ways, the resulting Structure can perform complicated tasks.

As you become familiar with *Generator*, you may want to use parts of certain Structures repeatedly. You can save these Structures as reusable Macro files. A Macro "module," which is identified by its gray label and an icon representing a Structure, can be thought of as a Structure within a Structure. Indeed, they are similar to Instruments, except that they neither manage MIDI data nor have Panels or Snapshot settings. Their main purpose is to encapsulate functional blocks of Structures hierarchically, furnishing a clearer layout for complex Structures.

### MODULES AND ROCKERS

Unlike Seer Systems' *Reality*, which offers many different forms of synthesis, *Generator* adheres mainly to the traditional modular synthesis model by providing numerous subtractive synthesis possibilities, with FM and additive synthesis capabilities thrown in for good measure. (For more information on subtractive synthesis, see "Square One: Spectrum Sculpting" in the December 1998 issue of *EM*.) And though *Generator* doesn't offer multisampling such as you would find in stand-alone samplers, you can import WAV files for triggering, which is good for playing percussion sounds and short loops.

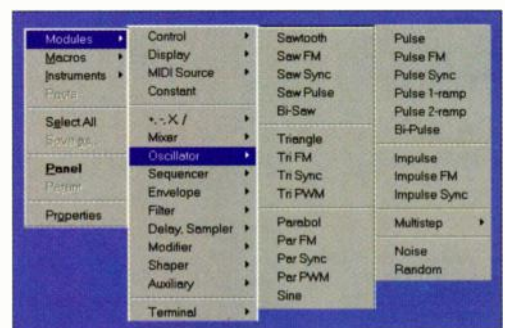
*Generator* provides all the oscillators you'd expect in a subtractive synthesizer, including sine, sawtooth, triangle, and various pulse (square) shapes (see Fig. 3). The program expands on this basic arsenal with some interesting variations. For example, Saw FM is a sawtooth oscillator with frequency modulation. The Saw Sync oscillator is similar to Saw FM but adds an

audio input for controlling the synchronization of the generated waveform. Saw Pulse is a sawtooth oscillator whose wave slope can be altered from a normal sawtooth to a triangular pulse waveform.

Additionally, *Generator* includes a number of oscillators that may be unfamiliar to many people. For example, the Parabol oscillator generates a parabolic waveform composed of two halves that are each a section of a parabola. This type of oscillator, which sounds like a sine wave with added odd-numbered overtones, can be used instead of multiple sine-wave oscillators to reduce computational load when constructing an FM or additive synth-like structure.

There's more to a modular synth than just oscillators. Filters and envelope generators are every bit as important for processing oscillator output and incoming audio signals. *Generator* doesn't skimp on these, offering ten types of envelope generators and ten types of filters. What's more, it has a fine selection of signal-processing building blocks for creating a variety of effects, including delay modules (Static, Modulation, Diffuser, and Event Delay) and modifier modules (Saturator, Clipper, Rectifier, Chopper, and Sample & Hold).

In keeping with the modular synth concept, *Generator* includes Auxiliary and Mathematical Function modules that perform the mundane but necessary tasks of processing audio and events in various ways. For example, a summing module combines the output of two or more oscillators so that you can hear them both at once. There are Audio and Event Relays, Event Separators, Event to Audio and Audio to Event modules, and so on. You'll even



**FIG. 3:** *Generator* has more than 180 sound-generating and processing modules. Like the other modules, the oscillators are accessed via the right mouse button.

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Akai MB76, Alesis D-4, DM5, HR-16\*, HR-16B\*, MidiVerb III, MidiVerb IV, NanoBass, NanoPiano, NanoSynth, QuadraSynth, QuadraSynth S4, Quadra-Synth Plus, QuadraSynth Plus Piano, QS6, QS7, QS8, QSR, QuadraVerb, QuadraVerb Plus, QuadraVerb GT, QuadraVerb 2\*, SR-16\*, ART DR1\*, BOSS DR-5, DR-660, SE-50, SE-70\*, Casio CZ101, CZ1000, CZ3000, CZ5000, VZ1, VZ10m, Creative Labs WaveBlaster, Digital MX-8, Digitech DSP128\*, DSP128\*, DSP256\*, GSP2101\*, IPS33B, TSR-24\*, Valve FX\*, Emu Classic Keys, Launch Pad, Morphous, Orbit, Procussion, Proteus MPS, Proteus MPS Plus, Proteus 1, Proteus 1XR, Proteus 1 with Protologic, Proteus 1 XR with Protologic, Proteus 1 with Orchestral, Proteus 2, Proteus 2XR, Proteus 3, Proteus 3XR, Proteus FX, Sound Engine, Ultra Proteus, Vintage Keys, Vintage Keys Plus, Ensoniq DP-2, DP-4, EPS\*, ESQ-1, ESQ-M, KMX-16, KMX-8, KS-32, KT-76, KT-88, Mirage+, MR-Rack, MR81, MR76, SD-1, SO-1, SO-1 Plus, SQ-2, SQR, SQ-80, TS-10, TS-12, VFX, VFX-SD, VFX-SD II, Eventide Harmonizer\*, Evolution EVS-1, JL Cooper Fader Master, MSB-1620, MSB-Plus, MSB Rev2, PPS-100\*, Synergy\*, Kawai GMega, K1, K1R, K1 II, K3, K3m, K4, K4R, K5, K5000S, K5000R, K11, R-50\*, R-100\*, Spectra, XD-5, KMX KMX MIDI Control, KMX 8 x 8, Korg 01/W, 01/W Pro, 01R/W, 03R/W, 05R/W, A4, DDD-5\*, D-8, DVP-1, DW6000, DW8000, DSS-1, EX800\*, EX8000, I1, I2, I3, I4, I5a, Ix300, M1, M1EX, M1R, M1REX, M1+1, M3R, N264, N364, N5SR, Poly800\*, Prophecy, SDD-3300\*, S3\*, T1, T2, T3, Trinity, Trinity Pro, Trinity Plus, Trinity Rack, Wavestation, Wavestation EX, Wavestation AD, Wavestation SR, X2, X3, X3R, X5, X5D, X5 DR, Z1, 707\*, Kurzweil K2000, K2000R, K2500, K2500R, Lexicon LXP-1\*, LXP-5, LXP-15, MOTU 7s, Peavey DPM3, DPM-V3, Spectrum Bass, Spectrum Bass II, Spectrum Filter, Spectrum Organ, Spectrum Synth, Rane MAP33\*, MPE14, MPE28, MPE47\*, Rhodes Model 660\*, Model 760\*, Oberheim Matrix 1000, Matrix 6, Matrix 6R, Matrix 12, Xpander, Octave Plateau Voyetra 8, Roland A-50\*, A-80\*, A-880, CM-32, CM-32P, CM-64, D-5, D-10, D-20, D-50, D-550, D-70, D-110, DEP-3, DEP-5, E-660, GM-70, GP-8, GP-16, GR-09, GR-50, GS, JD-800\*, JD-990, JP8000, Juno-106, JV-30, JV-60, JV-880, JV-90, JV-1000, JV-1060, JV-2060, JX-8P, MC-303, ME-10\*, MGS-64, MKS-80, MT-32, Pro-E\*, P-330\*, PMA-5, RA-50\*, R-5, R-70\*, R-8, R-8II, R-8m, SCC-1, SC-35, SC-50, SC-55, SC-55 MkII, SC-155, SC-88, SC-88VL, SC-88VL-WH, SCP-55, Sound Expander (M-BD1, M-DC1, M-OC1, M-SE1, M-VC1), SPD-11, Super Jupiter, TD-5, TD-7\*, U-110, U-20, U-220, XP-10, XP-50, XP-60, XP-80, Sequential Circuits Drumtraks\*, MultiTrak, Prophet10\*, Prophet5, Prophet 600, Prophet 78\*, Six-Trak\*, Tom\*, Turtle Beach MultiSound, Voce DMI-84\*, Waldorf Microwave, Microwave (v2.0), Yamaha DMP7\*, DX1, DX5, DX7, DX9, DX7IID, DX7IS, DX11, DX21, DX27, DX27S, DX100, FB01, KX76\*, KX88\*, MEP4\*, MU60, MU80, MU-100R, RX11, RX17\*, RX21\*, RX7\*, SPX90\*, SPX900\*, SPX1000\*, SY22, SY35, SY55, SY77, SY85, TG33, TG55, TG77, TG100, TG500, TF01, TX7, TX802, TX812, TX816, TX81Z, V50, W5\*, W7\*, 386 Systems Midi Patcher. (\* = librarian support only)

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## GENERATOR

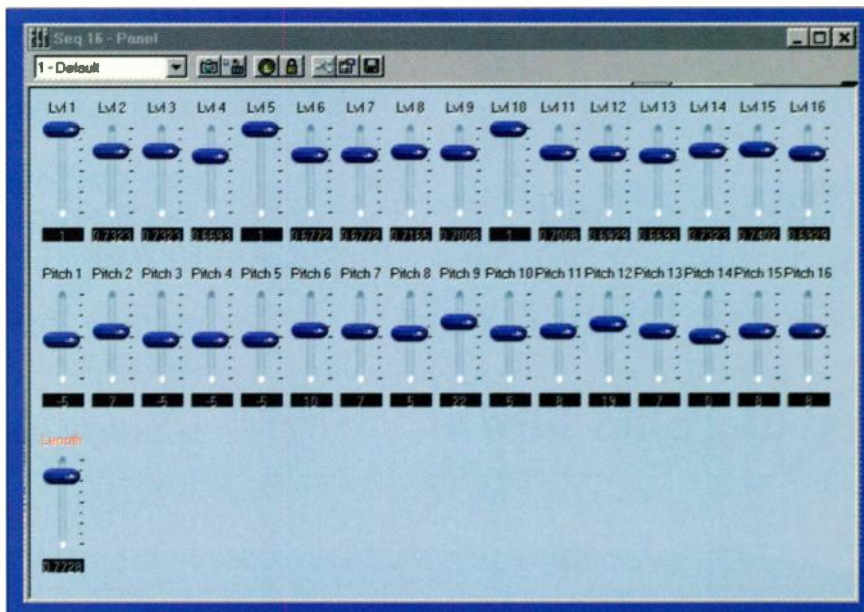


FIG. 4: *Generator* offers several step sequencers, including the 16-step option shown here. It has no dedicated arpeggiator, however.

find faders and knobs that you can use as control sources in your designs.

Out of all of *Generator's* approximately 180 modules, there is only one glaring omission: the program comes with no arpeggiator module that you can play in real time. *Generator* does have multiple step sequencers that you can program to play as arpeggios (see Fig. 4), but that's not the same thing as having a real arpeggiator.

All this talk about oscillators, filters, and modules means nothing if the program doesn't produce anything that sounds good. Luckily, you can create a variety of classic synth sounds with *Generator*. I wouldn't be surprised if someone released a "classic synth" series of Ensembles based on famous synths such as the Roland Jupiter 8, Korg Polysix, and Yamaha DX7. (The first *Generator* synth I played was an FM synth that sounded eerily like my dearly departed Yamaha TX81Z; it was just as properly harsh and thin as I remember.) The synth you create is limited only by your imagination (and computer capabilities), so you can build "combination synths" using multiple forms or variations of synthesis methods.

### MANY WAYS TO PLAY

Provided you have the luxury of using two computers, the easiest way to play a *Generator* synth is to treat the computer on which it resides as a separate "tone module." You can play a *Generator* patch

on that computer using an external MIDI keyboard and send its output in real time into a digital audio program on the second computer. (You can capture the output directly to disk as a WAV file, too.) You could also use the MIDI Thru on the second system's sequencing program to record any MIDI data you play. You could then edit this data and use it to trigger *Generator*, as well.

You'll most likely want to run *Generator* on the same platform as your

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Generator 1.5.3  
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FEATURES

EASE OF USE

DOCUMENTATION

VALUE

1 2 3 4 5

**PROS:** Feature packed. Exceptionally deep synthesis capabilities. Numerous sound design modules.

**CONS:** Unfriendly copy-protection scheme. No advanced tutorials. Limited usefulness as a DirectX plug-in. No arpeggiator.

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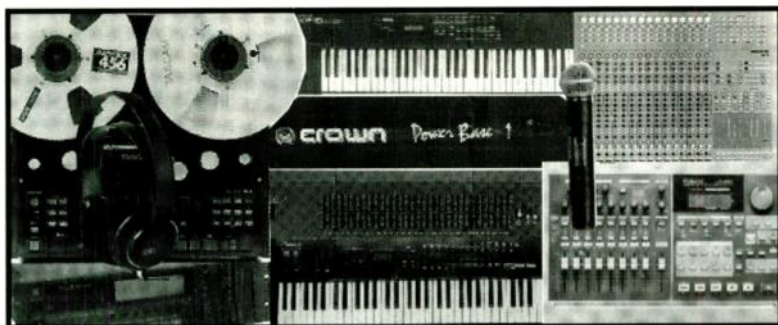
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*PC Magazine*
- ▶ "Remarkable user programmability of styles and arrangement options. Simple to learn and use."  
*Keyboard*
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## GENERATOR

sequencing or digital audio programs. For this purpose *Generator* provides an Internal Midiport, which appears as a software MIDI Out device in your MIDI programs. This lets you play a *Generator* synth in real time from a sequencing program running on the same computer; or send MIDI Clock, Stop, and Start commands to a *Generator* Ensemble that uses a step sequencer as part of its design.

You can import MIDI data from *Generator* into a sequencing program. To do that you'll need a separate software device such as the freeware program *Hubi's LoopBack Device*, available at [www.hitsquad.com/smm/programs/Hubis\\_LoopBack\\_device](http://www.hitsquad.com/smm/programs/Hubis_LoopBack_device).

*Generator* is more than a software synth; it also functions as an effects processor. You can process external audio sources with *Generator* and the input from any full-duplex sound card. You'll have to switch to the MME sound card drivers in *Generator*, though—the DirectX standard doesn't support audio input. That's a shame, because MME card drivers put more of a strain on your system. However, you'll still be able to control any faders and knobs in real time while processing audio, and even capture any MIDI messages your controls generate.

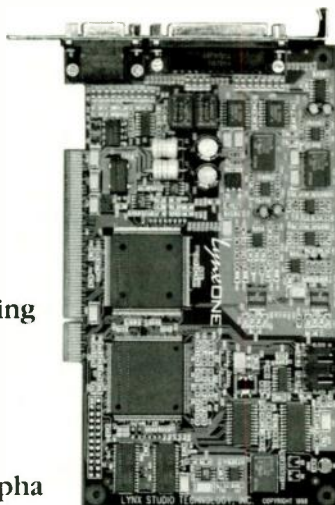
One feature that separates *Generator* from other programs in its class is its potential to run as a DirectX plug-in within certain host programs. (The DirectX option currently has numerous compatibility problems, so see the manufacturer's Web site for a list of compatible applications.) If you have an audio program that's on the supported list, you can use *Generator's* audio processing capabilities to process a WAV file directly within a host program. An added benefit is that *Generator's* plug-in version processes the audio through your card much faster and with less strain on your system.

