Electronic Musician

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Slick EQ tweaks for thunderous bass tracks

Homemade
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the Internet!

Paul Lehrman's quick take on QuickTime 2.5

A Cardinal Publication

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REALITY FOR \$1500 A PAIR. INTRODUCING

f you've been trusting the quality of your creative product to passive monitors costing \$400-\$600 a pair, there's an astonishing revelation waiting for you at your Mackie dealer. In our opinion, the active,

biamplified HR824 is the most accurate near-field monitor available. So accurate that it essentially

HR SERIES "sound" of its

own. Rather, the Mackie Designs High Resolution HR824 is the first small monitor with power response so flat that it can serve as a completely neutral conductor for whatever signal you send it.

You'll hear the precise attack, texture and quality of individual bass notes exactly as they're being recorded. On instrumental and vocal tracks, you'll discern details of pitch, timbre and harmonics that passive monitors simply don't resolve.

SCIENCE, NOT SNAKE OIL.

Internally-biamplified, servo-controlled speakers aren't a new concept. But to keep the cost of such monitors reasonable, it's taken advances in measurement instrumentation, transducers, and electronics technology. In

developing the High Resolution Monitor Series, Mackie

HR824
Active Monitors accept balanced or unbalanced 46"

and XLR inputs.

Jacks & removeable

IEC power cord face

downward so that the

speaker can be placed

close to rear wall

surfaces



Mackie acoustic engineer David Bie uses scanning laser vibrometry to map HR824 tweeter dome vibrations. Film at 11.

Designs sought out the most talented acoustic engineers (being able to live in perpetual drizzle was a plus) and then made an enormous commitment to exotic technology such as scanning laser Doppler vibrometry, analyzers, time delay spectrometers and machines that go "ping." The High Resolution Series HR824 is the

result of painstaking research and money-is-no-object components. Not to mention thousands of hours of listening tests and tens of thousands of dollars in tooling.

FLAT RESPONSE...ON OR OFF-AXIS.

One of the first things you notice about the HR824 is the gigantic "sweet spot." The detailed sound field stays with you as you move back

and forth across the console
— and extends far enough
behind you that musicians,
producers and your mom can
hear the same accurate playback.

The reason is our proprietary exponential high frequency wave guide. Without it, a monitor speaker tends to project critical high frequencies in a narrow beam (Fig. A) — while creating undesirable edge diffraction as sound waves interact with the edges of the speaker (red lines in Fig. A). Imaging and definition are compromised.

The "sweet spot" gets very small.

Like biamped speakers, wave guides aren't a new concept. But it takes optimized, internal electronics

and a systems approach to make them work in nearfield applications. The HR824's

wave guide (Fig. B)
maximizes dispersion,
time aligns the acoustic center of the HF transducer to
the LF transducer's center, and
avoids enclosure diffraction (notice
that the face of the speaker is
perfectly smooth.) The exponential
guide also increases low treble sensitivity, enabling the HF transducer to
handle more power and produce flat

CLEAN, ARTICULATED BASS.

When seasoned recording engineers heard the HR824 at a recent tradeshow, they couldn't believe the controlled low bass extension — several snooped around for a hidden subwoofer. They heard low frequency



The Mackie HR824 Active Monitor. ±1.5dB from 42 to 20kHz.

accuracy that simply can't be achieved with passive speakers using external amplifiers. There are many reasons.

First, the HR824's FR Series 150-watt bass amplifier is directly coupled in a servo loop to the 8.75inch mineral-filled polypropylene low frequency transducer.

It constantly monitors the LF unit's motional parameters and applies appropriate control and damping. An oversized magnet structure and extra-long voice coil lets the woofer achieve over 16 millimeters of cone excursion. Bass notes start and stop instantly, without overhang, distortion or "tubbiness."

Second, instead of relying on ports or slots, the HR824's low frequency driver is coupled to a pair of aluminum mass-loaded, acousticinsulated 6.5-inch passive drivers. While typical, undersized ports cause vent noise, power compression and low frequency distortion, our ultrarigid drivers eliminate these problems and couple much more

response at high SPLs.

THE HR824 ACTIVE MONITOR.

effectively with the control room's air mass. They achieve the equivalent radiating area of a 12-inch woofer cone, allowing the HR824 to deliver FLAT response to 42Hz with a 38Hz, 3dB-down point.

Third, the woofer enclosure is airdisplaced with high-density adiabatic foam. It damps internal midrange

reflections so they can't bleed back through the LF transducer cone and reach your ears. The typical problem of small-monitor midrange

precisely match each transducer's actual output via electronic adjustments. During final assembly, each HR824 is carefully hand-trimmed to ±1.5dB, 42Hz-20kHz. As proof, each monitor comes certified with its own serialized, guaranteed frequency response printout.

The HR824's front board is I-inch thick with "radiused" edges to further eliminate diffraction. An "H" brace bisects the enclosure for extra rigidity.

Mackie is the only active monitor manufacturer that also has

Below: The HR824 Development Team. L to R, clockwise: Terry Wetherbee, Cal Perkins, Greg Mackie, David Bie, Paul Brengle, Jeff Hammerstrom, Dan Bonilla and Mats Jarlstrom holding P.D., our Over-20kHz Specialist.





Fig. D: HR&24 alloy dome's uniform, accurate pistonic motion.





"boxiness" is eliminated.

A TRUE PISTONIC HIGH-FREQUENCY RADIATOR.

We scoured the earth for the finest high frequency transducers and then subjected the likely candidates to rigorous evaluation. One test, scanning laser vibrometry, gives a true picture of surface vibration patterns. Two test results are shown in the upper right hand corner of this ad. Figure C is a conventional fabric dome tweeter in motion. You

needn't be an acoustic engineer to see that the dome is NOT behaving as a true piston.

Figure D shows our High Resolution metal alloy dome at the same

frequency. It acts as a rigid piston up to 22kHz, delivering pristine, uncolored treble output that reproduces exactly what you're reco ling

INDIVIDUALLY OPTIMIZED.

You won hear it from other manufacturers, but individual low and high frequency drivers can vary more than 10% in sensitivity due to production variations. Because our monitor is active, we can

experience building stand-alone professional power amps. The HR824 employs two smaller versions of our FR Series M·1200 power amplifier - 100 watts (with 150W bursts) for high frequencies, and 150 watts (200W peak output) for low



high-speed, latch-proof Fast Recovery design using extremely low negative feedback.

TAILOR THEM TO YOUR SPACE

Because control rooms come in all shapes, sizes and cubic volumes, each HR824 has a three-position Low Frequency Acoustic Space control. It maintains flat bass response whether you place your monitors away from walls (whole space), against the wall (half space) or in corners (quarter space). A low frequency Roll-

Off switch at 80Hz lets you emulate small home stereo speakers or popular small studio monitors.

CONFRONT REALITY AT YOUR MACKIE DESIGNS DEALER

We've made some pretty audacious claims in this ad. But hearing is believing. So bring your favorite demo material and put our High Resolution Series monitors through their paces.

If you've never experienced an active monitor before, you're going

to love the unflinching accuracy of Mackie Designs' HR824s.

If you've priced other 2-way active monitors, you're going to love

the HR824's \$1498/pair price* AND its accuracy.

\$1498 suggested U.S. retail price per pair. @ 1996 Mackie Designs Inc. All rights reserved.



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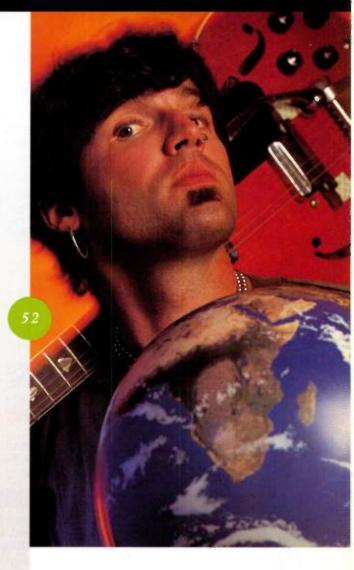
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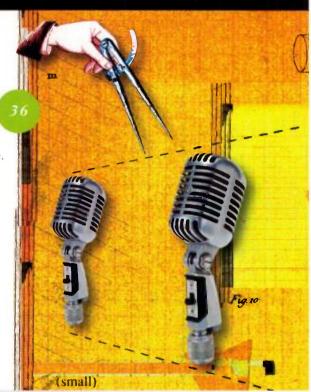
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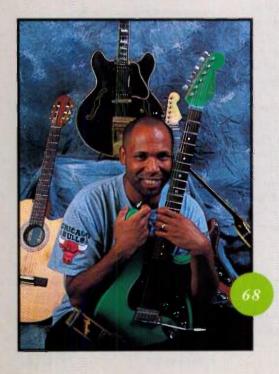
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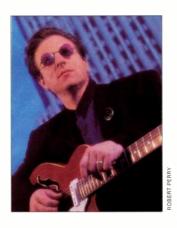
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Cover: Christopher Watkins photographed by Gary Laufman.

Underachieving

Can you make one brief attitude adjustment for 1997?

As talented, creative, and oh-socrafty electronic musicians, we're absolutely filthy with options. Modern gear is so wonderful that we can make almost any sound, record it exquisitely, and produce an entire career's worth of albums, film soundtracks, and multimedia scores without leaving our homes. Yep, times ain't half bad.



And of course, every month **EM** strives to help you find new ways to maximize your equipment, your artistry, and your productivity. We often encourage you to reach for the big brass ring of Achievement because technology has placed affordable, pro audio tools at the feet of the masses. Today, there is no reason you cannot produce a personal masterpiece, and yes, we're always on your butt to just make it happen. But in 1997, I'm going to ask you to slack off a bit. Forget about the sweeping statement, the commercial slam dunk, the artistic *tour de force*. I just want you to use your musical expertise to make one person smile.

This is a simple—and admittedly a rather dorky and wholesome—request. I'm not trying to be the Walt Disney of music technology here, but sometimes I think we get so wrapped up in the technical aspects of audio production that we forget about how important it is to affect a listener. All the technology that money can buy is pretty much worthless if we use our tools to produce cold, musical "architectures" that lack passion and emotional resonance. After all, what we do as musicians is a powerful thing. At our best, we can reach into a stranger's soul and seduce that person into joy, contemplation, or even anger. On a personal note, I know that I would have succumbed to paralyzing depression during my recent divorce if I couldn't have surrendered to the curative effects of my favorite rock songs and symphonies.

So just once, throughout all of 1997, I'm asking you to quit obsessing about quantization, pristine gain stages, perfect loops, and all the other technical elements of music making. Instead, think about writing a melody that would wrestle a smile, a giggle, or a tear of happiness from a listener. Hey, give it a shot! You might be surprised how composing that one simple melody inspires you to new creative heights in 1997. And don't freak if you begin to get really moved by your own work: I don't think we should fear—or ridicule—emotionalism in music; we should lament its absence.

And as another year is coming to a close, I want to thank our readers for their enthusiastic support; all the equipment manufacturers for "more better" gear; and the entire EM staff for the sweat and time and tension that it takes to produce this mag each month. I sincerely hope that only marvelously wonderful things happen to everyone in 1997, but in the unlikely event that something crummy does occur, I pray that we all have supportive families and friends to cushion the blow. (And don't forget to tell any irreplaceable human treasures that you love them dearly.) As far as the state of the world goes: well, let's all float delicate bubbles of optimism. One of these years, that "peace on earth" thing has to ring true. Happy Holidays!

P.S. The manic newsboy on our cover is not some fashion model. He's Christopher "Preacher Boy" Watkins, a Web-savvy bluesman (with two albums on Blind Pig Records) and a music producer for Canter Technologies.

Electronic Musician®

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BOUNDLESS GOODIES

The October 1996 EM was packed with so many things that applied to me, I just had to say thanks! After making nine albums and now moving into film, televison, and interactive media, I found the articles on Escape from L.A. ("A Day in the Life: An Orchestrated Escape") and time code ("That Synching Feeling") especially helpful. It's funny, but I've used time code for many years and never understood it fully until I read this article!

I've been using Studio Vision since 1992 (every day, all day) but still found the "Persistence of Vision" article interesting, informative, and easy to understand. I now have a Web page (http://www.arkensounds.com) and have been spending more time on the Internet, so your "Cool Tools" article was also fun. The same with the reviews of the Ensoniq MR-Rack and Mackie Ultra-Mix, two products I own. I guess I got lucky, with this issue, to find so many things I can directly apply to my professional life.

David Arkenstone ark@adnetsol.com

THE RIGHT POWERBOOK

enjoyed the article on Studio Vision Pro ("Master Class: Persistence of Vision," October 1996). What type of PowerBook was author Gerry Bassermann using for his trip to the mountains? I understand that the only PowerBooks that actually will sync up audio to MIDI are in the 500 series.

Alex Untermyer auntermyer@kraft.com

Author Gerry Bassermann responds: Currently the way to go is with the Apple 500 series PowerBooks. A 520 or 540 with Studio Vision Pro gets three to four tracks of Sound Manager audio with a bunch of MIDI happening. The 5300 series would seem to be a good bet, but alas, it is not. (Apple cut corners in the hardware.) But all of this will improve with the next software release (3.5), which will deliver more tracks on all Sound Manager platforms.

CREATIVE KICKSTART

he Thunderbirds Teen Center has developed a new prevention program known as TechCARE—Teens Using Technology for the Creative Arts, Recreation, and Education. An integral part of the program is the establishment of a small project studio. This studio is made available at no cost to city-of-Phoenix residents ages thirteen to nineteen as part of an extensive curriculum designed to present youths with positive alternatives for creative expression and exposure to alternative career paths. Your articles in the September 1996 issue ("Back to School" and "The Budget Desktop Studio") could not have been more timely in helping me research the latest technology!

Bruce Baldwin
TechCARE Coordinator
Thunderbirds Teen Center
Phoenix, AZ

CBX-D5 SHAREWARE

Regarding your recent review on the Yamaha CBX-D5 (September 1996), I want to let your readers know that there is a great shareware editor for the unit available for download from the Opcode Web site. Written using Opcode's MAX object-oriented programming software, Pavlos Andronikos' "MixDown" allows access to all CBX-D5

functions. You'll find it at: http://www.opcode.com—look under "MAX!"

Butch Rovan

MAX Product Manager
Opcode Systems, Inc.

Palo Ālto, CĀ

NOT FOR EVERYONE

was curious to see what you thought of the Alesis DM5 drum module ("Reviews" September 1996). I agree with the points brought up in the review but wanted to mention some roadblocks I came across. (I used a trapKAT drum pad system to trigger the sounds.)

While playing a song with some friends, I noticed that a cymbal sound was being cut off. I wasn't playing anything too complicated, and it didn't seem that I would have used up the 16-note polyphony, but I guess I did. (Did you experience any drop-outs?) I read that Alesis had incorporated a method to prevent these drop-outs, so I dug out the manual. What a surprise! Alesis actually said that their way around this was to buy another DM5 and plug that in also. (What a lame way to add polyphony: spending another \$450.)

A second problem I encountered was that the cymbals do not ring out long enough to emulate real cymbals. I understand this eats up polyphony, as well, but the 2-second ride-cymbal sound is unusable in certain situations (such as at the end of a song, during quiet passages, etc.). You can't lengthen the decay of the samples, either.

I agree with author Steve Wilkes that the unit could have had more orchestral sounds. I was surprised to see that there was no tympani. I perform for a number of cantatas, operas, etc., and there is almost always a need for a tympani. Oh, well.

Although the unit is packed with excellent sounds and is worth the low price, it was not the right tool for me, and I returned it.

Mark Adams madamsl@hotmail.com

Author Steve Wilkes responds: Your letter is proof that the DM5 may not be for

America's Fastest Growing Music Retailer

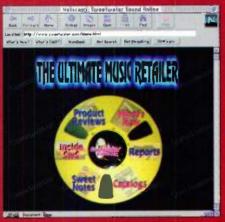
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LETTERS

everyone. However, I'd like to offer a couple of thoughts that may help with your dilemmas.

It is possible that polyphony limitations were not responsible for your cymbal sound being cut off. The Group modes offer various ways to control the manner that sounds (such as cymbals) respond to repeated attacks. If the cymbal sound you mentioned happened to be assigned to "Group 1 and 2," any sound from the same voice family that is subsequently attacked (e.g., another cymbal) will cut off the original voice if it is still sustaining. Setting the Group selection to "Multi" should cure this problem. I must agree with you that a greater editing capacity on the DM5 (one that allows for tweaking the samples' attack, decay, sustain, and release) would be welcome.

Keep in mind that 16-note polyphony is not uncommon for drum modules under \$1,000. I checked the specifications on some of the other equipment in my studio and found that the Alesis D4 sports 16-note polyphony, the Novation DrumStation has 12-note polyphony, and the Kawai XD-5 has 16-note polyphony. Thus the Alesis DM5 is par for the course in this area, with the MIDI Overflow mode being a "bonus."

TOSLINK INFO

The Budget Desktop Studio" (September 1996) was great, but I have some questions. I have a Power Mac 7500 with Opcode's Studio Vision Pro and an Alesis ADAT. I have been waiting for Korg to release the Soundlink 1212 I/O card because it would seem to be an excellent addition to my setup. However, if I wanted to play back and exchange synchronized digital audio between my computer and ADAT with a 1212 I/O card, would I need an Alesis AI/1? Would the 48 kHz word-clock output of MOTU's MIDI Timepiece AV allow me to do this with a 1212 I/O card?

Paul Doughty pdoughty@inreach.com

Paul—I have good news! The Korg 1212 I/O has Toslink connectors that connect directly with the ADAT's Lightpipe optical interface, so you don't need to buy another interface. Simply connect the ADAT's digital I/O ports to the 1212 I/O's optical ports via a standard Toslink fiber-optic cable. This lets you transfer all eight audio tracks in sync.

Your ADAT shipped with one optical cable, which is the same type of cable used for Toslink S/PDIF I/O in many DAT machines. If you want to move audio bidirectionally between ADAT and computer and don't want to repatch the free cable, you can probably buy a second Toslink cable at a local hi-fi store that sells consumer DAT decks. (See "Square One: Caveat Connector" in the November 1996 issue for details on the Toslink interface as used for S/PDIF.)

The Lightpipe interface is self-clocking. As long as you are transferring digital audio from one source to one destination—such as from ADAT to the 1212 I/O and vice versa—you don't need word clock. Word clock usually becomes necessary only when combining digital audio streams from multiple sources.—Steve O.

IT'S LOGICAL

The September 1996 article "The Budget Desktop Studio" mentioned that *Logic Audio* for the Mac supports the SDII plug-ins. How does *Logic* do that?

Alexander Khatchadourian Glendale, CA



Alexander—As noted in "The Budget Desktop Studio," Emagic's Logic Audio is one of several host programs that accept Sound Designer II plug-ins. Installation is simple: just drag the plug-in into the SDII Plug-Ins folder, which the host program's installer created. It's just like installing a plug-in into a Web browser. The next time you launch the host program, the plug-in should show up in the host's DSP menu. For details on how plug-ins work, see "The Hitchhiker's Guide to Plug-Ins" in the July 1995 EM.

By the way, Digidesign just announced the release of Sound Designer II 2.82, which runs on PCI Macs and adds some new features. (We'll provide details in next month's "What's New" column.) However, SDII plug-ins work only with NuBus Macs. Comparable PCI plug-in support will arrive with Digidesign's new AudioSuite plugin format for Pro Tools 4.0—Steve O.

NOT SO SILENT

Brian Knave, in "Silent Partners" (August 1996), says, "A standing wave is an unnatural-sounding peak or dip in bass response caused by sound waves as they bounce back and forth between parallel surfaces." Although they may be more prominent between parallel walls (because of coincident modes resulting from symmetry) and in the bass register (because the peaks and dips can take up more space than in the treble), standing waves can exist in any shape room that is not too damped, and they can exist in any register. Just thought I'd set the record straight!

Michael O'Neill loquitur@bif.com

ERROR LOG

October 1996, "Ensoniq MR-Rack," p. 139: The author mentions it would be cool to be able to bend a single Sound from unison into a chord. According to Ensoniq, this can be done using the Pitch Modulator. Also, the "Sound Programming" sidebar on p. 140 declares, "You can't edit MR-Rack Sounds or Layers without a computer." In fact, you can edit Sounds from the front panel. As stated, you need a computer and editing software to edit Layers or create Sounds from scratch. Finally, the manual has been improved since we saw it and now lists the drum sounds and identifies which waves are single and which are multisampled.

October 1996, "Cool Tools," p. 50: The sidebar "Icy Cold Mac Shareware" contains a few inaccurate Web addresses. The correct address for the HyperArchive is http://hyperarchive.lcs.mit .edu/HyperArchive.html. Yes, those uppercase letters do make a difference; everything after the first single slash is passed on to the host computer, and some of these servers are case sensitive. The addresses given for downloading MIDIGraphy 1.2.3 and SoundHack 0.868 are incorrect, as well, but these programs are also available from the HyperArchive.

WE WELCOME YOUR FEEDBACK.

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



Over the years many electronic drum lines have become extinct. Only one has become distinct. At Roland, we've been designing

world class electronic percussion for a quarter of a century. And it shows. Today we carry the widest selection of kits, pads, sound modules and accessories in the business. See for yourself by visiting your Roland dealer or call (800)386-7575 to order The Electronic Percussion Demo Video (\$5.00). Then commit yourself to a truly distinctive electronic drum line. And don't be surprised if your reputation grows like ours has.





str to ke MDM-

Sony introduces the mini stu a better idea wh

From the people who created the MiniDisc format comes the home studio that makes it easy to keep creating. The Sony MDM-X4 Recorder.

How does incredible recording and mixing flexibility sound?

With MixWrite you can mix 4 tracks down to 2 "virtual" tracks on the same disc. With the X4's sophisticated song and track editing functions, you can record and

Nailing
the hook is
as hard as ever;
capturing it,
however, just
got easier.

Here's a machine that can keep up with your ideas.

It uses a digital optical disc which is read by a laser, just like a CD.

So now you can edit with instant access to any track without the waiting that comes with cassette

and rewind.

And it's

easy

to use,

with a

jog shuttle

knob that

, fast forward

helps you find what you're looking for faster.



Your search is over: the new Sony MDM-X4 4-track recorder finds edit spots instantly, among other things.

combine 8, 12 or more tracks, creating complex productions that go far beyond what is possible with traditional cassette-based mini studios.

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dio for musicians who know en they hear one.



you can actually operate multiple X4s from your MIDI sequencer.

And the built-in 10-input mixer helps you come up with the perfect stereo mix.

Designed by engineers, priced by musicians.

The X4 is a great mix of low price and digital performance.

140MB, 21% x 21%

Goodbye, tape hiss, wow and flutter. Hello, 37 minutes of 4-track digital audio.

With the Sonv MDM-

X4 you're recording onto a digital optical disc. That means improved sonic performance and no crosstalk. No need for

noise reduction.
No heads to clean.
And no generation

loss for near CD quality sound.

Compare MiniDisc with tape



and you'll weep at the difference.

Some things actually get better as they wear out. Tape is not one of them.

Tape stretches and deteriorates the more it's used, a fine idea if you're talking jeans, lousy when it comes to tape.

But with the Sony X4, there is no tape.

No tape to break. No tape

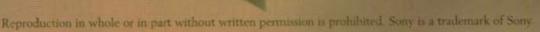
to wear out. No
tape to fast forward
and rewind. In fact,
with the X4 you can
rerecord over the same
section a million times
with no loss of quality,
making MiniDisc the cost-

efficient way to go. Not to mention the most durable.

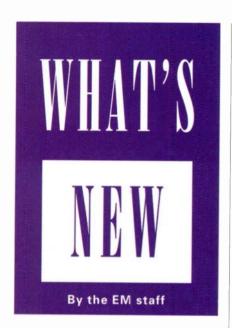
MiniDisc is the way to go digital. Sony is the way to go MiniDisc.

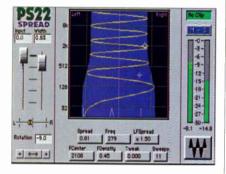
See your Sony dealer for a hands on demo. For more information and the dealer nearest you, call 1-800-635-SONY, ext. X4.











▲ WAVES PS22

aves' new PS22 StereoMaker TDM plug-in (\$1,169) creates a stereo image from mono sources and can also enhance the spread of a stereo mix. The program's graphic interface displays position as a function of frequency and lets you place specific sounds anywhere in the stereo image.

Waves claims that *PS22* processing results in no interchannel phase difference (a common problem when "stereoizing" mono sources) and causes little coloration, although changing the stereo spread necessarily results in some change in the perceived tone.

When working with stereo sources, *PS22* can be used to "spread" each sound around its original stereo position. The goal is to give sounds a perceived size rather than having each sound seem to come from a point source in the stereo field. Waves; tel. (423) 689-5395; fax (423) 688-4260; e-mail waves@waves.com; Web http://www.waves.com.

Circle #401 on Reader Service Card

INFUSION I-CUBE SYSTEM

Infusion Systems' I-Cube System (\$595) is designed to let you control your MIDI setup using practically anything. The I-Cube's digitizer translates control voltages (0 to 5V) from sensors into MIDI messages, which can be processed with the I-Cube software. The unit has 24 12-bit inputs and eight 8-bit inputs

that can double as 1-bit (switch) outputs.

The package comes with six sensors as well as an LED and a relay switch. Two of the sensors respond to illumination; the other four respond to contact pressure, temperature, close proximity, and rotation angle. A variety of additional sensors are available, including acceleration and tension sensors (prices tba) and a distance sensor with a range of six meters (\$148). Infusion's Touchglove (\$198) has a contact-pressure sensor in each finger.

The Macintosh version of the *I-Cube* software consists of object definitions for use in Opcode's *MAX* programming environment. These object definitions let



you map signals to any MIDI message, scale and quantize signals, send on and off messages to the digitizer's outputs, and reconfigure the digitizer via SysEx.

The Windows 3.1/Windows 95 program (which should be ready by the time you read this) is a stand-alone application that does not have the Mac version's flexible routing and scaling abilities. In stand-alone mode, the digitizer sends continuous controller messages on one MIDI channel. User configurations can be stored in eight patch-memory locations. Infusion Systems; tel./fax (604) 253-0747; e-mail info@infusionsystems.com; Web http://www.infusionsystems.com.

Circle #402 on Reader Service Card

AKAI CD3000XL

f you're looking for a full-featured, expandable sampler, you might want to sample Akai's CD3000XL (\$2,495). Like the original CD3000, the new unit is designed for sampling from CD in the digital domain. The 3U rack-mount device offers a built-in 4x CD-ROM drive and comes with 8 MB of RAM (expandable to 32 MB with standard SIMMs). The large, backlit, graphic LCD display allows onboard waveform editing.

The CD3000XL can play SMFs and can record stereo audio direct-to-disk (for flying in vocal tracks, for example). It comes equipped with ten outputs (a stereo pair plus eight individual outs), S/PDIF digital I/O, and SCSI.

Like other XL-series samplers, the CD3000XL is compatible with Akai's Modular Editing System (M.E.S.A.) sample-editing software, which is provided with the unit. M.E.S.A. lets the user transfer and edit CD3000XL samples

and program data, save and load AIFF and Sound Designer II files, and manage a large sample library.

Three option boards are currently available to expand the CD3000XL's capabilities. The SampleVerb 4-bus multieffects processor (\$399) provides up to six simultaneous effects, and the Pro-Filter (\$399) offers highpass, bandpass, and swept peak-notch filtering. The CD3000XL has room for two FMX008 Flash ROM boards (\$1,079 ea.), each of which provides 8 MB of nonvolatile flash ROM. Akai Professional; tel. (817) 336-5114; fax (817) 870-1271; e-mail akaiusa@ix.netcom.com; Web http://www.akai.com/akaipro.

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6 PENI

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Studio Vision Pro 3.5

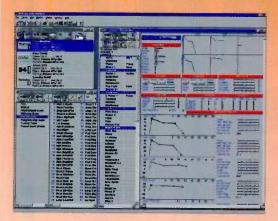
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www.opcode.com

Don't wait for a full moon or a lucky penny. Find out what's new anytime at Opcode's web site—open 366 days in a leap year. Check out all the new releases and upgrades including: Studio Vision Pro 3.5, the Studio 64X cross-platform MIDI interface, Musicshop 2.0 for Windows and Macintosh, Overture 2.0 and MAX 3.5.

See ya' in a couple minutes...

REV UP! A A A



SOUND QUEST

Sound Quest has released MIDI Quest 6.0 (\$249 CD; \$269 disk; \$79 upgrade) for Windows 95, NT, and 3.1. The 16-bit and 32-bit programs are included in one package. The new version features user-definable Floating Editors—patch-editing windows that stay on top of other windows so you can access selected instrument controls while working in your sequencer.

A new feature that Sound Quest calls Virtual NRPNs allows you to map a MIDI controller to one or more parameters in a patch editor. In response to controller messages, the program modifies the patch and sends SysEx to the instrument, giving you real-time control over any SysEx-modifiable parameters.

MIDI Quest 6.0 comes with new definitions for more than 60 instruments, including the Alesis QuadraSynth Plus, QS6, QS7, QS8, and DM5; Ensoniq DP/4; Korg Trinity, N264, and N364; Roland Sound Expansion series, SC-88, and MGS-64; and Peavey Spectrum series. All told, the program now supports more than 250 instruments.

The CD-ROM version offers extra goodies, including video tutorials and more than 50 MB of SysEx data, which provide more than 30,000 patches, Voices, Multis, and drum setups.

The programs require an 80386 or better PC with 4 MB of RAM and Windows 3.1 or higher. Sound Quest; tel. (800) 667-3998 or (604) 478-4337; fax

(604) 478-5838; e-mail: 76702 .2205@compuserve.com; Web http://www.squest.com. Circle #404 on Reader Service Card

WAVES

If you work with a lot of sound-file formats, you will be glad to hear that Waves has updated their batch conversion program, WaveConvert (\$300). Mac version 1.6 and Windows

version 1.3 are included in one package. The Mac version now supports QuickTime and Flattened QuickTime formats, and you can convert to these formats from within QuickTime and apply separate conversion parameters to each QuickTime audio track. When converting between SDII and AIFF files, the regions, markers, and loops are preserved.

WaveConvert can now play back SDII, WAV, and QuickTime files. Special RealAudio filters are included to prepare audio for the Internet; these filters are designed to boost presence by applying limiting and by removing some bass frequencies. Other new features include a quantization-noise gate, improved dithering, custom creator IDs, and filename extension handling.

New in the Windows version are support for AIFF files, quantization-noise gate, and conversion to and from any sampling rate between 3 and 48 kHz.

WaveConvert 1.3 for the Mac requires a 680X0 machine with FPU or a Power Mac with 8 MB of RAM, System 7.1 or higher, and Sound Manager 3.0 or higher. The Windows version requires an 80386 or better PC with 8 MB of RAM and Windows 3.1 or 95. Waves; tel. (423) 689-5395; fax (423) 688-4260; e-mail waves @waves.com; Web http://www.waves.com.

Circle #405 on Reader Service Card

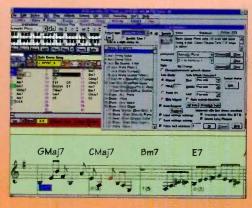
PG MUSIC

G Music has upgraded its awardwinning Band-in-a-Box accompaniment software for Windows to version 7.0 (\$88; upgrade \$49). The most important new feature is Automatic Soloing. When you type in the chords to any song, this feature creates and plays an improvised solo in the style you choose. More than 100 Soloist definitions are included, and you can create your own Soloists by setting parameters, such as instrument type and range, phrase lengths and spacing, Soloist style, and how "outside" the usual scales the solos should be. The solo is placed on a second melody track; previous versions had only one melody track.

Band-in-a-Box 7.0 also lets you change Styles at any bar in a song, enter chords using a MIDI keyboard, and tap in tempos on the keyboard. An Intelligent Humanize routine has been added to combat the stiffness that can result from quantizing melodies. The notation and lyrics can be set to scroll a bar or two ahead as the music plays, which helps when sight-reading from the screen.

Other new features include a streamlined patch-selection dialog box with a customizable patch list and support for Roland GS and Yamaha XG units. PG Music; tel. (800) 268-6272 or (604) 475-2874; fax (604) 475-2937; e-mail 75300.2750@compuserve.com; Web http://www.pgmusic.com.

Circle #406 on Reader Service Card



For Musicians Who Bought The Other Digital Multitrack Sorry!



For The Rest Of You

Your Time Has Come.

Now you can have the digital multitrack you really want. Designed specifically for musicians, the DA-38 is packed with new features and uses the same award winning Hi8 format and technology as TASCAM's highly acclaimed DA-88. The same quality, durability

and dependability. And the same great sound. The DA-38 is



completely compatible with the Hi8 machines used by post-production pros. Pros who can afford anything — but won't settle for less than

the best. Till now, the best has had its price. But for the musician, your time is here. At \$3,499* Hi8 is priced for you. So get to your dealer and buy your first DA-38. You won't be sorry!



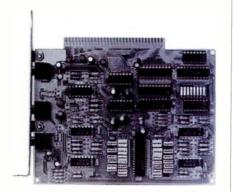
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Take advantage of our experience.

WIDIMAN EQ MAN

he EQ Man (\$99.95) is a stereo, 7-band graphic EQ on a 16-bit ISA-bus PC card. The center frequencies are fixed at 60 Hz, 160 Hz, 400 Hz, 1 kHz, 2.5 kHz, 6.3 kHz, and 15 kHz, with 12 dB boost/cut available on each band. EQ settings and volume can be changed from the included Windows 3.1/95 software or via MIDI, and settings can be loaded and saved. The software offers stereo-pair linking of any band and sports a Flat (bypass) button.

The EQ Man provides stereo input, output, and auxiliary input on %-inch minijacks. Multiple cards can be installed to provide additional channels of EQ. The card's signal-to-noise ratio is rated at 82 dB and THD at 0.01% (1 kHz, 0 dB). Midiman; tel. (818) 445-2842; fax (818) 445-7564; e-mail midiman@midifarm.com; Web http://www.midifarm.com/midiman.

Circle #407 on Reader Service Card





TURTLE BEACH PINNACLE

urtle Beach released the MultiSound Pro Series ISA audio cards, which feature 20-bit A/D and D/A converters. Leading the line is the MultiSound Pinnacle (\$429), which uses Turtle Beach Hurricane architecture to accelerate data transfers from card to disk. The Pinnacle also includes an onboard Kurzweil M.A.S.S. General MIDI synth engine with effects. The card is Windows 95 Plug 'n' Play compatible and comes bundled with Voyetra's Digital Orchestrator Plus digital audio sequencer.

The stock unit does not include sample RAM, but the user can add up to 48 MB of RAM by installing standard 72-pin PC

SIMMs. A Wave Blaster port admits an optional second synthesizer daughter-board. According to Turtle Beach, the Pinnacle boasts an impressive signal-to-noise ratio of >97 dB.

The MultiSound Fiji (\$299) offers the same DACs, specs, Plug 'n' Play compatibility, and optional daughtercard as the Pinnacle but does not include the synthesizer.

Either card can accept a Pro Series daughterboard (\$70), which provides S/PDIF digital I/O. Turtle Beach Systems; tel. (510) 624-6200; fax (510) 624-6291; e-mail sales@tbeach.com; Web http://www.tbeach.com.

Circle #408 on Reader Service Card

► B.P.M. CR-73-II

That's new from the land of sauerkraut, Volkswagens, and some of the finest microphones money can buy? Let's start with the CR-73-II (\$999.95), an affordable studio mic from German manufacturer B.P.M. Studio Technik. The CR-73-II is a large-diaphragm condenser mic that features switchable cardioid and omnidirectional polar patterns, a 10 dB pad, and a 10 dB bass rolloff at 80 Hz. The mic operates on standard 48V phantom power and comes packaged with a cable, windscreen, and shockmount in a sturdy aluminum road case. Frequency response is rated at 40 Hz to 18 kHz and maximum SPL at 124 dB.

B.P.M. also offers five other large diaphragm mics, all with switchable cardioid and omni patterns. Three of these are tube mics: the CR-76 (\$1,499.95), which handles up to 124 dB SPL and ranges from 40 Hz to 18 kHz; the TB-94 (\$1,599.95), which goes all the way down to 20 Hz and handles up to 134 dB SPL; and the transformerless TB-95 (\$1,849.95). The other B.P.M. large-diaphragm mics are the transformerless CR-95 (\$1,199.95) and the CR-73 (\$899.95).

