

Sell Your Music Online ■ Pro Mixing

# Electronic Musician

March 1995

## Tabletop Orchestras

4 GENERAL MIDI MAESTROS COMPARED

MIDI Accordions Rule!

Patrick O'Hearn  
Scores a Jazzy  
Curtain Call



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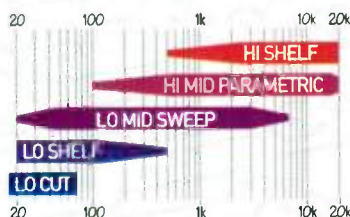
# WHY MACKIE IS YOUR BEST 8-BUS

Lately, several big pro audio companies have gone out of their way to "mention" us in their own 8-bus console ads. Many satisfied Mackie owners have urged us to shoot back with hardball comparisons of our own. But that's not our style.

Greg believes that if a product is really good, it should speak for itself — without resorting to slagging the competition. First in a series, this ad details some of the features that we believe make our 8•Bus the best recording or PA console value available today for under \$20,000.

## Comprehensive equalization for creativity and problem-solving.

To quote Electronic Musician<sup>1</sup>, "It's no secret that the versatility and pristine sonics of the 8•Bus EQ have astonished jaded



pros and home hobbyists alike. The 4-band EQ section includes two shelving controls fixed at 12kHz and 80Hz; parametric high-midrange EQ with a 500Hz to 18kHz sweep and a bandwidth that can be adjusted between three octaves and one semitone; and low midrange EQ with a 45Hz to 3kHz sweep. A full 15 dB of boost or cut is provided for each band. In addition, an 18 dB/octave low-cut filter is set at 75 Hz. That's a heck of a lot of firepower!

No kidding. But we also like that part about pristine sonics. One of the

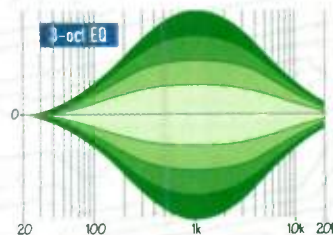
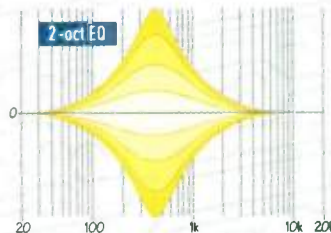
*"The 32•8 is so clean that you don't really hear the EQ; everything sounds deceptively natural, which is really great."*

We wouldn't have it any other way.

## What parametric EQ means to you.

The biggest gun in the 8•Bus' EQ arsenal is its true parametric high midrange EQ. Conventional sweepable midrange (like our 8•Bus' low mid), has a fixed bandwidth of about 2 octaves. No matter how high or low in frequency you sweep it (or how much you boost or cut it),

2-octave EQ's contour stays the same. While extremely useful, it's just one tonal "color." Having to rely on swept, 2-octave midrange alone is like being asked to paint a picture with only a bucket of bright yellow paint.

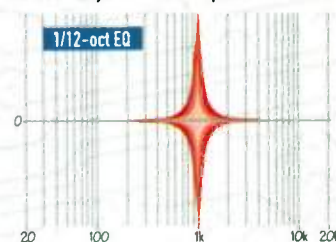


natural-sounding, it can unobtrusively change the character of a track without noticeable tonal intrusion. If you're used to conventional 2-octave swept midrange, you'll be surprised at how much 3-octave EQ you can add

without things starting to sound obnoxious.

On the other hand, there are times when you want what can only be called surgical EQ. At its narrowest, our parametric Hi Mid is four times as precise as a 1/3rd-octave graphic equalizer. It's like having a delicate artist's brush and a magnifying glass for erasing or enhancing tiny details.

Between three octaves and 1/12-octave is a vast range of tonal colorations, nearly all possible only with parametric equalization. And, since our "HI" mid's sweep range extends from 18kHz all the way down to 500Hz, your creative palate extends



over six octaves — to our knowledge the widest midrange sweep currently available<sup>3</sup>.

reasons that the 8•Bus Series took so long to ship was that Greg was determined not to compromise EQ sound quality. Cheap circuitry can create all sorts of sonic grunge that may add distinctive "character" to a console's EQ... but Greg's goal was clarity, not eccentricity.

To further quote Electronic Musician, "In all applications, the 8•Bus EQ was extremely musical and transparent... One of the engineers summed it up best by saying,

By letting you vary the bandwidth, parametric EQ gives you the equivalent of a full rainbow of tonal "colors" in your artistic pallet. Spreading high midrange EQ over three full octaves transforms it into an extremely subtle — yet extremely dramatic — effect<sup>2</sup>. Sweet and

<sup>2</sup> This is what we meant when we used the phrase "Expensive British Console Sound" in our first 8•Bus ads: Classic English desks were the first to offer extremely wideband (i.e. greater than 2 octaves wide) equalization. Obviously we didn't make ourselves clear on this point, because everyone from our

<sup>1</sup> September 1994 issue, page 64, in a sidebar to an article on The British Invasion (of consoles). We urge you to read the whole thing so that we don't get in trouble for quoting stuff out of context.

Above: Left to right, 32•8 console with MB•32 meter bridge, 24•E Expander with MB•E meter bridge, and The Sidecar.