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### Generator 1.5.3

#### Minimum System Requirements

Pentium 100; 32 MB RAM (Windows 95/98), 64 MB RAM (Windows NT); Windows 95/98 or NT 4.0; full-duplex sound card; DirectX 5.1 or higher to operate the *Generator* plug-in.

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On the other hand, when you use the DirectX plug-in version, the MIDI messages produced by *Generator's* faders and knobs will not have precise time stamps; that's because DirectX plug-ins process audio one buffer load at a time. Buffer length is determined by the host application, and because they are not optimized for the kind of real-time operations that *Generator* performs, these buffers are typically quite long. For example, if the buffer length in the host application is 100 ms, *Generator* will process new MIDI events only

every 100 ms. Needless to say, all timing will be inaccurate by the same amount. (This is also why you can't successfully play a real-time synth using *Generator's* plug-in version. Obviously, none of this is an issue when running the stand-alone version of *Generator*.)

**PET PEEVES**

My primary complaint about *Generator* is with its decidedly unfriendly copy-protection scheme. Once the program is installed, you must unlock the installation with a code key that transfers

the license onto the hard drive. (The key can unlock a maximum of two installations at any given time.) Unfortunately, this form of copy protection often penalizes the legitimate user. For instance, you have to transfer the license back to the original floppy disk before installing a new program drive or repartitioning an existing program drive. If you forget to do that first, you'll lose an installation key. Furthermore, if your hard drive crashes and you have to reformat the disk and reinstall your programs, you'll also lose an installation. Although Native Instruments provides support to help *Generator* users recover from disasters, I'm still uneasy about this type of copy protection.

I was also disappointed by the brevity of the tutorials in the *Generator* manual. Although they provide a good starting point for learning to use the program, I wish there were more examples showing how to develop complex instruments or sound-processing structures. Perhaps Native Instruments can post some extra tutorials on its Web site. But then again, the main reason you would buy this program is to design your own custom modular synths, and at some point you just have to dive in and do it on your own.

**BEAUTY IN COMPLEXITY**

Creating a synth or effects processor from scratch isn't exactly a snap, but building anything from scratch is rarely easy. Native Instruments wins my courage-in-advertising award for stating an obvious truth that too many other companies try to evade. To quote the manual: "*Generator* is a complex program that offers complex functions that allow you to achieve complex things." When is the last time you heard a company admit that about its product? Fortunately, the program is straightforward enough that it doesn't get in the way of constructing complex instruments or processors that sound great, and it includes so many tools that you'll never run out of options.

If you like the idea of making your own custom synths without unloading a ton of money (or moving a ton of equipment), check out *Generator*. It's one cool program.

*Zack Price is a complex modular structure with stereo inputs, multiple filter controls, and a monophonic output.*



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# BSS AUDIO

DPR-944

*Four independent channels of high-quality dynamics processing.*

By Erik Hawkins

Most personal studio owners in the United States probably haven't heard of BSS Audio. One reason is that the United Kingdom-based company is better known for sound-reinforcement products (crossovers, time correctors, distribution systems, equalizers, and so on) than for studio gear. About a year ago, BSS introduced a line of dynamics processors called the Opal Series. This new line is based on several pieces of gear found in the company's main product line, only pared down—in terms of features, not quality—to make it more affordable.

The most recent addition to the Opal Series is the DPR-944 2+2 parametric compressor/gate. The DPR-944 is a 4-channel unit that features two channels of frequency-selectable parametric compression and two channels of tunable gating, all for only \$899.

## ROMANCING THE GEAR

When I pulled the DPR-944 out of its box, the first thing I noticed was how substantial it is. Posing as a 1U rack-mount device, it weighs a hefty 6.6 pounds and seems like it could take a serious beating. Out of curiosity, I opened it up to see what accounted for its weight, and I discovered a very large transformer coil. It gets extremely hot after being on for a while, so be careful not to put anything that might melt on top of this unit, and make sure the DPR-944 has plenty of ventilation.

A recessed voltage-selector switch on

the unit's rear panel allows the DPR-944 to operate at either 115 or 230 VAC, 50 or 60 Hz power. I always applaud built-in power selectors because they make traveling with your equipment between North America and Europe carefree. An easily accessible fuse is also provided on the back panel. There is no power switch for the unit, however, so plugging it into a switchable power strip is recommended.

All of the DPR-944's inputs and outputs are XLR. This is inconvenient, considering that most personal studio consoles are equipped with 1/4-inch TRS jacks. (But then again, many live consoles are fitted almost exclusively with XLR connectors to accommodate microphones and onstage breakout boxes.) I'd like to see future incarnations of the DPR-944 with 1/4-inch jacks as well as XLRs. The Key Insert jacks for the gates take a standard 1/4-inch TRS insert cable.

## A GLITTERING FACE

The DPR-944 has a unique, blue-green face, accented with plenty of easy-to-read text. Attractive oval buttons and LEDs, which recall the forms and textures of polished gemstones, are used throughout. The gate and compressor sections are clearly divided from each other by a white line. Four large in/out buttons—two per section—are easily distinguished by their half-oval shapes. These buttons are placed back to back to form a complete oval; their shape and position allows you to press both buttons at the same time, activating both channels of the compressor or gate simultaneously. The control buttons are red and light up when depressed, so it's easy to tell from a distance that they're on.

The DPR-944's knobs are rubberized, providing nonslip turning action. Although the knobs have well-defined alignment indicators, I found myself wishing that there were center detents on the gain controls of the compressor. Center detents would have made aligning the relative values of each

channel easier—especially when dealing with stereo signals, because the stereo-link feature does not apply to the compressor's gain control.

## A GEM OF A COMPRESSOR

Each of the DPR-944's channels of compression has five parameters: gain, ratio, threshold, parametric filter width, and parametric filter frequency. Overall gain, after compression, is  $\pm 20$  dB; threshold can be adjusted from  $-30$  dB to  $+20$  dB; the filter width varies from a tight 0.4 octave to full bandwidth; and the filter frequency is continuously variable from 60 Hz to 12 kHz. Width and threshold are "out" when they are turned all the way to the right, while ratio is "out" when turned to the far left. When a knob is in the "out" position, that parameter is disabled. For example, when width is turned to "out," the compressor functions as a full-bandwidth compressor rather than a parametric compressor.

Each channel has LED meters for displaying input level, threshold, and gain reduction. The input meter is composed of four segments:  $-20$ ,  $-12$ ,  $-6$ , and  $-3$  dB. The threshold meter is a single LED that lights up all the way when the threshold is reached. BSS Audio calls the combined LEDs of the input and threshold meters the "Below Threshold Meter." This is an apt title because they are grouped together, and viewing them concurrently gives you an idea of where the input level is in relation to the threshold. The gain-reduction meter is composed of seven segments and shows gain reduction (from  $-1$  dB to  $-24$  dB) as a result of compression. The DPR-944's combination and arrangement of meters makes it extremely easy to see what's happening to your signal. For this, BSS Audio deserves another round of applause.

Many 2-channel compressor/gate devices in this price range have a stereo-link button for quick and easy stereo operation—the idea being that stereo linkage should put all of the controls of one channel under the control of



The 4-channel DPR-944, featuring two independent parametric compressors and a pair of tunable gates, offers greater creative flexibility than the average stereo compressor/gate.



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the other channel. However, this is not the case with the DPR-944's stereo-link button. Only the threshold and ratio parameters are linked, leaving the width, frequency, and gain parameters independent. When width is in the "out" position, the compressor is in full-bandwidth mode, leaving only the gain controls independent.

On the one hand, this setup is a major disadvantage for the person who wants to have complete stereo linkage of all parameters. On the other hand, you're given the benefit of independent gain control, while the stereo link of the threshold and ratio ensures (according to the manufacturer) that there will be no stereo-image shifting during compression. This implementation also allows you to give the same kind of compression to both channels, while having a different frequency chosen for each one. This could be useful if you want to subtly tweak each of the stereo sides when miking a drummer with a pair of overheads.

Two attack/release settings are available on each compressor: Auto and Fast. Auto is the DPR-944's default setting, which, according to BSS Audio, automatically analyzes the incoming signal and adjusts its attack and release times accordingly. I found it to be very musical and satisfactory for most applications, from vocals to guitars. If the compressor does not respond quickly enough in the Auto setting (say, if the release time is too slow), a faster attack/release mode can be accessed by pressing the Fast Release button. The Fast setting is about ten times faster than the Auto setting. I com-

DPR-944 Features	
<b>COMPRESSOR</b>	
<b>Threshold Range</b>	-30 to +20 dB, continuously variable
<b>Ratio</b>	1:1 to ∞:1, continuously variable
<b>Output Gain</b>	±20 dB, continuously variable
<b>Maximum VCA Range</b>	>30 dB
<b>Parametric Filter Frequency</b>	60 Hz–12 kHz, continuously variable
<b>Parametric Filter Width</b>	0.4 octave—fully out, continuously variable
<b>GATE</b>	
<b>Threshold Range</b>	-50 to +20 dB, continuously variable
<b>Key Filter Range</b>	60 Hz–12 kHz, continuously variable
<b>Attenuation Range</b>	-80 or -20 dB
<b>Attack Time</b>	40 μs or 2 ms
<b>Hold and Release Time</b>	1 ms–4 sec., continuously variable. Hold represents 25% of release-time setting.

pared the two on some percussion tracks and could definitely hear a difference; the Auto setting often cut off transients, while the Fast setting did a much better job of preserving them. However, I didn't like the Fast setting on everything because it's so fast that, on some material, the compressor will occasionally slip into pumping or breathing. Use the Fast setting sparingly for best results.

Another interesting feature, the Side Chain Listen button, allows you to hear the unit's parametric bandpass filter without compression. This feature is invaluable because it takes the guesswork out of finding the frequency you want to compress—just use your ears, along with the frequency and width knobs, to dial it in.

The DPR-944's filters sound so good they could stand on their own. For example, you could leave the Side Chain Listen button depressed, ignore the compression controls, set the width to a narrow Q, and sweep the frequency knob for bandpass filter effects.

#### PARAMETRIC COMPRESSION

Parametric compression is one of the things that makes the DPR-944 worth its weight in gemstones. A parametric compressor enables you to select specific frequencies to compress, rather than compressing the entire signal. This gives you far more control over what's being processed; by compressing only certain frequencies, you're able to home in on individual instruments (or sounds) without affecting the overall dynamics of your source material. Controlling a frequency's gain in this fashion is often more desirable than simply cutting the frequency out with a parametric EQ, because it leaves the tonal quality of the original sound intact. Parametric compression is great for mastering (e.g., if the mix sounds great but the kick drum is too loud, you would isolate the kick frequency and compress only that portion of the audio spectrum). It also works wonderfully for controlling problem frequencies during tracking.

BSS Audio's parametric compressor uses subtractive compression, which removes only the user-selected frequencies, compresses them, and then adds them back to the original signal. This type of compression is more expensive

#### DPR-944 Specifications

<b>Inputs</b>	(4) XLR
<b>Outputs</b>	(4) XLR
<b>Key Inserts</b>	(2) ¼" TRS insert jacks
<b>Maximum Input Level</b>	+20 dBu
<b>Maximum Output Level</b>	+20 dBu
<b>Frequency Response</b>	20 Hz–20 kHz, ±0.25 dB
<b>Distortion (compressor)</b>	<0.005% THD, 20 Hz–20 kHz, +10 dBm output below threshold
<b>Distortion (gate)</b>	<0.04% THD, 20 Hz–20 kHz, 0 dBu input
<b>Noise</b>	-95 dBu (22 Hz–22 kHz)
<b>Crosstalk</b>	<-85 dB
<b>Power Requirements</b>	115V or 230V switchable
<b>Dimensions</b>	1U rack-mount x 7.48" (D)
<b>Weight</b>	6.6 lbs.



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FEATURES ■■■■

EASE OF USE ■■■■

AUDIO QUALITY ■■■■■

VALUE ■■■■

1 2 3 4 5

**PROS:** Gates and compressors are independent of one another. Tunable gates. Frequency-selectable compression. Key inputs. Nice-sounding filters. Great overall sound.

**CONS:** Inputs and outputs are XLR only. No power switch. Compressor's stereo link does not link all parameters. Gain knobs are not center detented.

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you have some imagination, the applications are numerous.

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The DPR-944 is an excellent-sounding unit. I felt that it had a distinctly British quality: a warm, round sound with just enough clarity to let it shine in the mix without being overly muddy or harsh. The parametric compression is suitable for mastering, mixing, and tracking applications; it is clean and transparent but without the artifacts (e.g., a dark or heavy sound quality) that are often associated with compressors costing under a grand. The gates are fast, and their tunability and keys make them superior to those of most models in this price range.

The 4-channel DPR-944 is a device that offers you greater flexibility than your average stereo compressor/gate and is well worth the bucks. It would be a welcome addition to any personal studio—or any live rig, for that matter. If you're in the market for gating and compression, and you need a unit that goes the extra distance in features and quality, check out the DPR-944. I think you'll be impressed.

*Erik Hawkins is a musician/producer in Los Angeles County and the San Francisco Bay Area. You can watch the birthing of his indie label at [www.muzicali.com](http://www.muzicali.com).*

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# TC WORKS

TC NATIVE ESSENTIALS (WIN)

## Tune up your audio with these three essential plug-ins.

By Dennis Miller

TC Works has released a set of three DirectX plug-ins that can enhance any audio project. The company's *TC Native Essentials* consists of a reverb, an equalizer, and a dynamics processor and is aimed at desktop musicians who need a quick and easy way to add high-quality processing to their audio.

TC Works' parent company, TC Electronic, is highly regarded for its state-of-the-art hardware effects units. *TC Native Essentials* clearly owes much to its ancestry: its processing quality is as good as any I've heard.

### IN YOUR FACE

Rather than cluttering up the interface with an overwhelming number of buttons and sliders, TC Works opts for a "lean and clean" look that makes using the plug-ins a pleasure. Each of the three effects offers its settings on a single screen, and even a beginning user

will quickly grasp the basic operating procedures. The simple layout is especially appealing when you're using lots of effects as channel inserts—for example, in a host program like Steinberg *Cubase*. No need to clutter up the screen when the real action is elsewhere!

Experienced users may be a bit disappointed by the lack of advanced options in the Reverb, which provides only Delay Time, Mix settings, and input and output levels. (The other two plug-ins offer numerous controls.) But the trade-off here is ease of use versus fine control, so advanced users will no doubt find TC Works' "dedicated" plug-ins—*TC Native Reverb*, for example—more to their liking.

By giving the user several ways to perform basic tasks, *TC Native Essentials* allows you to work in the way that is most comfortable for you. For example, you can set a value in the EQ by using a slider, typing directly into a field, or moving an onscreen joystick. All of the effects have a level display that includes faders to adjust input and output levels. Peak hold meters can be disabled, which can improve performance by a small percentage. This ability can be especially useful if you've got numerous plug-ins running at once.