Rounding out the B.P.M. line are the CR-79ST (\$539.95) condenser microphone, which is designed for onstage use, and two small-diaphragm condensers: the cardioid CR-4N (\$469.95) and the omnidirectional CR-4K (\$489.95). B.P.M. USA; tel. (305) 588-7008; fax (305) 266-6803; e-mail bpmstusa@aol.com; Web http://websamerica.com/bpmusa.

Circle #409 on Reader Service Card





The VTP-1 Story

We had been upgrading our studio but there was still something missing. You told us that some tracks just sounded too clinical, too brittle, especially the vocals. With all the new technologies available, name of us seem to capture the warmth that can still be heard in 25 year-old classic recordings.

So, we took a fresh look at equipment designs behind those classic recordings, added what we've learned since then and came up with the VTP-1.

Designed for tracking, mixing and mastering, the VTP-1 meets the challenge of today's studios. Two discrete, metered channels

of vacuum tube preamplification and 4-band semi-parametric EQ allow for dual mic recording, as well as incividual instrument processing and tone shaping. 18-bit digital converters and AES/EBU and S/PDIF output formats mean that you can use your multitrack digital recorder, or for mastering from analog to DAT.

The VTP-1, another vocal solution from Digitech.

Available at your dealer now.

the VTP-1 to interface directly to

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2 CHANNEL VACUUM TUBE MIC PRE-AMPLIFIER WITH DIGITAL OUTPUTS

SOUND ADVICE A A A

DIGITAL KITCHEN

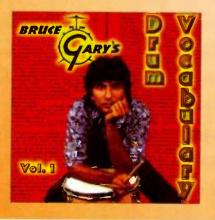
he Digital Kitchen has released *The Low End: Bass Loops*, vol. 1 (\$49.95), an audio sample CD featuring more than 74 minutes of bass grooves performed by Akil Wemusa. There are 732 grooves, for a total of more than 1,000 measures, arranged by tempo, tonal key, and type of loop: Slap Bass, Fingered Bass, and Filter Envelope. The filter envelope effect varies the emphasized frequencies of the bass, and the envelope controls the progression of the filter. Wemusa supplies funk, soul, jazz, hiphop, and trip-hop grooves.

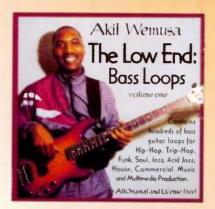
Akil performed on a Music Man Sterling Bass and was recorded from an Eden WT-800 bass head through a Studio Technologies Mic PreEminence preamp into a Digidesign Pro Tools III system. The Filter Envelope loops use a Mutron III+ or a DOD Green Box and are digitally compressed with Sound Designer II. Otherwise, these sounds were recorded completely flat and unprocessed. I & Eye Productions (distributor); tel. (800) 726-7664; fax (510) 625-7999; e-mail info@dkitchen.com; Web http://www.dkitchen.com.

Circle #410 on Reader Service Card

CYDONIA PRODUCTIONS

rummer Bruce Gary's credits include The Knack's platinum album Get the Knack (featuring the platinum single "My Sharona") and work with such artists as Bette Midler, George Harrison, Bob Dylan, and Yoko





Ono. Gary has recently released *Bruce Gary's Drum Vocabulary* (\$79.95), an audio-CD compilation of rock drum beats. Produced by Steve Deutsch of MARS recording, the disc contains more than 300 drum loops at tempos from 69 to 179 bpm and more than 200 individual hits. Most of the loops are four bars long, consisting of a 2-bar phrase repeated twice. Only a few fills are included. Gary was sampled on two drum kits, both of which include Gretsch drums and Paiste cymbals. Cydonia Productions; tel. (310) 260-9988; fax (310) 260-9944.

Circle #411 on Reader Service Card

► 3D SOUND

D Sound records samples using a proprietary binaural process designed to give the impression of a 3-dimensional soundscape when the sounds are played back on regular stereo speakers. The company recently released two audio sample CDs, 3D Drums, vol. 1, The Stingray Kit and 3DSFX, vol. 1, Industrial Sound Events (\$99.95 each).

The Stingray Kit contains 1,200 hits and licks played by drummer Gary Ponder and engineered by Franz Pusch. The collection is divided into three sections containing eighteen to 38 tracks each (one track per instrument), with each track containing numerous samples of the instrument.

The Recording Studio section contains 38 tracks with twelve to 27 sam-

ples recorded from the drummer's perspective in a large, wood recording space. The Perspectives section includes samples recorded from locations where you wouldn't normally stick your head, such as inside the kick drum or under the snare. There are eighteen tracks in this section with one to sixteen samples in each. The P.A. System section has twenty tracks with ten to 38 samples each. These are hits played through a P.A. and sampled from second row center in a 500-seat venue.

The roster of drums includes a selection of brass, steel, and fiberglass snare drums; power-wedge (curved) and normal, straight-sided toms; four sets of hi-hats; and a sizable array of ride, crash, splash, china, and effects cymbals. Two different-sized kick drums (16 x 20 and 16 x 22) are sampled with a variety of beaters including soft felt, hard felt, wood, rubber, and plastic. Drum hits are recorded with wood-tip sticks as well as felt-tip sticks, mallets, and bundles of dowels.



Industrial Sound Events contains 183 samples of industrial tools divided into 58 tracks. Tools such as grinders, lathes, and chains were recorded in a factory environment. Some factory-floor ambiences are also included. 3D Sound International; tel. (714) 643-7666; fax (714) 643-7615; e-mail dddsound@ix.netcom.com; Web http://www.3dsound.com/3d.

Circle #412 on Reader Service Card

CREATE YOUR SPACE

ALESIS

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The Alesis MidiVerb 4 is the best solution for full-featured, completely programmable reverb and multieffects. Its algorithms for reverb, chorus, flange, delay, rotary speaker simulation and special effects are beyond compare. It offers up to three great-sounding effects at once, and lets you change programs and parameters in real time using MIDI controllers like foot pedals or keyboards. Its incredible sonic fidelity comes from 18-bit digital converters, a 24-bit internal DSP and a professional 48kHz sampling rate.

But the key to MidiVerb 4's power is that every program offers dozens of detailed parameters that let you create the perfect effect for every environment. And since it's also easy to use and surprisingly affordable, MidiVerb 4 is the obvious choice for musicians and engineers looking to expand their effects processing horizons.

Start creating your space with the MidiVerb 4. It's at your Authorized Alesis Dealer now.

For more information on the MidiVerb 4. visit your Authorized Alesis Dealer or call 800-5-ALESIS.

Alesis and MidiVerb 4 are registered trademarks of Alesis Corporation.

Alesis Corporation 3630 Holdrege Avenue Los Angeles CA 90016 800-5-ALESIS alecorp@alesis1.usa.com

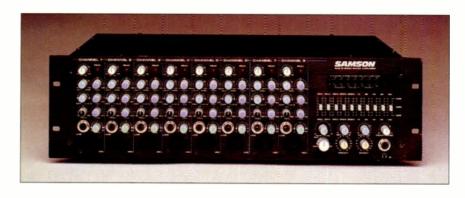
ALESIS

► SAMSON SD8

rigs to gigs, so a powered mixer that includes effects is a particularly welcome product for many club bands. Samson's 3U rack-mount SD8 stereo mixer amp (\$999) offers eight input channels, delivers 250 watts per side into 4 ohms, and includes digital time-based effects from Zoom.

Each channel features an XLR mic input with trim control, a balanced ¼-inch line input (which accepts signals from -20 to +10 dBu), gain and pan pots, peak LED, two aux sends, and 3-band channel EQ.

The master section includes a 10-band stereo graphic EQ, two stereo effects returns with level controls, 48V global phantom power, and a built-in headphone amp. Individual rotary level controls are supplied for main output, monitor output,



and headphone output. Two 7-segment LED meters display the output signal level. A relay prevents audible "thumps" when powering on and off.

The sixteen built-in Zoom effects include delays, chorus, gates, flanging, 2-octave pitch shift, tremolo, echo, noise reduction, and wide variety of reverbs. Two effects can be connected in series

or parallel. Each effect has sixteen preset variations, but there are no adjustable parameters except for the wet/dry mix.

Samson rates the unit's THD at 0.01% typical and its frequency response at 20 Hz to 40 kHz (±1 dB). Samson Technologies; tel. (516) 364-2244; fax (516) 364-3888; e-mail sales@samsontech.com.

Circle #413 on Reader Service Card

▼ BEHRINGER MX 3282

esigned for both sound-reinforcement and studio applications, Behringer's new Eurodesk MX 3282 32-channel, 8-bus console (\$1,995) offers 24 mono mic/line channels and four stereo channels. Servo-balanced mic inputs offer gold-plated Neutrik XLR con-

puts offer gold-plated Neutrik XLR conter, The s

nectors. The 48V phantom power can be globally defeated.

The mono channels feature insert points and 3-band semiparametric EQ (sweepable mids from 100 Hz to 8 kHz, high and low-shelving at 12 kHz and 80 Hz, respectively) with 100 Hz low-cut filter. The stereo channels provide 4-band

EQ with fixed mids at 800 Hz and 8 kHz. All channels provide mute, pan, solo, PFL, and channel-overload LEDs. The MX 3282's eight subgroups also provide insert points, pan, and solo.

The MX 3282 features eight aux sends per channel, each with solo-in-place and PFL. Aux sends 1 and 2 are fixed prefader, aux sends 3

and 4 are fixed postfader, and aux sends 5 through 8 can be switched to pre- or postfader as a block. All eight aux sends are post-EQ but can be modified to pre-EQ. The four stereo aux returns also feature individual solo switches, and returns 1 and 2 can be assigned to any stereo mix bus.

Additional MX 3282 features include 60 mm logarithmic faders; bar-graph meters; a talkback microphone that is assignable to all prefader aux sends and headphones; separate headphone, recording, and monitoring outputs; a mono switch; 2-track tape-return on RCA connectors; and a BNC lamp socket. Samson Technologies Corporation; tel. (516) 364-2244; fax (516) 364-3888; e-mail sales@samsontech.com.

Circle #414 on Reader Service Card

► SENNHEISER MD421 II

Sennheiser's classic MD 421 cardioid, dynamic microphone has been upstaged by a new, improved version, the MD 421 II (\$485). The new mic incorporates all the characteristics of its predecessor but, according to Sennheiser, has a faster response and sounds more open and transparent. Also, thanks to better materials and modern manufacturing techniques, the mic is more rugged and less sensitive to dust and

humidity than the original MD 421.

Like its predecessor, the MD 421 II has a 5-position bass rolloff switch. The new switch, however, is contourfitted to the housing, resulting in a slightly shorter mic. Sennheiser rates the mic's frequency response at 30 Hz to 17 kHz and maximum SPL at 175 dB. A locking mic-stand holder is included. Sennheiser Electronic Corporation; tel. (860) 434-9190; fax (860) 434-1759; e-mail miclit@sennheiserusa.com;



Web http://www.sennheiserusa.com.

Reader Service Card not available



YOUR POTENTIAL AS A MUSICIAN IS STARING YOU RIGHT IN THE FACE.

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AP PROFESSIONAL

he Sonic CD-ROM for Desktop Audio Production (\$44.95; Mac/Windows versions on one disc), published by Academic Press Professional, is a guide to producing audio for multimedia. Written by Durand R. Begault, a visiting researcher for NASA who has taught electronic and computer music at several California universities, the CD-ROM includes 276 pages of instruction with numerous color illustrations and 315 sound examples embedded in the text.

Topics begin with frequency and pitch, intensity and loudness, and spectra, modulation, and phase. The text also covers sound authoring, miking, recording, digitizing, and editing. A chapter is devoted to digital signal processing and another discusses 3-dimensional sound. A section of simple tests also helps you evaluate and fine-tune the performance of your computer's play-back system.

The program is bundled with Sound-Hack, a sound-file utility program for the Mac. The program requires a Mac with System 7.0 or later (Sound Manager 3.0 or later recommended) or a PC running Windows 3.1 or later, 256-color monitor, 16-bit stereo sound capability, and stereo loudspeakers or headphones. Academic Press Professional; tel. (800) 3131-APP; fax (800) 874-6418; e-mail app@acad.com; Web http://www.apnet.approfessional.

Circle #415 on Reader Service Cara

V SDG SOFT

DG Soft's Guitar Magic (\$139) is a 2-CD-ROM multimedia educational program aimed at the beginning through advanced guitarist. It includes examples and study of blues, rock, metal, jazz, country, pop, classical, jazz fusion, and neoclassical fusion styles. The program is broken into seven sections. The School section provides video and voice-guided instruction.

There is also an interactive Library of chords, scales, and arpeggios, a Tunes area for storing personal transcriptions, and a Licks collection that plays back audio recordings integrated with a fretboard display and a display of the chords, scales, and arpeggios that the licks are drawn from. Jam Sessions presents a dual-fretboard display for study of rhythm and lead playing. The user can mute either part and



play along. A guitar-oriented sequencer is provided in the Studio section. A Gym section includes exercises to build hand strength and agility.

Guitar Magic allows teachers to create HTML files (which may include text, graphics, voice, video, and song files) that can be incorporated into the program. The program requires an 80486 or better PC with 8 MB of RAM, Windows 3.1 or 95, a sound card, and a CD-ROM drive. SDG Soft; tel. (800) 477-7341 or (713) 859-0236; fax (520) 717-2298; e-mail mail@sdgsoft.com; Web http://www.sdgsoft.com.

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COOL BREEZE SYSTEMS

ool Breeze Systems has released an educational CD-ROM designed to teach basic operation of hard-disk recording, with a focus on Digidesign products. *Cool School Interactus*, vol. 1 (\$99.95) includes more than 90 movie tutorials, 500 pictures and flow charts, and a 1,200-term glossary.

Beginning lessons are provided on sound fundamentals, computer basics, MIDI, and digital audio. Other units cover synchronization, system upkeep, and Digidesign's Pro Tools, Sound Designer II, and SampleCell II. The lessons are made up of text, sound, pictures, flowcharts, movies, and interactive examples.

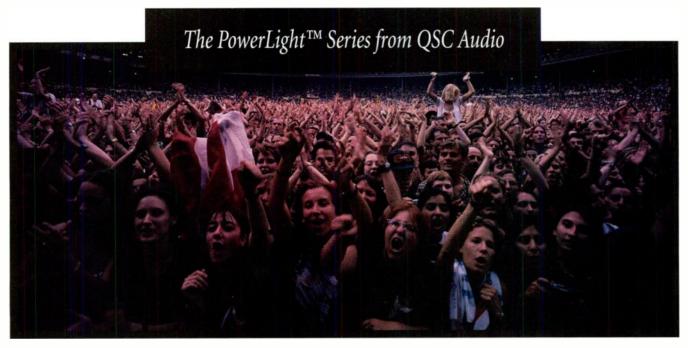
Locator XL (\$39.95) is a supplemental program that provides Spanish, French, and German versions of the glossary as well as improved navigation features and the ability to access quizzes and exercises from within Cool School. Locator XL can also be purchased as a stand-alone glossary.

Another option, the stand-alone program *CSi Quizmaker* (\$199.95), allows you to create quizzes that students can access from within *Cool School Interactus*. (Locator XL is included with *Quizmaker*).

The program requires a 68040 or faster Mac with System 7.0 or later and 8 MB of RAM or an 80486/66 or faster PC with Windows 3.1 or 95, 8 MB of RAM, and a 16-bit sound card. Cool Breeze Systems; tel. (614) 481-4000; fax (614) 486-4690; e-mail coolbreezesys@ee.net; Web http://www.coolbreezesys.com.

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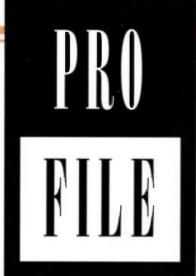
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Good Vibrations

Bryan Bogue gives his vibes a spiritual touch.

By Jennifer Conrad Seidel

ou don't see a lot of solo vibes records out there. But on Bryan Bogue's Together for Good, a light instrumental jazz CD of original compositions and new arrangements of traditional hymns, this melodic and percussive instrument is given full range. Although Bogue has performed vibes with such greats as Lionel Hampton, Mel Tormé, Henry Mancini, and the Moody Blues, he has also spent many hours working alone in his home studio, tinkering away with the mechanics of recording. A desire for "humanistic" recordings led Bogue to stretch himself in his roles as musician, recording engineer, and producer.

Although vibes are Bogue's instrument of choice, the songs on *Together for Good* aren't just backup tracks for his vibes solos. Bogue sought out other musicians to add their own touches to his songs.

"On this project, I really moved away from doing it all myself," Bogue explains. "When MIDI was introduced, I thought, 'This is great. I can do everything.' But a one-man band can get really boring."

Bogue went to such extremes to collaborate with other musicians that he had to act as a remote-recording engineer for the recording of "Forever Friend"

"I wanted to use a real grand piano, so I went to the home of the pianist for the Spokane Symphony to record her playing on her grand piano," Bogue explains. "I took my Mackie 1604 mixer and my Panasonic SV-3700 DAT deck along, close-miked the piano with two Shure SM81 condenser microphones, and conducted her through the song."

This was also the only song Bogue didn't build up from an already sequenced basic track. "I went home and flew the track from the DAT to a Fostex R-8, which was striped with SMPTE. I set the offset time on Opcode's *Vision* and sequenced the string parts along with the piano, and then I did more sequencing.

"Once the sequences were done," he continues, "I recorded the vibes and the vocalists. This process was backward compared to how I'd recorded the other songs, but it was the

only way I could record an actual grand piano."

Another part of the collaboration process that was important to Bogue was laying down scratch tracks (using *Vision*) to give the musicians an idea of what he wanted while letting them "be themselves."

"If I told them how to play everything, I might as well do it all myself," he stresses. He even revised his arrangements when another musician played something he didn't expect. In "All Creatures of Our God and King," Bogue left in a scratch track he'd laid with his vibes as a guide for the vocalist because this track ended up complementing what the vocalist actually sang.

Bogue also took a hands-off approach to recording his own parts. "I try to use my sequencer as though I'm rolling tape," he says. "I don't like to sit and quantize everything. If I do have to fix a section, I try to treat it as a phrase rather than just lining everything up. Life's not like that: our lives are not quantized."

For more information, contact Good Vibes Productions at W. 3315 Decatur, Spokane, WA 99205; tel. (509) 328-8697; e-mail bbogue@soar.com; Web http://www.soar.com/~business/b/bogue.



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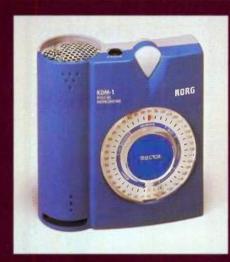
This tiny (//-rackspace) effects processor is almost literally pocket sized, yet it delivers quality reverb, flanging, chorusing, delay, and rotary-speaker emulation. A Program Adjust knob controls one predeterm ned parameter for each program. Alesis; (310) 841-2272; fax (310) 836-9192; e-mail alecorp@alesis1.usa.com. (\$179)

Crown PZM-185

This low-impedance pressure-zone microphone is handy for all sorts of recording situations. Thanks to its hemispherical polar pattern, you can place it on a wall, put it on a microphone stand, or attach it to the underside of a piano lid. Its frequency response is rated at 50 Hz to 16 kHz. Crown; tel. (219) 294-8000; fax (219) 294-8329. (\$199)











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Quik Lok QL-400

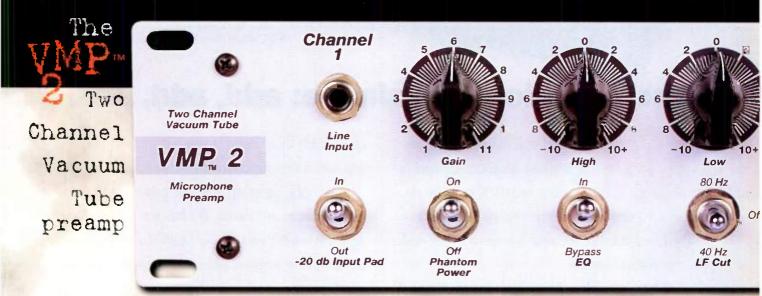
This practical stand is designed to hold auto locators but works equally well with multitrack recorders, drum machines, samplers and effects boxes. The stand has full-circle tilt adjustment and a 5-wheel caster base that locks. Music Industries Corp.; tel. (800) 431-6699 or (516) 352-4110; fax (516) 352-0754; Web http://www.musicindustries.com. (5179.95)

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This nifty organizational software for Windows can help you manage multiple mailing and phone lists, maintain equipment inventory logs, and track VIP contacts, income, and expenses. It includes a word processor and will even play MIDI and WAV files through a sound card. *Musician's Manage* requires at least an 80386 PC with 4 MB of RAM and Windows 3.1 or Windows 95. Gracenote Software; tel./fax (714) 533-4117; e-mail rhall@gracenote.com. (\$89)











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Photo shows the internal version, the RO-1420C.

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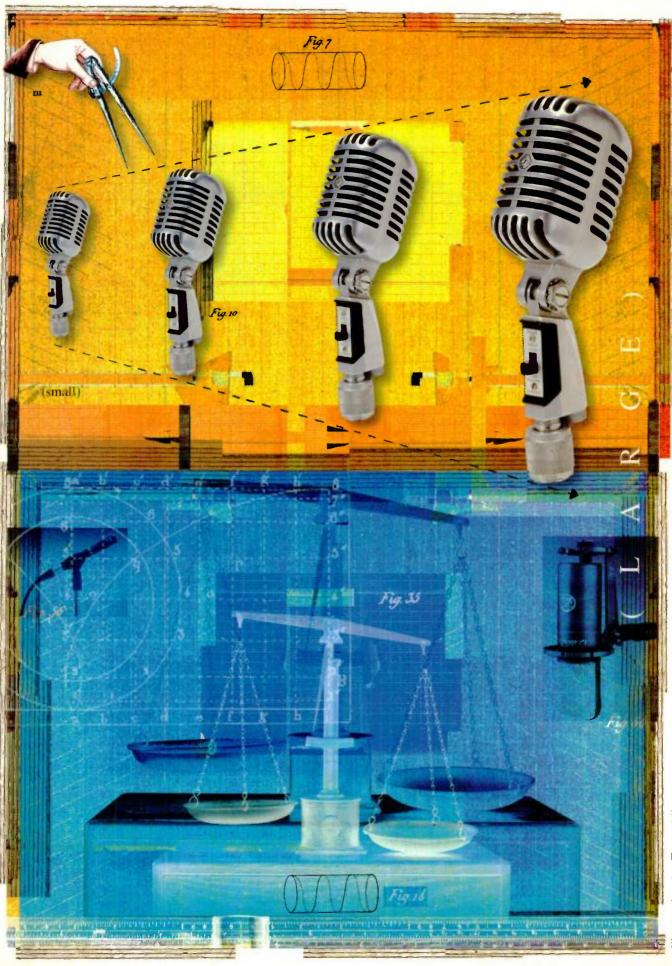


Illustration by Terry Miura

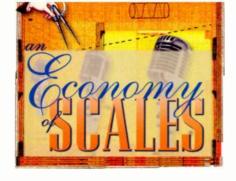
Economy of SUALLS

It's a big mistake to consider microphones as soulless mirrors of sound that simply reflect what they "hear." The truth is, hidden amongst a mic's wires and diaphragm is a living, breathing personality that shapes signals to its will. Some microphones are gruff, others refined; some treat signals delicately, others bash sound waves around like a pro wrestling team. So if you want to record exquisite audio signals, it's imperative that you ensure a harmonious match between the demeanor of the microphone and the sound the mic is being asked to reproduce.

Minimizing sonic "personality conflicts" is particularly important when using condenser microphones, as a condenser is typically more sensitive to minute tonal shadings than a dynamic mic. An optimum condenser mic collection, therefore, would be a study in schizophrenia, with a host of audio characteristics rivaling Sybil's multiple personalities.

Unfortunately, most home studio owners can't pony up the bucks for a bunch of slick mics. Don't sweat it. We have analyzed eight condensers—four small-diaphragm and four large-diaphragm models—and have documented their personality traits. Just match each mic's disposition to the sounds you typically record and decide which model works best for the majority of your studio needs. If you're flush enough to afford two mics, a combination of one large-diaphragm and one small-diaphragm condenser can be sufficiently schizoid to enhance an abundance of signals. Now, let's take a peck into these shiny little heads...

EM weighs the benefits of eight small and large diaphragm condenser mics.



BIG EGOS

Thanks to their acute sensitivity, large-diaphragm condensers are especially favored for vocal recording. (It's no accident that all the really hip vocal mics, such as the classic Neumann U 87, are biggies.) The personality issue also looms large when tracking vocals because a particular mic might, or might not, zero in on the crowning attributes of a singer's voice. In a worst-case scenario, the mic may even accentuate the bad aspects of a voice, such as a nasal quality or excessive sibilance.

The sonic benefits offered by largediaphragm mics are not limited to vocals (something I once tried to tell a freaked-out studio owner when I miked a kick drum with his precious Neumann U 67). These condensers are great for miking acoustic guitars, screaming guitar amps, grand pianos, saxophones, flutes, and just about anything that goes "boom." As with vocal recording, all you have to do is pick the best mic for the job.

Luckily, there are always a bunch of excellent large-diaphragm condensers floating around—and many of them are quite affordable (unlike that Neumann U 67!). The models "psychoanalyzed" for this article are a relatively



CAD E-300

recent crop and include CAD's E-300, Electro-Voice's RE1000, Oktava's MK219, and Rode's NT-2.

CAD E-300

Appearance-wise, the E-300 is a throw-back to the classic vocal mics of the 1950s and '60s. It's a huge, almost intimidating hunk of a microphone. Yet despite its Falstaffian girth, the E-300's flexible swivel mount makes it a snap to position the mic just about anywhere.

An ergonomic benefit of the E-300's size is that the function switches are clearly labeled and readily accessible on the front of the mic. You get a versatile menu of polar patterns (cardioid, figure-8, and omnidirectional), a 20 dB pad, and a bass rolloff. There is also a power switch because the E-300 employs two nickle-cadmium, 9V batteries to supply extra current for handling high-SPL transients. (According to CAD, some phantom-power supplies can be afflicted by "current limiting" when a condenser is hit with an extremely loud input signal.)

The mic will not operate when the power switch is off, even if phantom power from a console or mic preamp is active. I couldn't get used to turning the E-300 on, so I did a lot of running back and forth between the control room and the studio. The batteries are trickle charged by the phantom-power source when the mic is in use and automatically turn off when phantom power is not present. However, you can disable the auto shutoff mode and run the E-300 solely on battery power (for up to six hours) by moving a jumper pin inside the mic.

Personality profile: Pure sex. The E-300 is one of the most sensual vocal microphones I've ever used. The mic's presence peak seems to hit a tonal area of the voice that intensifies breathiness and "air." Every whisper, breath, and sigh is captured with astounding clarity. The E-300 was the "feel good" mic of the test; every vocalist who used it immediately relaxed into a soulful performance.

Good playmates. This is the mic for adding some luscious aural "tingles" to the human voice. The E-300 also translated well to stringed instruments—most notably acoustic guitars, violins, and zithers—adding an articulate sparkle to single notes and chords. Used as a room mic for trap drums, the E-300 delivered a very tight, aggressive



Electro-Voice RE1000

tonal picture. Not surprisingly, cymbals and stick attacks were rendered sharply, but the mic also captured the resonance of the toms and kick drum. In a classical miking position, centered three feet above the sounding board of a grand piano, the E-300 produced a wonderfully crystalline tone.

Problematic pals. On vocals, the E-300's sexy sheen comes with a price: increased sibilance. Vocalists who tend to be sibilant may *really* sizzle when recorded through the E-300. Likewise, when tracking acoustic guitars, annoying fret squeaks may be accentuated.

Case study. I needed a sexy, almost confessional timbre to inspire Cindy Smith to deliver a goosebump-raising vocal performance for her song "Swear to God." The singer/songwriter was recording her debut CD and was putting herself under tons of pressure to cut amazing tracks. The E-300 saved the day by helping Smith to relax.

The mic's heightened presence zeroed in on the fragile, wispy timbre of Smith's voice, and she liked being able to clearly hear her breaths and the air surrounding her notes. In short, she sounded sexy through her headphones, so she *sang* sexy. Her final vocal performance was achingly evocative, sensual, and moving.

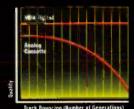
My only beef is that I can't take credit for the sensual vocal sound, as the E-300 did most of the job. I simply placed the mic approximately eight inches from Smith's mouth and set the

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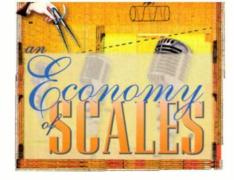
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polar pattern to cardioid. No external windscreen was employed, and the mic functions were flat (i.e., no bass rolloff or pad).

ELECTRO-VOICE RE1000

The RE1000 is a no-nonsense, no-frills microphone. You get just one internal control—a 12 dB-per-octave bass rolloff at 130 Hz—and a single supercardioid pattern. It's a tough customer, too: the mic is so ruggedly built that it could easily survive consistent live-performance abuse by brutish sound crews.

But as much as I appreciate simple, ready-for-action designs, I missed having a pad control when I used the RE1000. For studio use, this omission shouldn't be a problem because most consoles have a pad on the channel strip. However, the lack of an internal

pad could be a drag for live- and fieldrecording applications because some mic preamps and portable mixers don't have this feature. And trust me, it can be pretty demoralizing when you have one shot to get a perfect recording and a blistering input signal fries your track.

The RE1000's spartan design is carried through to its mount, which is a plastic stand adapter. Happily, the mic's slim, flat silhouette makes it possible to achieve a number of miking positions with what is basically a cheap mic clip. The adapter doesn't compromise the RE1000's functionality, but the recordist isn't exactly getting a perk, either—especially when you consider that the other manufacturers include some type of swivel mount.

Personality profile: Easygoing and trust-worthy. Of all the large-diaphragm models tested, the RE1000 was the mic that stayed truest to the source sound. However, the mic also exhibited a slight tendency towards a sedate, mellow quality. For example, when a rock tenor exploded into a high-pitched crescendo, the result was a seemingly transparent reproduction of a rock 'n' roll



Oktava MK219

yell—minus the piercing timbre that would have been accurately captured by an AKG C 414 or a Neumann U 87.

Good playmates. Because the RE1000 is darn close to being a sonic "mirror,"



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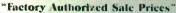


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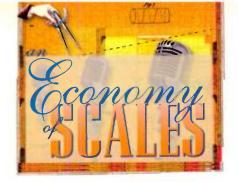
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the mic is an ideal match for any sound that cries for accurate documentation. That's a valuable trait; it's a good idea to have at least one mic in your collection that reproduces a source sound close to the way that you hear it in the actual recording environment. In addition, the RE1000's easygoing temperament makes it an excellent tool for smoothing jagged edges, such as squeaking frets on an acoustic guitar.

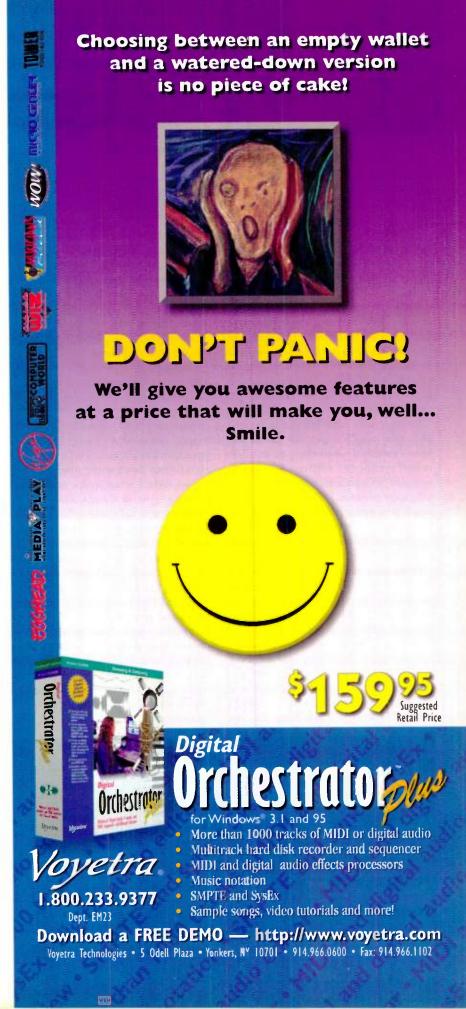
Problematic pals. If you want a mic that delivers a strong, visceral impact, don't look here. The RE1000 doesn't "do" hyper-reality or cop an attitude; it gently documents the source sound. I wasn't jazzed about the mannered sound that the RE1000 produced when I was recording acoustic guitar and piano for a rock track. However, I must admit that the colorless timbres would have worked just fine for less dynamic musical styles, where the sounds don't have to compete with pounding rhythm sections.

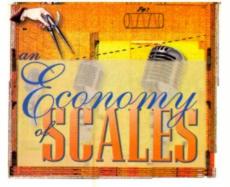
Case study. Violinists can be extremely sensitive about recording. They're used to hearing the resonance of the violin right against their ear, as well as the reflections produced by the room, so it's often a shock when they hear how a microphone translates the timbre of their beloved instrument. Place the mic too close, and the tone can be dry and abrasive; move the mic back too far, and the sound can be thin and vaporous.

Luckily, when recording master violinist Cat Taylor for a Celtic music project, I could position the RE1000 close enough to the violin to achieve a round, present tone without getting the rasp. The RE1000's mellow personality didn't emphasize the attack of the bow upon the strings. I placed the mic approximately two and a half feet from the violin, hovering about one foot over the strings and angled towards the headstock. No additional signal processing was employed, and the RE1000's bass rolloff was not activated.

OKTAVA MK219

Can you trust a Russian microphone? Dr. Strangelove and the Cold War may





was a major treat to have it included with the mic. The mount is solidly built and affords easy mic positioning whether you're miking a voice, an acoustic guitar, or even rack toms. The NT-2 itself is also extremely well-constructed. In *that* regard, the NT-2 seems like it could match Neumann for rendering many years of illustrious, trouble-free service.

Personality profile: It's a macho, macho mic! The NT-2 delivers a brilliantly aggressive character that puts the source sounds right up in your face. Vocals sparkled with an enhanced presence, drums almost leapt out of the speakers, and acoustic guitars stabbed the air with a ringing, articulate jangle. The punch and detail captured by the NT-2 produced sounds with an almost 3-dimensional quality.

Good playmates. Although the NT-2 was especially wonderful on vocals, acoustic guitars, and drums, it sounded marvelous on every single instrument it was asked to record. This is an extremely versatile microphone. In fact, if you can afford only one condenser for your mic collection, then the NT-2 should be that mic.

Problematic pals. There *were* no problems. The marvelous NT-2 records just about everything well.

Case study. During preproduction for the debut CD release by chanteuse Eva Jay Fortune, I decided to go for an "acoustic ambient" sound—that is, a soundscape that evoked the sensation of ambient dance records but was constructed with acoustic instruments rather than sequences and samples. A consistent, throbbing drum sound was critical to making this concept work,

and Fortune's drummer, while accomplished, struck his kit very meekly. As a consequence, the bass player overwhelmed the rhythm section, and the grooves lost some impact.

To capture enough oomph on the kick drum to effectively drive the tunes, I placed the NT-2 approximately six inches from the hole cut into the front drumhead. Normally, I would position the mic somewhat off-axis to the hole to avoid a punishing rush of air, but I left the NT-2 "dead on" to grab as much resonance as possible. (My mom and dad didn't raise a recording fool, however: I did activate the mic's -10 dB pad.) In this position—despite the

SMALL EGOS

The classic use for small-diaphragm microphones is recording a trap-drum kit from the "overhead" perspective. A matched pair of these condensers is typically positioned to capture a stereo image of the cymbals and the kit as a whole. The smaller diaphragm can react more swiftly to acoustic energy and therefore is well suited to handling cymbal crashes and other abrupt dynamic changes.

However, echoing the versatility of their larger siblings, small-diaphragm mics are suitable for more than just percussion duties. These condensers can add a beautiful shimmer to acous-



Audio-Technica AT4041

drummer's light touch—the NT-2 captured a boomy, chest-rattling tone.

In addition, the mic was just far enough from the source sound to invite a dab of room ambience. The short, sharp reflections added a wonderful snap to the beater strikes and produced, overall, a more dimensional tone (meaning boom and bang). The coolest thing was that no EQ or compression was needed to produce this sound: the NT-2—set to its cardioid pattern—and the mic position did the whole job.

tic guitars, brass instruments, woodwinds, and pianos. You can even use these cigar-shaped mics to capture an ambient room perspective of an entire band in performance: place two mics in a stereo configuration, and you have an instant live album!