Although moving a fader slowly or at normal speed produces a very smooth response, I detected a slight lag in the plug-in's response to very rapid fader movements, even with the meters off. This sluggishness is probably due to the

buffering scheme used by the host application (in my case, Sonic Foundry *Sound Forge* running on a Pentium II/400), but I wasn't able to get rid of the lag completely, even by tweaking the options that *Sound Forge* provides. Depending on your own setup, you may or may not experience any latency using other host programs—just be sure to follow all the manufacturer's suggestions about tweaking your system.

### READ ALL ABOUT IT

The printed manual that comes with the software is pretty slim, but it covers all the basic operations. There are some good introductory notes on the various settings that each plug-in offers, but don't expect a lot of hand-holding to help you get started. The final section provides good general information about the three types of effects.

TC Works' online help is mostly a duplicate of the printed manual, and in at least one case it's even less thorough. The EQ help, for example, doesn't cover the frequency control options that are available with the joystick. Fortunately, this is not a big problem because the program's controls are so intuitive, and most controls display their function when you right-click on them.

*TC Native Essentials* uses a copy-protection scheme that, according to the manual, shouldn't create problems "if you set it up properly." I understand that TC Works needs to protect its investment, and I was relieved that the program didn't ask me to insert the CD in the drive again and again. (I had no trouble getting it to run at any time during the review period.) Copy protection seems to be necessary because piracy is rampant on the Web these days, so I guess this is the way to go.

### EQ

The EQ plug-in offers frequency, bandwidth, and gain settings for up to three bands of EQ (see Fig. 1). Any one of four filters—low shelf, parametric, notch, and high shelf—can be selected independently for each band. Frequency is adjustable from 20 Hz to 20 kHz, and you can make very precise settings by using mouse-button shortcuts as you move the Frequency slider. Bandwidth is adjustable from 3 to 12 dB/octave but only in 3 dB increments. Gain settings range from -18 to +18 dB with a resolution of 0.5 dB across the entire range.

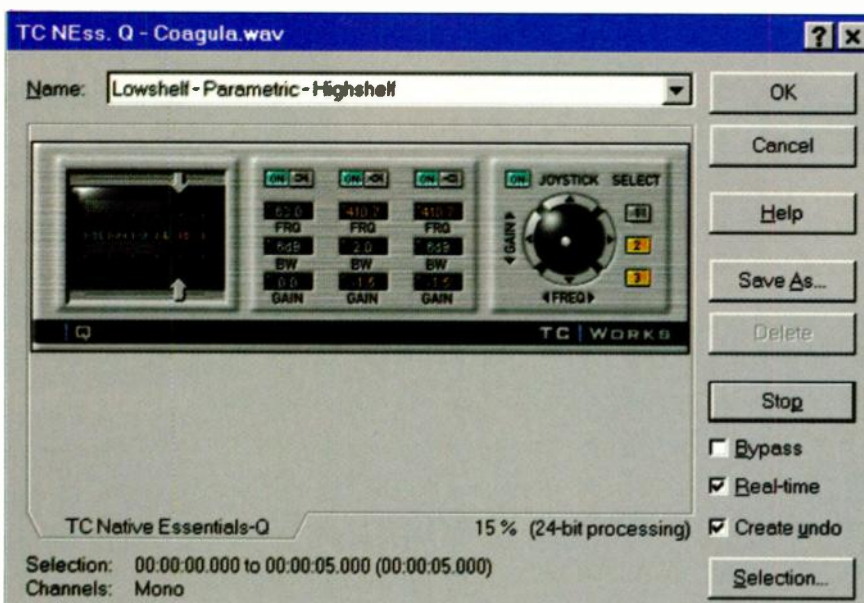


FIG. 1: *TC Native Essentials* offers up to three bands of EQ that can employ any of four filters. Numerous controls are available to fine-tune the EQ settings.



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Only five presets are provided for the EQ (the Reverb and the Dynamics Processor offer more than a dozen each), but that's not surprising since equalization settings tend to change dramatically depending on what type of material you're working with. Fortunately, it's very easy to make your own presets and reuse them as needed.

The coolest thing about the EQ (besides the sound, of course) is the joystick. This controller maps gain values to up and down joystick movements, and frequency to the left and right. You can enable the joystick to manipulate all or any combination of bands and easily toggle between Absolute and Relative control. Absolute will reset all of your settings when you enable the joystick, and then it adjusts the parameters in tandem, according to its position. I found the Relative option to be more useful, as it retains any existing values and simply sweeps the values up or down as you move the joystick around.

### REVERB

The Reverb plug-in is, without a doubt, my favorite of the three. Start playback of your audio file, and then press the ROM tab. Next, use the dial to call up a reverb algorithm. The effect kicks in without the slightest pause, even while audio is playing. (I don't get that kind

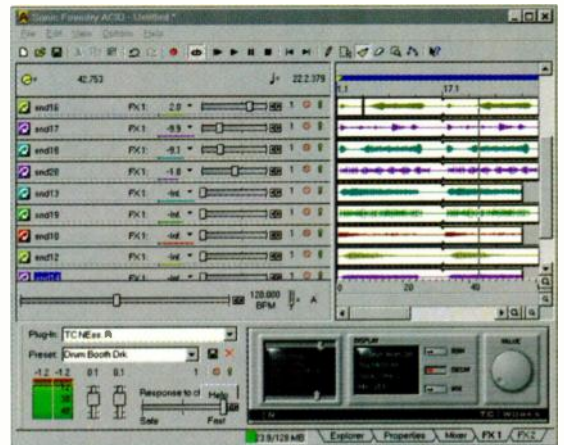


FIG. 2: The *Native Essentials* plug-ins run very efficiently. On a Pentium II/400 system running Sonic Foundry's *Acid*, 20 tracks could be simultaneously processed with the Reverb effect.

of response from my outboard hardware effects processor!) The presets cover a wide variety of room types, and the simulations could not be more realistic. Drums sound sharp and crisp in the Drum Booths, and the long reverbs are smooth and silky without a hint of coloration. Outstanding. What more can I say?

### DYNAMICS

I don't often use a compressor in my music, but I knew upon first hearing this plug-in that it would be useful in many situations. The four variable settings—Attack, Release, Threshold, and Ratio—give you more than enough control to design the exact effect you want, and the soft-knee option allows you to apply a gradual reduction to your audio level.

An Automatic Make-Up Gain setting kicks in after the compressor section to boost your signal; this is an effect you will normally want. It ensures that your audio signal is normalized to an optimal level, regardless of how much compressing you do. It would be nice to have the option of disabling this boost or perhaps have a variable control such as the ones found on most hardware compressors. But you can probably find a way to lower the output in almost any host program.

The program's SoftSat function adds warmth to your sound, and it can help avoid digital clipping when you push the plug-in too hard. You do have the option of disabling this effect in the Dynamics Processor section, although SoftSat is always enabled in the equalizer.

### TC WORKS

TC Native Essentials DSP plug-ins  
\$249

FEATURES ■■■■

EASE OF USE ■■■■

AUDIO QUALITY ■■■■

VALUE ■■■■

1 2 3 4 5

**PROS:** Exceptionally high-quality effects. Simple to operate. Smooth fader response. Efficient processing.

**CONS:** Limited reverb parameter settings.

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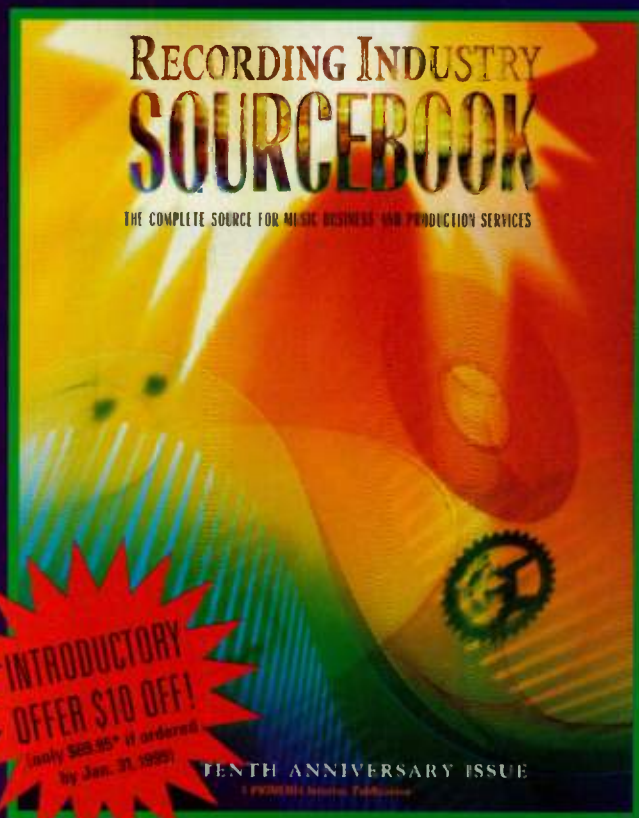
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**TC Native Essentials**  
**Minimum System Requirements**  
 Pentium 133; 32 MB RAM; Windows  
 95/98/NT; DirectX host application

I tested the compressor on a track that had a smokin' slap-bass part. I was able to raise the part's level well up in the mix without overdriving the transients—just what you'd expect from a competent compressor. I was also

impressed with the effect's low demands on my PC: the "CPU %" indicator in *Sound Forge* bounced around between 3 and 4 percent. There's no question that you could throw one of these compressors on more than a few tracks without straining the system (see below).

#### COMMAND PERFORMANCE

*TC Native Essentials* delivers its power in a very efficient manner. Using *Cakewalk Pro Audio 7* as my host application, I was easily able to apply compression

on 18 tracks of 16-bit, 44.1 kHz mono digital audio files, along with 12 tracks of EQ and a single reverb on the master section. (*Cakewalk* can't use the Reverb as a track insert, though it can be used on an aux bus or as a master effect. You can also process audio "offline" in the Audio view.) Admittedly, the Pentium II/400 is a very powerful system, but those benchmarks weren't even the maximum; I simply stopped counting.

Running Sonic Foundry's *Acid*, I had no trouble loading 20 tracks of looping samples and sending all 20 through the Reverb plug-in (see Fig. 2). *Acid* offers only two global effects, so I couldn't tweak the settings for each individual track. But even when I changed presets while the loops were playing, there was

▼

**It's very easy  
 to make your  
 own presets and  
 reuse them  
 as needed.**

no glitching of any kind. I did detect the same short lag as before, however, when making rapid throws of the input or output level faders.

#### END OF FILE

Although you won't find an abundance of settings to tweak in the Reverb plug-in, *TC Native Essentials* will deliver great sound with minimal effort on your part. The plug-ins are extremely efficient and of exceptionally high quality, which is not surprising, given the reputation of their manufacturer.

At \$249, *TC Native Essentials* is a great value, especially when you consider that you are not likely to find a hardware effects unit with this quality for anywhere near that price.

If you're still unsure whether these plug-ins are for you, I suggest you cruise on over to TC Works' Web site and give the Reverb demo a try. It's definitely one of the finer things in life.

*Associate Editor Dennis Miller lives in the suburbs of Boston. He's processed just about everything in sight and is on the lookout for new raw material.*



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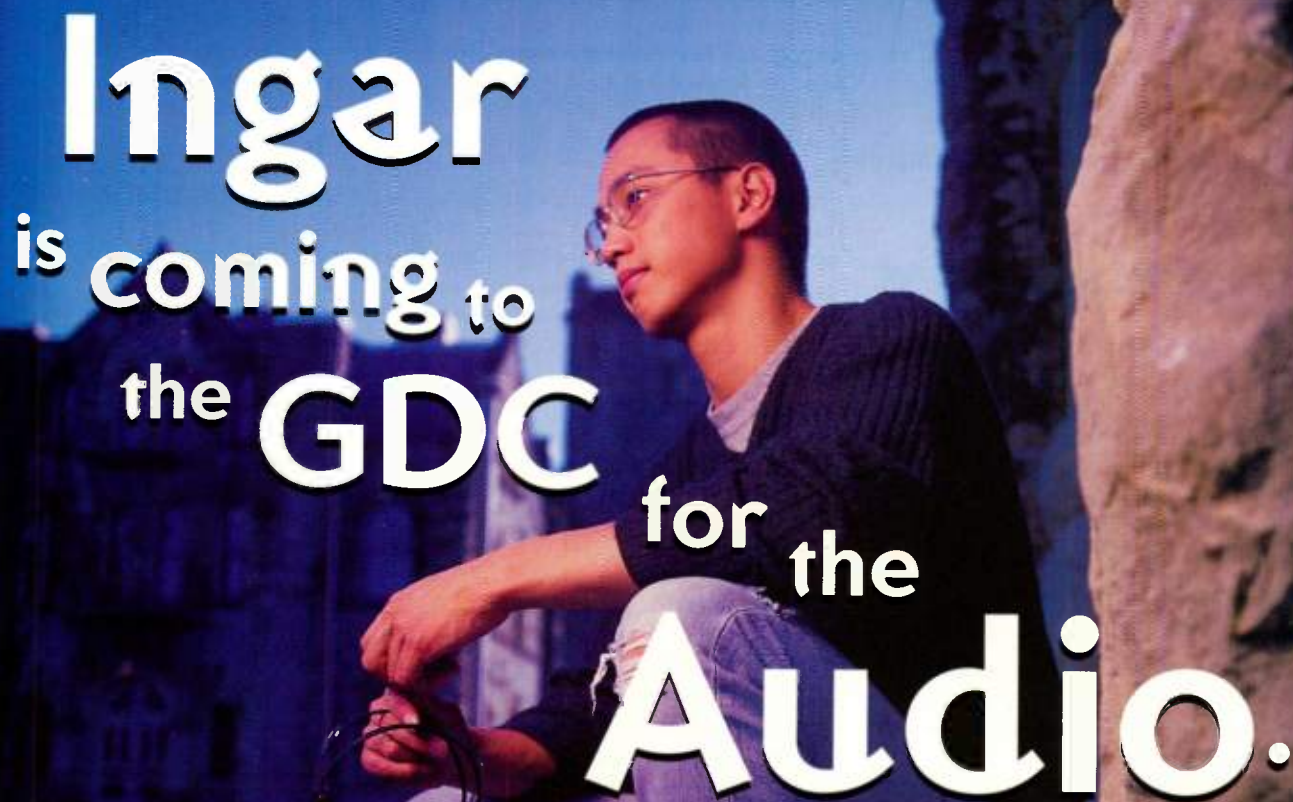
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*An affordable tube preamp with useful extras.*

By Myles Boisen

Global warming has hit the audio industry in a big way, with manufacturers falling over each other in the rush to get hot new tube gear into the shivering fingers of the "Big (digital) Chill" generation. Now, even dbx—a company that has achieved legendary status with its solid-state compressors—has been tinkering with tubes.

The first contender in dbx's new Silver Series is the 586 dual-vacuum tube preamplifier, a 2-channel mic preamp that is suited for minimal-path recording directly to tape or hard disk. The unit offers a variety of EQ, tube-gain, and peak-limiting options that you can use while recording and then access again during mixdown, thereby doubling its effectiveness and value. (An optional add-on digital output module, the dbx Type IV conversion system, was not installed on the review model, so I couldn't evaluate it.)

**BODY DOUBLE**

While that lovely little tube is heating up, let me take you around the exterior of the 586. The unit's styling, dubbed "progressively retro," melds a sort of Studebaker sensibility with the high-tech gleam of lab equipment. U-shaped bumpers next to the ears—a thoughtful touch borrowed from the military—make carrying and installing the 586 a

snap and protect the control surface from flying elbows and accidental jostling. The left- and right-channel controls are identical and are segregated on either side of the front panel, with a narrow strip in between for the digital-output switches.

A rectangular VU meter and 1950s automobile-grille vent slots are the unit's most prominent panel dressings, instantly establishing an aura of vintage credibility. The controls—clunky plastic faux-aluminum knobs and frosted on/off buttons that light up in red, green, and amber—are laid out logically and should ease the first-time user toward rapid comprehension of the 586's varied functions. All inputs and outputs and in/out level switches are located on the back panel, along with an IEC power-cord connector, a power switch, and a fuse cover. The thorough and informative manual—which includes complete diagrams, specs, and recording tips—addresses any lingering setup questions you might have.

The mic preamp has switches for 48V phantom power, 20 dB pad, phase invert, and low cut—which engages a 75 Hz highpass filter. Drive (+10 to +60 dB range) and level (-15 to +15 dB) knobs govern the tube gain level and output levels, respectively. A noiseless line switch routes the line inputs (available on either XLR or 1/4-inch connectors, with a dedicated line/instrument level switch) to the gain stages, with a 0 dB line-level calibration point provided on the drive pot. Curiously, the phase inverter cannot be selected for line-level processing, but the low-cut filter can be engaged in this mode.

A smooth-sounding PeakPlus limiter is located in the circuit after the output-level control. The limiter is adjusted by a single threshold knob and has program-dependent attack/release and

a preset, ∞-to-1 compression ratio. A red LED indicates when limiting is taking place; a second peak LED, located next to the VU meter, alerts you when internal signal levels are within 3 dB of clipping. Beneath the VU meter are three meter-source switches that permit VU monitoring of either the drive (input), insert, or output level.

**CAN-DO EQ**

The 586's 3-band equalization section is straightforward. The low- and high-shelving controls offer 15 dB of cut or boost at 80 Hz and 12 kHz, respectively. The semi-parametric midrange band offers 15 dB of cut or boost, and its center frequency is continuously sweepable between 100 Hz and 8 kHz. The midrange bandwidth is set wide (1.5 octaves) for subtle frequency shaping; for more surgical adjustments, the Narrow button toggles to a slender 0.5-octave bandwidth.

The EQ section can be bypassed (with a hard-wired switch), making it handy for both equipment reviewers and sound tweekers. I also appreciated the 586's innovative Insert switch, which lets you bypass or A/B external gear connected to the 1/4-inch TRS send/receive jacks, without having to pull patch-bay cables.

The insert loop is available for both mic and line-level inputs. Unfortunately, the 586 has neither a level adjustment for routing the insert to -10 dBV equipment nor a -10 dBV level switch for the line in. The line outputs are, however, equipped with a +4 dBu/-10 dBV switch for optimal level matching to any recorder or mixing board.

That tube is probably glowing by now, so let's take a look under the hood and take this baby for a test-drive.

**VALVE JOB**

At the heart of the 586 is a 12AU7 tube (parallel-triode configuration) in each



The dbx 586 dual-channel preamp is a hybrid tube/solid-state unit with several useful features. It provides a low-cut filter and 20 dB pad, 3-band EQ with sweepable mids and switchable Q (wide/narrow), and dbx's proprietary PeakPlus limiting. The switches in the center of the unit control an optional digital-output module.

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The rear panel of the dbx 586 provides mic and line/instrument inputs, as well as separate 1/4-inch insert send/return jacks on each channel. Line inputs and outputs offer a choice of XLR or 1/2-inch jacks, plus level-matching switches.

channel, contributing a single gain stage in the hybrid tube/solid-state circuit. Although the manual says that "if your 586 ever has a meltdown...repair is as close as your guitar amp head," some sleuthing on my part confirmed that neither of my tube amps (Fender and Magnatone) uses the 12AU7. (Guitar amps more commonly use 12AX7 and 12AT7 high-gain tubes.)

I consulted tube expert Lawrence Fellows-Mannion of Rance Electronics in Oakland, California, who told me that the 12AU7, often used in line-level equipment because of its lower-gain characteristics, gives only minimal tube coloration when high-plate voltage is applied. He felt that its inclusion in the 586's predominantly solid-state circuitry would probably provide only a marginal amount of tube coloration, at least as compared with an all-tube-based mic preamp using high-gain tubes. The listening tests I conducted at my studio bore out this prediction.

## LISTEN UP

Compared with the stock solid-state preamps in my studio console, the 586 yielded noticeably more warmth and less noise. But up against classier, dedicated preamps, the 586's preamp section didn't do nearly as well. For example, when compared with a similarly priced, all-tube-based mic preamp on full-frequency program material (using a matched pair of Neumann U-87s in standard loudspeaker test conditions), the 586 attenuated the extreme low and high frequencies, conveyed less detail and room ambience, and sounded lifeless and deficient in tube character.

When pressed into service as a tube DI box for guitar and bass (instrument-level line input, EQ bypassed), the 586 brought out clear upper mids but often sounded metallic and lacked both low-end "oomph" and rich tube coloration. Although the unit is basically quiet, noise became a distraction when I

added any mid or high EQ to the signal.

A head-to-head comparison with professional-quality, solid-state preamps confirmed the 586's personality as bright and metallic around 2 to 4 kHz, with some desirable warmth and punch around 200 Hz. But it definitely lacks the high- and low-end accuracy of more upscale preamps.

## UPS AND DOWNS

My favorite part of the 586 is the EQ section. It's dramatic and musical sounding, especially for remedial treatment of bass and low to midrange frequencies. Unlike with the EQ on some high-end units, it's easy to hear what a little twist of the knob does here. The low-shelving control is particularly robust, with the power to effortlessly carve out the entire bottom end of a track or kick chest-pounding bass into a sterile MDM mix.

Another fun feature is the 586's dual gain controls, which almost beg to be

overdriven for thick, tube-distortion tones. This effect added more "mush" than I usually like but would be useful for vintage/alternative production techniques, as well as for hot compression when followed by the PeakPlus limiter.

I did, however, encounter some problems with the 586. The first review unit I received, for example, had obvious distortion problems in one channel and therefore should not have passed the "rigorous set of performance tests and 24-hour burn-in period" promised in the manual. The second unit I received performed fine.

Other gripes include input/output-level switches that are too small to see and are nearly flush with the rear panel when pressed in; front-panel knobs that don't always center on zero or line up exactly with calibration marks, making it impossible to repeat or match settings for both channels; and stepped gain controls so imprecise that, in the vicinity of unity gain, one click can produce anywhere from a 1 to 5 dB change, as confirmed by the built-in VU meters and external LED-level monitoring. I have reservations about using this box for audiophile-class stereo recording, for stereo mix-bus processing, or in a mixed +4/-10 dB environment.

## FINAL MARKS

The dbx 586 is a versatile mic preamp that comes with some useful extras,

## dbx 586 Specifications

<b>Main Inputs</b>	(2) balanced XLR mic, (2) balanced XLR line, (2) 1/4" unbalanced line
<b>Main Outputs</b>	(2) balanced XLR, (2) 1/4" unbalanced
<b>Other Connections</b>	(2) 1/4" insert send/receive jacks; IEC power-cord receptacle
<b>Maximum Input Level</b>	> +13 dBu
<b>Frequency Response</b>	10 Hz–200 kHz ±3 dB
<b>EIN</b>	-128 dBu unweighted (20 Hz–20 kHz)
<b>THD + Noise</b>	0.04% typical @ 0 dBu out, 1 kHz, 35 dB gain
<b>Interchannel Crosstalk</b>	-88 dB (20 Hz–20 kHz)
<b>Pad</b>	20 dB
<b>Low and High EQ</b>	80 Hz and 12 kHz shelving filters
<b>Mid EQ</b>	sweepable 100 Hz–8 kHz
<b>Mid EQ Bandwidth (Q)</b>	switchable 1.5 oct./0.5 oct.
<b>EQ Cut/Boost</b>	±15 dB
<b>Low Cut</b>	75 Hz, 12 dB/oct.
<b>Limiter Threshold Range</b>	0 dBu to +22 dBu (off)
<b>Dimensions</b>	2U x 8" (D)
<b>Weight</b>	12 lbs.



## DBX

586 dual-channel mic preamp  
\$999.95

FEATURES ■■■■

EASE OF USE ■■■■

AUDIO QUALITY ■■■■

VALUE ■■■■

1 2 3 4 5

**PROS:** Dual gain stages provide tube distortion and vintage/alternative sounds. Dramatic EQ and smooth-sounding limiter. Insert sends/returns on each channel, with insert bypass switch. Choice of XLR or 1/4-inch connectors on line ins and line outs. Switchable VU meters with peak LED. Thorough and informative manual.

**CONS:** Mic preamp lacks detail, attenuates extreme low and high frequencies, and sounds deficient in tube character. No level adjustment for routing insert to -10 dBV equipment. No -10 dBV level switch for line input. Back-panel switches are difficult to see and operate. Front-panel knobs are imprecise, misaligned, and difficult to calibrate for stereo use.

CIRCLE #442 ON READER SERVICE CARD

including equalization and peak limiting. The EQ section is dramatic and musical sounding, and the PeakPlus limiter works smoothly. I am much less fond of the preamp, which lacks detail, sounds bright and somewhat metallic, and doesn't provide the high- and low-end accuracy that I expect from a dbx product.

With its hybrid tube/solid-state circuitry and low-gain tube, the 586 lacks what most people would consider a classic tube sound. However, it's easy to see the appeal of this multifaceted module for the budding computer or MDM recordist, who can get an introduction to the realm of outboard preamps along with an affordable taste of tube tone.

*Myles Boisen is a guitarist, producer, composer, teacher, and head engineer/instructor at Guerrilla Recording and the Headless Buddha Mastering Lab in Oakland, California. Thanks to Bart Thurber at House of Faith and Lawrence Fellows-Mannion at Rance Electronics.*

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# M I C R O M A T

## SOUNDMAKER 1.0.3 (MAC)

*There's a new kid in town  
with plenty of cool toys.*

By David M. Rubin

**B**ecause the Macintosh has always come with built-in sound, it has always had a retinue of handy editing utilities that could tap into its audio capability. In recent years, however, new stereo editing programs for the Mac have not exactly been popping up like mushrooms. So it's always good news when another member joins this rarefied group.

MicroMat's *SoundMaker* is the creation of Alberto Ricci. The program does an admirable job of combining the past and present, offering an assortment of modern features along with good old-fashioned ease of use in a RAM-based stereo audio editor. With *SoundMaker* you can import, view, edit, and mix multiple audio files and save the results as a single mono or stereo file. The number of tracks that you can handle at once depends on the speed of your CPU; the length of the files that you can record or import depends on how much RAM you assign to the program. While *SoundMaker* would not be a logical choice for mastering your next CD (unless you have lots of RAM), it is well suited to working with dialog,

soundtracks, multimedia music clips, and sound effects.

In spite of its modest price (\$150, and available at this writing for an introductory price of \$49.95), *SoundMaker* boasts several appealing features, including unlimited undo capability, drag-and-drop editing, and an Effects menu packed with DSP plug-ins that are ready to go at the click of a mouse. On the other hand, the program lacks support for SMPTE time code, it has no synchronizable playlist capability, it doesn't allow single-sample editing, and it doesn't support standard third-party Mac plug-ins. Those shortcomings and a few others keep *SoundMaker* from joining the ranks of the true high-end professionals. Nevertheless, this unassuming program, which installs from a couple of floppy disks, has many surprises to offer.

### MAKE YOURSELF AT HOME

*SoundMaker's* simple user interface is thoughtfully laid out and presents a friendly, accessible environment. The large main window includes a central area for waveform displays; above the waveforms, nine information fields provide data such as the sampling rate, resolution, number of channels, file size, and selection length (see Fig. 1).

To the left of each waveform, a set of channel buttons routes the output of the adjoining waveform to both channels or to the left, right, or neither channel. On the right side of the window, small Waveform icons can be dragged up or down to change the order of the waveforms within the window. The

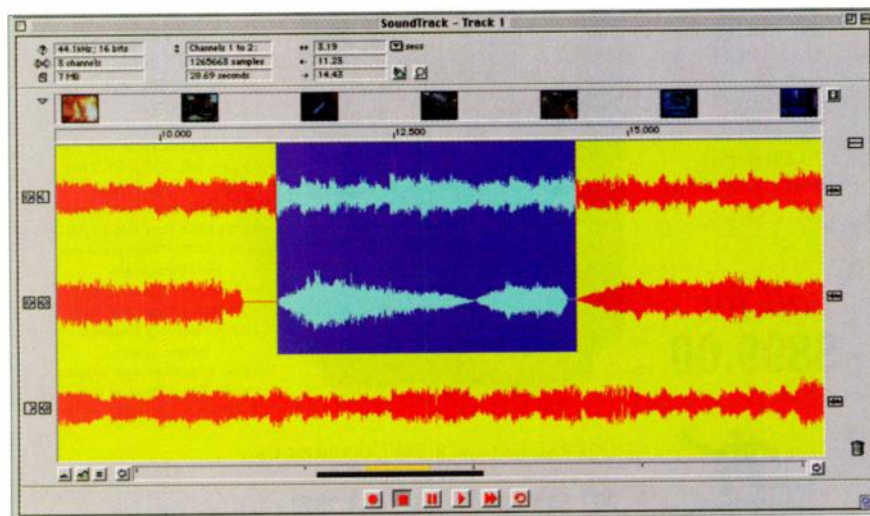
transport controls are attached unobtrusively to the bottom of the main window, where they are always handy. I much prefer this type of arrangement to the floating palettes that many audio editing programs use—they always seem to be in the wrong place at the wrong time.

A set of tools located just above the transport controls lets you find your way easily through the waveform. Two arrows serve as typical scrollbar buttons, allowing you to scan left and right through the display. The area between the arrows represents the entire file length. In the lower half, a black bar represents the visible part of the waveform; in the upper half, a yellow bar represents the selected region. Although scrolling with the left and right arrows works fine, I prefer grabbing the black bar and dragging it directly. Scrolling in this way is so fast and smooth—the waveform display responds in real time as you drag the bar—that it's easy to locate any part of a file, especially if you're looking for a selection that is offscreen. While the miniature waveform displays found in some programs might give a better overview, *SoundMaker's* system works remarkably well.