Recently, there have been some breakthroughs in the small-diaphragm community regarding cost versus performance—a beneficial development for the consumer, to say the least. To get an overall perspective, we tested two exquisite, mid-priced models from

DAVIDS Small-Diaphragm Mics	Polar Pattern	Frequency Response	Maximum SPL	Bass Rolloff	Price
Audio-Technica AT4041	cardioid	20 Hz-20 kHz	145 dB	80 Hz	\$395
Crown CM-700	cardioid	30 Hz-20 kHz	151 dB	100 Hz	\$289
Neumann KM 184	cardioid	20 Hz-20 kHz	138 dB	n/a	\$599
Sennheiser K6/ME64	cardioid	40 Hz-20 kHz	130 dB	100 Hz	\$525

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"if doesn't communicate,...



Logic

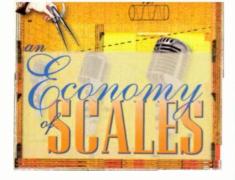
... then it doesn't really fulfill its goal. It's not doing what I think it's supposed to do. As an artist, I feel like I haven't achieved my goal unless I touch that one person out there. I DO believe that spiritually sometimes things are given to me. I mean, a melody will pop into my head and I don't know where it came from. You know, it certainly didn't come from me.

I'm fortunate enough to have a studio so I basically can record whenever I want. And so the creative process is changed. I'm just making music. Whatever pops in my head is what I'm doing; whatever style it is, that's what it is. And I'll put the album together later. Well, that's a luxury. The diversity is what is important. But in all seriousness, if you don't have the tools to make this work right, it's not going to happen. To be able to express myself and do all of the myriad of things I wanted to do. - For what I CAN do and

what I KNOW I'll be able to do in the future because there's product development going on all the time. - Seriously, I'm doing stuff I wouldn't have ever dreamed that I'd be able to do. It's not so much to do with a commitment to the product as much as I have a commitment to MY work, and the art that I'm trying to do. -It keeps me going in music. It's like, 'MAN, this is interesting! I can do this; I can do that!""

George Duke





Neumann and Sennheiser and two "price busters" from Audio-Technica and Crown.

AUDIO-TECHNICA AT4041

Slim and simple, the AT4041 offers a bass rolloff and a cardioid polar pattern. The mic is well built, well-balanced, and rugged. Freebies include a standard mic clamp (although I would not trust it for holding the mic securely in an overhead position without taping the mic to the mount), a foam windscreen, and a carrying case.

Personality profile: Big bottom. The AT4041 is one of the warmest, bassiest small-diaphragm condensers that I've heard. For most applications, I had to activate the bass rolloff because the low frequencies were way too pronounced. This was actually a welcome "problem," as these types of condensers seldom deliver hunky bass response.

Good playmates. Because of the AT4041's beefy bass, the mic kills as a drum overhead. You get the crisp highs of the cymbals and the resonance of the toms and kick drum. In fact, you could get a pretty amazing drum track by using a pair of AT4041s in a stereo overhead position. If the drummer digs in and whomps the kit, you'll get a well-balanced, slamming drum sound without resorting to close miking or putting a mic on every tom, cymbal, and snare. The AT4041 also sounded great record-



Crown CM-700



Sennheiser K6/ME64

ing background-vocal tracks: the mic captured a thick, meaty tone from four singers crowded around it in a semicircle.

Problematic pals. The AT4041's propensity towards booming lows can turn bass-heavy source sounds to mud. This is not the mic to place near the sound hole of an acoustic guitar or to position close to the body of a standup bass.

CROWN CM-700

The CM-700 is a small, squat design with a handy, 3-position bass contour switch (flat, low-cut, and rolloff). Included with the mic are a foam wind-screen, foam pop filter, carrying case, and a very tight and secure mic clamp. Like all of the small-diaphragm con-

densers tested, the CM-700 is built tough and should be able to handle live use with nary a worry.

Personality profile: Clean machine. The CM-700 is a very transparent, well-mannered mic. Everything sounds precise and clear, with no apparent high-end sizzles or midrange crankiness.

Good playmates. The CM-700 works brilliantly for just about every miking situation you could imagine. As a drum overhead, it handles cymbal crashes

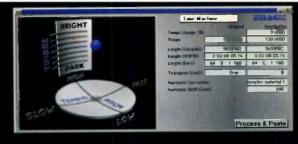
without smearing and delivers a tough, punchy tone overall. The shimmer of acoustic guitars is reproduced beautifully; the bell-like tones are even, the bass is tight, and the upper partial harmonics come through clean and appropriately ringy.

Problematic pals. No real problems, although the even tonal quality of the mic will not bowl you over with pumping bass or sizzling highs.

NEUMANN KM 184

The stumpy Neumann KM 184 is the shortest of all the small-diaphragm mics tested. However, it's built as solid as a bank vault and is virtually impervious to rough treatment. (I've accidentally dropped a few onto cement floors, and I haven't trashed one yet!) In the feature department, the KM 184 is the miser of the group, offering no bass rolloff or windscreen.

Personality profile: Brash. The KM 184 is an extremely present mic. The sound quality is so precise and detailed that cymbal crashes almost cause you to jump out of your skin—just as if you were (rather stupidly) standing right next to the kit during a live performance. The level of clarity is amazing. In addition, the mic seems "hotter" than the other models tested. When I did some tests mismatching mics for drum overheads, I always had to reduce the input level of the KM 184. The tiny little Neumann just slaughtered its



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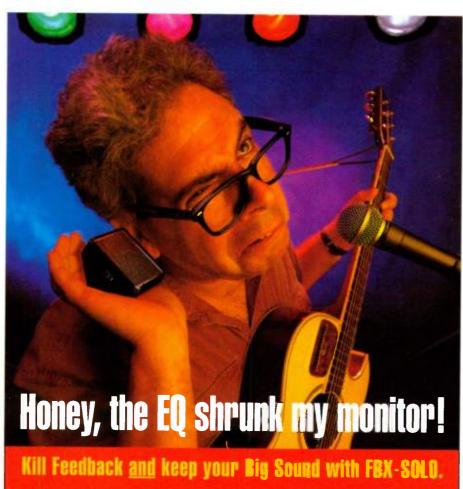
Instead of hiding behind a specific feature like: Pitch Shifting Audio or Audio to MIDI, Logic Audio provides the complete solution for Digital Audio and MIDI production. Yes, these features exist in Logic Audio, for instance Pitch Shifting Audio with Harmonic correction is available in Logic Audio 2.6. Unlike the others, the Time Machine II works with

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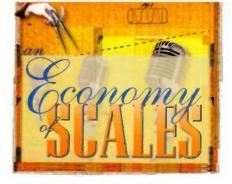
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companion mic in terms of pure volume and sharpness of tone.

Good playmates. Obviously, drum overheads are a good bet, especially if you desire an aggressive, take-no-prisoners tone. Acoustic guitars sound very tough and jangly, and pianos are reproduced with a clear, percussive attack. If you're into miking hi-hats individually, the KM 184 will deliver a smooth yet biting tone that will cut through any track.

Problematic pals. Hey, it's a Neumann; there *are* no problem pals! The KM 184 is an incredibly versatile mic that nurtures every signal it records.

SENNHEISER K6/ME64

The Sennheiser K6 system currently consists of interchangeable omnidirectional and cardioid capsules, but I tested the mic with the ME64 cardioid capsule for the sake of fair comparison. With the capsule in place, the K6/ME64 is easily the longest small-diaphragm condenser of the bunch. It is also the lightest model—solid, but not as obviously rugged as the other mics. A number of optional accessories



Neumann KM 184

are available for the system, but what you get with the basic mic/capsule configuration is a bass rolloff and a standard mic clip.

Personality profile: Sparkling. The K6/ME64 is a bright, articulate mic. High-mids and highs are exquisitely detailed and present.

Good playmates. I loved what the K6/ME64 did for acoustic guitars. All the glimmer and luster of jangling strings is wonderfully detailed. The sparkle factor certainly helps cymbals punch out of the mix when the K6/ME64 is used as a drum overhead mic, although the sound can be a little harsh if the drummer is a basher. Because the K6/ME64 goes fairly light on bass frequencies, however, it's a good choice when you want to diminish the amount of tom and kick drum bleed into the overheads.

Problematic pals. There's not a lot of low-end definition to the K6/ME64, so any source sound that requires a strong bass presence (such as tablas or cellos) should be avoided. In addition, aggressive cymbal crashes tend to smear a

little because the high-end articulation of the mic is so sharp. The K6/ME64 is not a Deion Sanders type that can fill in everywhere, but it certainly plays its position ("sparkle-back") like a champion.

FINAL WEIGH-IN

There are no winners or losers here. All of these mics are tremendous. In fact, if money was no object, I'd recommend buying the whole lot. Obviously, if you own a number of different mics, your creative options increase exponentially. That's why big studios have

massive, varied, and frighteningly expensive microphone collections.

However, if you're looking for versatility on a budget, I would choose the Rode NT-2 for your large-diaphragm mic and the Crown CM-700 for your small-diaphragm model. But my *real* advice is to save as much money as you can so you can buy every wonderful microphone that crosses your path. There is simply no surer road to sonic bliss.

EM Editor in Chief Michael Molenda is a certified microphone maniac.



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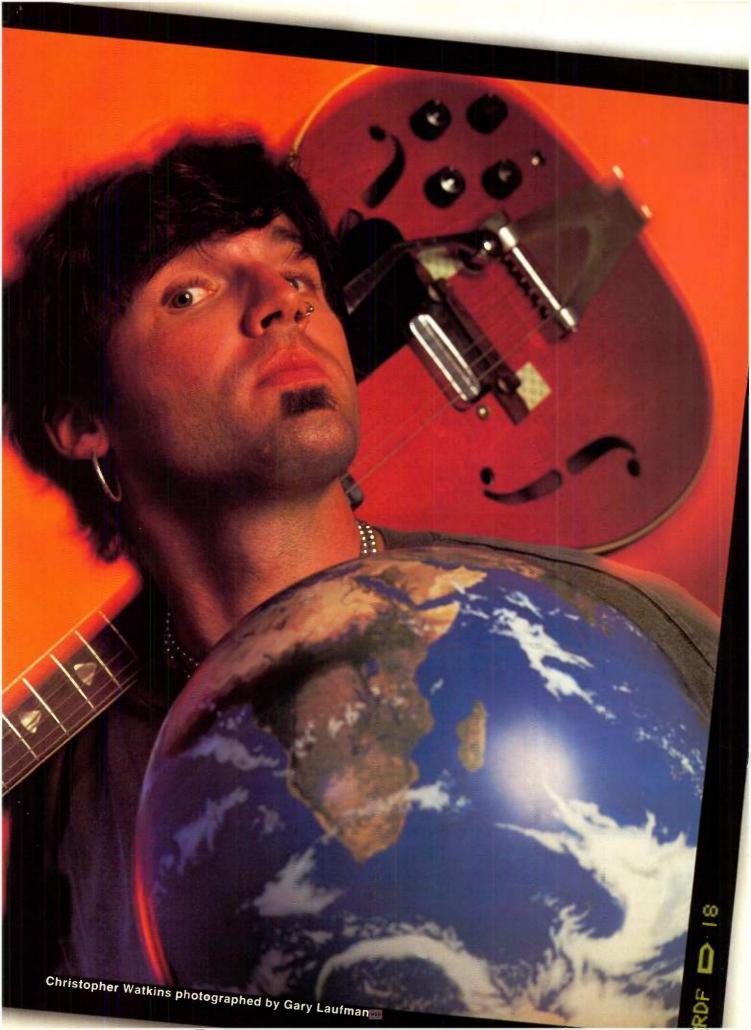
my 30-plus years on this planet (I'm not copping to any actual figures here), I have never seen any new technology inspire the kind of childlike, wideeyed, and downright zany enthusiasm that the Internet has. Drunk with ex-In citement over this burgeoning medium, millions of entrepreneurs are flocking to cyberspace, convinced that pots of gold await at the end of every fiber-optic rainbow.

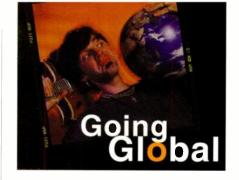
heard this kind of story before. My aunt used to reminisce about her family's move from the Midwest to Southern California in the late 1930s. She had heard so much about the glamour of Hollywood that I've she actually expected to find the streets paved in gold. Imagine her disappointment when she arrived and discovered that Tinseltown was just like any other big city: noisy and cluttered but humming at a head-turning pace. The Internet is a lot like that. Despite the fervor of blissed-out cyberdisciples, what you really find at the end of the Web's rainbow is just another crowded, highly competitive marketplace.

yet, there's no sin in being starry-eyed about a medium that connects billions of computer users all over the globe. In And fact, the real value of the Internet may be its role as the Great Equalizer. It puts people and companies around the world as close as your computer keyboard.

By Mary Cosola







When it comes to music distribution, you can't beat the Net for worldwide. direct access to listeners. Create a Web site, implement a thoughtful marketing strategy, and the planet's music fans are just a few keystrokes away. You don't have to worry about whether a label thinks your music is marketable—just bypass the clueless record companies altogether and sell your stuff over the Web. Bummed that no one in Portland, Oregon, is digging your sitar symphony? No problem. Offer music clips on your Web page, and sitar nuts from across the continents will be ecstatically downloading your opus. You don't even need to sell music from your site. Consider the Internet simply as a way to communicate with like-minded artists.

"The great thing about the Internet is that it puts us at the same level with

the major record labels," says David Hooper of Kathode Ray Music (http://www .kathoderay.org) in Columbus, Ohio. "Nobody is going to be able to get to Sony's Web site and not be able to get to ours just as easily."

Of course, to open this window to the

with EM readers. When you're through reading this piece, you'll know a good bit about links, audio formats, Web marketing, and other basic facts regarding music distribution on the Internet. So what are you waiting for?

SETTING YOUR SITES

Creating your own Web site isn't an easy task, but it isn't insurmountable, either. Plenty of resources are available to walk you through the process, from easy-to-use, "What you see is what you get" Web-design software (e.g., Adobe PageMill, Claris Home Page, and Delta-Point QuickSite) to books on HTML programming. Be sure to also check out "Square One: Internet Glossary" in the July 1996 EM. But before you get too far into the technical aspects of setting up a page, you should conceptualize your site and what you plan to offer. Take time to research other sites, not just music-related ones. As you roam, take note of what you like and dislike about the pages you encounter, and think about whether you would want to make a return visit.

"When Kathode Ray started out a

'There are 5 billion computer users in the world; why aren't we getting any hits?' Part of the solution is getting people to know about your site, the other part is getting them to come back after the first visit."

Hooper revamped his site by providing links with hundreds of indie bands, labels, and 'zines. He also started promotional gimmicks like CD giveaways. "We know so many people who are in bands," he explains, "that we tell them to send us fifteen discs and we'll give them away to people who visit our site. It's just another way for musicians to distribute their work." Kathode Ray's Web site has evolved into a valuable resource for independent artists, offering radio promotion, information on publishing contracts and trademarks, and other services.

"One of the main things we do is produce compilation CDs," says Hooper. "Our latest compilation is called *Money Talks...and Sex Sells!* Because of our Web site, we've hooked up with bands from Japan, Ireland, Germany, Australia, Canada, and South America. It's really cool that we can put together a disc with people from countries I'll probably never visit. It shows that music is universal, and there's a lot more hap-

pening than just what's going on in the United States."

Bassist John Byrnes, of the San Francisco band the Weeds, set up a Web page for his band and one for the band's label, Vibrant Records (http://www.best.com/~vibrant). His goal is

more limited in scope than Hooper's but no less ambitious: he's hoping a label will either give his band a recording contract or will pick up his label and re-release the Weeds' CD.

"I think having a Web site is proof that you're serious about your music," says Byrnes. "It takes a lot of work to put together and maintain a page. Our sites have only been up for a few months, and we've already received calls from other bands who want to be on our label and from music sites that want to review our CD. We have even received inquiries from record distributors in Asia."

Byrnes plans to update the band's club dates and change the audio clips



on graphics (above). Mike Caffrey, owner of Monster Is-

land, saves the flashier graphics for subsequent pages,

such as the various band pages, three of which are depict-

ed here. He currently offers MPEG audio and RealAudio

files for both the Macintosh and Windows platforms, with

Shockwave audio files coming soon.

world, you must get off your duff and develop a Web presence. It's not a scary proposition. Any computer-savvy

electronic musician can get a Web page up and running in a few days. (Yes, a few days!) I've interviewed some people who have made it happen and who were willing to share their experience

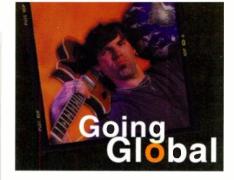
couple of years ago, my page was just about me and what I wanted do, like music publishing and radio promotion. It was really dull at first; no one was coming to visit," says Hooper. "I thought,



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frequently so that if visitors liked what they heard the first time, they'll want to come back for more. He also plans to add a page for visitor feedback. "You have to give people some form of interaction," he adds. "They love to type in comments and send them off. That's half the fun of being on the Internet."

When Mike Caffrey set out to establish his label, Monster Island Records (http://www.monsterisland.com), a Web site wasn't even in the plans. While in the process of doing the legwork to set up the record label, he received an offer of free server space should he decide to create a Web site. That's a pretty tough offer to refuse, and Caffrey didn't.

"The offer of free server space pushed me to set up the label's page, but it actually solved another, unrelated problem," explains Caffrey. "There is a story about my band, White Courtesy Telephone, in an upcoming issue of *Details* magazine. The magazine considered including a CD with each issue, but that was out of the question financially because they have about half a million subscribers. But now that we have a Web site, *Details* can publish our URL, and readers can visit our site, download clips of our songs, and check out the other bands on the label."

WEAVING YOUR WEB

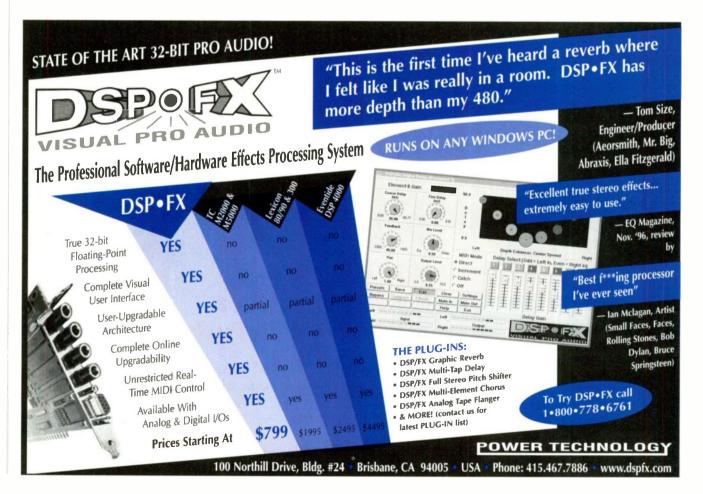
Once you have an idea of what you want to offer by way of a Web presence, you need to decide how you want to interface with those who visit your site. Designing your site isn't something to be taken lightly. Web surfers are notoriously short on patience when it comes to waiting for screens to redraw or deciphering hard-to-read information. (See "Desktop Musician: Home, Home on the Web" in the May 1996 issue for some pointers on setting up your own Web page.)

How to set up a site's graphic interface is one of the biggest questions

faced by designers. A home page that has colorful illustrations and fun icons is a visual treat for the user. But if that user has a slow Internet connection, he or she might get bored waiting for those graphics to download and appear onscreen. On the other hand, with a text-heavy page, it can be difficult to engage the user right away—especially if the type is too small or is difficult to read. (Small italic type on Web pages is one of my pet peeves.) The ideal approach is to strike a balance between attractive and user-friendly.

"Some people who visit our site think we should have fewer graphics, but I don't think it's so graphically oriented that it is hard to use," says Hooper. "We have frames on our pages and some browsers can't translate them. We solved this by writing a nonframe version that the users can load if they're using a text browser. When we set about improving our page, we decided that we wanted to have a wide appeal, and the masses seem to like all the flashy stuff."

Caffrey takes the opposite point of view when it comes to graphics: "One



thing that I really like about our site is that it's not graphics heavy. I can't stand waiting for a page to appear on my screen. For me, the excitement of the graphics wears off in a few seconds, and if there's no content to back it up,

I'm gone. I've tried to design each page on our site so that it loads in a couple of seconds."

Caffrey's compromise is to use mostly text on the home page and then offer more graphic elements on subsequent pages, such as band photos and CD covers on the audio-download pages and equipment photos on the recording-studio page.

KNOW THE CODE

Let's face it: it's not deciding the page's content or graphic quality that keeps people from establishing a Web presence, it's that darned HTML (Hyper-Text Markup Language). In very simple terms, HTML lets you arrange the graphic and text elements on your page. If you're already an experienced computer user, you probably have the know-how to write the code for your own Web page.

The people I interviewed for this story eschewed the prefab, WYSIWYG Web-design programs mentioned earlier and opted to teach themselves how to use HTML. A number of books are available on the subject, including Special Edition Using HTML by Mark Brown (Que Corporation, a division of Macmillan Publishing); HTML in Action by Bruce Morris (Microsoft Press); HTML 3 Manual of Style by Larry Aronson (Ziff-Davis Press); and Teach Yourself Web Publishing with HTML 3.0 in a Week by Laura Lemay (Sams.net Publishing).

A fun and sneaky way to learn how to set up your page using HTML is to look at the code for other sites. Most browsers have a function such as Netscape Navigator's View Document Source or Microsoft Explorer's View Source that lets you view and copy the HTML code for any Web page. Both Caffrey and Byrnes admitted that they found this approach very helpful.

"Before I set up our page, I looked for cool sites that had sound files and graphics," says Byrnes. "I just made copies of the HTML codes, studied them, and tried to understand what each entry was doing. Obviously, that's not going to teach you everything you need to know, but it's a great place to

start. After that, I bought a book, HTML 3 How-To [The Waite Group], and taught myself the rest. HTML is very easy to read,

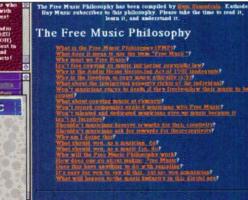


and it makes a lot of sense."

It must. Byrnes had both the Weeds and the Vibrant Records pages up and running within five days.

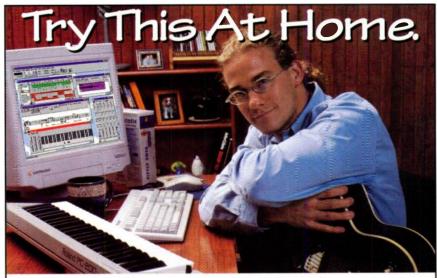
AUDIO OFFERINGS

Obviously, the most exciting prospect for cyberinclined musicians is sending their music out across the Internet. This capability is the perfect example



David Hooper often uses the Kathode Ray Music site to take shots at corporate America. A frequent target is Alanis Morissette (left), a former teen pop queen who has since been refashioned as the darling of the corporate alternative rock set.

of the Internet as the Great Equalizer because musicians can get their music directly to listeners. No record labels, pressing plants, distributors, or record stores are necessary. For users, it's like having a worldwide radio inside their computer: they can search for music



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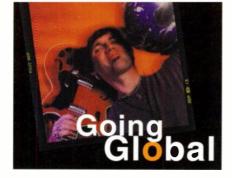
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styles, specific instruments, or geographic regions and stumble upon an amazing array of music they might never hear on local radio stations.

Caffrey encourages visitors to the Monster Island site to download songs and then make cassettes to share with friends. "It doesn't bother me that people are getting a few songs for free," he says. "My theory is that if 100,000 people download a couple of songs and give them to friends, that creates an immense fan base. I think distributing free music over the Web gives an advantage to the label and the listener. The label has easier and wider distribution, and the listener doesn't have to buy anything he or she hasn't heard first."

Many musicians offer short audio clips on their Web sites rather than enbut MPEG and RealAudio seem to be the most popular.)

MPEG is a form of compression that is used to compress both audio and video. It uses a type of "lossy" compression, meaning that something is lost in the compression process, typically the high end. MPEG audio is created by using a software encoder that compresses the audio file, which means that the end user needs a decoder to play the file once it has been downloaded. Two companies that sell MPEG encoders and decoders are Kauai Media in Cupertino, California (tel. 408/995-3005; Web http://www.kauai.com), and ODesign Corporation in Vancouver. British Columbia (tel. 604/688-1525; fax 604/688-1524; e-mail enquiries@ qdesign.com; Web http://www.qdesign .com). There are many other manufacturers that offer MPEG encoders

Once you have one of the RealAudio players, you only need to click on a RealAudio file to hear music immediately. Users can download a free version of the *RealAudio Player* from the Progress Network site (http://realaudio.com). The company has recently introduced *RealAudio Player Plus* (\$29.99), which the company claims has "near CD-quality audio" and a scan feature that lets you look for live audio on the Net.

The developer tools for RealAudio are free, which is a great incentive to offer RealAudio on your site. However, you do have to pay if you want your RealAudio-format songs to stream over the Internet in real time. You need to purchase RealAudio's server software along with a license key that controls the number of audio streams that you can run at one time. A *stream* refers to a continuous flow of audio going out to

an end user. Progressive Networks charges \$100 per stream. For instance, Caffrey paid \$500 for real-time RealAudio capability for five songs on the Monster Island site. If you don't want to pay for that capability, you can still offer RealAudio files, but the user will have to download the files and play them back from their computers (which sort of de-

feats the whole realtime audio intention of the format).

Monster Island currently offers six audio options to the end user: full-length songs in mono MPEG, stereo MPEG, RealAudio for 14.4 modems, and RealAudio for 28.8 modems and song clips in mono and stereo MPEG. At the Weeds site, users have the op-

tion of downloading WAV files or playing RealAudio files. Byrnes opted for these formats because they were the easiest and most accessible ways to get the music up and running quickly. The Kathode Ray site doesn't offer any audio clips, but it does have links to hundreds of indie bands, and many of those have audio clips available.



page (above) with the links to the rest

of the site under the band photo. This

way, the links also do double duty as a

menu for the site. The song-clip page

(left) offers the user the choice be-

tween WAV or RealAudio files. At press

time, Byrnes was looking into adding

MPEG and Shockwave audio files, as

well as any other formats that seemed

popular with visitors to the site. In ad-

dition to audio clips, the Weeds site

offers reviews, information on upcom-

ing shows, and links to other music-

related sites.

The melocites are infections. The hooks we sold. The Health Act The Weeds sound microsity savidars They are stored in the Weeds sound microsity savidars They are stored in the Weeds sound microsity savidars They are stored in the Weeds sound microsity savidars They are stored in the Weeds sound microsity savidars They are stored in the Weeds sound microsity savidars They are stored in the Weeds sound microsity savidars They are stored in the Weeds sound microsity savidars They are stored in the Weeds sound in the Health Color of the Weeds sound in the Wee

tire songs because the latter can take a long time to download. There is also the issue of audio formats. The smart thing to do is to offer a few different formats, which allows any user to download the audio, regardless of his or her computer platform.

Currently, the types of audio files encountered most frequently on the Internet are MPEG (Motion Picture Engineering Group) and Progressive Networks' RealAudio. (There are many other audio formats in use on the Web, including WAV files, AIFF, and the upand-coming Macromedia Shockwave,

and decoders; ask your friends and cruise the Net for more resources. Most audio sites have links to other sites that provide free or inex-

pensive, downloadable shareware MPEG decoders. If you plan to offer MPEG audio, you should also include this type of link on your site.

The RealAudio format is gaining popularity because it plays sound files in real time over the Internet, so the user doesn't have to hassle with downloading a file and then playing it back.

DETAILS, DETAILS

Even though you'll want to spend most of your energy tending to the technical aspects of setting up a Web site, don't overlook the more mundane details, especially if you plan to use your site to sell CDs or conduct any other types of business transactions.

When Byrnes was setting up the site for Vibrant Records and the Weeds, he thought he could use his existing Internet service provider. He discovered that his contract with his provider prohibited him from running a commercial business from the account.

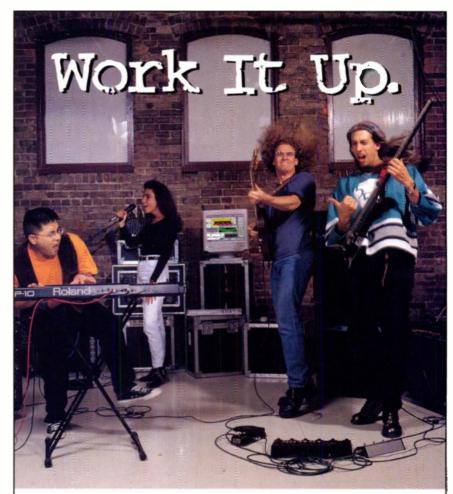
"Most providers won't let you run a commercial service for their basic fee," he explains. "To switch my account from a personal one to a commercial one was going to increase the cost from \$20 a month to about \$80 a month. And they only provided 5 MB of server space, which isn't nearly enough to include audio files. I would advise people to research providers carefully and look for unlimited access and a large amount of server space." He ended up going with Best Internet of San Jose, California. For a \$30 monthly fee, he can run a commercial site with 25 MB of server space and unlimited access.

Caffrey was surprised that the business aspects of setting up the Monster Island site took longer to deal with than the programming did. "Some of the paperwork and business details can really bog you down," he says. "First, I had to set up a post-office box for CD orders, then I had to set up a business checking account, then I had to make sure that no one else in New York was using the name Monster Island Records, and so on. It seems like every step of the way, I encountered a new business detail that needed attention."

Some of these details can be settled after you get your site up and running. It is important at the outset, though, to trademark your business name and get a business license and a tax identification number if you plan to conduct any monetary transactions.

GET YOUR SITE SEEN

It's no secret that hundreds of new Web sites are popping up everyday. Competition for the hearts, minds, and time of Web surfers is enormous. Even major corporations are having difficulty getting people to their sites. You might think that you are the most interesting and talented musician in the universe.



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but strangers won't be willing to take your word for it. There are a few Webspecific ways to promote your site and a few old-fashioned marketing ploys, such as giveaways and contests, that always keep people coming back for more. Two helpful books on online marketing are Guerrilla Marketing Online and Guerrilla Marketing Online Weapons by Jay Conrad Levinson and Charles Rubin (Houghton Mifflin Company).

As far as Web-specific tactics go, the first stop you should make is the Submit It! site at http://www.submitit.com. Give them your URL and some keywords that describe your site, and the Submit It! folks will submit the information to more than 250 search engines and directories. That's one way to save yourself a lot of leg...err...fingerwork.

Carefully choose your keywords when

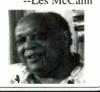
submitting your URL to search engines and directories. Include more than just your band name and genre because that doesn't always give the average Web surfer much to go on. Think about including keywords describing your influences (these don't have to be musicians, they could be painters, writers, philosophers, or cartoon characters), any interesting instruments band members play, and your geographical region. For example, one of the Monster Island bands, David McLary and Huevos Rancheros, features funk violins. By including those words in their keywords, their name will come up when people search on either "funk" or "violin." The point is to hook up with people who have similar interests and tastes. Any word relating to your site that will pique the curiosity of a potential fan is worth including.

Also, some search engines search on the content of your HTML code, so adding a few extra words to your code is one way to bring in the masses. "A lot of people really manipulate the search engines," explains Hooper. "You can put a remark in your HTML that won't do anything, it's just listed in there so when someone searches on that term, your site will come up. One of the topics most frequently searched for is Pamela Anderson Lee. Some people will put her name as a remark about a thousand times in their HTML, so every time someone searches on that, the page will be at the top of the list. That's a great way to get people to see your page, but if they have no interest in your site, it's a waste of your time and theirs. We put remarks like 'indie,' 'promotion,' and 'free CDs' about 500 times each in our code, so when people search on those words, we usually end up at the top of the list."

Establishing links with other sites is a good way to get the word out. If you're an active Netizen, chances are you'll develop relationships with people all over the world. You can offer to add a link to someone's site provided that they return the favor. It's the "I told two friends, and they told two friends..." approach to marketing.

"Most people are eager to trade links," says Byrnes. "Many independent artists don't have the resources or connections

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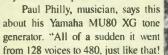
* Maximum number of tracks determined by your hardware configuration.

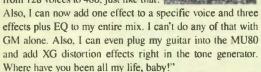


MYSTERIOUS SYMBOLS AFFECT MUSIC INSTRUMENTS

Astronomers and scientists are befuddled by a recent spate of "appearances" of an unusual symbol in cornfields, oatmeal cereals, Yamaha synthesizers, tone generators and computer sound cards and galaxies. This symbol apparently supercharges digital instruments, making them sound and work better than ever before.







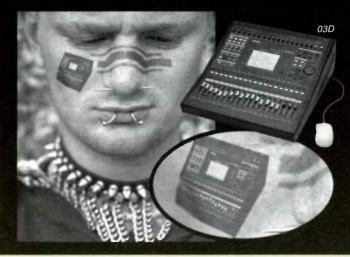
The XG symbol has given GM a galactic shot in the arm, agreed another musician. "I write music for computer games and I was limited to 128 voices. Do you know how difficult it is to create the music from HELL with those limitations. It sounded like a barking puppy. Now, with my Yamaha CS1x synth and QY700 XG mini-studio, I create THE MUSIC FROM HELL!! Anyone with a GM computer sound card can hear it but people with Yamaha DB50XG or SW60XG sound upgrade cards can FEEL it. It's smokin'."

"I was eating my cereal and it started bubbling and this weird shape popped out of it," said Bobby Fleisher, an eight year old from Connecticut. "My mom told me to stop playing with my food, but I didn't do it!"

Even grand pianos have been affected by the XG phenomenon. "My Disklavier piano went nuts. It sounds like the LA Philharmonic in my living room," said one stunned housewife, owner of a Yamaha Disklavier DGHB1XG.

"We're trying to pinpoint the source of XG," said Aspirin. "It seems only Yamaha devices, Quaker cereal and lowa cornfields have been affected by its intergalactic waves. But XG blows the lid off GM's limitations so pandemonium is spreading as people try to grab any XG product they can get their hands on."

AMAZON JUNGLE IQUITOS. Peru— Members of an Amazon jungle tribe have worshiped the Yamaha O3D Digital TRIBE WORSHIPS YAMAHA O3D!



IOUITOS, Peru — Members of shiped the Yamaha O3D Digital Mixing Console for centuries— even though they've never seen one and it wasn't even invented until 1996!

"This is one of the most primitive civilizations on earth, but they know more about the Yamaha O3D than the manufacturers themselves," revealed Swiss anthropologist Bettina Streudelmeister. Even more astounding, these primal tribesmen insist that their knowledge comes from the stars even before the O3D has come to America!

Streudelmeister based her findings on a recent expedition to a remote Peruvian rainforest. As she approached a village of thatched dwellings, she saw natives wearing masks, clothing and hand-drawn tattos depicting the 03D's automated faders and digital signal processors.

"Even their pottery was embla-

zoned with pictographs of the digital aux sends, 8 channels, 4 buses and 26 inputs that make the 03D so perfect for project studios and post-production work," said Streudelmeister. What's more, she saw half-naked sayages dancing around a totem pole that represented the digital dynamics. effects, parametric 4-band EQ and limiters on every channel. "They communicated to me through an elaborate dance that the 03D is identical to the Yamaha 02R Digital Recording Console in function but they prefer the 03D because it fits in their budget and in their cramped dwellings," said Streudelmeister.

"We can only guess who or what informed them about this digital mixing console long before the scientific world learned of its existence." declared Streudelmeister. In the meantime, the happy natives are mixing up their tribal music for an upcoming CD with the Yamaha O3D.

Invisible Munchkins Inhabit the Interior of Yamaha MD4 X-Ray Machine Reveals The Hidden Truth.

Yamaha Pro Audio technology is a total crock! That's the word from labor officials who claim the Yamaha MD4 Multitrack MD Recorder is really operated by a tiny team of invisible munchkins that live and work inside the digital four-track recorder!

Thanks to a new government X-Ray machine, the hidden truth behind this miniature sweatshop has been exposed. "These munchkins are responsible for the unit's flexible signal routing and sound control," states the report. "Yamaha's boast of superior audio fidelity and advanced editing/programming options is simply a scam."