To the left of the scroll bar, three buttons enable you to zoom in, zoom out, or fit a selection to the window. The Zoom In and Zoom Out buttons advance through eight steps, but if you click and hold either button the program quickly zooms through several levels. Unfortunately, you can't zoom in far enough to clearly view individual cycles when working with high frequencies—a few additional zoom levels would definitely help. Furthermore, the program offers no pencil tool for fixing spikes or other anomalies, so if you like to edit waveforms at the subatomic level, you're out of luck. (You may be able to work around some of these limitations with the DSP effects, though.)

A more surprising omission is the program's lack of a horizontal line to indicate the zero position in the waveform. *SoundMaker* displays a dotted line leading into and out of but not within the waveform. When you're zoomed in and trying to make selections at zero crossings, the lack of a zero line poses a real problem. Moreover, the program provides no amplitude markings, so you have to guess how close to clipping

(continued on p. 166)



**FIG. 1:** In *SoundMaker's* main display, you can view and edit multiple audio files. Individual movie frames appear above the waveforms when you edit QuickTime soundtracks.

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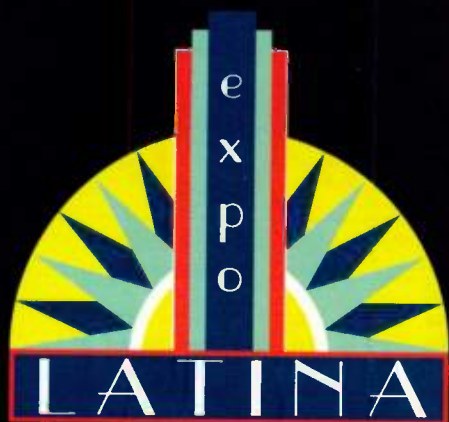
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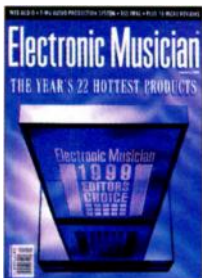
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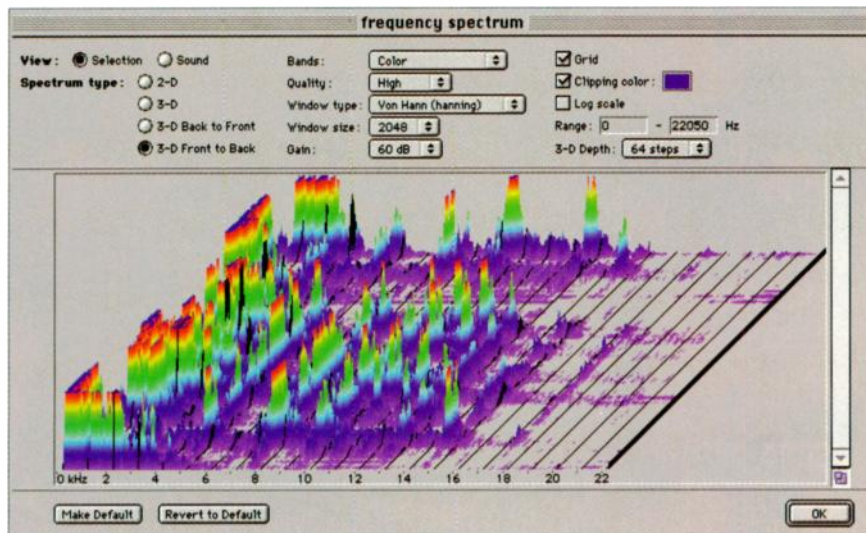
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**FIG. 2:** *SoundMaker's* Spectrum display provides a colorful 3-D view of selected regions. Several drop-down menus allow you to customize the display.

(continued from p. 160)

level your highest peaks are. These omissions add a vagueness to many of the program's editing operations.

As if to compensate for some of its display-related shortcomings, *SoundMaker* includes an excellent spectrum-analysis display that rivals those found in some more-expensive programs. The Spectrum window can display sound in several formats, including 2-D, which shows frequency strengths in different colors (time along the x-axis, amplitude along the y-axis), or 3-D, which shows different frequency strengths as peaks of different color and height (see Fig. 2). I especially like the versatile 3-D FFT display. You can change its colors, add a special color to indicate clipping, change resolution of the FFT-transform process, increase the peaks with a Gain function, add or remove grid markings, and view the display in Front-to-Back or Back-to-Front mode. A Range setting even allows you to specify a range of frequencies to examine, so you can focus on a particular part of the spectrum in greater detail.

### PICKIN' UP SOUND

*SoundMaker* is quite versatile when it comes to recording and importing audio files. The recording process is simple without being simplistic. A floating palette supplies a gain control and a set of peak-hold VU meters with clipping indicators. When you click the Record button in the transport controls, a Record dialog box opens, offering an assortment of additional

controls and recording options (see Fig. 3). The dialog box has its own set of transport controls, and beneath the buttons a small waveform display scrolls along in real time to show the incoming audio levels. The waveform changes from green to red as soon as you enter Record mode. A Synchro Play and Record option allows you to record new material while listening to previously recorded tracks (if your CPU supports it).

*SoundMaker* also offers voice-activated (VOX) recording, which allows you to trigger recording when a user-defined threshold level is reached. The VOX Stop function lets you end recording when a minimum threshold (combined with a delay setting) is crossed. With the Pause Instead of Stopping option, new to this version, you can enter and exit recording mode automatically, based on the input level. I found that the VOX feature worked well, although it took some experimenting to set the Trigger Value sliders appropriately. Unfortunately, the documentation offers little help in this area.

If your work mainly involves importing and editing prerecorded audio, you'll appreciate *SoundMaker's* cosmopolitan approach to handling sound files. The program can open and save many types of file formats, including AIFF, AIFF-C, Mac System 7, WAV,  $\mu$ Law, SoundEdit, SoundEdit Pro, SoundEdit 16, and Sound Designer II (with support for regions).

QuickTime is also fully supported; in fact, you can import a QuickTime movie into *SoundMaker* and view the

movie's individual frames as thumbnails above the waveform display in the main window (see Fig. 1). *SoundMaker's* separate QuickTime editing window shows all the tracks in a QuickTime movie (along with size and relevant data) and enables you to adjust each track's volume, pan position, and offset. The controls are slick, easy to use, and intuitive. For more advanced editing, you simply select a track and open it in the main window as a waveform display.

Because *SoundMaker* provides full support for QuickTime, it also supports all the codecs that QuickTime and the Mac OS support, including MACE 3:1 and 6:1, IMA 4:1,  $\mu$ Law 2:1, MPEG, QDesign Music, and Qualcomm PureVoice. (You'll need Sound Manager 3.2 or higher for some of these.) Furthermore, *SoundMaker* can import a QuickTime MIDI track and convert it to an AIFF file (using QuickTime Musical Instruments). Be careful, though: a one-minute MIDI file will balloon into a 10 MB audio file when converted.

You also need to be careful about clipping. As I discovered, MIDI files with lots of high-Velocity notes may produce clipping when converted to AIFF tracks, and *SoundMaker* provides no gain control to adjust levels during conversion. You can avoid the problem by scaling down the MIDI file's Velocity values before converting it. Finding the proper setting, however, takes some trial and error.

In addition to its other audio-import capabilities, *SoundMaker* converts CD audio tracks (or parts of tracks) into its own format for processing and editing in the main waveform display. The Audio CD Import dialog box lets you downsample and lower the resolution of the file when converting. You can also convert to mono and specify a start and stop time within the track to capture.

### EDIT AWAY

Aside from the usual Cut, Copy, Paste, and Crop commands, *SoundMaker* provides several less-common but highly useful editing tools. The Select Peak command, for example, locates the sample with the highest amplitude in a selected area. In a similar way, the Find Clipped Samples command locates all the clipped samples in a recording or selection and then creates a list of places where clipping occurs. The list appears in *SoundMaker's* handy Chunk List window.



**SoundMaker 1.0.3****Minimum System Requirements**

Mac or Power Mac; 5 MB of available RAM; OS 7.0

The Chunk List window is similar to a playlist; it lets you create a list of selected regions within a sound file. Each region appears as an entry in the list, and you can view and play any region simply by clicking on it. Adding entries to the Chunk List is a breeze: select a region and click the Set Chunk button in the main window, or you can drag the selection straight into the Chunk List window. Either way, the new entry appears with its start and end times, length, number of channels, and name (if you choose to add one). A Play button lets you hear the current selection.

You can use the Chunk List window to keep track of important parts of a sound file and organize sections of music or dialog. The window also makes it easy to return later to selected areas that need further editing. Unfortunately, you can't play the Chunk List's entries in sequence, jukebox style, so you can't use it to try out different arrangements of a song or piece of dialog. You can select several entries at once, but all the regions play simultaneously when you click the Play button. The lack of automatic sequential playback capability keeps the Chunk List from being a true playlist. Also, *SoundMaker's* lack of support for SMPTE means that you can't use the Chunk List for triggering sound effects in sync with incoming time code, and that limits its usefulness for post-production work.

On the other hand, *SoundMaker's* excellent drag-and-drop capabilities make it slicing, dicing, and deconstructing audio files an intuitive process. Dragging a selection into the Chunk List window is one example, but you can also drag a selection onto the Mac's Desktop or into a Finder window, where the selection is transformed into a "sound clipping" with its own icon. Double-clicking the icon plays the sound.

If you drag a selection into the Trash, that part of the waveform is removed from the sound file. The selected region resides inside the Trash

as a sound clipping that you can drag back out later if you change your mind. (Realigning the clip at its original location, however, is another matter.)

The drag-and-drop feature is most effective when used within a sound file. You can drag a selection from one channel to another or from one part of the waveform to another. If you hold down the Option key, a copy of the selection is dragged. You can also drag selections from one sound file to another. If the receiving file has fewer channels than the dragged file, *Sound-*

*Maker* will automatically add the necessary channels. When the two sounds have different sampling rates or resolutions, a dialog box appears asking whether you would like to resample or change the resolution of the dragged file to match the other file. *SoundMaker* can import files with a wide variety of resolutions and sampling rates, but all files and parts thereof must conform to the same resolution and sampling rate to exist within a single document (and to play back together).

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## SOUNDMAKER

For mixing multiple waveforms into a single mono or stereo file, *SoundMaker* provides a separate Mixer window (see Fig. 4). The Mixer window displays the same waveforms in the same order as the main editing window, but in the Mixer each waveform has its own Pan and Volume slider, along with a Solo and Mute button. On the far right of the window, a Master Gain control allows you to set the overall volume. At the bottom of the window, a Normalize Volumes button normalizes all the tracks (taken as a whole) while maintaining their relative volumes.

### EFFECTS TO BEAT THE BAND

Although *SoundMaker* supports only its proprietary plug-in format, the program comes packed with effects plugins, and you can combine and save effects to create custom ones that further expand your options (more on this later). A few outside developers are also creating new proprietary effects for *SoundMaker*, such as the excellent *SoundMagic FX* set by Mike Norris (available for \$15 from [www.kagi.com/mnorris/soundmagic/default.html](http://www.kagi.com/mnorris/soundmagic/default.html)). Another set, called *SoundFront FX/SM*, focuses on spectral modifications (available from Alex Yermakov for \$10 at [members.tripod.com/~alex\\_yermakov](http://members.tripod.com/~alex_yermakov)). MicroMat plans to release additional effects of its own in the future. Even so, *SoundMaker* provides plenty to keep you busy right now.

The Effects menu lists more than six dozen entries ranging from the exotic to the mundane. Several commands are not what you would normally consider to be effects. Amplify, for instance, just increases the amplitude of a selection; Resample Rate changes the sampling rate; Statistics gives a detailed report on a selection's length and amplitude; and the oddly named Downsample Bits simply changes the resolution. A Keyboard "effect" allows you to play a selection at different pitches by clicking the keys of an onscreen keyboard, and Zero Crosser adjusts the boundaries of a selection so they land on zero crossing points to minimize clicks when cutting and pasting.

The Effects menu also has some redundancies, but that's not necessarily a bad thing. For example, the Fade In and Fade Out commands are overly simple, with only a single parameter—time—for you to set. I prefer working with the more flexible Envelope com-

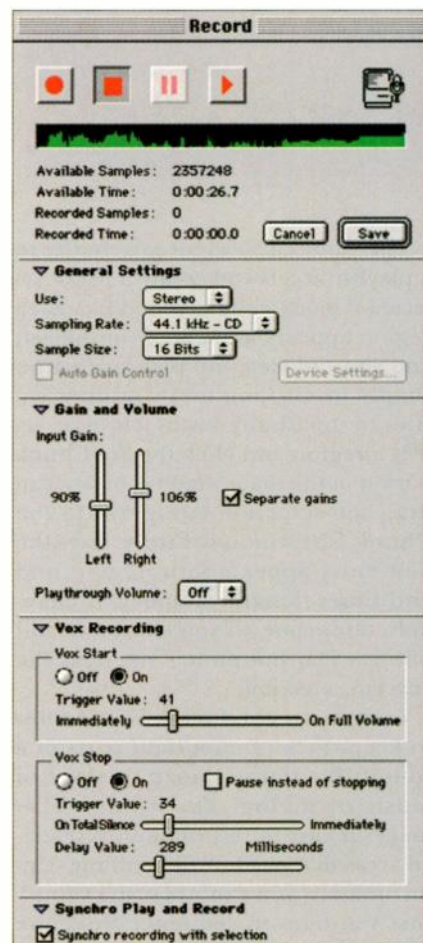


FIG. 3: The Record dialog box includes its own set of transport controls and a small waveform display that scrolls along in real time to show incoming audio.

mand, which superimposes an envelope graph over the selected region. It provides as many grab handles as you need, letting you create complex amplitude envelopes of any shape and length. Several presets are provided for typical linear and nonlinear fades.

Another example of *SoundMaker*'s useful redundancy involves its panning functions. At the most basic level, the program provides a simple Balance control with a single slider to adjust the stereo image. But you can also use the Auto Pan effect to move sounds in a regular pattern as they play. The Auto Pan dialog box allows you to specify whether the sound moves from one side to the other or back and forth. You can also choose a linear path (a straight line), a sinusoidal path (a more circular effect), or a square mode path (flipping back and forth). Other settings let you specify how quickly the movements take place.

For the greatest level of control, however, I prefer the Custom Pan effect, which allows you to create a panning "envelope" over the waveform, with as many grab handles as needed to shape the panning curve. As with the Envelope effect, several presets are provided to get you started.

*SoundMaker's* panning capabilities should be more than adequate for most people, but the program doesn't stop there. It also provides a Localizer effect, which uses Head-Related Transfer algorithms to create the illusion that a selected sound is coming from a particular point in space. The Localizer enables you to specify an elevation and an azimuth angle for a sound. As you adjust the sliders, a graphical display shows the position of the sound relative to the listener's head; in theory, you can position a sound's elevation from below the chin to directly above the head. The Azimuth control positions the sound horizontally in a circle surrounding the listener. Although the inclusion of the Localizer effect is admirable, it doesn't live up to its promise. The Azimuth control does give some sense of placement around the listener, but the effect is hardly overwhelming (beyond what you'd expect from a typical pan control).

The Elevation control is even subtler; I was unable to create a clear sense

### MICROMAT

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# ROCKTRON

## PC PREAMP

### An inexpensive guitar preamp for PC-based recording.

By Jim Miller

Rocktron's new PC Preamp is an inexpensive guitar/mic preamp designed to interface directly with your computer. At first glance, it's apparent that this unit is designed for the entry-level musician rather than the working studio pro; even the packaging supports this impression.

According to Rocktron, the original design concept behind the PC Preamp was to give college students a practical way of laying down guitar tracks in their dorm rooms. In other words, if you're looking for a mastering-quality preamp, this isn't it. But it's no lo-fi loser, either. If you're just getting started in computer-based recording, read on.

#### JUST THE FACTS

The PC Preamp's all-metal casing is solid and is designed to either rest under a computer monitor or attach to the side of a computer tower with the provided Velcro-brand strips. Rocktron calls this device a PC Preamp because it is intended to be used with a personal computer. This name is somewhat misleading, however: the two stereo outputs (1/4-inch and 1/8-inch) are basically line level and must be plugged into the audio input of a sound card to work with the computer. The PC Preamp does not provide digital I/O, but it is level-matched specifically for use with computers. This also means that it can be used in

recording situations away from the PC.

On the unit's front panel is a 1/4-inch instrument-level input; an XLR mic input (which is disabled when the 1/4-inch input is used); and knobs for Gain, Shape (a midrange scoop control), Hush (noise reduction) Threshold, Preamp Level, Reverb Level, and Aux Input Level. There's also a button for switching between Clean and Distortion modes, with two LEDs that let you see the setting at a glance: green for Clean, red for Distortion.

On the back panel are stereo 1/4-inch and 1/8-inch output jacks; a 1/4-inch unbalanced mono effects send; a 1/4-inch stereo effects return; and a stereo pair of RCA aux inputs for mixing in a drum machine, keyboard, CD player, etc. Power is supplied by a wall wart.

There's no power switch, so the PC Preamp remains on all the time.

The unit is packaged with an 1/4-inch cable for connecting to a sound card and includes PG Music's *PowerTracks Pro Audio 4.0* for Windows.

The PC Preamp is mono from the mic and line inputs to the effects return. At that point, the signal is split to dual mono and sent to the stereo outputs. Signals appearing at the stereo effects return and RCA aux inputs are routed to the stereo outputs with left/right separation intact.

#### START ME UP!

I took the module over to a friend's house to try it in his modest MIDI studio. He was a bit disappointed by the documentation—the 15-page manual

## PC Preamp Specifications

<b>Inputs</b>	(1) XLR mic; (1) 1/4" unbalanced instrument; (2) RCA aux in
<b>Outputs</b>	(1) 1/4" stereo; (1) 1/8" stereo
<b>Effects Loop</b>	(1) 1/4" unbalanced send; (1) 1/4" stereo return
<b>Maximum Input Level</b>	+10 dB
<b>Maximum Output Level</b>	+2 dB
<b>Frequency Response</b>	Clean mode: 10 Hz–20 kHz with a 2 dB increase at 10 kHz; Distortion mode: 10 Hz–3 kHz
<b>THD</b>	Clean mode: 0.155%; Distortion mode: 30.3%
<b>Noise (RMS)</b>	Clean mode: -73 dBu; Distortion mode: -69 dBu, A weighted, with Hush on, shape control full-clockwise position
<b>Shape Control</b>	± 20 dB @ 1 kHz
<b>Gain Control</b>	80 dB
<b>Compression</b>	attack: 15 ms; release: 50 ms
<b>Noise Reduction</b>	20 dB
<b>Effects</b>	spring reverb; distortion; compression
<b>Dimensions</b>	1.29" (H) x 10" (W) x 9.10" (D)
<b>Weight</b>	4.18 lbs.
<b>Power Supply</b>	9 VAC/1.5A adapter (provided)
<b>Power Consumption</b>	186 mA



The Rocktron PC Preamp's combination of XLR, RCA, and 1/4-inch inputs makes it a useful preamp for quick and convenient recording through your computer's sound card.

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Top: Renowned producers at StudioPro98 (L-R): Ed Cherney, George Massenburg, moderator David Schwartz, Nile Rodgers, Tommy LiPuma, Barry Beckett. Above: Mel Lambert introduces the panel on modular digital multitracks, moderated by *Mix* editor George Petersen.

contains very little in the way of technical information—but he was able to connect the PC Preamp to his Compaq Presario without my help. Being a guitarist, he immediately wanted to hear what his Strat sounded like through the unit, so we plugged the guitar into the ¼-inch input, adjusted the gain control, and let him go at it.

The first thing we both noticed was the liquidity of the reverb. The PC Preamp uses a built-in Accutronics spring reverb rather than a digital simulation. While it's no match for the full-size spring reverb of a Fender amp, it's still pretty nice. Through his small, full-range monitors, my friend's Strat sounded the way you would expect it to sound through a clean amp with the bass and treble controls set flat.

In Clean mode, the PC Preamp's internal Hush noise reduction circuit (a combination of dynamic filtering and downward expansion) is configured to operate as a compressor. Though I'm not a big fan of compressors in general, its inclusion here makes good sense. With it turned on, users are less likely to drive their recordings into digital

clipping, yet most tracks will still have plenty of meat. The compressor actually doesn't detract from the overall sound because the parameters are preset to function optimally for the unit's specific applications. It's basically program dependent—the harder you play (or sing), the more compression gets

high noise floor of a guitar signal when in Distortion mode.

## BEYOND GUITAR

Next, we plugged in a Shure SM58 and recorded some vocals. Again, the PC Preamp performed admirably. The unit doesn't have phantom power; it was designed for use with dynamic or battery-powered condenser mics. It clearly won't be going head-to-head with a premium mic preamp, but the sound is relatively clean and quiet. The reverb sounded somewhat less than stellar on our vocals, but it was acceptable. Of course, the built-in effects loop lets users access any outboard effect they choose.

Thanks to the stereo aux inputs, my friend was also able to plug in his Yamaha PSR520 and lay down some keyboard tracks. By the end of the evening, his reaction was solidly favorable.

The PC Preamp did not disappoint me in my own studio, either. I will admit to being a bit jaded after years of working with some fairly high-end gear, but it's always nice to see a product that is well thought out and hassle-free and does exactly the job it was designed to do. Although it's aimed at the PC market, I had no problems connecting the PC Preamp to my Macintosh Audiomeia III card (using a stereo ¼-inch mini-plug to dual RCA splitter cable). It also worked well with an ADAT and in the effects loop of my guitar amp.

## FINAL THOUGHT

Rocktron also makes an inexpensive version of the PC Preamp called the PC Preamp GIS (Guitar Interface System; \$279). It provides only a single ¼-inch input but gives the user a little more control over tone with the addition of Bass, Mid, and Treble knobs. It also includes an Output Level control, which is missing on the more expensive model. The PC Preamp GIS also comes bundled with a CD-ROM of PG Music's *PowerTracks Pro Audio 4.0* software.

Given the PC Preamp's list price, I'd say it's ideal for its target market: the guitar-playing entry-level recordist looking to interface quickly and conveniently with a computer's sound card or I/O. The PC Preamp is a well-built, solid performer that is versatile enough to perform multiple tasks in the personal studio.

*Jim Miller is a veteran sound designer and a frequent contributor to EM.*

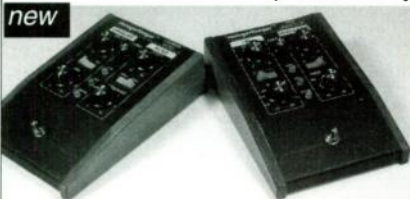
## The PC Preamp can be used away from the PC as well.

added (up to a maximum of 20:1). Attack and release times are also program dependent, with higher notes having a faster attack and release than lower notes.

Switching into the Distortion mode—which must be done by hand, because there is no footswitch jack—gave us a fairly bright, edgy snarl that sounded closer to a fuzz box than to a tube-based overdrive. (Think grunge/alternative rather than blues.) Using the Shape control, which provides ±20 dB of gain at 1 kHz, we dialed in a fairly respectable scooped-mid metal “death tone.” Unfortunately, the lack of true tone controls means that fine-tuning the distortion is a hit-or-miss proposition. However, Rocktron's Hush system does a good job of controlling the

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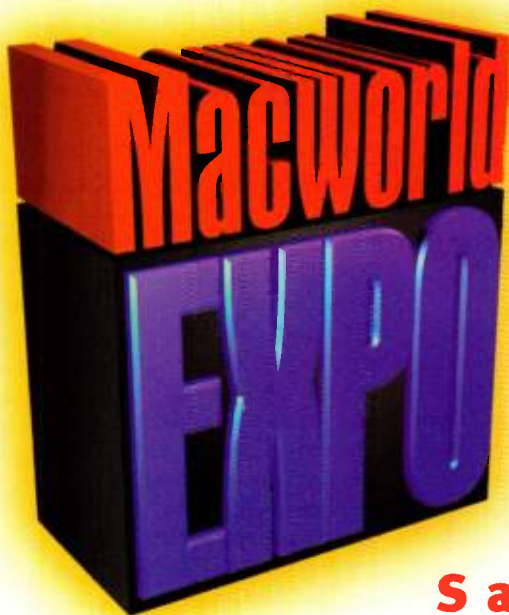
**PROS:** Solid construction. Versatile. Good selection of inputs. Spring reverb. Low price.

**CONS:** Minimal tone control. Wall-wart power supply. No footswitch. No power switch. No output-level control. No compressor control. No phantom power.

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# QUICK PICKS

## AMG

### Komputer Inside

By Jeff Obee

AMG's *Komputer Inside* (\$99.99; audio CD) opens with a nicely crafted little demo built upon electronically generated drum sounds and awash with spiraling delay effects, high- and low-frequency squonks and squidges, and all sorts of resonant analog filter sounds. I'm in with this disc already.



Loaded with a flexible selection of synth samples, AMG's *Komputer Inside* fits the techno-electronica bill.

### Tweaked

Komputer is a British group known for its Kraftwerk-like style. To concoct this teeming pot of sounds, they used a large battery of vintage synths and samplers, among them the ARP 2600, Yamaha CS-30, Roland SH-101, EMS PolySynthi and Synthi A, Korg MS-02, Synclavier, Akai S1000 and S900, and some custom-designed synths.

*Komputer Inside* is an unapologetically techno-electronica disc overflowing with programmed analog sounds. The audio quality is superb, and you get to feast upon hundreds of unique and esoteric—yet very usable—samples. You'll want to sample Komputer's loops, sequences, sweeps, synth notes, "noiz," effects, synth drum

patterns, electronic percussion hits, and other miscellany in abundance.

### Byting My Time

One thing that I liked about this CD right off was the way the Loops, Sequences & Sweeps, and Synth Drum Patterns sections provide separate instrumental elements. Each loop is presented in full, followed by variations that use only some of the ingredients of that loop (for example, synth effects minus bass and drums, bass and drums only, minus snaps, noiz only, and so on.) Therefore, you are not forced to use all of the sounds in the entire loop, and you can easily grab individual components.

Eleven tracks of Synth Noizes, each containing approximately 20 sounds (chirps, throbs, sweeps, beeps, dirty scratches—you name it), will keep your sampler well fed with cool patches for a long time. If you own a high-end sampler that also contains a sophisticated synth engine, you can use this disc's sounds as the basis for your own programs and really fly sonically.

I loved the generous helping of colorful, diverse sounds available on *Komputer Inside*. If you're into creating drum and percussion tracks that are entirely electronic, you will find plenty here to sample. Along with the synth drum patterns and the main loops, you get a huge palette of rhythmic percussive textures to work with.

I assembled a looping musical collage from a synth drum loop, dressing it with hits from the Electronic Percussion Hits section. I laid down a deep, pulsing jungle bass line underneath and spiced the stew with my own ambient pads and other textural effects from the disc, and it was time to rave.

### FYI

The documentation does an adequate job at best. The Loops, Sequences & Sweeps, and Synth Drum Patterns sections provide the tempo and define the variations on each track, but in the subsequent Synth Sequences section, only 2 of the 42 sequences are tagged with their bpm.

Very few of the synthesizers used on *Komputer Inside* are listed in the track info. This disc contains distinctive analog programs, and I would have liked to find out what instruments and signal processing were used in their creation.

### Techno Treat

If you're hungry for some quirky, edgy, pure electronic sounds, then you should give *Komputer Inside* a serious listen. The disc

is oriented toward a particular niche, which it fills very well. Sample it and serve it up at your next rave.

Overall EM Rating (1 through 5): 4.5

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## SAMPLEHEADS

### Pocket Syndrome, vol. 1

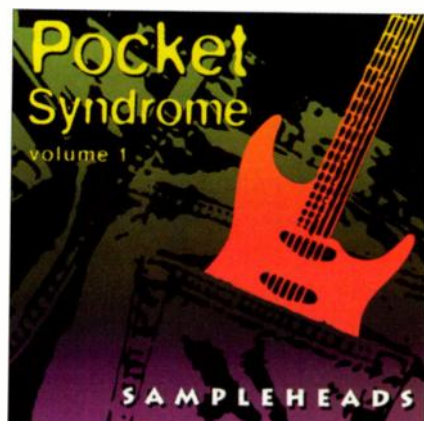
By Dan Phillips

Featuring the playing of guitarist Bernd Schoenhart, Sampleheads' *Pocket Syndrome* sample library delivers a load of highly organized, tasty guitar loops to your sampler or DAW. The collection concentrates on funk, with forays into ballads, swing, and classic rock. I reviewed the SampleCell version (\$149.95); the disc is also available in Roland, Akai, E-mu, and Kurzweil CD-ROM formats (\$149.95 each) and as an audio CD (\$99.95).

### It's the Little Things

*Pocket Syndrome's* approach is one of depth over breadth, delving into a few well-chosen grooves rather than skimming the surface of a larger selection. With the exception of the In the Pocket banks (described below), each bank presents a single phrase in a wide range of keys and tempi. For instance, the Disco Octave and Disco Chords banks each comprise a single phrase played at 11 speeds from 86 to 132 beats per minute, and in each of those tempi, the phrase is played in seven different keys.

This approach is designed to address transposition and time-scaling issues by providing a loop reasonably close to any required key and tempo. Its only downside



*Pocket Syndrome, vol. 1* from Sampleheads features funky grooves in just your size.



is that the variety of grooves that can be represented on a single disc is reduced.

### Funky Loops

The funk loops are all spectacular, with grooves born to lure dancers onto the floor. MuteWah features single-note picking with a slightly edgy wah tone, rocking back and forth between flat seven and one, in seven tempi from 86 to 110 bpm. The bouncy funk chords of JB Loops are available in two variations, each at three tempi from 98 to 106 bpm and in seven keys. There are also two intro patterns on the dominant fifth, in the same keys and tempi—one with 8th-note stabs and the other with a 16th-note strum (reminiscent of the tag line of Prince's "Kiss").