According to the findings, there's no possible way that Yamaha technology could create the precision punch in/punch out recording features and advanced editing components of the MD4. In reality, it's the crew of overworked and underpaid minimenehunes that enable the MD4 to bounce all four tracks to a single track (no open track required) without sacrificing any of the studio-quality audio. In fact, no matter

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how much bouncing they accomplish, the perfectionist mini-men always keep the audio quality at virtually CD level.

> What's more, says a government spokesman, it's the munchkins who maintain cue-lists and a table of contents so users can instantly jump anywhere in the song for efficient editing. And once again its the munchkins, not Yamaha, that move. copy or delete parts of songs anywhere at the whim of the user. They've been known to "copy over" bad versions of a chorus with previously recorded good versions without harming the original data. And if that's not enough, these poor little creatures also assist in storing the music on small (ves. small) removable MiniDiscs.

Despite all their work, the munchkins are paid a paltry \$1299 by Yamaha. Yamaha denies any charges of unfair labor practices, stating "It's a small price to pay for the editing features not possible with cassette multitrack recorders."



INCREDIBLE BUT TRUE!

MAN PERFORMS CONCERTS, RECORDS ALBUM IN TAXI



Aspen, CO—"10 years ago I started out trying to learn how to play piano while waiting for my next taxi customers," said John Barnes, taxi driver. Now, he's turned from transportation also-ran to entertainment giant. What was once a simple checkered yellow cab is now the Ultimate Taxi, a mobile recording studio, concert hall and amusement park with 360,000 miles on it.

"What an incredible experience. Laser lights, pink fog, great music, all in a four door, 8-cylinder car." said one rider. "I laughed, I cried, I sang along. It was like being at a concert except I got to sit a lot closer to the stage."

Barnes juggles driving tasks with his musical performance, playing dozens of instruments even as he makes a left turn. "I use a Yamaha PSR620 keyboard triggered by Yamaha DD14 digital drums for a lot of the music. The stereo input on the Yamaha MU80 tone generator lets me add XG effects like reverb and delay to my voice so I can make my cab sound like Carnegie Hall. The Yamaha SU10 sampler is great for drum loops as well as canned laughter and sound effects," said Barnes.

When he gets caught in traffic, Barnes doesn't lay on the horn, he pulls out his horn: a Yamaha WX11 wind controller and WT11 tone generator to play sax, trumpet, etc.

Apparently, his riders don't mind the traffic either. "In New York, I fear for my life in taxi cabs. Here I had the time of my life," said another Ultimate customer. "And what's more, by the time I got home I saw my picture on the Ultimate taxi web site, www.ultimatetaxi.com. What an experience."

"This couldn't be done without the Yamaha instruments," says Barnes. "They're so small and so powerful, I could even have made my taxi from a Yugo. Except then I couldn't have fit any customers in."

Tips For Sending Your Teen To College

Your teen can benefit from a college survival kit that has all the essentials, including a Yamaha acoustic guitar startup package and a case of macaroni and cheese, according to the Manongahala Institute of Dining Commons Administrators. "This is a great guitar kit for aspiring folkies. It comes complete with the F310 acoustic guitar, a tuner, strings, picks, polish, cloth and a beginner's guide to playing guitar," says the Institute.

"The macaroni provides nourishment for the body, the guitar provides nourishment for the soul," says one happy, strumming freshman.



SYNTHESIZER CAUSES EARTHQUAKE!



Seismologists at the Underground Laboratory (UGLY) in Placid, CA have pinpointed the epicenter of

a 6.0 earthquake that recently rattled Southern California: the second floor apartment of Wally Zaputo, a musician from Faulten, CA. "I was just playing a demo from the Yamaha QY700 when the earth started shaking like mad," says Zaputo.

"The demo caused the earthquake," confirmed Sandy Sandusky, UGLY scientist. "We recreated the entire episode in our labs. A new QY700 voice—called SINEBASS—shook our subwoofer halfway across the room and then the earth started to rumble." Although the demo is available at Yamaha dealers who stock the QY700, Sandusky strongly urges everyone to keep well away from it. "The power of the sound is unbelievable. We don't want anyone to get hurt."

The QY700 itself is a groundbreaking product, according to music expert Felix Overture. "It's a 48-track MIDI production

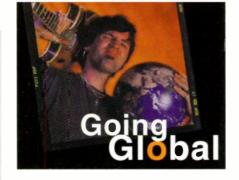


XG tone generator, a 110,000 note sequencer, 3,800 editable musical "clip art" phrases, a huge backlit LCD screen and a micro-keyboard. There's nothing like it. It's amazingly powerful. But really, this should shock no one."

Overture told The Inquisitioner that

Overture told The Inquisitioner that Yamaha has been building up to this for years. "They've always done an excellent job of integrating tone generators and sequencers into tiny music production tools, like the QY 10 and QY 20, which have evolved into the hand held QY 22. The QY 300, which is still a powerful GM music production studio in its own right, was the precursor to the QY 700, which has full XG implementation."

Meanwhile, UGLY has petitioned the President to ban the SINEBASS voice from the United States. "It poses a clear and present danger to the population. Who knows how many more earthquakes it might



to get where they want to be, so meeting people over the Internet is a great way to start."

KEEP 'EM COMING BACK

When it comes to marketing, getting people to your site is only half the battle. You have to give them a reason to return. The Internet is a fast-moving and quickly evolving medium. Anything dull or static might as well not exist at all. Be sure to set aside time to respond to e-mail and to update your page frequently. If you offer a fresh new look on a consistent basis, visitors will be interested in what you're going to offer next. Hooper changes the graphics on Kathode Ray's home page about once a week, sometimes more frequently. He also adds band links almost every day, so repeat visitors are almost always certain to find something new.

"One way we try to keep people interested in our site is by having contests," says Hooper. "We recently set up our ASCAP publishing division, so we had a 'Name the ASCAP Division' contest. The prize was a free CD. Sure, we get some people who come to our site just because

they want free stuff, but they're not going to keep coming back. Our site is more for musicians than it is for fans."

Caffrey plans to create a mailing list to let past visitors know when new bands have been added to the Monster Island site. "I'm planning to add a new artist per month, so visitors will have an incentive to come back," he explains. "The mailing list will also be help-

ful for advertising upcoming gigs."

You've probably noticed the little counter at the bottom of many home pages that tells you how many visitors have come to that site. Byrnes explains how you can use that function for more than just counting hits. "Every Web site provider will tell you how to set up the counter to track hits," he says. "But they'll also tell you how to set up a log

file so you can find out where the hits came from. You can find out which search engine the visitor used, or whether they came from another site. Because I've been searching out and using a lot of sites that list independent bands for free, I can easily figure out which sites are bringing me the most hits."

This kind of information is valuable when doing further promotion and advertising. When you know who is interested in your site and where they are, you can develop a more focused and targeted marketing plan.

THE IUMA OPTION

Now that I have you totally pumped to go do this yourself, I'm going to throw you a curveball. What if you don't want to do extensive marketing for your site? What if you don't want to create audio files in different formats? What if you

graphics and a plethora of music-related pages that include labels, publications, bands, new promotions, and so on.

The company will do everything from setting up your band's IUMA Web page to creating the audio files for users to download. (IUMA offers MPEG, Real-Audio, and Shockwave audio formats.) You can also utilize some of the IUMA services while maintaining your own proprietary Web page and establish links between the two sites. This is a great option if you don't want to hassle with creating your own audio files. Just create a link on your page that allows the user to click over to IUMA if he or she wants to hear your music.

The fee for basic IUMA services is \$240 for one year. For this fee you get one song on the IUMA site, up to two pages of text about your band, two images (photographs or other artwork),

the capability of selling your band's merchandise through IUMA, and the two additional options of one page of lyric text and a logo.

Other services, such as statistical reports on your band's hits, are available for



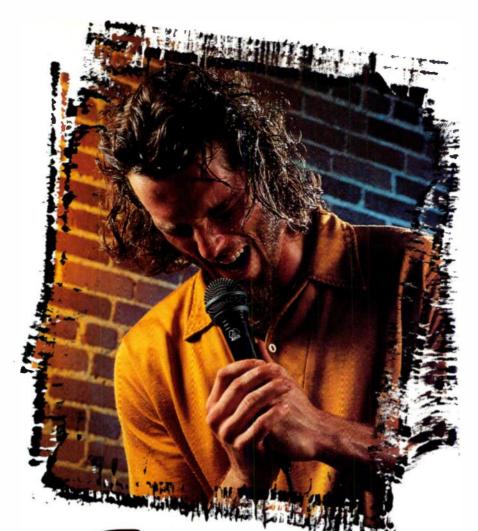
want an Internet presence but don't want to even set up your own page? Don't worry, you're not stranded on some podunk infobahn onramp. You, too, have options.

Santa Cruz-based IUMA (Internet Underground Music Archive; http://www.iuma.com) is arguably the most well known and successful online music resource. The site has fun, colorful

IUMA visitors have the option of exploring the site in its full-blown, graphics-rich format, or opting for the less graphics-intensive "IUMA Lite" approach. The latter option allows users with slower connection rates to get around more quickly, without waiting for the graphics to register on their screens. The organization is adding new features, such as IUMA Radio, which will allow users to browse IUMA while listensing to IUMA bands.

additional fees. The site is free of charge for visitors.

"There are a lot of benefits to musicians who choose to be on IUMA," says Todd Williams, IUMA's vice president



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he accepted standard for music microphones has suddenly been challenged with the introduction of AKG's Emotion microphone series. AKG's new design and manufacturing approach, known as Tiefzieh Varimotion Technology $^{\text{TM}}$ (patent-pending), optimizes a microphone's response while delivering killer sound at a price that will blow you away.

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of marketing and sales. "Our hits have been hovering around 300,000 per day. So obviously, the main benefit we offer is exposure. Users who come to IUMA come to find new music. Currently, we have more than 900 bands on our site, and that number is growing rapidly.

"Another benefit we offer is a fast and fat Internet connection," he continues. "Sound files want to go through a pipeline the size of the Holland Tunnel. We're connected to the Internet via five T1 lines. We can't control what type of connection our users are using, but we do everything we can on our side to make sure that the user is going to have a fast download. We want our users to have a pleasant experience while browsing IUMA." It's not only the average listener who's regularly checking out IUMA bands. Many A&R reps visit the site to scout for new talent.

"The exciting thing about music on the Internet is that it's a try-it-and-buyit situation," says Williams. "When you think about it, it's really no different than going to a supermarket and having someone shove a piece of cheese in your face saying, 'Try this.' It's a known fact that consumers are much more likely to purchase something if they've sampled it first. In the past, that wasn't a viable option for many artists, but now it's a new era."

PLAYING IT OFF THE NET

It's pretty clear that music distribution over the Internet is here to stay. Why wait to take advantage of this wonderfully wide-reaching resource? Whether you opt to build your site from the ground up or work with an organization like IUMA, it's hard to argue against putting your music up on the Net. As John Byrnes says, "The worst that can happen when you set up your own site is that more people will know about you and your music. And that never hurts."

Managing Editor Mary Cosola's eyes really hurt after spending more than a month researching this article. She needs to remember to blink when surfing the Net.



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FORTESS FORTES

here were more than a few surprises in store for young Henry Robinett

the day he arrived in New York City in the spring of 1978. First, there was a surprise birthday party organized by Charles Mingus for Mingus' wife. Robinett, feeling out of place in jeans and sandals, had just moved from Sacramento,

California, to spend three months living with the legendary jazz bassist/composer, his second cousin. ("My father's mother and his father's mother were sisters," explains Robinett.)

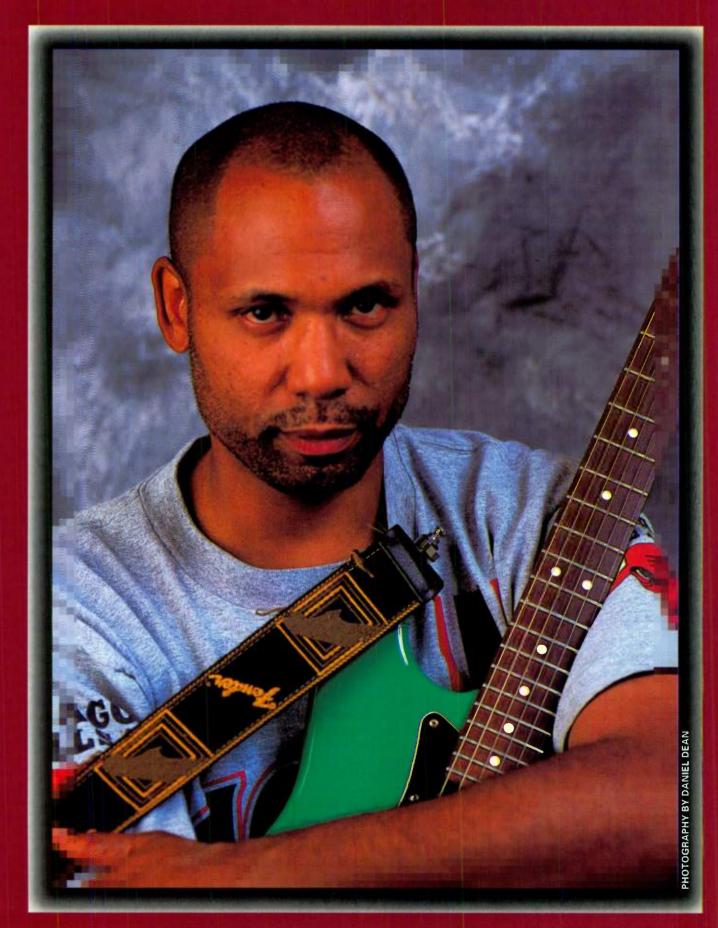
The night of his arrival, Robinett found himself in the presence of jazz luminaries such as saxophonist Sonny Rollins, pianist Armen Donelian, and critic Leonard Feather. Other jazz heavyweights would drop by the Mingus home during Robinett's stay, including Dexter Gordon (who lived downstairs), Dizzy Gillespie, Woody Shaw, and Ornette Coleman. Another guest was Joni Mitchell, who was recording *Mingus*, her collaborative effort with the maestro.

"It was great for a wide-eyed 21 year old to land in New York City and suddenly be in the lion's lair," says Robinett. "I got to see how my biggest heroes lived. Of course, I also saw a lot of stuff that wasn't attractive to me." What appealed to Robinett was the prospect of a life dedicated to jazz; what he didn't particularly savor, though, were the fast-paced, often dissolute lives of jazz musicians in the Big Apple. Returning to Sacramento, Robinett set about carving his niche in the local music scene, playing with Charlie Peacock, Bourgeois Tagg, and jazz pianist Jessica Williams. But like his famous cousin, Robinett was not content as a sideman, so he formed his own band, the Henry Robinett Group.

CREATIVI Space

Jazz
guitarist
Henry
Robinett
becomes
his own
big boss
man.

BY BRIAN KNAVE





After recording *The Henry Robinett Group* for Artful Balance Records and a second album, *Life X 2*, which the label did not release, Robinett grew weary of entrusting his musical destiny to people who didn't fully understand his direction. "First they tried to market me in the George Benson or Earl Klugh camp. Then they decided they wanted a funky, hip-hop thing. It was ridiculous. They paid no attention to what the Henry Robinett Group actually did."

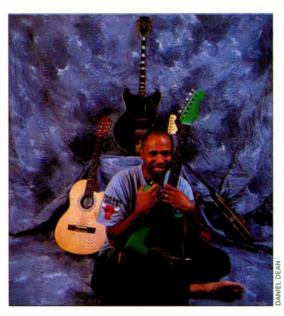
A CHANGE IS GONNA COME

Eventually, Artful Balance Records went bankrupt, which afforded Robinett the opportunity to start his own label, Nefertiti Records. "In this business, you can either be cause or effect," says Robinett. "As long as someone else is telling you how to play or sound, you're just the effect. Finally, I realized that the only way to have my ideal scene was to do it myself."

But when it came time to record album number three, the band was divided over how to proceed. Some members felt that professional results were not attainable short of recording in a professional studio. Robinett, however, believed differently. "My attitude was that we could shoot our wad and spend \$15,000 recording in a pro studio, or we could use the same money to build our own studio and then record as many records as we want." In the end, Robinett followed the do-it-yourself muse. With the help of engineer Christian Heilman, he built Blue Degrees Digital, a 16-track, ADAT-based personal studio. (See table, "Blue Degrees Digital Studio.")

The effort has more than paid off. The album, When Fortresses Fall, was quickly

picked up by Indi, the biggest independent distributor in the U.S., and will soon be licensed by Holland-based Challenge Records for worldwide distribution. Proof that first-rate recordings can be made on a budget, the CD features eleven mature, tuneful compositions in a contemporary jazz setting reminiscent of titles from GRP Records. Although Robinett's chorused



Henry Robinett cradling the prototype Eric Clapton/Strat Plus built for him by Fender.

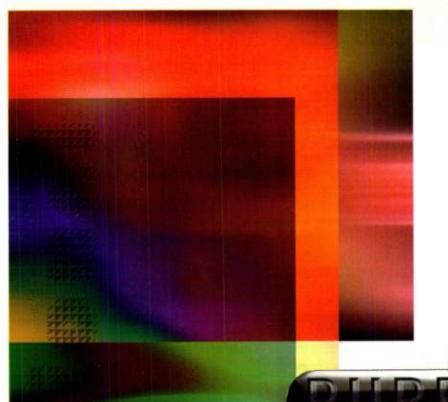
guitar tone suggests the styles of Mike Stern and Pat Metheny, also evident are the influences of Coltrane, Keith Jarrett, and Michael Brecker.

GETTIN' CLEAN

Constrained by a limited budget, Robinett wisely invested a good chunk of his dollars in equipment that would ensure a clean signal path from source

Blue Degrees Digital Studio

Mixing Console	Mackie 24·8		
Recording Media	Alesis ADATs (2) with BRC; Panasonic SV-3700		
	DAT; Denon DRW-750A cassette player		
Monitor Speakers	EV Sentury 100A; Yamaha NS-10M		
Microphones	AKG C 414		
Sound Modules	Akai S900; Alesis DR4; E-mu Proformance and Proteus/1; Ensoniq VFX ⁵⁰		
	and SQ-R; Korg M3R; Roland D-50 and R-8; Yamaha TX7		
Signal Processors	BBE 802; dbx 160X; DigiTech 128 (2) and 256 XL; Eclair Evil Twin;		
	John Cuniberti Reamp/DI box (prototype); Millennia Media Quad mic preamps		
	(2); Rocktron Hush IICX; Tech 21 SansAmp PSA-1; Yamaha REV7 and SPX90II (2		
Computer/Software	Macintosh IIvx with 8 MB RAM; MOTU Performer 5.0 and MIDI Time Piece;		
	Digital Music Corp. MX-8 MIDI patch bay; Opcode Galaxy		
Power Amps	Peavey CS-800; Pioneer SA-750		
Guitars and Amps	Gibson Chet Atkins nylon-string electric, ES-355, and Les Paul 25/50		
	Anniversary; Fender Eric Clapton/Strat Plus (prototype); Ovation 1615-4		
	12-string; Epiphone Broadway; Casio MG-510 MIDI guitar; MESA/Boogie Quad		
Rented and Borrowed Gear	Gear Alesis ADAT (1); AKG D 112 mic; Apogee AD-1000 20-bit A/D converter; Audio		
for When Fortresses Fall	Technica AT4033 mic; B&K 4006 (2) and 4002 mics; Drawmer 1960 tube		
	compressor and DS 201 noise gates (4); Eventide Harmonizer H-3000; Fatar		
	weighted keyboard controller; Lexicon 480L, PCM 70, and PCM 80; Millennia		
	Media Quad mic preamps (2); Sennheiser MD 421 mics (4)		



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Fortress Rising

To record the saxophones, Robinett used an AKG C 414 condenser mic routed through a Millennia Media preamp. He used the same combination for recording percussion overdubs and accordion on the song "Once a Gaucho." Drums were recorded with an AKG D 112 on the kick, a Shure SM57 and a B&K 4002 on the snare drum (top and bottom, respectively), an Audio Technica AT4033 on the hi-hat, Sennheiser MD 421s on the toms, and a pair of B&K 4006s for the overhead mics.

TRACKING THE JAZZ BEAST

Blue Degrees Digital is a one-room operation (it has no separate control room) with a single, small isolation booth. Luckily, the studio is just down the hall from Enharmonik Studios, a commercial facility with a big room



Inside Robinett's Blue Degrees Digital Studio, where he recorded and mixed When Fortresses Fall.

that works well for recording drums. Robinett ran a cable snake from drummer Rick Lotter's kit, which was set up at Enharmonik, to the Mackie 24.8 console the group used for monitoring. "It was kind of tough because there

was no visual communication with the drummer. But we wanted to preserve the integrity of the performances, so we strove to record the band tracks in one pass. Of course, as long as the drums were on the money, the other



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TUBES FOR MUSIC

Fortress Rising

instruments could be punched in later, if necessary."

The saxophonist was stationed in the iso booth, which allowed Robinett, the bassist, and the keyboardist to play together in the main room while monitoring through the studio speakers. Only the drummer and saxophonist had to wear headphones.

For the nonswing tunes, Robinett sequenced chordal pads and sweetening tracks into *Performer* prior to recording. "I wanted the instrumentation there for the band to play along with. It just doesn't work to say, 'Here's where the French horns come in,' or 'Keep in mind that there will be a marimba part here.' With the sequenced parts already in place, the band knew what the final instrumentation was going to be while they were playing."

FLIES IN THE OINTMENT

"The only problem we encountered tracking with the sequencer was a slight MIDI delay," says Robinett. "It was very frustrating. Everything sounded fine during recording. But then we'd play the track back, and it would sound awful. At first you think it can't be the equipment, because you've spent all that money. But of course, the keyboard player knows he wasn't playing behind the beat. Eventually, I determined that the delay was caused by using both the MOTU MIDI Time Piece and the MX-8 MIDI patch bay. So I removed the patch bay and tweaked the MTP's settings a bit, and the problem disappeared.'

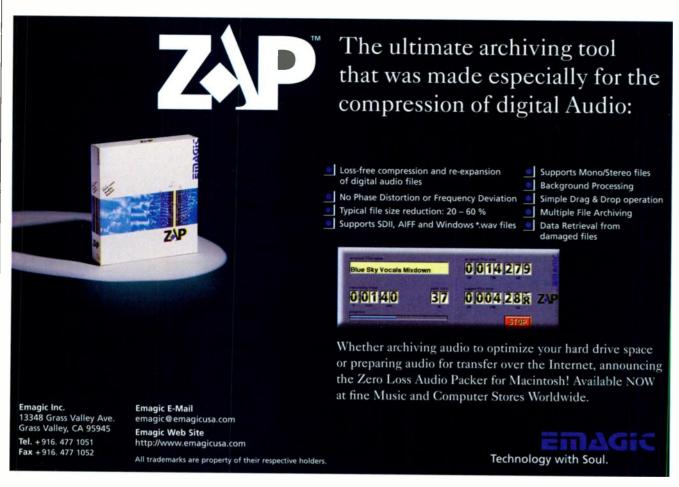
The only other technical glitches Robinett experienced were with the ADATs. "When ADATs first came out, Alesis recommended cleaning the heads every 600 hours. I'd see the little [head-cleaning] indicator light come on and think, 'The heads can't be dirty yet, so let's just keep recording.' But then something wouldn't get recorded. In the end, we learned that you have to



A peek inside the isolation booth at Blue Degrees Digital. "It's a real sweat box," says Robinett.

clean the heads a lot more frequently."

Of course, equipment malfunctions are only one of the hazards faced by



the recording artist who makes the jump to also being studio owner, engineer, and producer. "One danger in doing everything yourself," explains Robinett, "is that you can take forever to finish a project, which is not necessarily good. For example, there were times when I should have been adding a part or redoing a solo, but instead I would stay home and practice. Whereas in the 'real' world, when you're paying for studio time or you have a gig, the music gets done whether you're ready or not. You can't say, 'Well, I think I'll wait and play that festival next month."

FLAVORING THE MIX

Originally, Robinett intended to do only the tracking for When Fortresses Fall and leave the mixing to someone at a "real" studio. But as the project progressed, friendly advisers such as Stephen Jarvis (former head engineer at Wally Heider Studios) persuaded Robinett that his room sounded flat enough for accurate close-field monitoring and that with the help of a few extra ears he should be able to perform the deed at Blue Degrees Digital. Robinett and Heilman mixed four of the tunes themselves and enlisted the help of engineers Donnell Sullivan and David Houston for the remainder of

Mixing the direct-recorded guitar tones to better emulate the sounds Robinett gets with his amp required the use of some signal processors from the guitarist's stage rig as well as some other tricks. For example, to counter the slightly brittle quality the SansAmp added to the guitar, he ran the recorded signal from the ADAT through a John Cuniberti Reamp and then through the Evil Twin. Employing these tools helped fatten up the guitar tone on songs such as "Behind Irish Passions" and "The Laws of Returning."

To dial in his favorite chorus effect, Robinett typically uses a pitch-shift patch on his Yamaha SPX90II that he sets at eight cents plus and eight cents minus. But although he loves the SPX90II sound live, it proved problematic adding it to the guitar on certain tracks.

"Because it's a stereo patch, as soon as I'd drop in the effect, it would dilute the stereo placement of the other instruments in the mix. I tried panning the chorus effect mono, but I just didn't like how it sounded, especially







on certain songs. Fortunately, though, I found a chorus on the Eventide Harmonizer that sounded great in mono."

BACK FROM THE FUTURE

When he bought his first 4-track tape recorder and drum machine in 1983, the idea that he could be in full control of the music was what sold Robinett on personal recording. "Basically, I got into all this out of necessity: until I had my own band, multitracking was the only way to hear my tunes with all of the parts stacked on."

But nowadays, thanks to a band that reads music charts extremely well, Robinett finds he has come full circle. Originally he used the studio and the sequencer as writing tools, but he now composes the old-fashioned way, with a pencil and manuscript paper. "If I use

the studio to write," he explains, "it takes me about ten times as long to finish a tune. For example, I might come up with a great chord progression for a chorus. But then I'll loop it and play over it to the point that I never want to hear it again.

"The other problem with writing in the studio," he continues, "is that everything becomes fixed: drum parts, bass parts, whatever. But as long as the song is in your head it can still move and shift. The biggest thrill is to take a chart I've just written, give it to my band, and hear them play it. After all, the bass player is a far better bassist than I'll ever be, and the same is true of the keyboardist or saxophonist. These are the guys who should be interpreting those parts of the song, not me."

HIS OWN THING

Though his musical style is very different from Charles Mingus', Robinett shares the late virtuoso's commitment to doing things his own way. "Mingus was fiercely independent," says Robinett. "He started his own label, Debut Records, in the 1950s, long before

other musicians took that route. Individuality and originality were always central to his artistic sensibility."

Whether he's writing scores, rehearsing his band, recording tracks, or evaluating a new group for the label, Robinett epitomizes the do-it-yourself approach to making music. "One of the things I stand for is the idea that musicians need to remove the shackles from their necks," he says. "It's a kind of slavery when record labels feel they can own and control artists. Of course, you'll only be controlled for as long as you allow yourself to be. A lot of musicians are simply lazy or ignorant. If all you want to do is sit around and play your instrument and you're not willing to take care of business, you become an easy target.

"The problem arises when the marketing people put themselves before the artist," concludes Robinett. "But they need to keep in mind that without the artist, they have nothing to market. Ultimately, it's got to be about the artist."

Assistant Editor Brian Knave has just about run out of pithy bylines.

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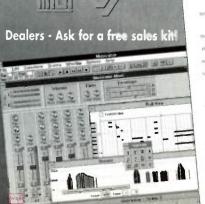
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to the USIC

By Greg Pedersen

Ithough Neil Giraldo doesn't sing for his supper, he shares plenty of meals and a successful recording career with a woman who does. Giraldo is married to Pat Benatar, the four-time Grammy winner whose vocal prowess satiated the public's hunger for rock candy in the 1980s with AOR smashes such as "Love Is a Battlefield," "Hit Me with Your Best Shot," and "Promises in the Dark." Giraldo has played an integral role in Benatar's career since her 1980 break-

Neil Giraldo

cooks up hits

with wife,

Pat Benatar,

in the

Soul Kitchen.

through album, *Crimes of Passion*, tackling the duties of producer, guitarist, songwriter, and musical director.

In 1988, the dynamic duo began recording in their state-of-the-art home studio, Spyder's Soul Kitchen, producing the major-label releases *True Love* and *Wide Awake in Dreamland*. Benatar fans will be happy to know that the latest offering from the Kitchen, *Innamorata*, is a focused, emotionally rich work that marks a return to the guitar-driven pop of the singer's glory years.

After basking in the glow of arena lights and kicking some major booty onstage (at the Northern California stop on Benatar's summer tour opening for Steve Miller), Giraldo agreed to share some of his production secrets with **EM** readers. Here's what went down.



You weren't credited as a producer on the first few Benatar albums, but there have always been whispers that you had a substantial role in their creation.

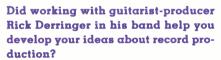
I really started producing during Crimes of Passion, even though I didn't get credit. On Pat's first record, In the Heat of the Night, I was more of an arranger. I would say stuff like, "I don't like the snare tone" or "The backbeat feels wrong," but I wasn't sophisticated enough to know exactly how to fix a problem.

One day, while I was still composing songs for Crimes of Passion, [producer] Keith Olsen gave me the keys to his Porsche because he knew I liked to write while driving. I drove around for a while, and when I came back, Pat was crying. We were tracking the first song for the record, which was probably "Hell Is for Children," and Keith said, "I don't know what to do; she can't sing this part." I went into the control room, set up a better headphone mix, talked her

through the song a little bit, and got the vocal happening. That's basically when I took over the production chores.

It seems you understand the fragile nature of singers. Does that empathy help you capture a great vocal performance?

How you get a great performance has a lot to do with the kind of environment you create. Emotion is a very important thing. If you knock emotion out of people, you take the inspiration right out of them, too. What I try to do is push positive reinforcement on everybody. It's like when you tell your spouse, "You look great tonight." Ideally, that kind of comment should make someone feel good. It's exactly the same way in the studio.



No. Actually, I learned from Rick's approach what not to do. I didn't care for the way Rick treated people in the studio. Technically, Rick knew what he was doing, but he would say the wrong things to the musicians at the wrong time. Also, his focus was as a guitar play-



Giraldo was thanked in the liner notes of *Crimes of Passion* for his production assistance, but he didn't get coproduction credit.

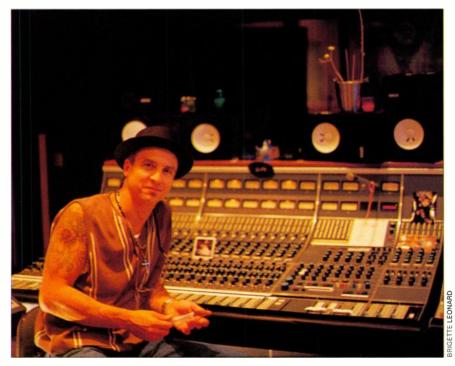
er whereas I always listen to the entire arrangement and have opinions on everyone's performance. I'm sensitive to the drum groove and the bass tones, not just the guitar parts.

After working together and being married so long, do you and Pat have an ESP-type relationship in the studio?

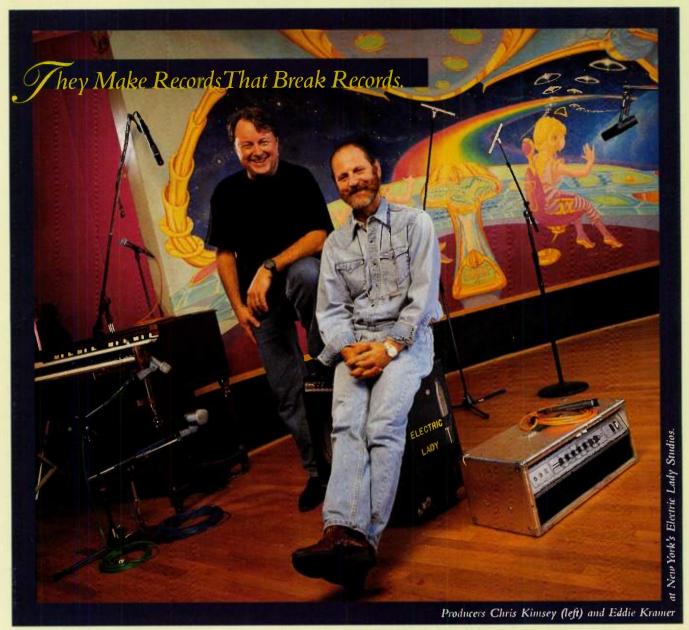
Sometimes, she'll sing a couple of tracks, and I'll comp them and say, "That's a pretty good vocal performance." She'll say, "Pretty good?" I'll answer, "Yeah, I think it's really good," and as soon as I say that, she'll go in and sing another take. It works every time. She always knows what I'm thinking; it's almost like she corrects the performance before I say anything. We've been together twenty years, so just my tone of voice will tell her that I think she can take it one step further. But her takes are never bad.

What are some of the initial tasks involved in recording Pat's vocals?

Typically, I'll do the headphone mix and make sure that I get a good balance of instruments for her. Then I let her run through the song once. I always compress her voice, usually with an old Neve stereo unit—I forget the number, but it's one of the vertical models—set to a real gentle, fast release time. In addition, I insert a limiter at the end of the signal chain so that none of the peaks take us too far into the red, causing unnecessary tape saturation. Sometimes there will be a



Neil Giraldo in the control room of his home studio, Spyder's Soul Kitchen.



"Frampton Comes Alive" still holds the record for the best selling live album in history.

But for veteran producers Chris Kimsey and Eddie Kramer, it's only one credit in a body of work that spans three decades, includes more than 50 gold and platinum albums and reads like a who's who of rock history.

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Kimsey's credits are equally impressive. To date, he's been behind the board on nine Rolling Stones albums, in addition to his work with scores of other internationally acclaimed artists. And although the music they've recorded has changed over the years, their choice in microphones hasn't.

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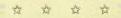
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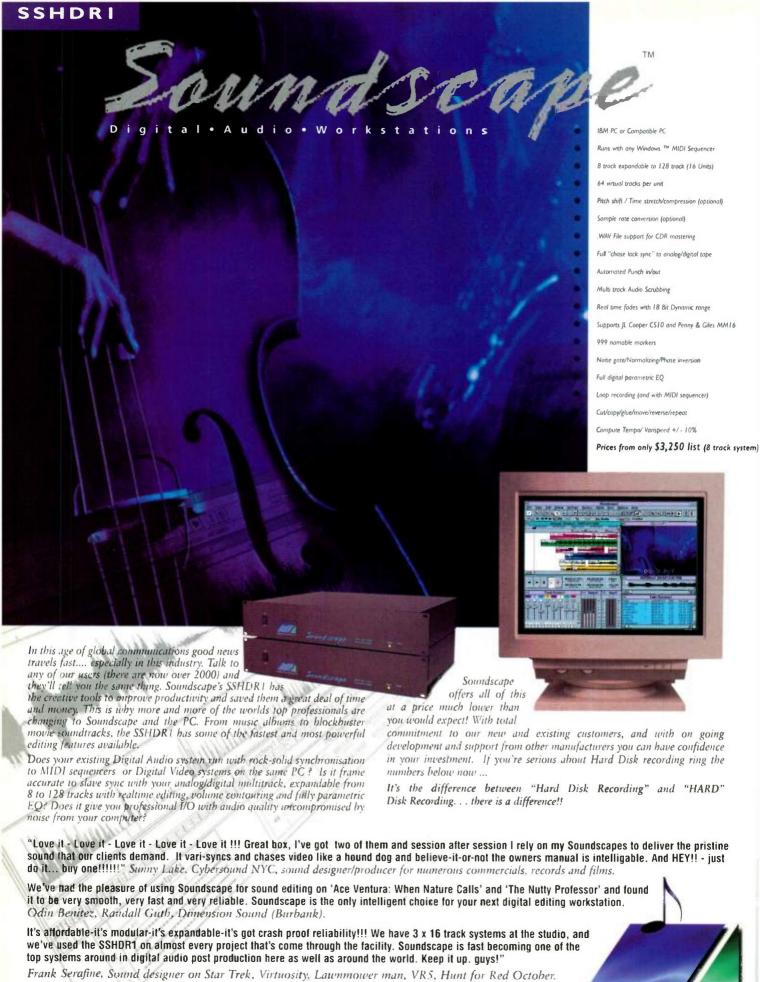
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situation when everything is set perfectly to catch all the peaks and things still sizzle a bit. That happened when we recorded Pat's vocals on "Fire and Ice." You can hear some slight distortion on the record.