With all this meticulously organized material, it's ironic that the In the Pocket banks—those after which the CD is named—are the most free-form. They offer only three speeds and three keys per riff. This paucity, however, turns out to be their strength: instead of spinning a single phrase over a large set of tempi and keys, the banks start with a groove and a key and then explore a set of possible interpretations. Guitar tone and feel are quite nicely matched across different phrases (thanks to Schoenhart's exceptional playing), so the different loops work well together.

The funk loops are great, but some of the other material doesn't merit the in-depth treatment that *Pocket Syndrome* provides. In particular, the two ballad banks, along with the Hendrix-like riffs of Jimi and Jimi Wah, contain melodic motifs that are too specific to be of general-purpose use.

### Put It in Your Pocket

Well played, cleanly executed, and impeccably organized, *Pocket Syndrome* is a pleasure to use. At this price, it's also a good buy. Anyone looking for funk guitar loops with a solid groove should check it out.

**Overall EM Rating (1 through 5): 4**

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## EAST CONNEXION

### Strings

By Julian Colbeck

The East Collexion CD-ROM Series from East Connexion is designed to provide a comprehensive body of samples for use in a wide variety of musical styles. *Strings*

(\$99.95), produced by East Connexion and distributed by Discovery Firm, can be described as a very spotty collection of classical string samples in the Akai S3000 format, encompassing violin, viola, cello, and double bass, played solo and en masse, in both bowed and plucked styles.

### The Road Map

The samples themselves veer between excellent and almost useless, but the documentation is unswerving in its lack of information; it lists only program name and size, leaving me to wonder, "Who, where, when, and how?" The CD's tally of around 160 MB of data is divided into six "Partitions," each containing 10 to 15 programs that are somewhat arbitrarily apportioned.

### Zing Went the Strings

With one or two exceptions, the disc's sampling quality is fair to good. On very rare occasions—such as with the cello samples in Partition F—it is outstanding. Equally rarely, some tones are nasal, and one or two of the loop points are clearly audible. You'll find both live and studio-deadened versions of most tones. All samples are recorded dry, though some do come with a little extra decay, which makes them rather more forgiving to play.

The disc features strictly orchestral string samples: no folksy fiddles, no gypsy violins. In Partition A (the "strings" section) nothing gave me chills, but I did find a pleasant range of sounds, from soupy legato to aggressive marcato bowings. Most of the programs are made up from at least a dozen samples in separate key groups, and occasionally 40 or more. That is an impressive specification, but I wouldn't want to have to leaf through 40-odd pages of envelope generators just to tweak the attack on a sound that most current synthesizers—especially physical modeling synths—could match in a heartbeat. I liked some of the plucked sounds, particularly the cello and basses.

Solo violin is always one of the most difficult tones to capture convincingly and attractively, and here it does not fare well. Amazingly, although some of the solo cello are truly vile, others are actually sweet.

Orchestra hit, anyone? Not here. Instead, I give you Pizz Hit—ininitely more subtle, but still dramatic. Will this become the sample du jour among the techno crowd in the coming year? I don't think so.

### Our Survey Says...

*Strings* loses a lot of points on organization and documentation. Some samples are in



The string's the thing on East Connexion's *Strings* CD-ROM, a sample library packed with violin, viola, cello, double bass, and all sounds orchestral.

stereo; some are mono. Some are live; some are studio. Which are which? You'll have to load 'em up and find out for yourself. All the disc's programs are mapped to the extremities of the keyboard range, irrespective of whether the sound is a double bass or a violin. This is just plain sloppy.

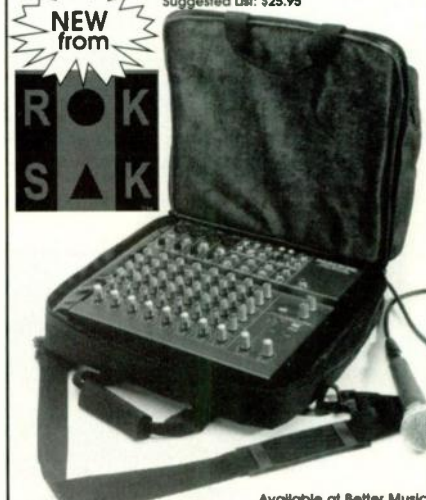
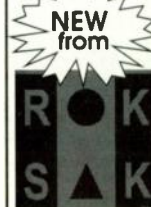
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(continued on p. 182)

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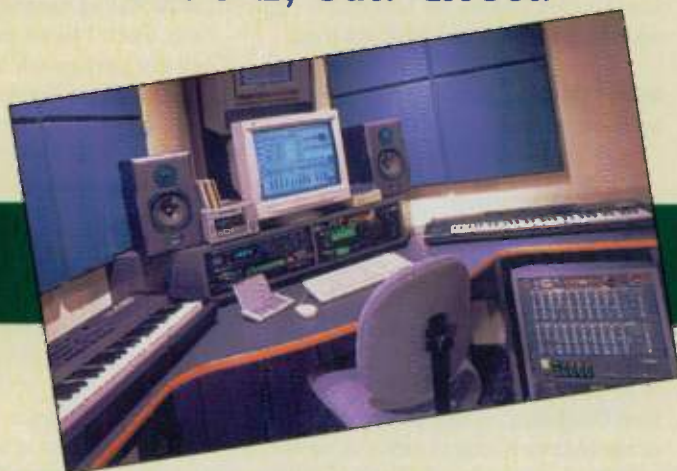
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# TASCAM

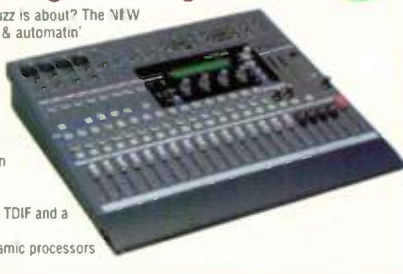
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- EQ section includes a mid parametric band with frequency and gain control as well as a gentle bell shape to bring out the character of the voice.
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# lexicon

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## EQUALIZERS

# Focusrite

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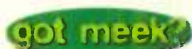
### FEATURES-

- XLR & 1/4" inputs are similar to the Dual Mic Pre but have been adapted to cope with a wider range of levels.
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- Extra XLR input on front makes for easy patching
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## CD RECORDERS



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#### FEATURES-

- Built-in Sample rate converter
- Analog and digital inputs and outputs



- 1-bit A/D converters for lowest possible distortion
- Synchronized recording and editing
- Digital fader for natural fade-in and fade-out.

## STUDIO DAT-RECORDERS



### SV-3800 & SV-4100

The SV-3800 & SV-4100 feature highly accurate and reliable transport mechanisms with search speeds of up to 400X normal. Both use 20-bit D/A converters to satisfy even the highest professional expectations. The SV-4100 adds features such as instant start, program & cue assignment, enhanced system diagnostics, multiple digital interfaces and more. Panasonic DATs are found in studios throughout the world and are widely recognized as the most reliable DAT machines available on the market today.

#### FEATURES-

- 64x Oversampling A/D converter for outstanding phase characteristics
- Search by start ID or program number
- Single program play, handy for post.



- Adjustable analog input attenuation, +/-10dBu
- L/R independent record levels
- Front panel hour meter display
- 8-pin parallel remote terminal
- 250x normal speed search



### D8 Digital Recording Studio



The new D8 Digital Recording Studio features an 8-track recorder, a 12-channel mixer, onboard effects, and basically everything else you'll need to record and mix your music, you supply the talent.

#### FEATURES-

- 8-track recorder, 12-channel mixer
- 1.4GB hard disk for up to 4.5 hours of recording on a single track
- High and low EQ on each channel
- 130 high-quality stereo digital effects for complete recording in the digital domain
- MIDI clock sync, SCSI port and S/PDIF digital interfaces all standard



## DIGITAL MULTI-TRACK RECORDERS

### TASCAM DA-98 Digital Audio Recorder

The DA-98 takes all the advantages offered by the DTRS format and significantly ups the ante for the professional and post-production professional alike. With enhanced A/D and D/A converters, a comprehensive LCD display and full compatibility with the DA-88 and DA-38, the DA-98 delivers the absolute best in digital multitrack functionality.

#### FEATURES-

- Confidence monitoring for playback and metering
- Individual input monitor select switch facilitates easier checking of Source/Tape levels
- Switchable reference levels for integration into a variety of recording environments with internal tone generator
- Digital track copy/electronic patch bay functionality
- Comprehensive LCD display for easy system navigation



- Dedicated function/numeric keys make operation easier
- Built-in sync with support for MMC and Sony P2
- D-sub connector (37-pin) for parallel interface with external controller
- Optional RM-98 rack-mount ear for use with Accuride 200 system

### DA-88

A standard digital multitrack for post-production and winner of the Emmy award for technical excellence, the DA-88 delivers the best of Tascam's Hi-8 digital format. Its Shuttle/Jog wheel and track delay function allow for precise cueing and synchronization and the modular design allows for easy servicing and performance enhancements with third-party options.

### DA-38

The DA-38 was designed for musicians. Using the same Hi-8 format as the highly acclaimed DA-88, the DA-38 is an 8 track modular design that sounds great. It features an extremely fast transport, compatibility with Hi-8 tapes recorded on other machines, rugged construction, ergonomic design and sync compatibility with DA-88s.



### ADAT XT20 Digital Audio Recorder



The New ADAT-XT20 provides a new standard in audio quality for affordable professional recorders while remaining completely compatible with over 100,000 ADATs in use worldwide. The XT20 uses the latest ultra-high fidelity 20-bit oversampling digital converters for sonic excellence, it could change the world.

#### FEATURES-

- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.
- Remote control
- Servo-balanced 56-pin ELCO connector.



- Built-in electronic patchbay
- Copy/paste digital edits between machines or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder.

## TASCAM DA-30mkII

A great sounding DAT, the DA-30MKII is a standard mastering deck used in post-production houses around the world. Among many other pro features, its DATA/SHUTTLE wheel allows for high-speed cueing, quick program entry and fast locating.

#### FEATURES-

- Multiple sampling rates (48, 44.1, and 32kHz).
- Extended (4-hour) play at 32kHz.
- Digital I/O featuring both AES/EBU and S/PDIF.
- XLR balanced and RCA unbalanced connections.



- Full function wireless remote.
- Variable speed shuttle wheel.
- SCMS-free recording with selectable ID.
- Parallel port for control I/O from external equipment.

## Fostex D-15

The new Fostex D-15 features built in 8Mbit of RAM for instant start and scrubbing as well as a host of new features aimed at audio post production and recording studio environments. Optional expansion boards can be added to include SMPTE and RS-422 compatibility, allowing the D-15 to grow as you do.

#### FEATURES-

- Hold the peak reading on the digital bargraphs with a choice of 5 different settings
- Set cue levels and cue times
- Supports all frame rates including 30d!
- Newly designed, 4-motor transport is faster and more efficient (120 minute tape shuttles in about 60 sec.)
- Parallel interface • Front panel trim pots in addition to the level inputs



### D-15TC & D-15TCR

The D-15TC comes with the addition of optional chase and sync capability installed. It also includes timecode reading and output. The D-15TCR comes with the further addition of an optional RS-422 port installed, adding timecode and serial control (Sony protocol except vari-speed)

## SONY PCM-R500

Incorporating Sony's legendary high-reliability 4D D. Mechanism, the PCM-R500 sets a new standard for professional DAT recorders. The Jog/Shuttle wheel offers outstanding operational ease while extensive interface options and multiple menu modes meet a wide range of application needs.

#### FEATURES-

- Set-up menu for preference selection. Use this menu for setting ID6, level sync threshold, date & more. Also selects error indicator.
- Includes 8-pin parallel & wireless remote controls



- SBM recording for improved S/N (Sounds like 20bit)
- Independent L/R recording levels
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## MIDI HARDWARE



### Mark of the Unicorn **MIDI Time Piece™ AV** 8x8 Mac/PC MIDI Interface

The MTP AV takes the world renowned MTP II and adds synchronization that you really need like video genlock, ADAT sync, word clock sync, and even Digidesign superclock!

- FEATURES-**
- Same unit works on both Mac & PC platforms.
  - 8x8 MIDI merge matrix, 128 MIDI channels.
  - Fully programmable from the front panel.
  - 128 scene, battery-backed memory.
  - Fast 1x mode for high-speed MIDI data transfer.

### Digital Time Piece™ Digital Interface

Think of it as the digital synchronization hub for your recording studio. The Digital Time Piece provides stable, centralized sync for most analog, digital audio, and video equipment. Lock together ADATs, OA-88's, ProTools, word clock, S/PDIF, video, SMPTE, and MMC computers and devices flawlessly. It ships with "Clockworks" software which gives you access to its many advanced features and remote control of some equipment settings such as record arm.

## OPCODE

### Studio 64XTC Mac/PC MIDI Interface

The Studio 64XTC takes the assorted, individual pieces of your studio-your computer, MIDI devices, digital and analog multitracks and even pro video decks, and puts them all in sync.

- FEATURES-**
- 4 In / 4 Out, 64 channel MIDI/SMPTE interface/patch-bay with powerful multitrack & video sync features
  - ADAT sync with MIDI machine control
  - Simultaneous wordclock and Superclock output, 44.1kHz or 48kHz for perfect sync with ADAT, DA-88 and ProTools
  - Video and Blackburst in (NTSC and PAL)
  - Cross-platform Mac and Windows compatibility

## SAMPLING

### AKAI S-Series Rack Mount Samplers

Starting with 64X oversampling, Akai's S-Series Samplers use 28-bit internal processing to preserve every nuance of your sound and the outputs are 18" and 20-bit to ensure reproduction of your sounds entire dynamic range. These three new samplers add powerful capabilities, ease-of-use, expandability and affordability to set the standard for professional samplers.

## KEYBOARDS & SOUND MODULES



### XP60 & XP80 Music Workstations

The XP-80 delivers everything you've ever wanted in a music workstation. An unprecedented collection of carefully integrated features provide instant response, maximum realtime control and incredible user expandability. The XP-80 features a pro-quality 76-note weighted action keyboard while the NEW XP-60 features the same sound engine in a 61-note keyboard.

**XP80 FEATURES-**

- 64-voice polyphony and 16-part multitimbral capability
- 16 Mbytes of internal waveform memory; 80Mbytes when fully expanded (16-bit linear format)
- 16-track MRC-pro sequencer with direct from disk playback. Sequencer holds approx. 60,000 notes
- New sequencer functions like "non-stop" loop recording and refined Groove Quantize template



- Enhanced realtime performance capability with advanced Arpeggiator including MIDI sync and guitar strum mode and Realtime Phrase Sequence (RPS) for on-the-fly triggering of patterns
- 40 insert effects in addition to reverb and chorus
- 2 pairs of independent stereo outputs, click output jack with volume knob
- Large backlit LCD display

### SR-JV80 Series Expansion Boards

Roland's SR-JV80-Series wave expansion boards provide JV and XP instrument owners a great-sounding, cost-effective way to customize their instruments. Each board holds approx. 8Mb of entirely new waveforms, ready to be played or programmed as you desire.