Did you go through a trial-and-error process to find the perfect mic for Pat's voice?

Oh, yeah! I tended to use the Neumann U 67 tube mics a lot, but they had certain quirks that really bummed me out. For example, when we'd go to fix a couple of vocal things, the punched-in lines would always sound a little different than the original vocal track. The tonal variations occurred because the mic's tone would change after the tube warmed up and then it would fluctuate again as the tube started to "tire out" from hours of use. So sometimes I'd put up an AKG C 414 to capture a more consistent tone.

Pat will also sing into a Shure SM58



Pat Benatar's powerful voice, catchy songs, and toughgirl image made her a megahit, MTV icon in the 1980s.

mic as she runs through a song, and occasionally we'll use those scratch tracks in the final mix. Often, when she is talking into the mic before we start recording, I'll notice that her voice sounds too bright or has too much presence, and I'll change the mic before she even starts singing. You just have to listen and use whatever mic works on a given day for a given track.

What about the mix? Do you have any favorite tricks to enhance her voice?

I always use an EMT 250 because it's the most beautiful-sounding digital reverb, and it sounds absolutely great on her voice. I set a 120-millisecond predelay, so when she sings, you don't hear the reverb immediately. The reverb appears right after each word, kind of like a cloud.

Another trick I use is doubling the vocal electronically with a stereo delay. I typically set the delay time to 35 milliseconds and compress the input signal. It's subtle, but the sound is brilliant. If you do it right, the vocal effect is sort of like the one on John Lennon's "Instant Karma."

You've recorded guitar tracks in some pretty famous studios with bigwigs like producer Keith Olsen. Let's dis-

cuss some practical applications to capturing a great quitar tone.

Well, a Shure SM57 is a great mic for recording guitars. An AKG C 414 is good, too, because it adds a certain brilliance to the sound. Placement-wise, I stick the microphone right up against the speaker cabinet's grille cloth. Then, I play the guitar and listen through headphones while I move the mic around to find the spot where everything sounds good. Sometimes I'll tilt the mic off-axis to the speaker by 45 degrees to take a bit of the scratchiness away. For miking acoustics, I typically use a Neumann KM 184 tilted towards the 15th fret.

It also helps that I've got an old Neve 8068 console. The Neve definitely colors the sounds that go through it, and I like that. There's not a better sound than a vocal or a guitar going through a Neve. That sound,



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combined with the right mic, usually eliminates the need for tons of EQ.

Another major element of my guitar sound is a Fairchild Model 670 stereo tube compressor. I have a little trick where I will not use the mic preamps on the Neve to get the maximum signal level to tape. What I'll do is set the Neve preamps to about half and then make up the gain with the Fairchild. That method of gain staging ensures the guitar signal is getting the maximum tonal benefits of the Fairchild's tubes—which is the way to go if you're going to spend the money to buy the 22 tubes that thing uses!

You obviously prefer an extremely close-miked guitar tone rather than placing mics to also capture some room ambience.

Yeah. I remember walking into a session where the engineer placed one mic on the speaker grille and another mic about three feet back. I looked at him right away and said, "The sound is never going to be completely in sync. It'll sound tubby."

Do you find yourself twisting EQ knobs to dial in the guitar tones you're after?

I never EQ my guitars to tape during recording. I'll only add EQ during the mix, and that's often limited to a few boosts at 10 kHz and 700 Hz to get some extra chunk.

I usually like to keep sounds as flat as possible. I've worked with engineers who EQ everything, and it can get out of hand. I mean, if the drums are heavily EQ'd, you have to EQ the guitars so their sound matches the intensity of the drum sounds. And then you have to EQ the vocals heavily so that they can stand out from the guitars, and so on. It's a mess.

Do your demos ever sound better than the studio tracks?

Well, I have recorded demos that turned out to be masters. "Let's Stay Together" [from the album Wide Awake in Dreamland] is a good example. The song was a demo that only lasted about a minute, and we had to construct the final track by looping the verses and choruses and dropping them onto the master reel. That was a real headache!

I have found that if a demo just kicks the heck out of the "real" track, it's important to maintain the demo's instrumentation on the final version —especially if you plan to fly in tracks from the demo to the master reel. I mean, do not change one instrument from the arrangement on the demo. If vou do, it will permanently upset the balance of the other instruments, and you'll lose the sound and vibe that made the demo so special.

How much do your songs evolve from the demos to the final recorded versions?

Let me think of a few examples. Well, "All Fired Up" [from the album Wide Awake in Dreamland] used to start with just guitar. But when we started recording the studio version, I was kind of bummed because we weren't getting the track together. So I asked the

drummer, "What are you doing?" We got into an argument about the parts, and then I just broke into this groove, and that's how the song's intro came about. The breakdown in the middle section wasn't planned, either. It was basically a magical moment that just happened-it wasn't on the demo and it wasn't supposed to be there.

That just goes to show you can't ignore the importance of "accidents" in the studio. For example, the drum machine introduction to "Love Is a Battlefield" [from Get Nervous] was a mistake. I accidentally hit something on the Linn that made a 6-bar phrase instead of the 8-bar phrase I wanted. But the 6-bar phrase had a nice rhythmic turnaround that worked great.

A unique groove can definitely make a pop song come alive. If you notice, on all those big records we did, the songs have a real strong, identifiable rhythm. I love rhythm; I am a frustrated drummer!

After all the hard work you've done during tracking, how do you preserve the feel of the song when it comes time to mix?

Well, getting the right perspective is important. So as soon as you record your last overdub, do a rough mix right away to document a good vibe for the track. If you wait two weeks or so to mix, you'll never capture the song. It's critical to get some kind of mix down while you're still building the track and the song is a living thing.

Your motto as a producer seems to be "Keep it simple." Is that the ideal you would like to impart to readers of Electronic Musician?

Well, the records that [producer] Trevor Horn makes with Seal are really complex. There's a lot of stuff going on and everything sounds fantastic. He also spends two years and two million dollars making an album. EM readers may eventually want to get to that stage, but I recommend keeping your productions as organic as possible because, many times, that's where you'll capture the magic.

Freelance writer Greg Pedersen thinks Neil Giraldo is aces because he plays BC Rich guitars and always shares his beer.

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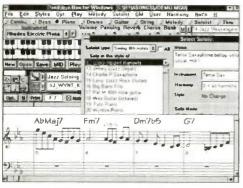
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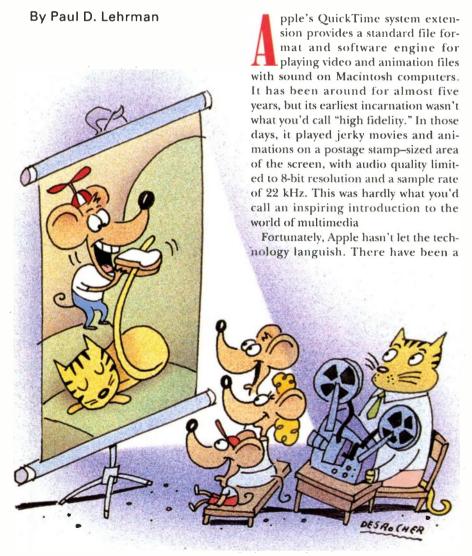
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QuickTime Face-Lift

Apple's latest version of QuickTime is a beautiful thing.



number of upgrades to QuickTime over the years, each offering significantly improved performance and intriguing features, especially for musicians and other audio types. For example, version 1.6 added the ability to extract 16-bit, 44.1 kHz, stereo audio files from a compact disc directly to the computer's hard disk with no digital-to-analog conversion necessary. That version allows the user to incorporate those audio tracks into QuickTime files, which are called Movies.

The latest incarnation of QuickTime for the Macintosh is version 2.5. It offers all sorts of enhancements and new features for multimedia developers and users, whether their medium of choice is floppy disk, CD-ROM, or the World Wide Web. Movie playback has been greatly improved, and all the code is now native to the Power Mac.

On the visual side, PCI-based accelerators and multiple processors, such as those found in Daystar's Mac clones, are now supported. In addition, the software can import and export JPEG files and import MPEG files, allowing easier interchange of video files with other platforms. A new set of graphic importers lets you work with a wider variety of image-file formats, and Apple's QuickDraw 3D technology can now render objects within QuickTime Movies. According to Apple, a new Clock component guarantees synchronization of video and sound, something that \(\xi \)

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QuickTime has always done somewhat better than its competition, although it hasn't always done it perfectly.

I GOT THE MUSIC IN ME

QuickTime 2.5 includes a number of nifty new features that are of definite interest to musicians. Most of these features are part of the QuickTime Music Architecture (QTMA), which was introduced with QuickTime 2.0. This technology allows the Mac to act as a polyphonic, multitimbral synthesizer.

QTMA includes about half a megabyte of very carefully compressed and tweaked wavetables, which are loaded into RAM as needed by a sequence. These sounds are played through the Mac's internal sound chip according to instructions sent by a sequencer, the MIDI tracks in a Movie, or some other application. In the case of the Power Mac, the sounds are played by the processor itself. Although the system doesn't technically qualify as a true General MIDI (GM) synth, the sounds are arranged in a program map that follows the GM standard, with channel 10 reserved for drums. The available polyphony is dependent on the Mac's processor speed (see "Flash in the RAM" in the October 1995 EM).

In its earliest version, QTMA was barely usable. The sounds were developed by Roland from the company's highly successful GM sound set. However, they were 8-bit renditions of 16-bit samples and sounded pretty weak. In addition, many GM patches were missing; when you tried to call up one of these missing sounds, the software substituted something else that was often less than satisfactory.

To make matters worse, a bug caused the software to misinterpret incoming Program Changes and offset their values by one. If you tried to call up a missing GM sound, the software would substitute something that wasn't even in the right bank. This Program Change bug was joined by a sneaky bug that occasionally dropped samples in the middle of a file and another bug that caused everything to crash when you tried to load a large MIDI file.

Happily, these bugs have all been fixed in version 2.5. The sound set is essentially the same, but it has been tweaked (especially the drums and percussion) and the substitutions for missing sounds make a lot more sense now. In addition, the synthesis engine has been improved, so the system sounds quite a bit better than it did. On Power Macs, the mixing bus uses a 32-bit pathway before the sound gets to the 16-bit D/A converters. There still seem to be some problems chasing Sustain commands in a file, but overall, the software behaves respectably.

Perhaps more significantly, QTMA's architecture itself has been opened up in some very useful ways. Instead of burrowing through a lot of obscure subwindows in *MoviePlayer* to access Quick-Time's parameters, you now can open a control panel called QuickTime Settings (see Fig. 1).

For example, the control panel shown in Figure 1 reveals that QTMA can now address an external synth instead of the internal one. You can patch QTMA's output through Apple's own MIDI Manager or through a simple interface attached to the modem or printer port. (On a Power Mac, however, you must use the modem port.) In addition, QTMA can be





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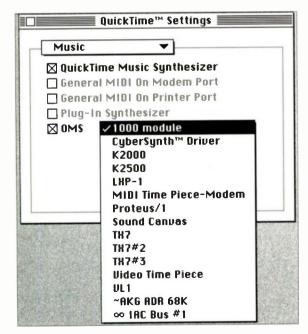


FIG. 1: The new QuickTime Settings control panel lets you select the internal synth, an external synth, or both. Using OMS, you can select any device known to the system, including InVision Interactive's CyberSynth VS.



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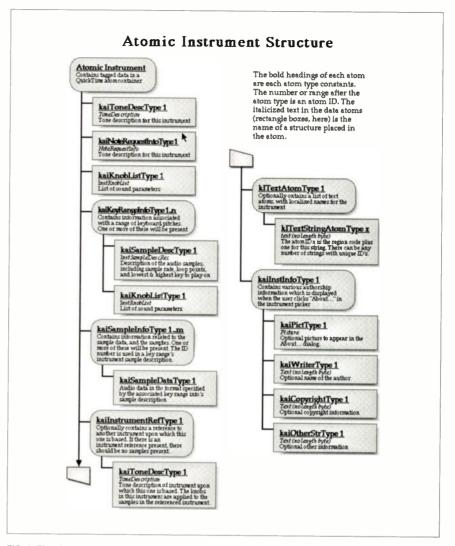


FIG. 2: The Atomic Editor for QTMA sounds is not for the squeamish. (Courtesy Apple Computer)

routed through Opcode's Open Music System (OMS) version 2.2, which has been licensed to Apple.

If you have OMS running, you can choose any synth that OMS supports to play back your files. However, you can only use one synth at a time because multiple MIDI cables are not supported. But you can have the internal synth and an external synth available simultaneously. In this case, QuickTime uses the external synth first, which presumably has higher-quality sounds. The internal synth kicks in when the external synth's polyphony is exceeded, which QuickTime determines from OMS. The internal synth engine is also used when the external instrument can't play a requested sound, such as a custom sample embedded in a particular sequence.

Unfortunately, the process of setting up the synthesis parameters and signal

routings with QuickTime 2.5 is very finicky, and the computer often crashes while you're working with these system parameters. It may be a system extension conflict of some kind, but even after several days of trying, I was not able to isolate the problem.

NEW SOUNDS

As an addition to the existing internal sounds, Roland, Yamaha, and InVision Interactive are reportedly working on new sound sets for QuickTime 2.5. Although one source at Apple says that Roland is the "most active" of these companies, Roland isn't making any official announcements. Yamaha says it's working "not just on a sound set, but on replacing the entire engine." Yamaha has also released their own fullfeatured software synthesizer, called MIDPlug, which is a plug-in for Netscape Navigator.



FIG. 3: This control panel appears when you download a QuickTime Movie MIDI file with Netscape Navigator and the QuickTime plug-in. The slider is a volume control, and the "LEDs" indicate its position; they are not level indicators.

InVision won't say when its Quick-Time plug-in will be available, but QuickTime users can play their files on the company's *CyberSound VS* (formerly known as *CyberSynth*) sound engine, using OMS as a go-between. In general, the InVision sounds are a step up from Apple's sounds, but I wouldn't recommend using them with Quick-Time. The playback level is so low that system noise is a problem, and the *CyberSound* engine puts so much strain on the Macintosh's CPU that musical timing suffers markedly.

Apple has also developed a program for rolling your own QuickTime sounds, but it's not for the squeamish. Called Atomic Editor (see Fig. 2), it's "unsupported," which means you're on your own if you try it. Apple offers no official user support. On the other hand, it's free; you can download it from http://www.srm.com/qtma/AtomicInstruments.html. In addition, this Web site offers several authoring extras for MoviePlayer 2.5 that let you drag and drop System 7 Sounds into the instrument list. It's crude but potentially effective.

Another addition to QuickTime actually predates version 2.5 but is only now enjoying wide distribution. This addition is a plug-in for *Navigator* that is available from Apple (http://quicktime.apple.com/qt/sw/readme.html) and is also included with *Navigator* 3.0. With this plug-in installed, MIDI files can be played right from a Web page, without having to first save them to disk and then launch an application such as *MoviePlayer* (see Fig. 3). Interestingly, the LiveAudio plug-in for *Navigator* uses QuickTime to play MIDI files.

The plug-in only works with MIDI sequences that have been uploaded as QuickTime Movie files (MooV or .mov), even though QuickTime itself can handle Standard MIDI Files (SMFs). WAV files, KAR (karaoke) files, and other types of music files. A large li-

brary of Movie files, ranging in quality all the way from pretty lame to pretty good, can be found on the MIDI Farm (http://www.midifarm.com). In addition, check out the files at http://qtpartners.apple.com/caffeine/eugenol/OuickTime/#midi.

For more information about Quick-Time, surf to http://www.info.apple.com. A Web page devoted to QTMA can be found at http://www.srm.com/qtma (which is where the Atomic Instruments editor and MoviePlayer extras are located). For info about

Yamaha's MIDPlug, go to http://www.yamaha.com.

Clearly, QuickTime has come a long way since its inception. Many of the early bugs have been eradicated, and the performance has been improved dramatically. It looks like this technology is here to stay, which demonstrates Apple's commitment to music and multimedia.

Paul D. Lehrman isn't at all sure about this internal synthesizer stuff, but he is nonetheless looking forward to the day when he can throw away all his MIDI cables.

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Creative Bass EQ

Improve your mixes from the bottom up.

By Brian Knave

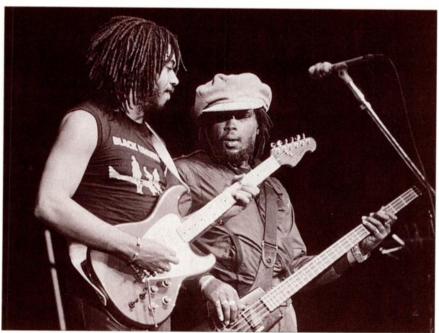
here are two basic reasons to mess with your console EO during a mix: to shape an instrument's tone so that it "sits" better in the overall track or to alter the tone because you want the instrument to sound different. The first reason can be thought of as corrective EQ and the second as creative EQ. Often it's a combination of the two that yields the best results.

However, creative EQ is particularly useful when you want a tone that's more appropriate to a groove or style of music than what's actually recorded on tape. As long as your board offers one or two sweepable midrange bands as well as low and high shelving, you can usually tailor the sound of an existing track to better match the mood and style of a song. You can also get imaginative, of course, and dial in unusual or bizarre sounds.

This month, we'll look at enhancing the timbre of the bass guitar. Keep in mind that even the most creative equalization can't alter a bass player's style, technique, or musicality. For example, if you record a heavy-metal bassist play-

ing a Gibson Ripper with a pick, no amount of tweaking in the world is going to make the track sound like Jaco Pastorius playing a fretless Fender. But if your bass track is just shy of hitting the yummy mark, twisting a few knobs can slam home a great tone. Of course, it's important to have a general idea of which frequencies to boost and/or cut, so I'll list my tonal recipes for some classic bass sounds to get you on the right track. **BEATLE BASS**

Paul McCartney's bass sound evolved over the years, but whether it was the early Hofner thump or the Rickenbacher rumble of Wings, his tone was always round and fat. Low mids often



The rule of thumb for reggae bass is tons of wall-shaking low end. Here the master of the genre, Robbie Shakespeare (right), lays down the law with Black Uhuru.



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RECORDING MUSICIAN



When was the last time you saw a P-bass with both pick and bridge guard intact? Motown session whiz James Jamerson not only didn't tamper with his favored axe, he also rarely changed its strings—a fact that contributed considerably to his fat, muted tone.

predominated, and the attack was very articulate because McCartney usually played with a plectrum. To push a track towards the Beatle zone, start by boosting 80 Hz or 100 Hz (depending on your board's EQ configuration) by 2 or 3 dB. If the bassist used a pick, there's probably sufficient midrange "pluck" already; if not, try boosting 3 to 6 dB at 3 kHz to increase string intelligibility and punch.

If your mixer has high shelving EQ in the 12 kHz to 18 kHz range, you can make the sound a bit smoother and warmer by cutting 6 dB up there. But if all you have is a 10 kHz shelf, take care when cutting or you may dull the sound too much.

SILLY LOVE TONE

For a similar sound with a little more warmth, again boost the 80 Hz range a few dB, then boost 500 Hz by 6 dB or so. Next, cut 300 Hz by about 3 dB and 12 kHz by 6 dB. (Obviously, this application requires four-band EQ with two sweepable mids.) Cutting at 300 Hz gets rid of any hollow tin-can tones, and—in combination with the boosts—yields a warmth that can complement a ballad while retaining enough author-

ity to drive a rockin' blues or clubhouse shuffle.

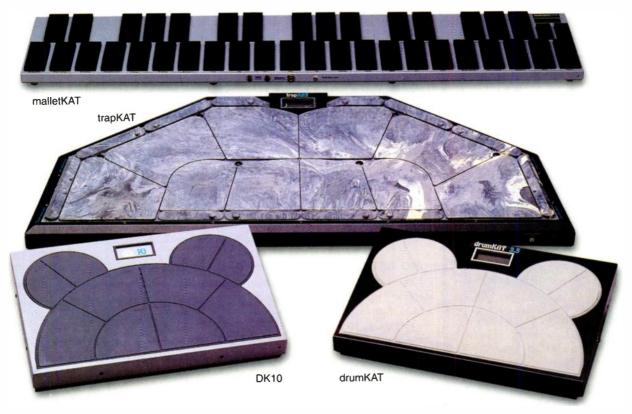
BASS IN YOUR FACE

If the tune calls for an aggressive Chris Squire or John Entwistle sound, you'll need to roll off some low end and crank up the mids. First, add 6 to 9 dB of high mids and sweep between 1 kHz and 2 kHz until you find the appropriate flavor of honk. Next, cut 200 Hz by 6 dB. If you want an even more brittle sound, cut 80 Hz by another 2 or 3 dB. The result is a trebly, piano-string sound with enough attack to help a busy bass line slice through the mix like a machete through sugarcane. Geddy Lee, stand back!

TWANG THANG

If you want to accentuate the twang in a bass track, try this approach. First, cut 200 to 250 Hz by 6 dB or so. This cut is good for reducing "mud." Now, boost an equivalent amount of 1 kHz for the twang. Finally, beef up the low end a tad by boosting a dB or two at 80 Hz. Country session player David Hungate (formerly with Toto) may not call this an "authentic" C&W twang, but hey, we're being creative, right?

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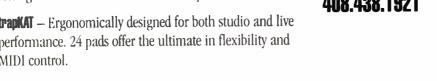
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• RECORDING MUSICIAN



If you're lucky enough to record bass monster John Patitucci, you probably won't have much reason to touch the EQ. Remember, sometimes the best EQ tweak is *no* EQ tweak.

MO-BETTER MOTOWN

Legend has it that the classic "dead string" bass sound of Motown groove king James Jamerson depended on. well, dead strings. And supposedly, after he switched to some new strings given to him as a gift, he never quite got that sound again. To achieve a similarly smooth, muted tone without dumpster diving for discarded bass strings, simply cut 1 kHz by 5 or 6 dB, boost 200 Hz by 3 dB, and pump up the lows with a slight boost at 80 or 100 Hz. Then, cut the high end (preferably 18 kHz, but 12 kHz will work) by 6 dB or so. Also, note that by boosting a few more dBs of low end, you can achieve a passable reggae bass sound as well.

STAX-VOLT JOLT

This tone is basically a variation on the Motown sound—which is not surprising when you consider that Duck Dunn (of Booker T. and the MGs) was also known for never changing his strings. But rather than cutting at 1 kHz, go for a punchier, more aggressive sound by scooping out 6 or more dB at around 5 kHz. By staying "down in the basement," either the Motown or Stax-Volt sound works nicely in a mix cluttered with midrange elements such as guitar, piano, and horns.

JACO JAZZ

The bass sound of jazz legend Jaco Pastorius has been described alternately as tight, farty, animalistic, and horn-like. But however you describe it, the bottom line is that it takes a Jaco Pastorius (or a darn good clone) to get a true Jaco tone because much of his sound was in his fingers.

But you can approach the Jaco sound—especially if working with a fretless bass—by boosting the midrange while reducing low mids. Start by cranking 1 kHz by 6 dB or so to get some honk. Then, carve out a big chunk of 200 Hz, cutting as much as 9 dB or more. Finally, boost the low end and cut the highs by 1 or 2 dB. This sound actually works well in a variety of progressive jazz applications. To get more of a Marcus Miller sound, cut at around 800 Hz rather than 200 Hz.

BASSIC MIX TIPS

Keep in mind that small, close-field monitors don't provide subsonic bass response. If your monitors can't accurately reproduce frequencies below, say, 60 Hz, the plain fact is that you'll be stuck guessing about what's going on below that point. Therefore it's very important to reference your mixes on several different playback systems.





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In addition, as anyone who has done much mixing knows, there's a fine line between too much bass and too little. Finding that line is complicated by the fact that we typically perceive certain tones differently when we hear them at different volume levels.

As it turns out, our ears have a flatter response at high volumes than they do at low. The lower the volume, the quieter low frequencies (from 20 Hz to 200 Hz) sound in relation to mids and high mids (those from 1 kHz to 6 kHz). In other words, what sounded like tons of bass while you were mixing at 100 dB will likely sound puny at 70 dB. That's why it's also vitally important to check your mixes at several different volume levels.

CLEVER DISCLAIMER

Now that I have laid out more than a half-dozen bass EQ settings, I will remind you that not one of them is worth a hill of beans if the resulting bass sound doesn't complement the song and work to enhance the other elements of the mix.

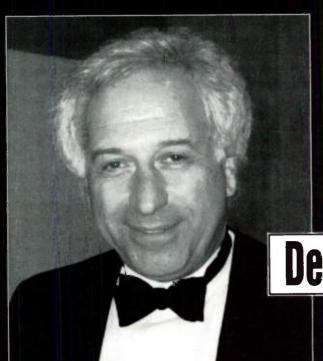
Although it's certainly no sin to tweak a track in solo mode, equalization settings should only be finalized in the context of the complete mix. The purpose of equalizing a mix, after all, is to minimize frequency conflicts among the various instruments so that they're not fighting for the same sonic space.

In other words, you're trying to create an aural "niche" for each instrumentand this can only be done while listening to all the parts together. Often, after you've EQ'd a track in the context of the entire mix, an individual track will sound absolutely horrible when soloed. Well, so be it. All that really matters is that the sound works when it is joined by all the other elements of a (we hope) well-balanced mix.

A final plea: Use these recommendations only as starting points. Sometimes my suggestions will work for your track, and sometimes they won't. But if nothing else, these "tone templates" will help you get acquainted with the sonic capabilities of your console's EQ section. Then you can find your own favorite bass tweaks more readily.

(Special thanks to Edo Castro, Jeff Simons, Marty Holland, Mark "Gibby" Gibson, Dennis "Diz" Dismore, Charlie Aesque, Barry Cleveland, John Baccigaluppi, and Michael Molenda.) @

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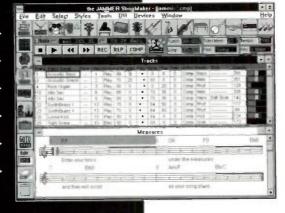
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In the past, PowerTracks has offered powerful features such as music notation, wave file support, lyrics, chord symbols and score printout. Now we've added even more! PowerTracks 3.5 has a big "Karaoke Style" window to display lyrics up to "full-screen". The notation is greatly enhanced with support for finer resolutions such as 32nd notes. You can also now align a rubato piece to a click track. We've improved the intelligent piano hand splitting routines. The enharmonics are intelligently chosen based on the chord symbols, and more - Read on for more details.

Big Lyrics window lets you view song lyrics in the font of your choice in a full-screen window. Select your own font style, size, and color. Great for singing along with the music! Notation Scrolling Ahead. If you're sight-reading the music off of the screen, you'll be pleased to note that the music can now scroll ahead. This is how we normally read sheet music! You can set the notation to scroll 1 or 2 bars ahead of the music without interfering with your view of the current notation. A great feature for sight-reading practice.

Rapid Resume. PTW can now automatically save the window positions of all opened windows and restores them the next time the program is used. You can optionally store and recall setups with a ".WS" file. Have PTW start out with your favorite setup every time you run the program by simply saving a file called FAVORITE.WS to your PT directory.

Save Your Patches. The enhanced patch select dialog now lets you select the patch list from within the dialog. PowerTracks 3.5 will remember the patch list used for each track and will save the name of the patch list used for each track to a ".SEQ" file. A "must have" for people who own multiple sound modules.

SysEx Input Buffer Size setting is now adjustable within the Options | MIDI. In dialog to help the people who normally have SysEx-input problems. The Buffer Amount can also be set.

- supports finer resolutions which allows you to enter notes such as 32nd and 64th notes
- "bars per line" markers which allows you to adjust the bars per line on a screen by screen basis
- . "hard rests" which will be in effect even if you have minimize rests set to false, as well as the option to make notes invisible.
- a special mode for autodetection of finer resolution and/or multiple chords. PowerTracks can now "clean up" the kinds of notes & chords that can otherwise look like a bunched up mess.
- · the Chord Note Separation and Chord Total Separation settings are now fully adjustable
- "Clean Mode" which automatically "cleans up" grace notes and any unwanted glitch notes from the notation. Glitch Velocity and Glitch Duration settings are fully adjustable.
- transpose setting will now transpose the key signature and the chords.
- · improved Guitar Tablature draws the note and fingering exactly like your favorite magazine.
- improved Lyrics editing makes it possible to cut and paste using the Windows clipboard.

Align Music To Click Track command will align the music you've entered or recorded to a click track. This is very useful for songs that were recorded rubato or without using a metronome. Improved hand splitting. Instead of arbitrarily splitting the keyboard into two parts, PowerTracks can make intelligent hand-splitting decisions which results in a highly accurate depiction of how the song should be actually played on the piano. These parts are also put on separate MIDI channels so that you can play or edit them individually.

Intelligent accidentals (enharmonics). sharps(#) and flats(b) are now context sensitive to the key and the chord its in. For example, if you are in the key of Eb and the chord is a D7, a F# note will show up as an F#, and not a Gb. This means that the notation accidentals will automatically show up correctly.

Convert loaded files to specific PPQ. Regardless of what PPQ a song was recorded in, you can work with it at the PPQ that is most familiar to you. For example, set this to 480 and all files will be set to 480, regardless of their original PPQ.

Forced Channels, channels that you normally use for different instruments (e.g. Bass on Channel 2) can be embedded in a midi file in addition to .SEQ files.

New Tips of the day. We have added some new tips of the day to keep you informed of the new features of version 3.5.

Hot Keys. Common procedures such as "Select all" and "Run DLL" can be performed with a single keystroke.

Other Enhancements such as a new setting to prevent PowerTracks from sending an "All Notes Off" command when synched to MIDI or SMPTE. This is important if you're using a lighting controller or other device that has a tendency to 'misbehave' when receiving an All Notes Off command.



Dithering Heights

Adding noise reduces the inherent distortion of digital audio.

By Scott Wilkinson

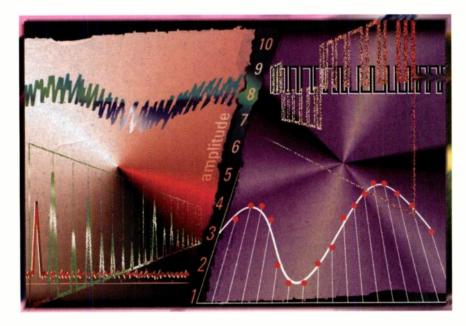
igital audio systems usually start by converting an analog audio signal into a stream of numbers. This process is called digitization or quantization, which should not be confused with quantization in a MIDI sequencer. (For a complete discussion of the basic concepts of digital audio, see "Square One: Digging into Digital Audio" in the February 1996 EM.)

The conversion process goes something like this: when an analog signal (an electrical voltage in a cable that varies over time) is directed to the input of a digital audio system, an ana-

log-to-digital converter (ADC) measures the instantaneous voltage level of the signal many times per second (typically 44,100 or 48,000 times per second). Each measurement is then represented by a binary number called the quantization value, which includes a fixed number of bits (typically eight or sixteen bits). The number of bits in the quantization value is called the resolution of the system.

But what if the voltage falls between two consecutive quantization values (e.g., between 1010101010101010 and 1010101010101011)? In most cases, the system uses the quantization value that is closest to the actual voltage (see Fig. 1), which is similar to rounding a fraction to the nearest whole number. This happens more often than not in digital audio systems because the chance that a voltage will correspond exactly with a quantization value is very small. After all, there are an infinite number of voltages between any two consecutive quantization values. This is one of the fundamental differences between analog and digital audio.

The rounding process results in an inaccurate representation of most measured voltages, which can lead to audible distortion and noise. One of the most common solutions to this problem is called *dither*. But before I can explain what dither is, you must first understand the nature of the distortion caused by the rounding process.



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IN A DITHER

The difference between the actual voltage and the nearest quantization value is called quantization error, which leads to an often audible artifact called quantization noise or distortion. This artifact manifests itself in several different ways, depending on the situation.

In part, quantization distortion depends on the resolution of the system. The greater the number of bits used to represent each voltage

measurement, the smaller the interval between consecutive quantization values, and the less the measured value must be rounded. This means less quantization error and therefore less quantization distortion. Each added bit of resolution lowers quantization noise by 6 dB. However, adding more bits to a system's resolution becomes cost-prohibitive after a certain point.

Quantization distortion also depends on the input signal itself. With highlevel signals, quantization distortion is random and resembles white noise. However, this distortion is rarely objectionable (or even perceptible) with high-level signals such as those most music presents.

With low-level signals (including lowlevel harmonics in otherwise high-level signals), quantization distortion is more problematic. These signals have a small

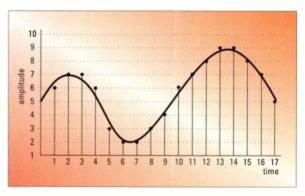


FIG. 1: As an analog waveform is digitized, the measurement of each voltage value is rounded to the nearest quantization value, causing quantization error and distortion. (Courtesy Ken C. Pohlmann)

amplitude, i.e., the voltage varies over a narrow range of values. As a result, only a few quantization values are used to represent the entire signal. To put it another way, low-level signals only use a few bits of the system's resolution.

This leads to greater quantization distortion because most of the measured voltages are rounded to only a few quantization values. In this case, the digital waveform doesn't look much like the original analog waveform. This type of quantization distortion is often called *granulation noise* because of its "gritty" quality. In extreme cases, a sine wave can become a square wave, or it might even disappear completely.

Unlike many digital audio systems, the system depicted in Figure 2 always rounds upward to the nearest higher quantization value. If the sine-wave voltage crosses a single quantization value

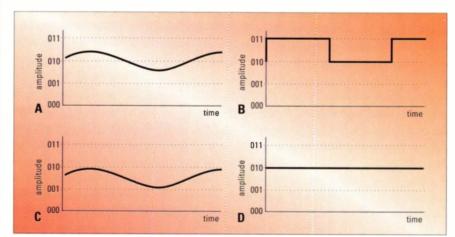


FIG. 2: In the digital audio system represented here, all voltage values are rounded up to the next higher quantization value. If a low-level input sine wave crosses a single quantization value (a), it is digitized into a square wave (b). If the input sine wave stays within the boundaries of two consecutive quantization values (c), the digitized output does not oscillate at all (d). (Courtesy Ken C. Pohlmann)

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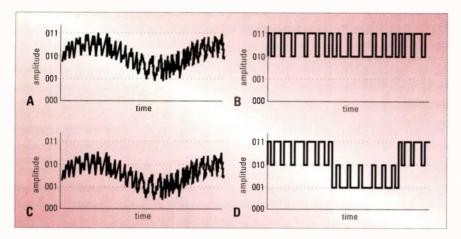


FIG. 3: If the sine waves in Figure 2 are dithered by adding white noise (a and c), the pulse width of the digitized rectangle wave varies according to the shape of the original sine wave (b and d). The original sine wave is reconstructed from this pulse-width modulated waveform by a lowpass filter, and we perceive it as a sine wave. (Courtesy Ken C. Pohlmann)

and never reaches the adjacent values, all voltages above the center value are rounded up to the next higher value, while all voltages below the center value are rounded up to the center value, which produces a square wave output (see Figs. 2a and 2b). If the voltage remains within the boundaries of two consecutive quantization values, all voltages are rounded up to a single value, which results in no oscillation at all (see Figs. 2c and 2d).

If a low-level sine wave is distorted into a square wave in this manner, it exhibits its own set of harmonics that extend well beyond the Nyquist frequency of the system. All digital audio systems include a lowpass filter at the input that removes any overtones above the Nyquist frequency to prevent aliasing. (If you are unfamiliar with the concepts of Nyquist frequency and aliasing, see "Square One: Digging into Digital Audio" in the February 1996 EM.) However, the harmonics arising from quantization distortion appear after the lowpass antialiasing filter, so the filter

cannot prevent aliasing in this case. If these harmonics are near the sample rate, a chirping effect called *bird singing* or *birdies* can be heard.

COME DITHER

Oddly, one of the best solutions for quantization distortion is to add a small amount of analog white noise to the input signal before it is digitized. This added noise is called *dither*.