**Boards include-**  
 Pop, Orchestral, Piano, Vintage Synths, World, Super Sound Set, Keys of the 60's & 70's, Session, Bass & Drums, Techno & Hip-Hop Collection.



## KURZWEIL

### K2500 Series Music Workstations

The K2500 series from Kurzweil utilizes the acclaimed V.A.S.T. technology for top-quality professional sound. Available in Rack mount, 76-key, and 88 weighted key keyboard configurations, these keyboards combine ROM based samples, on-board effects, V.A.S.T. synthesis technology and full sampling capabilities on some units.

**FEATURES-**

- True 48-voice polyphony
- Fluorescent 64 x 240 backlit display
- Up to 128MB sample memory
- Full MIDI controller capabilities
- 32-track sequencer
- Sampling option available
- Dual SCSI ports
- DMTI Digital Multitrack interface option for data format and sample rate conversion (Interfaces with ADATs or DA-88s)



## KORG

### Trinity Series Music Workstations DRS

Korg's Trinity Series represents a breakthrough in sound synthesis and an incredible user interface. It's touch-screen display is like nothing else in the industry, allowing you to select and program patches with the touch of a finger. The 24MB of internal ROM are sampled using ACCESS which fully digitizes sound production from source to filter to effects. Korg's DSP based Multi Oscillator Synthesis System (MOSS) is capable of reproducing 5 different synthesis methods like Analog synthesis, Physical Modeling, and variable Phase Modulation (VPM).

**FEATURES-**

- 16 track, 80-note MIDI sequencer
- Flexible, assignable controllers
- DRS (Digital Recording System) features a hard disk recorder and various digital interfaces for networking a digital recording system configured with ADAT, DAT recorder and hard disk.
- 256 programs, 256 combinations
- Reads KORG sample DATA library and AKAI sample library using optional 8MB Flash ROM board

*\* (Digital IF, SCSI, Hard Disk Recorder, and sample Playback/Flash ROM functions are supplied by optional upgrade boards)*



88 Weighted-key/Solo Synth



76-key/Solo Synth



61-key/Solo Synth



61-key

## MONITORS

### Hafler TRM-8

Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Transnova power amp circuitry.

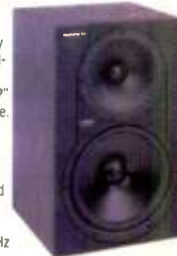


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- 75W HF, 150W LF
- Electrically & Acoustically matched

## MACKIE

### HR824

These new close-field monitors from Mackie have made a big stir. They sound great, they're affordable, they're internally bi-amped. "What's the catch?" Let us know if you find one.



**FEATURES-**

- 150W Bass amp, 100W Treble amp
- Full space, half space and quarter space placement compensation
- Frequency Response 39Hz to 22kHz, ±1.5dB

## TANNOY Reveal



The latest playback monitor from Tannoy, the Reveal has an extremely detailed, dynamic sound with a wide, flat frequency response.

**FEATURES-**

- 1" soft dome high frequency unit
- Long throw 6.5" bass driver
- Magnetic shielding for close use to video monitors
- Hard-wired, low-loss crossover
- Wide, flat frequency response
- Gold plated 5-way binding post connectors



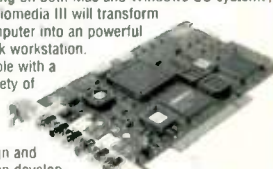
## SOUND CARDS



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### Audiomedia III Digital Audio Card

Working on both Mac and Windows OS systems, Audiomedia III will transform your computer into a powerful multitrack workstation. Compatible with a wide variety of software options from Digidesign and Digidesign development partners, Audiomedia III features 8 tracks of playback, up to 4 tracks of recording, 24-bit DSP processing, multiple sample rate support and easy integration with leading MIDI sequencer/DAW software programs.



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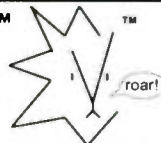
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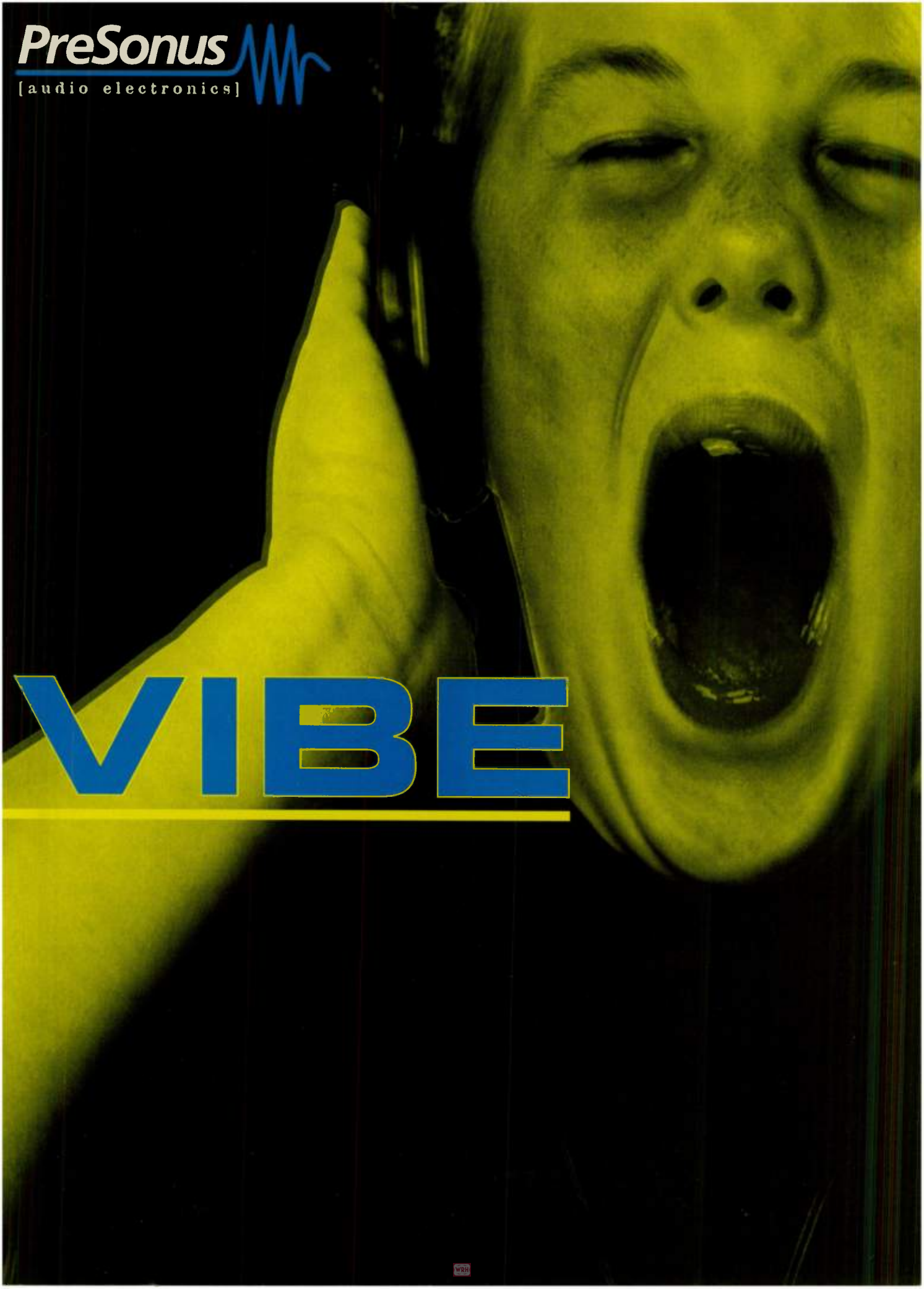
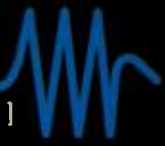
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By Larry the O

## One Is the Loneliest Number

**T**hey say opinions are like, er, noses: everybody has one, and they all smell. If that's so, maybe speakers are like ears: everybody has, maybe, six. (OK, at least two.) The point being, how many people have only one? Speakers, that is, not ears.

There was a time when lots of people had only one: car radios, televisions, and portable radios were all monaural. No longer. Car and home audio systems, televisions, and boom boxes are all in glorious stereo nowadays. Even computers, long a bastion of the single three-inch speaker, are usually accompanied by a pair of small speakers if the user intends to listen to anything besides system beeps.

So here's the question I've been stealthily leading up to: is mono compatibility still something with which we must always comply? I think not. DVD, which is expected to dominate home entertainment, typically carries 5.1 audio; it seems we are finally moving out of the time when people commonly listen to purely monophonic sound. Sure, some old mono radios and televisions are still out there, but are there enough to continue to mandate mono-compatible mixes?

Dolby Surround-encoded material steers signals to the surround channel when the same audio exists in the left and right channels, but 180 degrees out of phase with each other. That fact means that most people who buy or rent movies or watch the top TV shows are listening to mixes that are, by definition, mono incompatible, because any surround-channel signals simply disappear in mono.

Does this mean we needn't concern ourselves with mono compatibility? Well, I'm not ready to go that far. Mono incompatibility still could be detrimental in some situations. Phase information is the key to whether a mix is mono compatible or not, and that can translate directly into how consistent a mix sounds at different locations within a room. Acoustical phase anomalies—both architecturally based (such as standing waves) and those based solely on the listener's position relative to the speakers—can certainly manifest themselves when someone is listening to stereo or multichannel material containing complex phase information, such as in a mono-incompatible mix. This fact is espe-

cially true in a less-than-perfect acoustical environment.

To be frank, I have been cavalier about mono compatibility when mixing my own music ever since my early work with synthesizers revealed the wonderful, immersive counterlocalization effect created by out-of-phase material. However, when producing or mixing for clients or friends, I am much more conservative. Even in working on my own music, I still check mono compatibility regularly. I may choose to disregard cancellations that show up rather than lose a phasing effect that pleases me, but it is a deliberate, informed decision.

Let me give you an example of an out-of-phase effect that I considered worth the price of mono incompatibility. I had a mix—already thick with violin, mandolin, electric guitar, bass, and drums—to which I had to add bagpipes. Bagpipes cover a lot of spectral territory, and they masked the string instruments the moment the pipes' level reached audibility. After hours of EQ, panning, and level experiments, I put them through a small-room reverb and used only the reverb return, hard-panned left and right. The diffused bagpipes could be made quite loud in level without covering the more focused strings, but in mono, they got thinner than a supermodel. Nevertheless, it was the best solution, and it worked.

And that, to me, is the bottom line: managing phase can be a good thing, but the Age of Mono Tyranny is a thing of the past.

---

**Larry the O** is a musician, producer, engineer, and sound designer whose San Francisco-based company, *Toys in the Attic*, provides a variety of musical and audio services. He does not have a TV, VCR, cell phone, or Web page, but he holds the distinction of introducing the term *stud muffin* to audio writing.



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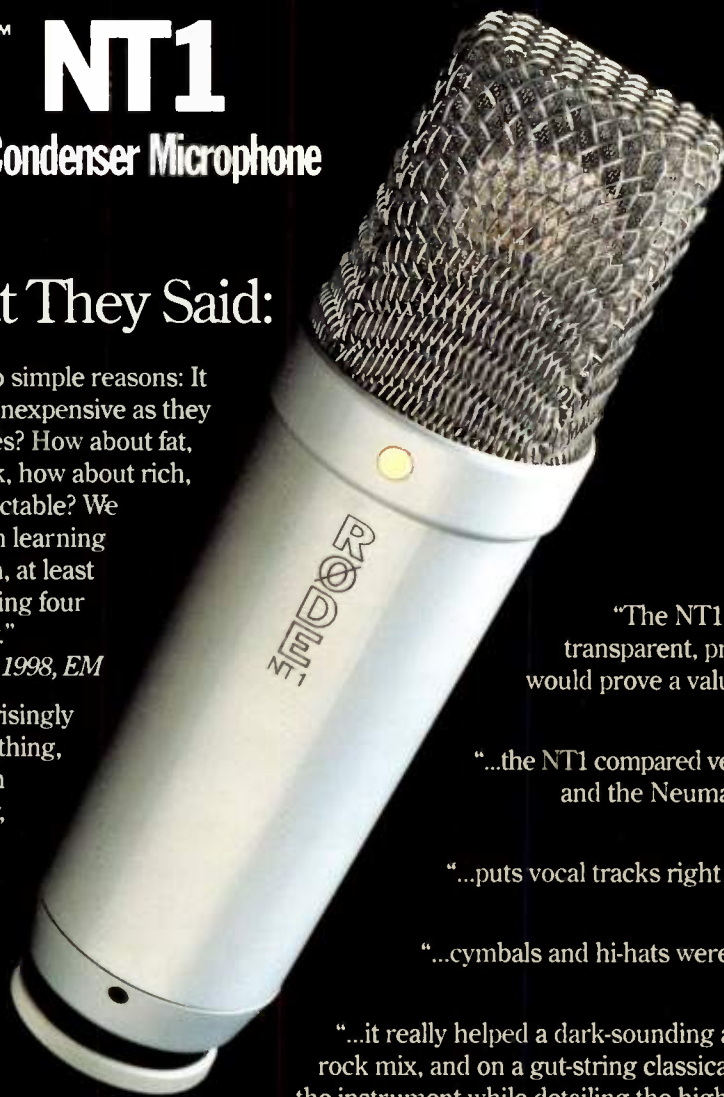
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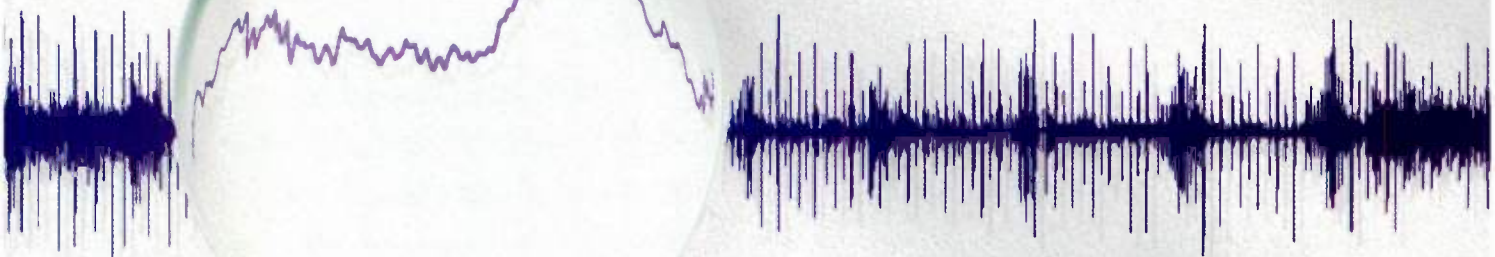
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