Take a look at **Figure 3**, in which dither has been added to the sine-wave signals from Figure 2. The added dither noise causes the waveform to jump around the nominal voltages of the original sine wave, although the overall shape of the original signal is retained (see Figs. 3a and 3c). As a result, the dithered input signal comes close to different quantization values much more often than the original sine wave does, and the digitized square wave jumps between quantization values more often. In fact, the output is no longer a square wave; it's a rectangle or pulse wave in which the pulse width

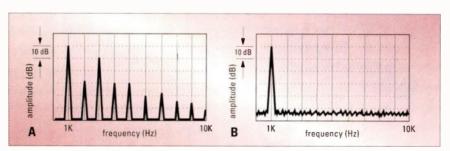


FIG. 4: In this example, a low-level, undithered sine wave with a frequency of 1 kHz is digitized, and quantization distortion produces additional harmonics (a). Dithering the input removes the distortion harmonics but adds some white noise (b). (Courtesy Ken C. Pohlmann)

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changes from cycle to cycle. This is called pulse-width modulation (PWM).

In Figures 3a and 3b, notice that when the overall shape of the dithered waveform is near its crest or peak, the PWM wave spends most of its time at the upper quantization value. The PWM wave does spend short periods of time at the lower quantization value when the dither noise is at one of its low points. Conversely, when the overall shape of the dithered waveform is near its trough, the PWM wave spends most of its time at the lower quantization

value with only short periods at the higher value when the dither noise is at one of its peaks.

In accordance with the overall peaks and troughs of the dithered input waveform, the PWM wave spends different amounts of time at the upper and lower quantization values. To put it another way, the changing pulse width corresponds to the overall shape of the dithered input waveform. This fact is critical for understanding the effect of dither, so let me repeat it: the changing pulse width corresponds to the overall shape

of the dithered input waveform.

When the PWM wave is converted into an analog signal by means of a digital-to-analog converter (DAC), it proceeds through a lowpass filter just before the final output. This filter removes the high-frequency harmonics that arise from the small stair steps introduced into the waveform by the digitization process. Removing these harmonics smoothes out the waveform, returning it to its original shape.

In addition, the output filter offers an added bonus: it reconstructs the original low-level sine wave from the PWM wave as depicted in Figure 3. This reconstructed sine wave includes a bit of white noise that was not present in the original input, but this is a small price to pay for recovering a low-level signal that would have otherwise been very distorted or lost altogether.

It is also helpful to consider the resulting harmonic spectrum of dithered and undithered inputs. As mentioned earlier, when an undithered, low-level signal is digitized, it can become a square wave, which introduces its own

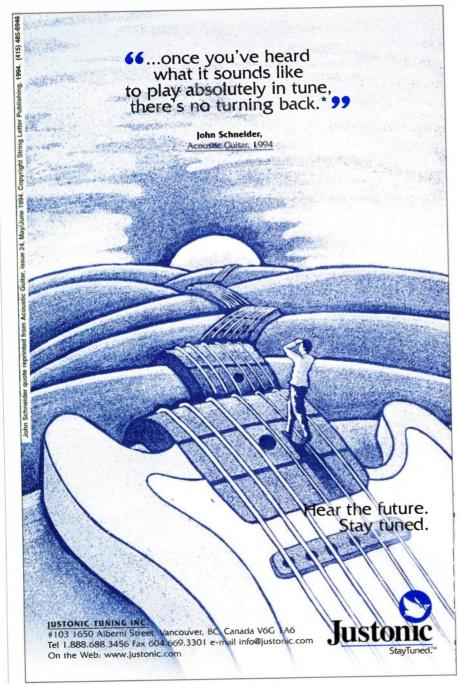
Quantization
can result in

harmonics (see Fig. 4a). If the original signal is dithered, these harmonics are eliminated at the cost of a bit of white noise (see Fig. 4b). In other words, dithering actually removes the distortion harmonics rather than simply masking them. Amazingly, dithering lets digital audio systems represent signals with amplitudes that are less than the minimum quantization interval. This is similar to the ability of analog systems to record signals with levels that are below the noise floor.

DITHERING DOWN

Dither can also be applied to a signal after it has been digitized; this is called redithering to distinguish it from input dithering. Redithering is usually performed when reducing the resolution of the signal. In this case, the process is often called dithering down.

For example, many pro recording studios record with 20-bit resolution in



order to improve the dynamic range of the recording and reduce quantization noise. But these signals must eventually end up with 16-bit resolution to accommodate the CD format. Also, just about any type of digital signal processing (DSP) results in data words that are longer than original samples in order to maintain the accuracy of the computations. These data words must be returned to their original resolution at some point, which means reducing the number of bits in each word.

Of course, you could simply delete the extra bits; this is called truncation. But truncation is generally considered unsatisfactory because of the potentially audible artifacts it creates. A much better solution is to add random numbers to the longer data words and then truncate to the desired resolution. These random numbers should have a resolution equal to the number of extra bits you want to remove. For example, if you want to convert from 20-bit to 16-bit words, add random 4-bit values to the 20-bit words and truncate to 16-bit resolution.

As a result of this process, the least significant bit (LSB) of the final 16-bit words switches its value from 0 to 1 and back in a pattern that represents the information from the extra bits, much the way the changing pulse width of a digital PWM signal represents the shape of the original, dithered analog waveform as described earlier.

As with input dithering, dithering down adds a bit of white noise to the final signal, which is pervasive throughout the audible frequency range. The noise is often compensated for by shifting it to regions of the audio spectrum to which the human auditory system is less sensitive. (The human auditory system is most sensitive to frequencies in the 1 to 5 kHz range and least sensitive to frequencies above 10 kHz.) This process is called noise shaping, and it is accomplished by controlling the pattern in which the value of the LSB switches from 0 to 1 and back.

The total power of the noise is maintained, but it is restricted to a limited frequency range, typically above 10 kHz. The level of the noise in this region is greater than the level of the original white noise, but our hearing is less sensitive to it, so we don't perceive it as well. The noise in the frequency range to which we are most sensitive is greatly reduced, which

means we perceive less noise overall.

Understanding dither is very important for all electronic musicians, who use digital audio systems more and more with each passing year. Multimedia producers must often create several versions of sound files in various formats, and each file might have a different sample rate and resolution. Many digital audio programs offer dithering options for just these purposes. Dithering is also important when performing almost any computational processing on a digital audio file. In a future column, I'll go into more detail about exactly how to apply dithering in various situations, but for now, it's enough to understand the basics.

(For more information, you should check out Principles of Digital Audio, third edition, by Ken C. Pohlmann, published by McGraw-Hill. You can also visit Digital Domain's Web site at http://www.digido.com.)

EM Technical Editor Scott Wilkinson thanks Ken Pohlmann and Bob Katz for their help with this article.



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Event Electronics 20/20bas

By Rob Shrock

.

Active, accurate, and affordable monitors.

wonder how many recordists have experienced this scenario: after trading a week of Nick at Nite for track-at-night, it comes time to mix the wundermusik that has kept you from all those great Dick Van Dyke Show reruns. Everything should go well; after all, the tracks sounded great as they were being recorded, right? Yet somehow, the final mix sounds lousy in your car, and it doesn't sound much better on your friend's home-stereo system. There's too much bass, the mids are cloudy, and half of those cool parts that tested your late-night playing chops are completely lost.

This frustrating finale to your recording efforts can happen if you don't

have a reliable, accurate monitoring system. Think about it: every decision you make in the recording and mixing process is based on what you hear, and your monitors are the primary link between your ear and the gear.

Fortunately, Event Electronics' affordable 20/20bas (Biamplified System) powered monitors deliver the performance one expects of powered monitors that cost two, three, or even four times as much. The 20/20bas performs so well, in fact, that it seems destined to see plenty of action in a variety of pro studios. The system is also available in a passive version (see the sidebar "Passive Personality").

The 20/20 line of reference monitors is the first speaker design from Event Electronics. The company name may be new to the industry, but the people behind the name are not. Event Electronics was founded by former Alesis President Russell Palmer, former Alesis Marketing and Sales Manager Ted Keffalo, and former Alesis Director of Engineering Frank Kelly. The 20/20 line was designed by Kelly and Walter Dick, who were two of the main designers of the Alesis Monitor One and Monitor Two.

A IS FOR ACTIVE

The 20/20bas monitors are active, which means that each of the cabinets has its own built-in, 2-way amplifier and crossover. Internal amplification typically provides more consistent speaker performance, eliminating the varying sound coloration that results when a monitor is connected to different amplifier models. Other benefits include reduced wear on speaker components and near-identical response on every like pair of monitors you run

If you carry your favorite monitors with you wherever you work, you don't have to worry about someone else's shoddy amplifier ruining your speakers. Fortunately, lugging the 20/20bas system around is but a slight inconvenience: the monitors weigh 28 pounds



Event Electronics' 20/20bas system delivers incredible sonic performance for a price that is well within reach of the home studio.

each and are of modest dimensions (see specifications table).

Input connections can be made with either XLR or 1/2-inch connectors (balanced or unbalanced). An input-level control provides up to 20 dB of padding, and the normally steady green power LED on the front of the monitor flashes if the input overloads the internal amps. Ideally, of course, you'll want the input control all the way up, but it's nice to have the flexibility to trim input signals that are too hot.

Speaking of hot, the back plate gets rather warm to the touch because it serves as the heat sink for the amplifiers. This isn't mentioned anywhere in the documentation, so it's easy to get caught off guard when you first grab a 20/20bas to reposition it. A friendly little burn may result, so be careful.

Separate low- and high-frequency filters are also available for tailoring the monitors to your taste. The LF filter affects frequencies below 400 Hz; when fully engaged, it provides 2 dB boost/cut from 100 to 400 Hz and 3 dB boost/cut below 100 Hz. The HF filter boosts/cuts all frequencies above the 2.6 kHz crossover point by 3 dB.

Normally you would set these filters at 0 dB for a flat response. However,

they are handy in situations where a particular room or monitor location is adversely affecting the system's frequency response. Each monitor comes with a small plastic tool for adjusting the filter controls, but I found it to be practically useless because it did not fit the Phillips-style control. However, any small screwdriver will do the job.

I have one more small complaint: I would prefer that the filter trims be notched at each dB marking to facilitate accurate matching of settings between speakers. Currently, the trims are continuously variable and must be set visually. There isn't even a notch to confirm the unity setting. Although each speaker is shipped with its settings at nominal, and the filter trims are recessed to prevent accidental movement, it's conceivable that some jostling (or a "ghost" in the machine) could cause the settings to change. Fortunately, these are usually set-and-forget features. After twisting them a few times to make sure they did what they were supposed to, I set the trims back to 0 dB for my listening tests.

In the event of an overload, each cabinet has a built-in circuit breaker. A button pops out if the breaker opens, and it can easily be reset by turning off the power switch and pushing the button

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PASSIVE PERSONALITY

Event Electronics also offers the 20/20 monitors in a passive, unpowered version. The cabinet design, speaker components, and appearance are identical to the 20/20bas version, with the exception of the power LED and internal amplifier.

The 20/20 Passive Direct Field performs very nearly the same as the powered model. However, it has a second-order crossover that is fixed at 2.2 kHz, rather than the powered version's active fourth-order crossover at 2.6 kHz. The frequency response of the passive version (50 Hz to 20 kHz, ±2 dB) is also a tad shy on the low end compared to that of the 20/20bas. Power handling for the Passive Direct Fields is rated at 150W program and 200W peak. Obviously, the absence of internal amplification means that the passive model, at 22 pounds, is lighter than the 20/20bas.

The connectors are standard 5-way binding posts.

I set up the Passive Direct Fields in my studio first and immediately liked them. In fact, when I first listened to the 20/20bas, I thought the active version was a little too bright. I eventually came to the conclusion that the passive model was slightly veiled in the upper midrange and not quite as deep in the very low end as its powered kin, but this is splitting hairs. The Passive Direct Field's imaging and transient response is as wonderful as the active version's.

Given a choice between the two models, I would choose the powered system, but I can't really say that you would lose much by going with the passive version. And the biggest bonus is the price: the 20/20 Passive Direct Field Monitors retail for just \$399 a pair.

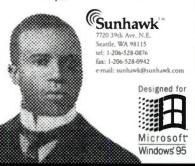
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Event 20/20bas Specifications

Frequency Response	45 Hz-20 kHz (±2 dB)
Amplifier Output (woofer/tweeter)	130W/70W (continuous)
Woofer	8-inch mineral-filled polypropylene cone; 1.5-inch voice coil
Tweeter	1-inch silk dome
Crossover	active, 2.6 kHz
Input Connectors	Combo XLR//4-inch
Input Pad	up to 20 dB
Dimensions	10.25 (W) x 14.75 (H) x 11.75 inches (D)
Weight	28 lbs. ea.

back in. Event opted for the breaker, rather than using built-in compressors to protect the monitor's internal circuitry, because the company feels that compression can cause inaccurate reproduction of transients at loud levels.

At present, the 20/20s are not offered in a shielded version; however, Event Electronics will modify a pair upon request for an additional \$200. I noticed some occasional grunge from my computer screen (located about two feet from the monitors) when I loaded samples from a CD-ROM or logged onto the Internet, so the shielded versions are probably a good idea if you can't place the monitors a reasonable distance from your workstation.

ACUTELY ACCURATE

I have a four-point agenda for reviewing personal-use monitors that consists of checking the accuracy of the overall frequency response at high and low monitoring levels, noting bass performance, discerning the stability of imaging, and then determining the fatigue

Product Summary PRODUCT:

20/20bas powered monitor speakers

PRICE:

\$999/pr.

MANUFACTURER:

Event Electronics, Inc. tel. (805) 566-7777 fax (805) 566-7771 http://www.eventl.com

EM METERS	RATING PRODUCTS FROM 1 TO 5					
AUDIO QUALITY	•	•	•	•	4	
VALUE	_	_	_	_	4	

factor after extended listening periods. The 20/20bas scored well on each test.

When I first fired up the 20/20bas for a casual listening test of familiar CDs, I was pleasantly surprised. I heard details in imaging and ambience—and even some new musical parts—that I had never noticed before. I spent the next five and a half hours just listening to a bunch of great music and enjoying myself until the sun finally rose. When was the last time you did that?

But don't take this to mean that the 20/20bas is an inaccurate system that is designed to make everything sound good; it isn't. In fact, the 20/20bas revealed deficiencies that I had not previously noticed in several recordings. Perhaps the most striking discovery was that the monitors allowed me to hear the contrasts in overall mastering equalization between different CDs. This extremely subtle detail is not easily distinguished, even in the critical listening environments of pro studios.

After two months of constant use, I never heard any holes in the frequency spectrum at loud or soft levels. The manufacturer claims frequency response dips a maximum of only 2 dB at 45 Hz, and I felt a solid bottom down to the 60 Hz range. There may be a little rippling in the very low end, but I was never able to pinpoint any consistently troublesome frequencies. (It's likely that some of the bumpiness I encountered was present in the source material.) For the most part, if the frequencies were present in the original program material, they were translated into my room. That's exactly what a pair of monitors should do.

One of the most pleasing aspects of the 20/20bas system is its superb imaging. This is an area where most closefield monitors fall short and where I typically rely on Genelecs. On the 20/20bas system, however, I never experienced smearing of the soundstage except at extreme monitoring levels bordering on amplifier clipping (which was way too loud for critical monitoring). Otherwise, the imaging is consistently precise at all monitoring levels. Individual sounds remain focused and distinct wherever they are positioned in the stereo spectrum.

Another important point: it is not critical to position yourself exactly within the monitoring sweet spot for the 20/20bas system to sound good. The monitors have an "in the other room" quality that lets everyone within earshot accurately hear what's happening without having to cram the entire band onto the engineer's chair like a fraternity trying to fit into a phone booth.

The 20/20bas system is not hard on your ears, either. I regularly work tento sixteen-hour days when on a roll, and I only once had a problem with ear fatigue in the past two months. And that instance was only after listening to loud, distorted guitars for a couple of hours. (At that point, the sound of my own breathing hurt my ears.)

ASSESSMENT

Event Electronics has done everything right with the 20/20bas system. There is not another powered monitor out there that delivers as much performance for the price. Not only is it half the cost of the Genelec 1030A system (which I reviewed in the January 1995 EM), but the 20/20bas rivals the larger and even more expensive Genelec 1031s in performance.

Although there are a lot of good monitors to choose from, the 20/20bas is exceptional, and I wouldn't be surprised if it becomes a standard. The accurate, balanced frequency response of the system makes it one of only a few pairs of monitors I would feel comfortable mixing an entire album on without using alternate speakers to confirm tonal details. If you are even remotely considering buying a pair of monitors, you should put them on your short list. Right now, the 20/20bas system is truly an unbeatable deal.

Composer-producer Rob Shrock is the keyboardist-arranger for Dionne Warwick and Burt Bacharach. He can be reached through Avatar Productions at avatarprod@aol.com.

CreamWare tripleDAT 2.0 (Win)

By Allan Metts

This powerful digital audio system offers a ton of features.

y computer has been helping me write MIDI compositions and balance my checkbook for years, but it seems that more of my daily life is spent in front of the screen now than ever before. First there was email. Then I started getting my daily news electronically. More recently, I started doing computer-based audio recording.

But lately, my machine has acquired a slew of new talents. It has become a multitrack audio-recording and editing environment. It's doing all sorts of real-time effects. It can slave audio to MIDI Time Code (MTC) and back up its hard drive to my DAT recorder. How did my computer acquire all this new power? I installed CreamWare's triple-DAT system.

TripleDAT combines a powerful DSP card with Windows software. The ISA-bus audio card includes MIDI In and Out, stereo analog audio inputs and

outputs on high-quality RCA jacks, and S/PDIF digital audio I/O on both optical and RCA (coax) connectors. A connector for an infrared transmitter (included) that allows tripleDAT to control your DAT recorder is also provided with the system.

INSTALLATION

After installing the card in my 120 MHz Pentium PC, I used my TASCAM DA-30 MkII DAT machine as an A/D converter to send a signal from my mixer to one of tripleDAT's two coax S/PDIF inputs. While digging in the manual's appendix, I noticed that the tripleDAT card can accept digital audio from an internal CD-ROM drive instead of the other S/PDIF coax input. The CD-ROM drive in my computer has a digital output, but I've never had anything to connect it to before. After a quick trip to the local electronics store for a jumper, my CD-ROM drive was wired for digital sound.

I connected the tripleDAT's optical output to an outboard D/A converter. Between the output of this converter and the card's analog outputs, I had four channels of tripleDAT audio to bring into my mixer. There was no reason to hook up the digital coax output; it always carries the same signal as the optical port.

With all the audio connections in place, I set up the DAT remote con-

trol. The DA-30 MkII cannot be controlled via infrared remote, but I was happy to learn that the tripleDAT system has this scenario covered. After setting a jumper on the card, you can run a stereo miniplug cable directly from the tripleDAT remote connector to the remote jack on the DAT.

The next step was to install the software, which went without a hitch. After installation, the drivers for tripleDAT audio and MIDI were visible in my Windows 95 multimedia settings. With just a few quick adjustments in the audio-driver control panel, I was ready to begin.

TURN IT ON

The tripleDAT software opens with one Arranger window inside the program's main window (see Fig. 1). The main window includes the transport controls, some dedicated buttons for common tasks, output meters, a variable-pitch control, time signature and tempo controls, and a couple of system performance indicators.

Wait a minute: time signature and tempo controls in a digital audio program? Yes, you can specify a time signature and tempo but only one of each for any given song. This allows you to find a particular bar and beat easily, which is very handy. In fact, time can be indicated in hours:minutes: seconds:milliseconds, hours:minutes: seconds:frames, bar:beat:thousanths of a beat, or sample number. TripleDAT supports SMPTE time-code frame rates of 24, 25, 29.97 drop, and 30.

As with most software of this type, you assemble your song in the Arranger window. This window can include up to 256 tracks, into which you "Add Samples." In reality, the Add Samples function adds Regions. In CreamWare's terminology, Samples are the digital audio files stored on disk. These files are in a proprietary format, but you can easily import and export WAV files, as well. Regions are pointers to portions of these digital audio files, and multiple audio Regions can point to the same Sample, which saves disk space. You can put as many Regions into a track as you like, and they can overlap with crossfades.

As you would expect, the Arranger window's horizontal scroll bar moves the view back and forth in time, and you can control the amount of time you see at once by changing the scroll



FIG. 1: The tripleDAT software opens with an Arranger window in which you assemble audio into multiple tracks.

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TRIPLEDAT 2.0

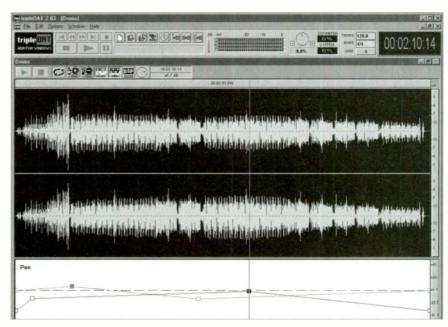


FIG. 2: Most basic audio editing is done in the Cutter window, but the required mouse techniques can be tricky.

bar's width. A vertical scroll bar adjusts the track's vertical height in a similar fashion. This is not intuitive to me; dragging the track boundaries to change width and height would be a more logical approach.

You can set each track's pan, volume, output (analog or digital), and name using the controls that appear at the left of each track. Unfortunately, these controls are often inaccessible. They are designed to disappear when the track width is narrow, but it is often difficult to get them back without messing with the Arranger settings and window width. It's usually easier to adjust the pan and volume of the Regions themselves. Double-clicking on the horizontal or vertical scroll bar toggles between full zoom and the previous zoom level, but this is not an intuitive method for changing track width. Besides, the controls should not disappear in the first place; other programs rearrange controls to fit in the available screen space.

The Arranger window's features appear in three places. Some are in the program's Main menu, others appear on a floating palette of buttons, and still others appear only in pop-up menus that are activated by right-clicking on an appropriate item. Although I applaud this attempt at flexibility, it makes the program difficult to figure out. Several features only appear in the popup menus, which makes them difficult to find.

I CAN DO DAT

Using the various menus and tools, you can mute, solo, insert, copy, and delete tracks. In addition, you can "freeze" (lock in place), mute, add, copy, split, merge, normalize, and remove Regions. I especially like the fade features, which let you quickly create fades of any duration using one of five different curves. You can also move Regions and create crossfades between two Regions by dragging with your mouse.

If you merge multiple Regions, you can mix them down to one stereo, one mono, or two mono files. You can also normalize the volume of a group of Regions. This feature is great for keeping the mixed volume below 0 dB as you record more tracks.

The Mixer window contains volume, pan, mute, solo, and attenuation controls for each selected Region. A master fader operates only on the currently selected Regions. The attenuation control is not continuous; it only reduces the level of the Region by 12 dB. By leaving the Mixer window open and then selecting different Regions in the Arranger window, you can create a subgroup on the fly that can be controlled by the master fader. However, I wish tripleDAT went further: I want to open multiple Mixer windows, each representing its own subgroup in the mix.

You can insert markers at any point and then name them anything you like. The coolest thing about tripleDAT's

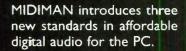
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TRIPLEDAT 2.0

markers is their integration with the program's DAT-control capabilities. At any marker, you can send any command to the DAT recorder, and it immediately obliges. This is a great feature for broadcast and specialeffects applications because it lets you cue up external material without having to record it to your computer's hard drive.

There are two permanent markers, labeled A and B. These markers let you loop the material in the Arrange window and set punch-in/out points. You can use them to loop playback, or you can create a new Sample by merging all the material between the two markers. Playback looping can be either disk-based or RAM-based. Using RAMbased playback prevents a gap when the loop starts over, but the loop can't be as long.

I constantly struggled with the program's mousing technique in the Arranger window. In most Windows programs, you select items with the left button and activate pop-up menus with the right, and you can usually drag selected items with the left button. In tripleDAT, you select items, activate pop-up menus, and drag items with the right mouse button. When selecting items, you get a pop-up menu whether

Product Summary PRODUCT:

tripleDAT 2.0 hard-disk recording system

PRICE:

\$1.798

SYSTEM REQUIREMENTS:

80486 DX2/66 or better PC (Pentium required for real-time effects); 16 MB RAM; Windows 3.11 or Windows 95

MANUFACTURER:

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ALESIS

TRIPLEDAT 2.0

you want one or not. And when you do want a menu, you must hold the mouse perfectly still or tripleDAT will think you're dragging. I usually had to click two or three times before I got what I wanted.

Other mouse operations are simply inconsistent. You resize Regions by dragging with the left mouse button, but you change the size of the A/B marker Region by dragging with the right. To edit a crossfade, you double-click with the left button; I kept right-clicking it, hoping to find a pop-up menu.

TRIPPED UP

TripleDAT can record up to two stereo or four mono signals simultaneously using both the analog and digital inputs. However, you lose the Arranger monitor function when you do so. When I first tried to do this, the program didn't let me activate both the analog and digital Record check boxes in the Record dialog. It was only after I disabled the Monitor check boxes (which are enabled by default) that I could enable both inputs for recording. Unfortunately, the user interface

and documentation give almost no clue about this problem.

My first recordings with tripleDAT did not go smoothly. I tried to record without reading the manual first, and I was surprised to find out that the recording process is more complicated than it is in the other audio programs I've worked with. You can't just press the button with the big red dot.

After opening the

Record dialog box to set up file names and recording options, you press the Rec/Play button to start playback. When it's time to record, you press the Rec/Play button again. When you're done, you drag an icon representing the recording to an appropriate track in the Arranger window.

Once I read the manual, I realized that tripleDAT's recording process isn't



FIG. 3: The Effect Manager lets you apply any combination of real-time effects, in any order, to your default audio output. You can store presets for each effect here, as well.

quite as bad as it first seemed. You can set an input-level threshold or punch in/out points to eliminate the need to press the Rec/Play button again. You can also invoke a function called Store All Takes, which lets you record multiple passes and place all takes in different tracks.

TripleDAT is designed to send and receive either MIDI Time Code (MTC)

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8 different Effects in any order	yes	no	no	no
Graphic Display	yes	no	yes	no
A/D	18 bit 128X	16 bit	20 bit 64X	16 bit
D/A	20 bit 8X	16 bit	20 bit 64X	16 bit
Sampling Freq.	44.1, 48kHz*	n/a	32, 44.1, 48kHz	n/a
Freq Response	20-20kHz	2-18kHz	10 20kHz	2-16kHz
Digital I/O	AES/EBU, S-PDIF (optional plug-in)	none	AES/EBU S-PDIF	none
THD @ 1kHz	<0.003%	<0.0032%	0.003%	<0.0032%
S/N ratio	-96dB	-90dB	> -96dB	-90dB
Power Supply	Internal	Internal	Internal	External
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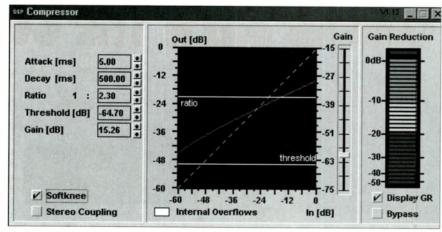


FIG. 4: I like the ability to enter attack, decay, threshold, ratio, and gain settings directly on the input/output graph of the dynamics-processor dialog box. The gain-reduction display provides a real-time picture of what's being done to the audio.

or MIDI Clock messages for synchronization to sequencers and other devices. You can sync with external devices using the card's MIDI connectors, or you can use the included Windows driver to synchronize a sequencer program running on the same computer.

There is one other MIDI sync function worth noting. The tripleDAT system can load and play a Standard MIDI File through its MIDI output. But I could not make this feature work during recording, either. (The Play MIDI Monitor option in the Record Settings dialog had no effect.) The program's MIDI metronome behaved in a similar fashion.

CUT DAT OUT

When you need to manipulate your audio in finer detail than the Arranger window allows, the Cutter window comes to the rescue (see Fig. 2). You can open a separate Cutter window for each Region in the Arranger Window. The Cutter window is similar to most audio editors, with waveform displays of each channel and zoom and pan tools. Other tools let you select, move, merge, skip, mute, clear, and copy portions of the Region. Unfortunately, these features use the same arcane mouse movements as the Arranger window. In addition, you can't separately manipulate the left and right channels of a stereo file

There are several tools that loop a selected area, loop the selected area a specific number of times (which is great for assembling sampled grooves), and loop everything but the selected

area. TripleDAT maintains a list of each selection you name, so you can always reselect it later. And each selection can be saved separately as a new Sample file or Region.

Markers have a few more flavors in the Cutter window than they do in the Arranger. You can choose whether a marker placed in the Cutter will be visible in the Arranger, as well. You can mark the end of a fade-in or the beginning of a fade-out, and you can place a marker that is used solely as a snap-to point during editing. (Selections can also snap to the grid, to the end of a Sample, or to the current song position, and each of these options can be independently switched on or off.)

My favorite Cutter features are the envelope curves. You can open an additional pane in the Cutter window that displays envelopes for volume and pan, and you can edit the curves directly. To create a swell in volume, double-click the volume envelope a few times to add extra break points to the curve. Then simply drag the break points around until the curve has the shape you want. If you right-click a section between two nodes, you can choose one of six curve shapes for the section. This is really neat!

The software offers no standard undo function. However, you can recover previous versions of your edits. As you work in the Cutter window, a CutList file is automatically created in which you can select an edit that has been performed and return it to its prior state. Even if you process an effect into a Sample, the program keeps an unaffected copy of the Sample in memory,



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which you can recall as long as you keep the Cutter window open. Once you save the file and close the window, this version becomes unavailable. Finally, all edits are nondestructive, and you can always get your original recording back.

EFFECTIVE POWER

One of tripleDAT's biggest assets is real-time effects processing. This means you don't have to process the audio, listen to the results, and then repeat the process if you don't like what you hear. In tripleDAT, you simply change a parameter or move an onscreen knob, just as you'd use a dedicated hardware device.

TripleDAT's effects are accessed in the Effect Manager (see Fig. 3). In this window, you select processing modules from the Effect Pool and add them to the list of effects in use. For each effect, you can open a parameter window or activate a previously defined preset. However, I was disappointed that all the Effect windows are programmed to stay on top of all other windows on the screen. This programmer's convenience is almost always inconvenient for the user. In fact, it's a significant inconvenience: as I write this, the compressor settings are blocking my word processor's features.

The effects in the list are always applied to the signal that is sent to the default audio output (as defined in the Audio Settings window). In other words, you can't have one track processed with one set of effects and another track processed with different effects.

However, you can include effects during a Merge operation in the Arranger or Cutter window. This lets you apply the effects offline to create as many different submixes as you want, with each submix having its own set of effects. These submixes are simply new Samples, so there's nothing to stop you from processing them again with even more effects, either in real time or offline.

TripleDAT supplies five dynamics effects: compression, limiting, expansion, gating, and de-essing. Each of these effects uses essentially the same setup window, which lets you set the attack, decay, ratio, threshold, and gain parameters directly on an input/output graph (see Fig. 4). A gain-reduction display reveals how much compression is being applied in real time.

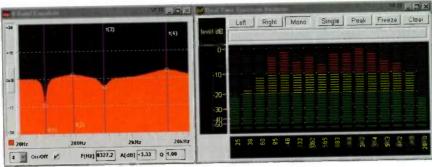


FIG. 5: Putting the Spectrum Analyzer after the parametric EQ lets you hear and see the effects of your EQ adjustments.

The delay and room-simulator effects are comprehensive, with advanced settings such as high-frequency decay. You can specify room size and liveness independently in the room simulator and manipulate the left and right channels separately in the delay processor.

The equalizer offers four bands of parametric control. I had a lot of fun using the equalizer in conjunction with the real-time spectrum analyzer (see Fig. 5). With these tools, I could hear and see the effects of my equalization adjustments in real time.

Rounding out tripleDAT's effects are Pitch Shift and Time Stretch, which can only be used offline. Another real-time analyzer, the Correlation meter, is also available to monitor your material for phase cancellation. When this meter moves into the red, it means you will lose source material if your audio is ever converted to mono.

THE KITCHEN SINK

Just when you think that you've had enough, tripleDAT throws in a few more goodies. The DAT Remote control panel gave me more control over my DA-30 MkII than I have from the TASCAM unit's front panel. Several DOS-based utilities are included, too. Most notable among these is the Streamer, which combines tripleDAT's DAT control and digital recording capabilities to back up your hard drive to a DAT tape. I love it when my toys learn new tricks! The existing Streamer doesn't support Windows 95 extended file names, but a new version is in the works.

TripleDAT's documentation is adequate but not great. It is hard to read at times, and it omits some of the more subtle details of the program (e.g., setting and using the A/B markers). The program offers reasonably thorough

online help, but the context-sensitive links bring you into the Help file at the highest level. For example, asking for help in the Arranger window always displays the main Arranger help screen, not the screen related to the function you are using. Most of the effects have no online help, and those that do require fluency in German.

I'm happy to report that the audio performance is better than I expected it to be. On my Pentium 120 with 16 MB of RAM, I could easily work with eight to ten stereo tracks at once. In addition, I could usually combine at least three real-time effects before tripleDAT started complaining about system resources.

The program is generally stable, although I did find a couple of places where pressing the wrong button hung the program. I experienced a few onetime glitches (for example, a window failing to open or incorrect entries in a dialog box) but nothing too serious. As I mentioned earlier, the user interface needs some redesign work. In several places, features are enabled or disabled without warning by seemingly unrelated settings in other parts of the program. But this program works as advertised. And that's saying quite a bit because tripleDAT has a ton of features.

This package really tied my studio together, communicating seamlessly with my audio gear, DAT, CD-ROM drive, and sequencer. True, there's a steep learning curve and a less-than-tidy user interface. But where else can you get multitrack digital recording, a slew of real-time effects, and hard-drive backup to DAT for less than \$1,800?

Allan Metts is an Atlanta-based musician, MIDI consultant, and software/systems designer.



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Quasimidi Quasar

By Julian Colbeck

Techno rules
with this Old World
synth module.

he Quasimidi Quasar snorts and snarls. It has a few quirks, too. But this German-built, multitimbral synth module is brimful of prime European techno fodder. And it has a killer arpeggiator. If this all sounds a bit daunting—and thanks to PPG and Waldorf, German synths do have a reputation for complexity—there's no need for alarm. The Quasar is an editable-preset synthesizer that is even easier to use than your average Korg or Roland synth.

This module is no workstation clone, no insipid General MIDI box for computer geeks. The 24-voice polyphonic Quasar can pump out sonic-warfare bass one minute and needle-sharp resonance whistles the next. It comes complete with more than 1,000 sounds that embrace stock acoustic and electronic fare and no fewer than nineteen different drum kits. (Some of these kits are very small, however; for example, the Brush set contains only three sounds.) You also get as impressive an assortment of essential squelchy, squeaky noises as a burgeoning technophile could ever wish for. The module includes onboard effects processing but does not include a sequencer.

The Quasar is advertised as a "Multi-Algorithm Sound Synthesis" instrument (M.A.S.S. for short) that draws on PCM, FM, and additive synthesis technologies (not to be confused with the Kurzweil M.A.S.S. General MIDI chip set). But it employs this impressive array of technologies transparently. The only things you have to worry about are simple, generic parameters such as envelope generators, filters, and LFOs. Programming the Quasar is largely a matter of mixing and matching.

CASING THE CASING

The 2U rack-mount Quasar has a 2-digit LED screen and an off-center, 2× 40-character LCD, flanked by an encouraging number of dedicated buttons and control knobs. The hardware doesn't look particularly robust—the rotary controls and jacks are made of light plastic—but nothing wobbled or fell off during studio testing. I make no promises about how it would survive the stresses of the road.

Sensibly, there's a front-mounted headphone socket. Not so sensibly, the headphone volume and main volume are controlled by the same rotary pot. A 10-digit keypad and Up and Down keys access the Quasar's staple diet of multitimbral Performance memories. (The current Performance number is always indicated on the LED screen.) A 10's Hold button locks you into a particular bank, a handy device first employed by Korg back in the days of the DW-8000.

Four medium-sized, continuous (i.e., without stops) knobs lie directly beneath the screen. These soft controls adjust the values for the parameters currently in view. The large wheel to

the right of the display spins through the parameter pages. This two-fisted operation is quick and logical, especially if you are an Etch A Sketch whiz.

On the front panel's far right are two small groups of buttons. The top group governs the modes: Performance, GM, FX-1/2, Arpeggiator, and Transpose. The second group navigates through the main edit pages: Drums, FX-1/2, Arpeggiator, Common, Part, Write, and Exit.

On the rear panel of the unit, I was intrigued to find two MIDI Ins, along with the MIDI Thru and MIDI Out. even though the Quasar is 16-part multitimbral. Interestingly, by choosing Multichannel On while in Performance mode, you can play the current Performance—programmed effects and all-while leaving the rest of the instrument available for multitimbral access from a sequencer. This feature. combined with the two In ports, is especially handy if your MIDI interface isn't peppered with ports. Such a twopronged approach makes complete sense and is something I've often needed, especially onstage. Quasimidi gets top marks for this feature.

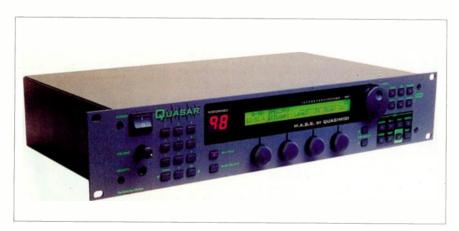
While we're on the subject of MIDI, let's quickly cover the Quasar's implementation. The synth operates on all sixteen channels and responds to Program Change and Bank Select. You can attach one programmable footswitch of either polarity, which defaults to Sustain (CC 64). The Quasar also supports All Sound Off, Reset All Controllers, All Notes Off, the various MIDI modes (Omni On/Off, Mono, Poly), and the NRPN and RPN controllers (CC 98 to 101). And of course, you can save and restore all Quasar settings via SysEx.

In the real-time modulators department, the unit can receive Note On Velocity, Channel (but not Poly) Aftertouch, Pitch Bend, Mod Wheel, and a selectable "free" controller. The last can be mapped to such common parameters as Modulation, Portamento Time, Pan, and Effects Type and Depth for the two onboard effects processors.

The Quasar features four separate audio outputs aside from the main stereo audio outputs. Last, but not least, the Quasar has a lump-in-the-line external power supply.

BASIC ARCHITECTURE

The Quasar uses a system of Singles, Parts, and multitimbral Performances, a common approach—for example, it's



Quasimidi seriously pursued the European techno market with its Quasar synth module. The 2U rack-mount synth combines subtractive PCM, FM, and additive synthesis with two effects processors and a large number of creative synth sounds.



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QUASAR

Quasar Specifications

Polyphonic Voices	24
Multitimbral Parts	16
Single Sounds (ROM)	1,024
Performances (ROM/RAM)	200/100
Drum Sets	19*
Effects Processors	2 (50 algorithms)
Audio Outputs (line)	6
Display	2-digit LED, 2 x 40-character LCD
Internal Expansion Slots	2
MIDI Ports (In/Out/Thru)	2/1/1
Dimensions	2U rack-mount x 9.65 inches depth
* 0	

* Set size varies from three to 61 sounds.

found on almost all Roland synths. A Single sound contains one multisample (or FM or additive sound) mapped to a programmable key range and can play polyphonically or in mono, or it can be switched off.

Single sounds do not employ the effects processors. Far from being a major drag, this aspect of the instrument is very likable. For a start, it removes all that "what will happen to my yummy effects when I play this sound multitimbrally?" hassle. Second, it forces the programmers (you or the folks at Quasimidi) to be more imaginative and not simply coat everything in a sticky sauce of reverb. Third, I actually found it helped clarify my arrangements. Armed with dry sounds, you tend to play consistently, and you can really hear whether a sound is working.

Single sounds can be accessed and played individually, although in most sequencing applications you will probably use multitimbral Performances (described shortly). A whiff of confusion lingers here because in order to play Single sounds you hit the GM button. Thereafter, you can spin through all eight ROM banks—not just the GM bank—to audition the Quasar's 1,024 Single sounds.

Single sounds are assigned to a Part, which includes the main editing parameters (e.g., tuning, filter, EG, basic modulation, pan position, and Velocity curve) and the effects routing. Each Part is premapped to a MIDI channel of the same number. Most screen pages display the current Part number, and you can access new Parts easily by pressing the Part Up or Down buttons on the front panel.

The standard Quasar sound currency is a Performance, which comprises up to four Parts (numbers 13 to 16) in a number of split or layered combinations. The Performance can be enhanced by two effects processors, an arpeggiator, and a range of real-time modulation sources and destinations.

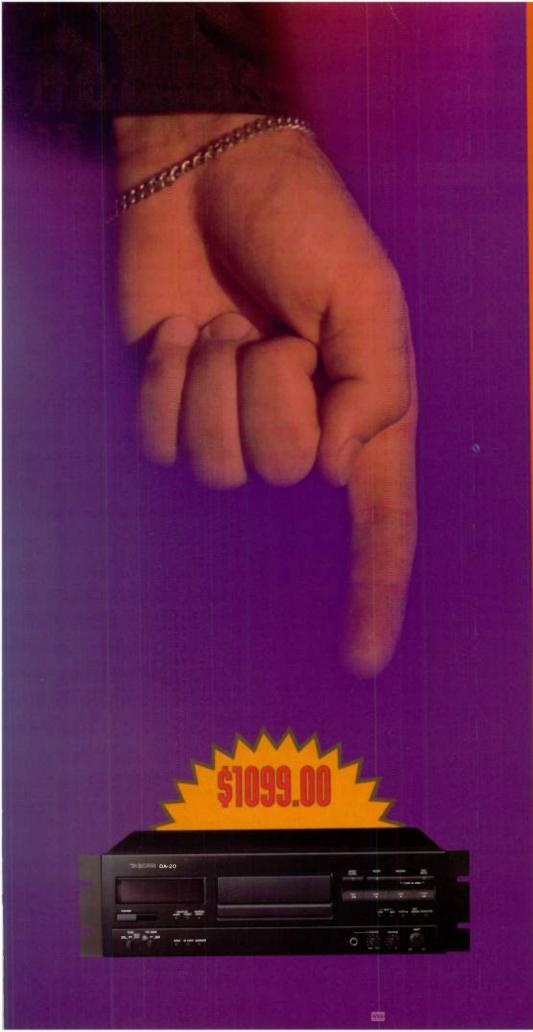
The Quasar provides three banks of 100 Performances, with bank 1 stored in ROM and banks 2 and 3 in RAM. If you add a ROM expansion board (\$295), you'll be able to add up to 256 preset Single sounds and 100 Performances, which are stored in bank 4. You can add up to two ROM expansion boards.

Quasimidi also offers an optional RAM expansion board (\$395) that lets you store your own samples via the MIDI Sample Dump Standard. The RAM board holds up to 255 Single sounds, one drum set, and up to 100 user Performances. However, its modest 768 KB capacity won't allow you to load that killer 6 MB guitar sample. Fortunately, it is possible to add both one ROM and one RAM expansion board.

The sound-selection process is eased considerably by the use of categories called Soundgroups. Each click position on the knob beneath the word "SndGroup" onscreen takes you to the beginning of the next category (GM Pianos, GM Guitars, voices, electric pianos, basses, etc.). Once settled on a Soundgroup, you can spin through the group's offerings using the next knob to the right. This method is easy and fast.

STAYING SINGLE

I have to say the GM sounds rarely rang my bell, and some are distinctly subpar. For example, the first acoustic



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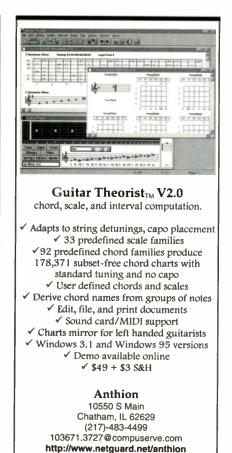
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• QUASAR

piano, "Klavier," is dull as ditch water. Piano 2 is a perfectly respectable piano tone, but unfortunately, most commercial MIDI files incorporating an acoustic piano automatically call up Piano 1.

When I played back a selection of SMFs, I found that some sounds differed radically from the *de facto* Roland Sound Canvas standard, most noticeably in the electric-guitar department. Unfair as it may be to criticize a manufacturer for not aping another manufacturer, the practical effect is that the Quasar GM set does not sound quite the way most people have come to expect a GM set to sound. Aside from the piano, there are no other major blunders in this department.

The Quasar comes to life when you use the non-GM Single sounds. Basses are unquestionably the Quasar's forte. You get facsimiles of all the fave raves from the grave—e.g., Minimoog, Micromoog, Taurus, SH-101, and various Oberheims—as well as acoustic delights such as didjeridoo, string bass, and piano bass. Quasimidi also provides some crazy concoctions with rather foul names that are not publishable in a respectable magazine. Finally, one patch name caused me, as an Englishman, far more concern: the totally flat and inert "British." What do they mean?

I liked many of the pianos, especially the Wurlitzer and Rhodes tones. The only negative, which does tend to show up throughout the instrument's sounds, is the minimal Velocity control over the filter cutoff. Sounds tend not to brighten sufficiently when you play harder; they just get louder. That's not quite sophisticated enough these days. There are synth-string tones aplenty: "OB String" in bank S4 is especially good, as is a splendid, soft twang called "LongPoly" in the same bank.

Then there are the sound effects, including whale noises and all manner of vocalizations. The latter range from sexy oohs and aahs to "geh," "fuh," "bang," "gosh," and even yodeling. There are enough industrial/explosive crashes and clatters to fill a Schwartzenegger movie.

The good news is rampant choice, imagination to die for, and clear and speedy access. The not-so-good news includes erratic levels—some sounds are but a faint impression until you crank up the volume, and others cleave you in two at your first stab—amusing

but generally unhelpful sound titling, and what can only be described as a random approach to sound editing, which I'll explain in more detail later.

PRODUCED PERFORMANCES

Performance sounds can use the two effects processors, so they feel more produced and lush. Effects can iron out character as well as wrinkles, and although the Quasar is wild and idiosyncratic in Single mode, in Performance mode you could easily mistake its range of pingy-pongy, misty strings and bells for any workstation since the Korg M1.

Standouts include the "OB-Chor" analog choir, "Juno 106" (a burring synth tone), and the phat and phull "PhasPuls." "Randomize" whizzes back and forth like a demented doorbell, and several of the acoustic guitars and electric pianos are quite good.

EDITING PARTS

Editing on the Quasar is a hit-and-miss affair. First, you must remember that you are editing the Part, not the actual sound. In addition, due to the multifarious nature of its sound generation, all of the edit parameters do not necessarily function on all of the sounds. Worse still for the inveterate twiddler, you cannot know that, for instance, "Elec Piano I" cannot access the filter, until you call it up, try to alter its filter cutoff parameter, and find nothing happening. There's nothing in the manual. All pages appear, but some won't do anything.

To be fair, the Quasar does label the sound-edit parameters "offsets," indicating that you are altering preset levels rather than starting from scratch. And granted, you have more than 1,000 Single sounds to choose from. Dicing and slicing is the order of the day. But I'd hate to be on a session where the client hears a sound and says, "Yes, right, that's almost it. Can you just increase the decay a bit?" and I have to sit there and say, "Sorry, no I can't." Or worse, "err...possibly!"

Assuming a given Part offers the following parameters, tweaking works like this: Choose your Part and hit Edit. Page 1 lets you choose the output routing and pan position, with such nice choices as Velocity-dependent panning and keyboard pan spread (in which the pan position tracks the keyboard so that lower notes are panned to the left

and higher notes to the right). There's a nice touch of humor, too: the Key setting delivers the aforementioned left-to-right pan positioning, and Yek sets the pan positioning in reverse.

After the coarse- and fine-tuning page come the filter cutoff frequency and resonance parameters, both represented by plus or minus offsets from the status quo. This lowpass filter has a 6 dB/octave, 12 dB/octave, or 24 dB/octave slope depending upon the algorithm of the particular sound. It's not an ideal way of working, but if you try to think of the Quasar as a pool of tone colors over which a modicum of control can be exerted, as opposed to a full-blown synth, frustration can be kept to a minimum.

After the filter page is an envelope generator page with attack, decay, and release. Again, parameter values are plus or minus offsets. Vibrato comes next, with rate, depth, and delay offsets, and it is followed by a small modulation page.

The final page lets you select one of eight Velocity curves and set portamento (available only in Mono mode) and Hold. Hold is an easy place to come unstuck because if you unwittingly flick this parameter to its off position, any sound applied to that Part is rendered incapable of responding to Sustain (CC 64) commands. This feature foxed me for quite some time.

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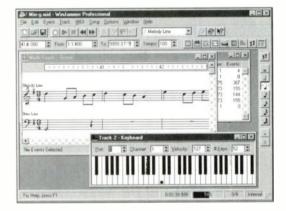
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• QUASAR

The Quasar's arpeggiator is simple but powerful. The fun begins just by hitting the panel Arpeg button; an LED comes on, and you're away. It works for Single sounds and Performances alike.

To fine-tune arpeggiation, you hit the Arpeg edit button and spin through a manageable number of edit pages. You can set the resolution (frequency of triggered notes), speed, and gate. (The gate allows you to turn an elongated bass sound into a clipped snap, for instance.) In addition, the arpeggiator syncs to MIDI Clock via either MIDI In port. It will not sync to MTC, however.

Naturally you have control over direction: up, down, up and down, or random. But you can also control whether notes are arpeggiated in the order they were played or whether the Quasar will sort them out (i.e., run high to low in sequence), and you can latch the arpeggiator or not. You can choose to preserve the initially played Velocity or not. And if you want to get really clever, you can do things such as assign only certain Parts within a Performance to arpeggiate, freeze chords via a footswitch, and even use MIDI continuous controllers to alter duration on the fly.

This is what you can do technically. In practice, the arpeggiator is also brilliant for auditioning Single sounds because you can create a simple pattern, latch the arpeggiator, and flip through the banks and patches. This surely beats plunking away at a keyboard while auditioning sounds. You can even do editing in midarpeggiation and record the edits into your sequencer so that your random panning, filter movement, attack changes, and even Program Changes are faithfully recorded and played back without skipping a beat. Like I said, the arpeggiator is fun.

EXTENSIVE EFFECTS

The Quasar's tally of effects and effectsediting features is impressive. The effects are innovative, and I really like the way they are implemented.

As noted earlier, the synth includes two onboard effects processors. Each processor has its own LED-equipped panel button and so can be switched in or out in an instant. FX1 delivers 22 reverbs and delays, and FX2 handles modulation-based effects such as chorus, flanger, vibrato, complex delays, wah, distortion, ring modulation, and

vocoding. There's no analog input at the back, so vocoding is purely an internal sport. But with its variable filter positions and the variable speed and decay of the vocoder's "analyzer," this effect rewards serious scrutiny.

Ring modulation is another valuable effect that is making a comeback in the late 1990s. In keeping with most of the effects algorithms, this atonal, clangorous effect can even be controlled in real time by means of a MIDI continuous controller.

DELUXE DRUMS

You have to sit up and pay attention to any instrument offering nineteen drum kits. There's something for everyone here, including Standardset, Powerset, Electroset, TR-808, Jazz, Orchestral, Steel, Dry, Natural, and Analog. You even get a Vocalset that perfectly mimics us bathtub drummers: "doo, doblap, doo-doo, do-blap." You can edit the note number, level, pitch, pan, and effects routing of individual drum sounds.

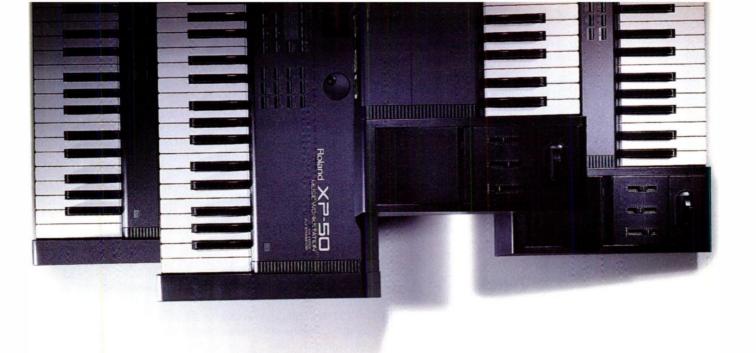
Equally useful, though, are the Single sound programs that feature an entire nonpitched span of a single drum or percussion sound. Given the ease with which you can assemble tracks on the fly in Multi mode, these sounds are excellent for programming complex rolls and fills by randomly drilling your fingers on the keys.

AT DAY'S END

The Quasar may be something of a flawed beast, but it has real character. You can add wave memory and more ROM sounds if the standard 1,024 sounds are not enough, but between the Single and Performance options, the arpeggiator, the recordable real-time tweaking, and the challenging range of effects, the instrument is hardly what you'd call short on features.

Quasars are imported from Germany in fairly small numbers becaue the instrument is deemed a niche product. Fair enough, but as techno music seems to be gaining a reasonable toehold in the U.S., I fancy this already 2-year-old instrument from the old country has plenty of shelf life left.

Julian Colbeck finds techno undeniable fun. As keyboardist on the new Steve Hackett Genesis Revisited CD, however, he suspects that techno is unlikely to become his professional endeavor.



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Voyetra Digital Orchestrator Plus (Win)

By David M. Rubin

Integrated sequencing and digital audio recording on a shoestring.

oyetra has been a venerable name in the music-software industry since the earliest days of the PC. With Digital Orchestrator Plus, the company has combined the best elements of its popular MIDI Orchestrator Plus sequencer with audio-editing capabilities. The result is an integrated music-production package that's easy to use and yet surprisingly powerful. Best of all, you don't have to be independently wealthy to start adding digital audio to your MIDI tracks.

Despite its low-end price tag, *Digital Orchestrator Plus* offers several high-end features, including multiple Undo and Redo capability, more than 1,000 tracks, 480 ppqn resolution, and support for several external sync sources: SMPTE time code (all frame rates), MIDI Time Code (MTC), MIDI Clock, and Song Position Pointer.

The program comes on both CD-

ROM and floppy disk, which is convenient. I installed it on a 133 MHz Pentium machine running Windows 95 with a SoundBlaster 16 sound card. Installation went without a hitch.

ON TRACK

If you've ever used a sequencer, you'll have little trouble navigating *Digital Orchestrator Plus*. Its user interface is a model of clarity. Most operations begin with the Track/View window, a bifurcated display that appears when the program first opens (see Fig. 1).

The left side of the Track/View window includes names and parameter settings in track-sheet format. You might not be able to see all the columns at once, but you can customize the display by dragging selected columns left or right to rearrange them. Several columns are also expandable. For example, the Patch column expands to show instrument names instead of just patch numbers, and the Volume column expands to reveal a set of fader controls.

The remaining columns allow you to view and set a variety of parameters, such as reverb, chorus, pan, transposition, Velocity offset, looping, solo, mute, and record enable. You can record on multiple tracks at once, but there's no overdub capability. You can also drag tracks up and down to orga-

nize takes or to group related instruments.

The right side of the Track/View window provides a graphic overview of the sequence. MIDI tracks appear as a series of small rectangles, each representing a single measure. The darker the rectangle, the more MIDI data it contains. Audio tracks appear as miniature waveform displays.

The vertical divider between the two panes of the Track/View window is draggable, which lets you see a few more measures in the sequence when you drag the divider to the left. Unfortunately, there's no Zoom button. It would be helpful to zoom way out for a better overview of a long sequence or zoom in for selecting less than a full measure.

Editing in the Track/View window is fast and smooth thanks to the program's excellent drag-and-drop capability. This feature lets you select a range in one or more tracks (MIDI, digital audio, or both) and drag the selection to another place in the sequence, where it's instantly pasted. If there's already data at that location, the new material is merged with the old. (You can replace the old data with the new by using the Copy and Paste commands.) You can also drag the selection to a group of empty tracks.

Furthermore, if you hold the Control key while you drag, the original data stays put and a copy of the selected data is pasted in the new location. Of course, you can't paste MIDI data into an audio track or vice versa, and you must be careful to avoid clipping when merging digital audio tracks, because the amplitudes are summed.

The Track/View window includes several navigational devices that are common to all the other editing windows. Above the track display, six onscreen buttons mimic the transport controls of a typical tape deck. Next to these are two fields that show the current location in the sequence. On the right, several controls let you specify a range for playing, looping, or punch-in recording.

Below the Track/View display, a Status Bar provides several Quick View buttons that instantly open any of the other editing windows, which is very convenient. The remaining fields show available disk space for audio recording, MIDI activity, and tempo information.

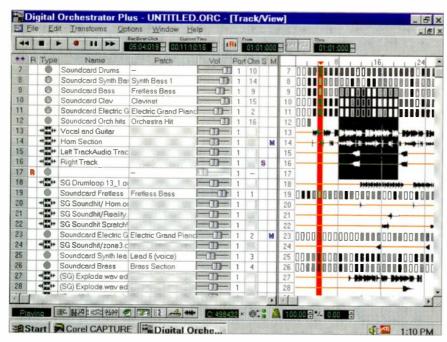


FIG. 1: The Track/View window shows track parameters on the left and a graphic overview on the right. In this example, the selection includes data from both MIDI and digital audio tracks, which can be dragged and dropped into another part of the sequence.



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ORCHESTRATOR PLUS

ON A ROLL

For detailed graphic editing of a MIDI track, you simply double-click on one of the rectangles (measures) in the Track/View display or use the Quick View buttons to open the Piano Roll window (see Fig. 2). This window provides the usual graphic display of MIDI notes as black bars on a grid with measures marked along the top and pitches identified along the left side in a keyboard display.

You can select groups of notes easily by dragging through them with the mouse. Once they're selected, notes can be dragged up and down to change pitch or dragged left and right to move them to another part of the sequence. As before, holding the Control key while dragging creates a copy of the notes. To facilitate copying and pasting, you can open multiple views of the track, which lets you copy things early in the sequence and paste them toward the end without a lot of back-and-forth scrolling.

Digital Orchestrator Plus also lets you select entire measures at a time by dragging through the measure ruler at the top of the display while holding the left mouse button. In addition, you can select all the notes of a certain pitch by clicking the corresponding key on the vertical keyboard. This feature is especially handy when working with drum parts. You can select the cowbell part and then drag the notes up to change them to a clave sound. Unfortunately, you can't select noncontiguous notes—a useful feature that most high-end programs have adopted.

Working with individual notes is easy. Clicking on the left end of a note lets you move it left or right. Clicking in the middle lets you move it up or down. And clicking on the right end lets you extend or shorten the note's duration. Double-clicking on a note opens a dialog box that lets you change such parameters as the note's pitch, length, and Velocity.

To help you find your way around, Digital Orchestrator Plus plays each note when you click on it. Even more helpful is the program's excellent scrub feature, which lets you play notes forward or backward at any speed by dragging through the measure ruler while holding the right mouse button. And unlike the Track/View window, the Piano Roll window includes a Zoom button.

The Piano Roll window also lets you

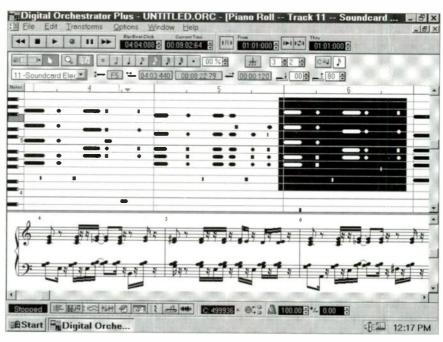


FIG. 2: The Piano Roll window can share the screen with the noneditable Notation display. Although the measures don't align well between the two displays, there's usually enough correlation to help you make sense of the piano roll's dots and dashes.

add new notes to a track with its Pencil tool. You simply select a note duration from the Piano Roll toolbar and click with the mouse to deposit the note on the grid. With the Articulation feature, you can fine-tune the actual duration of the notes you enter by setting a percentage of the default value. The Eraser tool lets you eliminate notes by clicking on them.

Sadly, the program won't let you stepenter notes directly from a MIDI keyboard, which makes the process of adding notes one at a time less convenient than it should be. The Piano Roll window also lacks the ability to graphically display and edit continuous controller data such as Volume, Pitch Bend, and Modulation. This deficiency makes it virtually impossible to see how controller messages correspond to individual notes in a complex passage, and it forces you to make changes by typing new values into dialog boxes, which can be a real drag if you have lots of values to change.

Finally, the Piano Roll display can share its window with the Notation display. A draggable divider lets you adjust how much of each display is visible. The notes and bar lines don't line up well between the two displays (the screens are aligned only on the left), but it's still helpful to see the music in both forms while editing. Any changes

in the Piano Roll display are instantly reflected in the noneditable Notation display below.

ON THE LIST

For those who aren't alphanumerically challenged, Digital Orchestrator Plus includes a standard event-list display for viewing and editing MIDI data. The Event Editor window provides a chronological list of MIDI events, showing the type of message, position in the sequence, MIDI channel, and related parameters. Note events include pitch, on and off Velocity, and duration. An Insert button lets you add a note, controller, or Program Change message anywhere in the sequence. The Track Select box allows you to switch quickly from one track to another, and you can open multiple views of the same track, which is handy.

To select a group of events, you simply drag through them in the list. Once selected, the events are subject to the usual cut, copy, and paste commands, but not the drag-and-drop operations found elsewhere in the program. In addition, you can't select noncontiguous events, which is a definite shortcoming in an event-list environment.

However, the program does include a view filter that lets you specify the types of events you want to appear in the display. This feature lets you isolate one or more types of events and focus your attention on them. It's also easy to delete a specific type of controller message, such as Aftertouch, from a passage.

You can change any of the parameters of a single event by double-clicking on the event in the list, which opens a dialog box that shows the event's parameters in small, editable fields. The parameters given are the same as those shown in the Event Editor, so it seems redundant to use a dialog box when direct entry of new parameter values would be faster and more intuitive.

ON THE MENU

When you select a group of notes or other events in the Track/View, Piano Roll, or Event Editor windows, several options become available in the Transforms menu. You can transpose notes chromatically or diatonically (but not to another mode or a custom scale), invert a series of notes chromatically or diatonically, and randomize the pitches. Note On and Off Velocities can be set to a specific value and offset, scaled by percentage, or humanized (randomized). You can also create a

crescendo or decrescendo by specifying a start and end value for Note On Velocities.

Note durations and start times can be affected by the same Set, Offset, Scale, and Humanize commands along with a Quantize command. The Quantize Note Start Time dialog box lets you



The user interface is a model of clarity.

specify sensitivity, intensity (strength), amount of swing, and offset when quantizing. Program Changes, Aftertouch, Pitch Bend, and other controller data can be offset, scaled, inverted, humanized, and thinned out.

Digital Orchestrator Plus also includes a Fit Time command that scales tempos to fit a specified amount of time. Tap Tempo lets you align bars after a recording, and Accelerando increases or decreases the tempo over a given time period.

IN THE MIX

The program includes a well-designed yet simple Mixer window that presents sixteen channels per MIDI port (see Fig. 3). Each control strip applies to a single MIDI channel. The Mixer includes much of the same information as the Track/View window but in a more convenient and intuitive format.

Beneath each channel number, an LED-style bar-graph meter reveals the level of MIDI activity at any moment. Oddly, this meter does not reflect Velocity or Volume, but only the number of MIDI events. Below that are knobs for reverb and chorus send levels, which can be reassigned to other controllers supported by your sound card or module. Solo and Mute buttons, a Pan control, and a Volume fader round out each channel strip.

Any changes you make in the Mixer window are instantly reflected in the Track/View window and vice versa. A Patch Selector box above each fader

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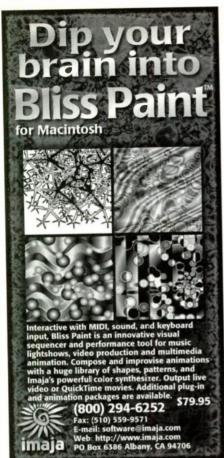


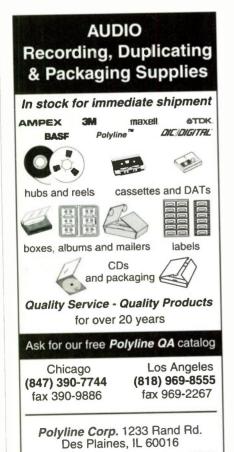






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ORCHESTRATOR PLUS



FIG. 3: The 16-channel Mixer window provides a graphic interface for mixing tracks. LED-style meters show the amount of MIDI activity. Knobs, buttons, and sliders let you adjust the same parameters that appear in the Track/View window.

lets you switch quickly from one sound to another while the sequence plays, which provides a handy way to try out different orchestrations.

ON THE STAFF

As mentioned earlier, Digital Orchestrator Plus includes a Notation window, but it's only intended for transcribing, viewing, and printing music, not for editing. However, it is a useful tool for extracting instrumental parts, printing scores for copyrighting, and viewing sequences as an aid to editing in the other windows.

Although the Notation window can't deliver engraver-quality page layouts, it includes a few basic options to help optimize scores and parts. The Transcription Settings dialog box allows you to specify which tracks (up to ten) will appear in the score and automatically selects the best clef for the part. If you prefer to choose your own clefs, the program lets you select treble, bass, alto, tenor, or grand staff.

A simple Voices option allows you to choose 1- or 2-voice transcriptions per staff, and a Split option lets you specify a split point for grand-staff parts. You can also transpose individual parts for instruments such as trumpet and sax that don't read at concert pitch.

Because you can't edit the Notation display directly, the final appearance

of the page is entirely dependent on the settings you make before the program transcribes the MIDI tracks. To help keep things legible, the program includes a triplet-sensing feature (which can be toggled on and off), a Suppress Rests option to avoid unnecessary short rests, and a Quantize control that cleans up the notation without altering the original MIDI data. If these options don't produce acceptable results, you'll have to go back to the Piano Roll or Event Editor windows and make changes there.

THROUGH THE MIC

The software's digital audio section is as easy to use as its MIDI section. Unfortunately, it lacks a number of important features that would make it more versatile and useful for serious audio-production work.

To begin with, the program only records and exports 16-bit files with sampling rates of 11, 22.05, or 44.1 kHz. If you import an 8-bit file, the program converts it to 16-bit resolution, which takes up more disk space without improving the sound quality. Many musicians work with multimedia producers these days, so the lack of 8-bit capability is surprising.

The recording process begins in the Track/View window, where you select a track and designate it as a digital audio

96Q/A1

track. A dialog box lets you enable stereo playback and specify a sampling rate. If your sound card is one of the few that can play and record at the same time, you can enable that capability as well.

Then you click the Record button in the Transport Bar and, after a metronome count-in, start to record. (Punchin recording is also available.) The software does not provide a record-level meter or clipping indicator, and it doesn't provide any way to adjust input levels from within the program, which is a significant shortcoming.

Unlike many pro-level programs, Digital Orchestrator Plus won't let you record on a single stereo track. For stereo recording, you must record-enable two tracks. The program treats the left and right channels as separate mono tracks.

As with most programs of this type, the total number of audio tracks vou can play simultaneously is based mainly on the power of your computer's CPU and your hard disk's throughput. Vovetra estimates that, along with your MIDI tracks, you can play about eight mono audio tracks at 22.05 kHz or four tracks at 44.1 kHz on a 90 MHz Pentium. You'll also need plenty of room on your hard disk: as with all hard-disk

Product Summary

PRODUCT:

Digital Orchestrator Plus 2.11 digital audio sequencer

PRICE:

\$159.95

SYSTEM REQUIREMENTS:

80486/66 or better PC with 8 MB of RAM, Windows 3.1 or Windows 95, sound card with MIDI/digital audio capability.

Also recommended:

CD-ROM drive

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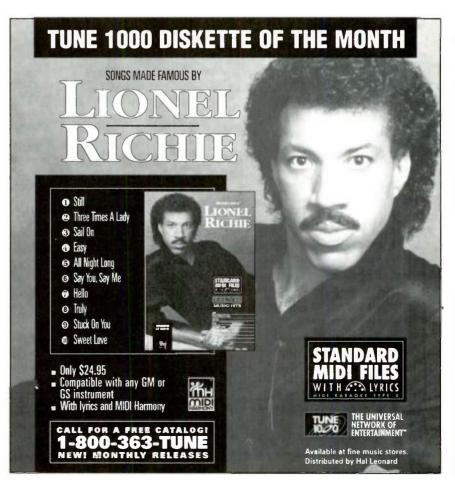
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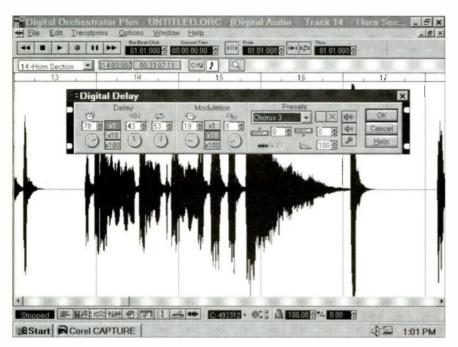


FIG. 4: The Digital Audio Editing window employs a traditional monaural waveform display. The "rack-mount" Digital Delay dialog box, shown here, and its companion Compress/Gate dialog box offer numerous "front panel" controls for customizing digital effects.

recordings, each 16-bit, 44.1 kHz, mono track consumes about 5 MB of space per minute.

As mentioned earlier, audio tracks appear in the Track/View window as tiny waveforms. For closer viewing and editing, the program provides a Digital Audio Editing window (see Fig. 4). With this traditional waveform display, you can select regions to drag and drop anywhere in the track. If you drop a selection on another part of the waveform, the new data is merged with the old.

A serious drawback is that stereo recordings always appear on two different tracks, and you can only have one waveform display open at a time. Therefore, it's impossible to edit both channels of a stereo recording simultaneously. You can select two tracks with the Track/View window's miniature waveforms, but only in 1-measure increments.

Once a waveform region is selected, several audio-specific options become available in the Transforms menu. The Scale command lets you increase or decrease the overall amplitude by a percentage, Normalize increases the amplitude as much as possible without clipping, and Crescendo produces simple, linear fade-ins and fade-outs.

The Compress/Gate command is one of the strongest features in the software's audio-editing arsenal. Its dialog

box resembles a rack-mount effects unit with surprisingly sophisticated gate, limiter, and compressor functions. However, there is no expander. Separate onscreen controls let you adjust the threshold, attack, decay, and output gain of each effect.

In addition, these dynamics effects include an Amount control that ranges from 0 to 100%. In the compressor, the Amount setting corresponds to the ratio. For example, a setting of 50% corresponds to a ratio of 2:1 whereas a setting of 100% equals a ratio of 10:1. In the gate, the Amount control determines how far the gate closes when the signal falls below the threshold, and in the limiter, it determines how much transients are processed. Two Audition buttons let you preview the effects with a short clip from the selected region and compare the processed and unprocessed versions. This aspect of the program is nicely done.

Along the same lines, the Delay command opens a similar "rack-mount" dialog box that offers 16 delay-related effects, such as echo, reverb, chorus, and flange. The "front panel" controls allow you to fine-tune a number of parameters, including delay time, depth, feedback, and other variables such as frequency rolloff. You can also save a group of new settings as a user preset. Again, nicely done.

The remaining options include a DC Offset command (for realigning a waveform's zero point) and a Convert Sample Rate command. Converting sample rates is easy, but the process is rather slow and can't be undone.

DOCUMENTATION

One of the software's strongest points is its excellent documentation. The 300-page manual is well organized and clearly written. The online help is also well designed and genuinely useful.

A CD-ROM tutorial takes you on a tour of the program, highlights its architecture, and demonstrates its main features, all of which is very helpful. As an added perk, the CD-ROM includes demonstration files, an assortment of sound effects, some background music tracks, and 50 MIDI drum tracks in a variety of styles. If you run into system problems, a separate application called *Sound Check* analyzes your computer, provides a helpful report of what's going on, and creates a log file that you can e-mail to Voyetra to help them troubleshoot your problem.

IN THE END

Digital Orchestrator Plus offers a number of useful features that you'd expect to find only in programs costing considerably more. Features like multiple undo capability, support for SMPTE time code, MIDI scrubbing (there is no audio scrubbing), a SysEx Editor (for dumping, loading, and editing SysEx messages), 480 ppqn resolution, drag-and-drop editing, and powerful audio effects make this an impressive program.

On the flip side, however, the program lacks some key features that keep it out of the big leagues. Overdub recording, graphic viewing and editing of controller data, step entry from a MIDI keyboard, an editable notation display, and support for 8-bit audio files are all conspicuously absent. Stereo audio recordings are also awkward to edit.

If you'd like to start combining digital audio with MIDI but you're saddled with a tight budget, *Digital Orchestrator Plus* is a package well worth considering.

David M. Rubin owns a computer-music studio in the Los Angeles area, where he composes for film, video, and multimedia. His latest book, The Desktop Musician, is published by Osborne/McGraw-Hill. You can reach him at dmrubin@aol.com.

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Electronic Musician

DigiTech VTP-1

By David Kaplowitz

An affordable tube mic preamp with choice extras.

hether your digital audio system is based on hard-disk recording, MDM, or DAT, you probably could use some tools to warm up the occasionally sterile sounds of digital recording. If so, the boom in tube-based signal processors indicates that you are not alone. Producers and musicians everywhere are attempting to combine the accuracy of digital recording with the desirable, natural-sounding distortion produced by well-designed vacuum-tube circuits.

DigiTech is by no means the first to join this movement. Its dual-channel VTP-1 offers a pair of vacuum-tube preamps, 4-band EQ, and stereo 18-bit A/D converters in a single, 2U rack-space box. The manufacturer's stated goal for this unit is to provide a prosounding product with a home-studio sticker price. Let's take a look at the VTP-1 and see how well DigiTech did.

ANATOMY

The front and rear panels of the VTP-1 are solidly constructed and logically laid out. Being a fan of solid switches and smooth pots, I was happily surprised at how solid this unit feels, especially when compared to similar products aimed at the home-studio market. All switches are 2-position toggles.

The rear-panel connections are simple and straightforward. Each of the two channels offers a balanced XLR

jack for mic/line input and output and a ¼-inch TRS jack for balanced or unbalanced line signals. Digital outputs are industry-standard AES/EBU and S/PDIF. An insert loop on ¼-inch jacks lets you introduce a processor, such as a compressor or de-esser, into the signal path of either channel.

The front panel is divided into two identical sections. The set of controls is almost complete; the only thing missing is a stereo link button to make one of the channel settings a master that controls both channels. I won't whine about it, but this feature would be a time-saver when running stereo mixes.

Well-lit VU meters reveal what's happening with output levels. Not only are the meters accurate and easy to read, they also add an attractive aesthetic element to the package. A clip LED indicator lights up when the unit is 6 dB below the onset of clipping at the analog output and 3 dB below clipping at the digital output.

To the right of each meter is the EQ section, which I'll cover in more detail later. Below the EQ section is a mic/line input switch, a 20 dB pad switch, a +48V phantom-power switch for powering condenser microphones, and a phase-reversal switch, which comes in handy if you run into phase problems between two microphones trained on a single source.

Two other switches, located near the power switch, allow you to select between 44.1 and 48 kHz sampling rates and between AES/EBU and S/PDIF digital output formats. (Thanks, DigiTech, for putting these switches on the front panel.) The last two controls on the front panel are the Pre-Gain and Post-Trim knobs, which I'll discuss shortly.

THE TUBES

"Warmth" is not usually a term associated with digital audio, but it is one

that most of us like having associated with our recordings. In general, vacuum tubes let you softly (or harshly, if you like) overdrive a signal, which results in harmonic distortion that is heard as "warmth." In addition, tubes are generally able to deal with transient signals more smoothly than solid-state circuits can.

The stock VTP-1 mic preamps comprise a vacuum-tube amplification stage and a low-noise, low-distortion, solid-state driver stage. They sound good, especially when you're pushing the tubes a bit to get some warmth.

To allow for sonic upgrades, Digi-Tech has designed the VTP-1 to be retrofitted easily with precision, transformer-balanced input circuits that bypass the stock, electronically balanced input stage. According to DigiTech, transformer-balanced circuits provide more presence in the higher mids and a slight rolloff on the bottom end. Of course, this approach is not necessarily better; many engineers prefer transformerless designs on the grounds that it is not acceptable for an input circuit to color the sound. At any rate, with the VTP-1, you have options.

TURNING ON THE HEAT

The Pre-Gain knob controls the amount of tube saturation applied to the incoming signal. This control offers a healthy amount of input gain: up to 66 dB on the microphone inputs and 26 dB on the line inputs. When it's turned fully counterclockwise, no signal gets through to the preamp.

The Post-Trim circuit attenuates the post-preamp signal to prevent over-driving the EQ and output. The Post-Trim control is an attenuator only; it does not boost the output level.

My favorite setting was Post-Trim at the one o'clock position and Pre-Gain set somewhere between eleven and two



DigiTech's VTP-1 is a terrific value, delivering two tube mic preamps, 4-band EQ, and 18-bit A/D converters for the price you might normally pay for just a tube preamp.

VTP-1 Specifications XLR + balanced/unbalanced 1/4-inch Analog Line I/O **Analog Mic Inputs Digital Outputs** AES/EBU or S/PDIF **Digital Sampling Rates** 44.1 or 48 kHz EQ (±15 dB) 80 Hz (shelving) 500 Hz-18 kHz 12 kHz (shelving) Low-cut Filter -12 dB/octave @ 75 Hz Signal-to-Noise Ratio >102 dB (A-weighted) THD + Noise <0.1% typical (user-variable) Frequency Response +0. -1 dB (20 Hz-20 kHz) +0, -3 dB (15 Hz-40 kHz) Maximum Gain +66 dB (mic inputs) +26 dB (line inputs) **Nominal Output Level** +12 dBu (balanced) +6 dBu (unbalanced) **Maximum Output Level** +23 dBu (balanced) +17 dBu (unbalanced)

o'clock. These settings added smoothness and roundness to incoming signals and were especially nice on low-end sounds such as kick drum and bass.

I ran several finished mixes through the VTP-1, making sure the stereo channels were set identically. On a synthesizer mix with no compression and very little EQ, the VTP-1 smoothed out the mix quite nicely. While processing a heavier, guitar-based mix that originally sounded a bit muddy, I applied some tube saturation and boosted the high-mid EQ a bit at 18 kHz. The result was a substantial improvement.

I also did some comparison recordings of bass, drums, and percussion. First I tracked bass guitar and kick drum (using a Neve 33114 preamp) and snare and percussion (using the preamps on my Mackie mixer) directly into Pro Tools III using the stock Pro Tools III A/D converters. I then recorded the same instruments through the VTP-1's preamps and A/D converters.

I didn't expect to be impressed by the combination of the VTP-1's preamp and converters, but boy, was I pleasantly surprised. There was a subtle but noticeable difference between the VTP-1 recordings and those done with Pro Tools and the other preamps. The VTP-1 tracks had a roundness that was absent from the tracks recorded without it. Other ears at the studio were also impressed with the subtle warmth the VTP-1 added. Of course, I attribute

this warmth more to the VTP-1's tube preamps than to its converters.

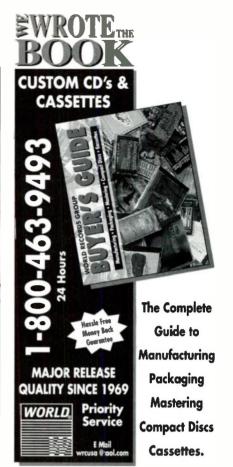
THE EQUALIZER

The EQ section is not the VTP-1's most immediately impressive feature. But it grew on me after I had used it for several hours. This is no Neve EQ module, to be sure, but it is quite usable.

The unit's low and high shelving bands are fixed at 80 Hz and 12 kHz and offer up to 15 dB of boost and cut. A Lo-Cut switch, when engaged, imposes a steep curve that cuts out almost everything below 75 Hz. This is useful for getting rid of 60 Hz hum, room rumble, and other low-end noise.

Two semiparametric bands, Lo Mid and Hi Mid, provide up to 15 dB of boost/cut with a sweepable center frequency. The Lo Mid's center frequency can be set anywhere between 50 Hz and 3.2 kHz; the Hi Mid's range is 500 Hz to 18 kHz. Unfortunately, no bandwidth control is provided, but apparently this compromise was necessary to achieve a reasonably low price point. DigiTech chose a fairly broad bandwidth, so the midband equalization is musical rather than "notchy" sounding.

Although the EQ is useful in many situations, the lack of bandwidth control makes it inflexible for others. For instance, I found both the low EQ and the low end of the Lo Mid to be a bit boomy on kick drum. Had I been able to narrow the bandwidth, I could have





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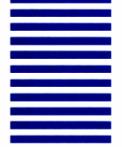
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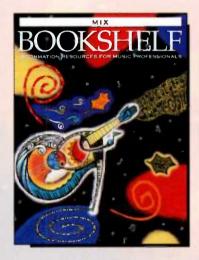
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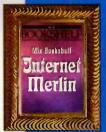
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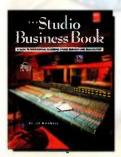


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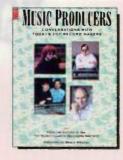
Bestsellers



MAKING MUSIC WITH YOUR COMPUTER

David (Rudy) Trubitt, ed. ©1993, 128 pp. (P) **013) \$17.95**

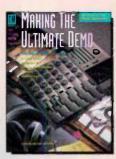
This book provides an invaluable introduction to the basics of computer music—whether you're a computer user just entering the world of music and sound or a musician searching for the right computer. Making Music will help you get the most out of today's electronic music technology by teaching you how computers contribute to the creative process; offering tips on selecting programs and gear and providing info on MIDI sequencing, music notation, hard-disk recording and desktop multimedia. It also includes a directory of manufacturers and an extensive glossary.



MUSIC PRODUCERS: Conversations With Today's Top Record Makers

The Editors of Mix ©1992, 128 pp. (P) 006) \$17.95

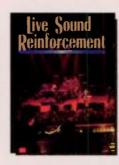
Twenty-four producers, including Don Dixon (R.E.M.), Bruce Fairbairn (Aerosmith), Daniel Lanois (U2), Bill Laswell (P.I.L.), Jeff Lynne (Tom Petty), George Martin (Beatles), Hugh Padgham (Sting), Phil Ramone (Billy Joel), Rick Rubin (Red Hot Chili Peppers), Don Was (Bonnie Raitt) and 13 others, discuss how they got started, how they mediate between labels and artists, what equipment they prefer, analog/digital format decisions, how they "build" a mix and much more.



MAKING THE ULTIMATE DEMO

Michael Molenda, ed. ©1993, 128 pp. (P) **017) \$17.95**

This book will teach you how to record and market a demo tape—a critical step toward gaining the exposure you want for your music. You'll learn how to record killer vocal and instrumental tracks, use signal processing like the pros and make intelligent mixdown decisions. And once your ultimate demo is "in the can," you'll know how to release and promote your recording on a budget and approach record labels without wasting your time. Packed with tips from industry veterans, this book will improve both the sound of your recordings and your prospects for success.



LIVE SOUND REINFORCEMENT

Scott Hunter Stark ©1996, 310 pp. (P) 1408) \$29.95

This reprint of the classic textbook is new from MixBooks. Its simple language, detailed illustrations and concrete examples convey the fundamentals of sound reinforcement theory in an intelligent and intelligible manner, making it an invaluable resource for aspirring live sound technicians and musicians alike. Written for novice to intermediate-level users, it outlines all aspects of P.A. system operation and commonly encountered sound system design concerns, with in-depth discussions of microphones, speaker systems, equalizers, mixers, signal processors, crossovers, amplifiers, system wiring and interfaces, indoor and outdoor sound considerations and psychoacoustics.



CONCERT SOUND: Tours, Techniques & Technology David (Rudy) Trubitt. ed.

David (Rudy) Trubitt, ed. ©1993, 180 pp. (P) 004) \$24.95

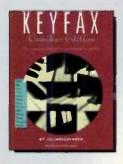
Go behind the boards with today's top touring acts and learn the basic principles of live sound from the pros. Concert Sound combines exclusive coverage of 24 major tours, including U2, the Rolling Stones, Garth Brooks and k.d. lang, with practical chapters on live sound techniques and business, safety issues and new technologies. Special sections on monitor mixing, drum miking, noise regulations and computer control make this a unique introduction to professional sound reinforcement.



TECH TERMS: A Practical Dictionary for Audio and Music Production

Petersen & Oppenheimer ©1993, 50 pp. (P) **012**) **\$9.95**

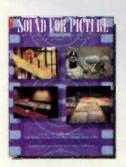
Keep this handy guide near your mixing console or musical instrument for precise, plain-English definitions of MIDI terminology, synth and sampler jargon, computer buzzwords and audio abbreviations. Written by the senior editors of Mix and Electronic Musician magazines, Tech Terms explains 300 of the most commonly misunderstood words and phrases in the field of studio recording, digital audio and electronic music



KEYFAX OMNIBUS EDITION

©1996 (P) 7080) \$24.95

This compendium of the previous five volumes in the Keyfax series includes tons of new historical information from the world's foremost expert on classic synths. Colbeck features the top 100 keyboards of all time, each with specific design history and technical information, original and current value and specs on features such as effects, storage capabilities and options. He also includes company profiles of the 13 leading synth manufacturers, plus loads of never-before-published stories about how these classic machines were conceived, designed and built and the people behind them. Finally, Colbeck provides technical specifications for hundreds of other synths, making the Keyfax Omnibus Edition a buyers quide like no other!

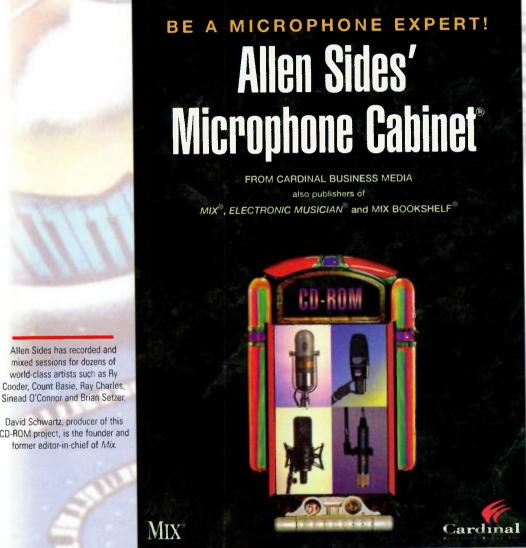


SOUND FOR PICTURE: An Inside Look at Audio Production in Film and Television

The editors of Mix ©1993, 140 pp. (P) 011) \$17.95

Sound for Picture is packed with film-scoring secrets! Take a look behind the scenes as top hollywood sound professionals reveal how dialog, sound effects and musical scores are recorded, edited and assembled into seamless soundtracks. Exclusive case studies spotlight such blockbusters as Terminator 2, Malcolm X, The Simpsons, The Doors, Twin Peaks and many others, focusing on both the equipment used and the philosophical side of sound design.

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David Schwartz, producer of this CD-ROM project, is the founder and former editor-in-chief of Mix.

Allen Sides has recorded and mixed sessions for dozens of world-class artists such as Ry

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- Complete specifications for each microphone.
- A color photograph and description of each musical instrument.
- A "Microphone Basics" section by noted author John Woram.
- · A directory of the microphone manufacturers.

This amazing disc features tests of 66 mics and 33 different instruments. The microphones were chosen from the worldrenowned collection at Sides' Ocean Way/Record One studios in Los Angeles. Sort by microphone to check out the best instruments for each, or sort by instrument to see which mics you should use. Item MC) \$69.95 plus \$9.95 shipping and handling.

honed in on the frequency I was looking for, thus reducing the boominess.

On the other hand, the low-end EQ had a fairly positive effect on gritty guitar and certain bass tracks. Not only that, it also managed to turn a few sluggish synth patches into some pretty monstrous sounds.

When running vocals, guitar, or an overall mix through the VTP-1's EQ, I liked the Hi Mid control set in the airy range (15 kHz to 18 kHz), which added brilliance to the track or mix. At first I found the 12 kHz control to be a bit harsh, but it turned out to be great for tweaking samples that originated on television or the radio. The 12 kHz control also does some great things to both male and female vocals, accentuating their grittiness and adding a pseudodistorted quality if you really push it. In addition, it works well for tweaking electric guitar and other tracks that sometimes benefit from a touch of harshness.

The bottom line is that the VTP-1's EQ sounds good and is useful, with some restrictions, for both tracking and touching up a mix.

ODDS AND ENDS

The VTP-1 can also be used as a simple direct box. However, due to the unit's impedance level, the VTP-1 isn't optimal for use with passive pickups (such as those on an electric guitar).

The 8-page manual is simple and to the point, amply documenting the few

Product Summary PRODUCT:

VTP-1 tube preamp/A-D converter

PRICE:

\$995

MANUFACTURER:

DigiTech tel. (801) 566-8800 fax (801) 566-7005 Web http://www .digitech.com CIRCLE #441 ON READER SERVICE CARD

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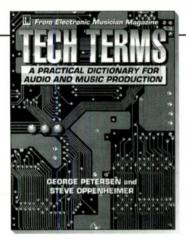
operations that aren't self-explanatory. Of course, the only potentially difficult thing to understand is how to set Pre-Gain and Post-Trim levels, and this procedure is explained clearly.

CONCLUSIONS

The VTP-1 is a pretty hot number. Its feature set allows for some nice tweaks while you're tracking, and the unit can give a nice finishing touch to a completed mix. The A/D converters are also impressive. My only wishes were for a stereo link button and a bandwidth control on the EQ.

Altogether, it's hard to find fault with a unit that provides this much sonic enhancement for so little money. The tube warmth it adds to signals is alone worth the unit's cost. Add to that two solid mic preamps, 18-bit A/D converters, a decent EQ, two lovely VU meters, solid construction, and clean sound, and you have a real winner.

David Kaplowitz is a sound designer-composer and cofounder and co-owner of the San Francisco-based recording facility Found Sound.



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Philips IS 5022 Sound Enhancer

By Peter Freeman

Philips is on a mission to convert you—to 20-bit audio, that is.

nalog-to-digital and digital-toanalog converters are among the most critical components of any digital audio system. Even the highest-resolution digital tape or harddisk recording suffers sonically if poor or mediocre converters are used. For this reason, an entire mini-industry has sprung up in the last few years supplying high-quality converters to discerning audio professionals.

Philips has entered this field with the IS 5022, a 1U rack-mount, 2-channel, multipurpose device that includes 20-bit A/D converters, a digital effects processor, and a multiformat digital audio interface. A lower-end tabletop version, the IS 5021, also is available. Both units are powered by external DC supplies.

WHAT YOU SEE

The IS 5022 offers AES/EBU and S/PDIF digital I/O as well as balanced XLR and unbalanced RCA analog inputs and outputs. These I/O options are selected with rear-panel switches. You can't use the digital and analog inputs simultaneously; a front-panel Input button selects between them. You can't use the AES/EBU and S/PDIF inputs simultaneously, either, but when the unit is used as an A/D converter, both digital outputs are active. A word-clock input allows use with an external clock.

Input levels are indicated by a pair of large, 25-segment LED meters. Two

trim pots independently control input levels for the left and right channels. Levels can be boosted by as much as 5 dB or attenuated. To the left of the level meters are three vertical rows of yellow status LEDs that indicate the state of the IS 5022's various effects and its audio configuration. To the right of the input-level controls are eight colored, lighted buttons that control the IS 5022's many functions. Parameters are selected with a pair of Select buttons, and values are adjusted with a pair of Adjust buttons.

WHAT YOU GET

In addition to its A/D and D/A functions, the IS 5022 provides a number of digital effects and corrective functions. You can bypass all the effects with a front-panel button.

Several of the IS 5022's processing functions are designed to reduce various types of noise. A scratch-suppression (declicking) filter with variable sensitivity is provided for masking surface noise from records. It works by identifying flaws of equal amplitude in both channels. If a flaw is not equal in both channels, the declicker can be used with a function called Max T.S. (maximum transient suppression), which collapses the stereo signal practically to mono so the declicker will recognize the flaw. However, this function produced such extreme results that I didn't find it useful.

The Spatial Stereo effect widens or narrows the soundstage of stereo audio in ten increments; five settings narrow the soundstage, and the other five widen it. The unit also offers stereo simulation, which creates a stereo effect from a mono recording, adding synthesized room/wall reflections to enhance the sense of spaciousness and realistic stereo. Philips recommends using this effect with the Max T.S. func-

tion to restore the stereo image, but I encountered significant phase problems that rendered this approach useless for all practical purposes.

The QNI key toggles the Quantization Noise Imaging effect, which uses noise-shaping techniques to move the quantization noise present in all digital audio signals outside the audible range. This feature improves the dynamic range of a signal by making low-level sounds clearer. However, QNI is not adjustable; it is either on or off. This function is also used to convert 20-bit signals to 16-bit resolution.

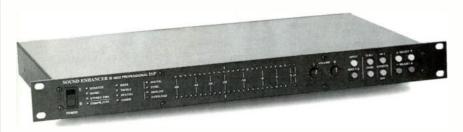
The IS 5022 also has a noise filter, which is a digital second-order (12 dB/octave) lowpass filter with an adjustable cutoff frequency between 5.5 and 16 kHz. This filter is recommended for such applications as reducing the surface noise from old 78 rpm records.

According to Philips, the IS 5022 automatically removes any jitter from a digital input. I was unable to detect any audible jitter in my signals, so I could not test this claim. The unit also automatically removes the copy-protection bit from Serial Copy Management System (SCMS) digital signals, which is great.

In addition to assorted types of noise reduction, the IS 5022 offers several other processing functions. For example, its bass and treble shelving filters provide up to 19.5 dB of attenuation in 1 dB increments. Unfortunately, the cutoff frequencies are fixed at 1 kHz (lowpass) and 2 kHz (highpass); this extremely wide bandwidth renders the filters far less useful than they could have been.

The Fader function activates a digital fade-out or fade-in (as selected with the Fader key) over a time adjustable from 0.5 seconds to 11 seconds. Another button changes the default sample rate from 48 kHz to 44.1 kHz.

The IS 5022 also offers dynamic compression and expansion, both of which operate on signals above a fixed threshold of -60 dB. Interestingly, the expander is of the old-fashioned type, increasing the dynamic range above the threshold and leaving signals below the threshold untouched. The compressor behaves as expected, reducing the dynamic range above the threshold. Because both functions operate in the same dynamic range, only one can be used at a time. Unfortunately, there is no clear indication of which one is



If you're in the market for high-resolution A/D and D/A converters, check out Philips' IS 5022 Sound Enhancer. The unit provides AES/EBU and S/PDIF I/O, balanced and unbalanced analog I/O, noise shaping, rudimentary compression/expansion, and simple EQ.



Home recordists who don't need AES/EBU I/O and balanced analog I/O may be better off with the consumer-oriented IS 5021 instead of the far more expensive IS 5022.

active until you send a signal through the unit.

Both the compressor and expander offer ten fixed, user-selectable ratios, which are specified as percentages of the input level. The compressor offers ratios from 50% (2:1) to 100% (1:1) in 5% increments, and the expander offers ratios from 100% to 190% (1:1.9) in 10% increments. Limited to these ten ratios, you have precious little control over the dynamics processing, which is disappointing.

The IS 5022 cannot perform all available DSP functions simultaneously due to the processing power required. For instance, you can use the declicker with the noise filter and stereo enhancement, but you can't use these with the compressor/expander. The bass and treble filters, Spatial Stereo, and fader can be used together with the compressor/expander, though.

TESTING THE ADC

I tested the IS 5022 primarily as a front end for my Panasonic SV-3700 DAT deck because I am accustomed to the sound of the A/D converters (ADCs) on the Panasonic machine. The SV-3700 converters are extremely good, so they make a good reference for evaluating the IS 5022.

I recorded the same 30-second segment of a finished mix on the 3700 twice: first via the IS 5022's 20-bit converters and then through the DAT's 16-bit converters. With the exception of the QNI function (which dithers the 20-bit output down to 16-bit resolution), I disabled all the IS 5022's processing features for this portion of the evaluation process. The differences be-

tween the Philips and Panasonic ADCs were extremely subtle. I had a difficult time discerning which was which in a blindfold test. The two sounded equally 3-dimensional and detailed.

When I tested both sets of converters as the front end of a Pro Tools II system, which is capable of recording 24-bit audio, the IS 5022's 20-bit A/D converters were noticeably, though still subtly, better than the DAT machine's 16-bit converters. The Philips box produced a more open sound than the DAT

recorder did, which is probably the cumulative result of the component quality, specifications, and 20-bit resolution of the IS 5022.

Next, I recorded some live vocals and instruments (including bass guitar) through a DI box via the Philips and Panasonic converters. In this context, the particular sound of the IS 5022 was a little more apparent. The Philips box sounded a bit more airy in the upper end of the frequency spectrum than the SV-3700, and it was very slightly more natural overall. In fact, the IS 5022 made the SV-3700 sound as if it had a slightly exaggerated bass response by comparison. Keep in mind that I'm talking about extremely small degrees of sonic variation between these two devices; they both sound generally excellent.

EVALUATING THE DSP

Having tested the A/D converters, I began experimenting with the IS 5022's processing functions, starting with the bass and treble EQ section. Using the same two categories of program material (finished mix and live instruments), I used the EQ to add and cut various amounts of top and bottom end.

Despite the unusual cutoff frequencies, I like the sound of the Philips EQ. Small amounts of treble boost extend the frequency response smoothly, which makes the program material sound bigger. However, the bandwidth is extremely wide in both the treble and bass filters. Although this is not a big problem in the treble region, boosting the bass frequencies can easily result in boominess.

It is important to mention that the

IS 5022's EQ and other processing functions sound best when used sparingly. Overusing any of this box's DSP features yields unnatural-sounding results.

The Spatial Stereo effect was next in line for testing. I was a bit wary of this from the outset because most devices designed to provide spatial enhancement usually end up making the source material sound out of phase and unnatural to my ears. When applied heavily, the IS 5022's Spatial Stereo effect is no exception.

If used very subtly, however, the IS 5022's Spatial Stereo function helps widen the stereo soundstage without compromising the quality of the stereo image too much. Purists may shudder at the idea of using this effect on a finished mix because it is quite noticeable even at its most minimal setting. I suggest you take into account the musical context when you apply this effect and let your ears be the judge.

The compressor/expander functions are good sounding, though nothing to write home about. A small amount of compression added to a finished mix helped improve its punch and impact. However, the IS 5022 lacks comprehensive parameter control, which proved to be a disadvantage. Without threshold, attack, and release controls, I could not precisely tailor the IS 5022's dynamics functions to the music. This difficulty considerably reduces the dynamics processor's usefulness.

Product Summary

PRODUCT:

Philips IS 5022 Sound Enhancer digital audio converter/processor

PRICE:

\$2,400

DISTRIBUTOR:

Mackenzie Labs tel. (800) 423-4147 or (909) 394-9007 fax (909) 394-9411 e-mail mackenzie@ earthlink.net Web http://www .keymodules.philips.com /MD/seprof.htm

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SOUND ENHANCER

One convenient feature of the IS 5022 is its ability to serve as a nearly universal sample-rate converter. Feed it a digital audio signal at any sample rate between 15 and 50 kHz, and it can convert the signal to 44.1 or 48 kHz on the fly. I fed the IS 5022 some 32 kHz samples from the S/PDIF output of my Audiomedia II card, and the Philips unit's sample-rate conversion routines worked like a charm.

DACS AND OPTIONS

It's probably safe to say that most people buying the IS 5022 will use it mainly as a high-quality A/D front end for their studios. Although the standard 16-bit, 4× oversampling digital-to-analog converters (DACs) on the unit certainly sound good enough for their intended primary application—monitoring—their specs are not as good as those of the ADCs.

If you plan to use the IS 5022 DACs for professional projects, I strongly suggest looking into the optional F3D D/A board (approx. \$800), which was designed for IS 5022 users who work extensively in the analog domain. The

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IS 5022 and F3D DAC Conversion Specifications

	S/N Ratio (A-weighted)	Dynamic Range	THD+N
IS 5022 (stock) RCA Analog Out	103 dB	98 dB	95 dB
IS 5022 (stock) XLR Analog Out	100 dB	95 dB	95 dB
F3D RC Analog Out	108 dB	101 dB	100 dB
F3D XLR Analog Out	103 dB	98 dB	100 dB

F3D brings the quality of the box's DACs up to the level of the 20-bit A/D section. The board includes two DAC-7 ICs that employ 1-bit, 256×-oversampling, Bitstream (Philips' variation of Sigma/Delta) converters. The F3D board also includes a digital filter with noise shaping.

If you plan to use the IS 5022 for both D/A and A/D conversion, this board is an excellent purchase. Otherwise, I do not deem it a necessity. Although I didn't have an opportunity to evaluate the F3D board, its specs (see table, "IS 5022 and F3D DAC Conversion Specifications"), coupled with the excellent sound of the standard IS 5022, lead me to believe it will be a fine performer.

CONCLUSIONS

The IS 5022 sounds excellent and is easy to use. It's also expensive. It seems to me that Philips was a bit confused about the potential target market for this device. The box sports features that clearly come from two different worlds: professional and consumer. Most of the processing functions are obviously designed for the consumer market. Although they are usable to some extent, these functions lack the precision and control required for most professional applications. On the other hand, the overall sound quality, hardware design, and price tag are thoroughly professional. Perhaps Philips was aiming at the high-end audiophile consumer market, which demands professional performance from consumer audio

Do you need this box? That depends on several factors, including the kind of music you make and how you work. If you routinely work on layered, subtle, detailed music with a lot of dynamic range, you may come to appreciate a box like the IS 5022, particularly if you are not satisfied with the A/D and D/A converters you're currently using. On the other hand, if you're in the quick-and-dirty, throw-it-down school of recording, this device may be a needless extravagance, especially if you already own a machine with excellent converters.

Philips offers a more attractive alternative for home recordists who like the converters and basic processing features in the IS 5022 but want to spend less money. The IS 5021 (\$1,500) is a tabletop version that includes the same converters and processing features as the IS 5022. However, it does not remove the copy-protection bit from SCMS signals. The IS 5021 has S/PDIF digital I/O and unbalanced RCA analog I/O but no AES/EBU digital I/O or balanced XLR analog I/O. Given its pro-audio quality and reasonably good price, the IS 5021 may be a good purchase for many "semipro" home studio owners.

Yes, 20-bit audio is wonderful, but it's hardly essential for most project/home studios. Would I mix a record through the IS 5022? Yes, without reservation; it's a quality product. Would I insist on having one in my project room? No. I would ask for better processing with much more extensive control before I would consider this unit a "must buy."

Peter Freeman is a freelance bassist, synthesist, and composer living in New York City. He has worked with such artists as John Cale, Jon Hassell, L. Shankar, Chris Spedding, Sussan Deihim, Richard Horowitz, and Seal.

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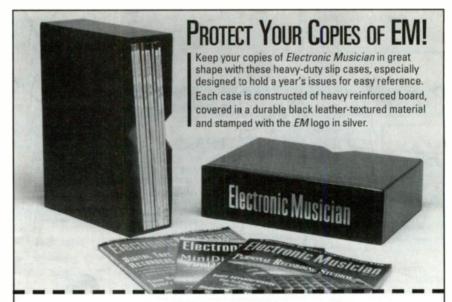
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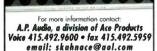
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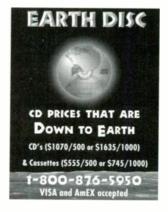


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TIGH. PAGE

omputer technology has helped electronic musicians make music for many years now. However, it can also help at the other end of the musical experience: hearing. Millions of adults around the world suffer from profound hearing loss of 90 dB or more, which prevents them from engaging in oral communication, perceiving auditory warnings (e.g., smoke detectors and sirens), using the telephone unaided, or fully enjoying music.

Such severe hearing loss is often due to damaged hair cells in the cochlea of the inner ear. These hair cells can be destroyed gradually as the ear is exposed to loud sounds over long periods of time, or they can be destroyed immediately due to acoustic trauma, such as a gun shot or sudden, howling feedback. (For more on the anatomy of the ear and noise-induced hearing loss, see "Hear Today, Gone Tomorrow" in the June 1993 EM and "Hear No Evil" in the June 1996 issue.) Other potential causes include measles, mumps, and meningitis.

In most profound cases, standard hearing aids are inadequate. A far better but more radical solution is a cochlear implant. This device includes a tiny wire that is surgically implanted in the cochlea (see Fig. 1). The wire contains electrodes that remain in physical contact with sections of the auditory nerve. An external microphone is placed behind the ear and sends an audio signal to a small processor that is

Now Hear This

Cochlear implants help the deaf to hear.

By Scott Wilkinson

often worn like a pager. The processor converts the audio signal into electrical pulses, which are then sent to the implanted electrodes via RF transmission. The electrodes stimulate the auditory nerve to send impulses to the brain, which are interpreted as sound.

Healthy hair cells and cochlear implants work on the same principle: we perceive different frequencies of sound when different sections of the auditory nerve are stimulated. Modern multichannel implants place several electrodes at different locations in the cochlea, which allows the implant to stimulate different regions of the auditory nerve that correspond to different sound frequencies.

Cochlear implants have been available since the 1970s and have steadily become more sophisticated since then. Recently, a company called Advanced Bionics (tel. 800/678-2575 or 818/362-7588; fax 818/362-5069; Web http://www.cochlearimplant.com) announced an improvement in cochlear-implant technology. Called the Clarion, this implant includes sixteen electrodes and a

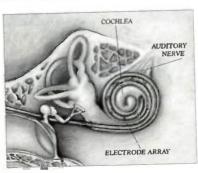


FIG. 1: A cochlear implant includes a tiny wire with electrodes that is surgically placed within the cochlea. (Courtesy Advanced Bionics)

sophisticated signal processor.

The Clarion can perform digital or analog processing on the audio signal from the microphone. In addition, it can deliver pulses to the electrodes much faster than previous generations. This can dramatically improve speech intelligibility, which depends on sonic fluctuations lasting only a few milliseconds.

Another important advancement is the ability to store and recall different sets of processing parameters. These parameters include loudness levels, listening thresholds, and processing speed. An audiologist programs these parameters in a computer and downloads them into the processor. The user can then select which set to activate in a particular environment. For example, it is possible to create programs optimized for loud restaurants, quiet environments, and listening to music. This capability also makes it easy to update the processor with new software.

Cochlear implants are intended only for the severely to profoundly hearing impaired, and results vary from one individual to the next. The primary goal is restoring the ability to understand speech, which facilitates basic communication that is critical for survival and quality of life. However, they can also enhance the experience of music for those who would otherwise feel only the thump of a loud bass. Of course, the best approach is to protect your hearing before you lose it, but if auditory misfortune befalls you, it's nice to know that computer technology can help restore at least some of your sense of sound.

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"There are so many enhancements in the K2500 that it would be impossible to describe them all in a single review. The K2500 is even deeper and more powerful than it's predecessor the K2000. The K2500 has one of the most powerful sequencers in any keyboard workstation today. I found it very easy to get around thanks to a logical layout. The editing functions are remarkably complete, and provide a variety of useful record and playback parameters, including quantization on input, auto punch-in and punch-out, looping, synchronization, countoff, and click options. Of special note is the powerful arpeggiator that can be used in Setup Mode. The ribbons are great fun to use. They let you play incredibly expressive vibrato and pitch bends. You can audition samples directly from disk without loading, which is very convenient. I applaud the breath controller input; it is far too rare in the synth world. The setups inspire creativity when you play them. It sounds fantastic, it's packed with useful and well-implemented features, it's lineage is impeccable, and it will continue to expand and improve. The K2500 is truly an awesome instrument. All that remains is for you to write a check!" - Scott Wilkinson

KEYBOARD - MAY 1996

"As a synthesizer, the K2500, like it's predecessor, is easily the deepest instrument you can buy. We couldn't wait to get our hands on one. The piano daughterboard (optional) provides a stunning stereo grand piano... you'd be hard-pressed to find a more playable instrument. It's warm, full, and responsive, and sounds equally realistic from one end of the keyboard to the other. The ribbon (controller) surface feels just right. The control over key velocity is superb. Basically, this is a serious piece of gear. The built-in sequencer has enough power to keep you jamming for a good long time. The sequencer has a much higher clock resolution than any other built-in sequencer that we know of. The K2500 is unabashedly aimed at the professional... it's a class act all the way. When it comes to overall musical muscle, this instrument really has no competition... this is the Steinway of electronic music." - Jim Aikin

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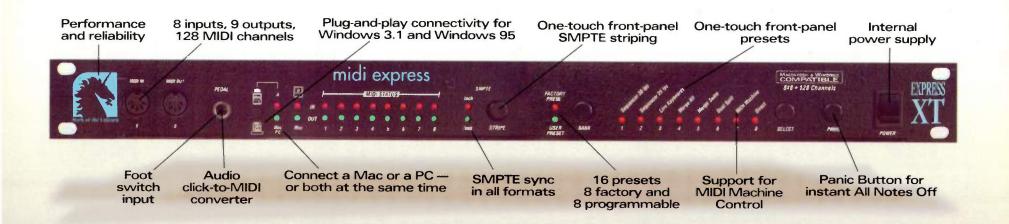
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