Apparently we're not alone in our belief. In competition with many of the very consoles that keep "mentioning" us in their ads, we recently won the coveted MIX Magazine TEC Award for Small-Format Consoles. As well as LIVE! Sound magazine's Best Front of House Mixer Award.

To learn why, call us toll-free for our detailed, 24-page 8•Bus brochure.



# CONSOLE CHOICE

## An expandable console system.

If you can successfully foretell the future, you might as well play the commodity futures market, make a zillion bucks and buy a 128-channel SSL console.

However, because most of us are less clairvoyant



and a lot poorer, we've designed a system that can grow with your needs and budget. Start with our 24•8 or 32•8 console<sup>3</sup>. Then, when your tax refund comes back, add an optional meter bridge<sup>5</sup>. When you land that Really Big Project That Pays Actual Money, add more input channels (and tape returns) in groups of twenty-four with our 24•E Expander console<sup>6</sup>.

You can keep right on growing your Mackie 8•Bus console system up to 128 channels or more.

And, beginning this spring, you can automate the whole shebang with our extremely affordable Universal MIDI Automation system. It consists of the OTTO-34 VCA gain cell unit, wicked-fast Ultramix™ Pro software and the innovative OTTOPilot™ control interface. Both the hardware and the software were debuted in final form at last Fall's AES Convention. They received rave reviews from seasoned pros who are used to working with "mega-console" automation systems.

<sup>3</sup>... on a comparably-priced 8-bus console. Oops! We're starting to sound competitive.

<sup>4</sup> \$3,995 (24•8) and \$4,995 (32•8) suggested retail. Slightly higher in Canada.

<sup>5</sup> \$795 (MB•24) and \$895 (MB•32) suggested retail. Slightly higher in Canada.

<sup>6</sup> \$2,995 suggested retail. MB•E meter bridge \$695... Yadda yadda, Canada, etc. etc.

## Very Low impedance Circuitry (VLZ) for very low noise.

We like to say that the 8•Bus console's monster 220-Watt Power Supply was a product of typical, fanatical Mackie over-engineering. But one of our real motives lies at the other end of the power supply's multi-voltage connecting cable.

At room temperature, all electronic components create thermal noise. Cumulatively, this can become audible and objectionable. We design around thermal noise by making internal

circuit impedances as low as possible in as many places as possible. For example, resistor values in our mix bus are 1/4 the value of those typically used — hence thermal noise is proportionally lower. Another advantage of VLZ is that low-

**VLZ** impedance circuitry is far more immune to crosstalk problems.

VLZ isn't easy to achieve. All circuitry must be thoroughly buffered. Plus, console current consumption goes way up, requiring a beefy power supply. Such as the massive, 31-pound, power supply we ship with each 8•Bus console.

## +4dBu operation throughout.

This is a biggie in terms of overall noise and headroom. There are two current standards for console operating levels: -10dBV and +4dBu. Without knocking our competition, let's just say that +4dBu is the professional standard, used with all serious recording, sound reinforcement and video production

components. This higher operating level effectively lowers the noise floor and increases dynamic range. Our 8•Bus consoles operate exclusively at +4dBu (although their tape outputs and returns can be switched to -10dBV to match other semi-pro/hobbyist gear you may still own).

## Built like tanks.

Our 8•Bus Series consoles have been in the field long enough to gain an almost legendary reputation for durability. For example, a lot of them absorbed the impact of toppling monitor speakers during last year's Los Angeles earthquake with little more than a few broken knobs. Others have survived drops off loading docks, power surges that wiped out whole racks of outboard gear and beer baths, not to mention hundreds of thousands of air and semi trailer miles with major tours<sup>7</sup>. Read our 8•Bus tabloid/brochure to learn about the impact-absorbing knob/stand-off design, fiberglass circuit boards and

steel monocoque chassis that make our consoles so rugged.

Bottom line: You simply can't

buy a more dependable console. Maybe that's why *LIVE! Sound* magazine readers voted us their 1994 "Best Front of House Console."

<sup>7</sup> Including the latest Rolling Stones, ZZ Top, and Moody Blues tours. (Footnote to the footnote: Mention in this ad denotes usage only, not official endorsement).

## We could go on this way for pages.

If we got into the details of 8•Bus features like special RFI protection, triple tape bussing, in-place stereo solo, constant power pan pots, or the extra 15dB of gain available at the 8•Bus's aux sends and returns, this ad would have even teenier type than it already has.

For these and other facts, call us toll-free (8:30AM-5PM PT) and ask a real live person for our obsessively-detailed, 24-page 8•Bus brochure.

## OUR 8-BUS CONSOLES REALLY WORK, THE UPDATE:



Ricky Peterson mixed ♀'s recent hit single, "The Most Beautiful Girl in the World" on his Paisley Park Studio 32•8 console.

Queensryche's new platinum album, *Promised Land*, was totally tracked on Mackie 8•Bus consoles (with help from OTTO-automated CR-1604s). A sonic (and musical) masterpiece, it has the tight bass, crisp highs and ear-boxing dynamic range that's becoming an 8•Bus console signature. Need more proof as to why pros prefer Mackie? Buy this superb CD.



# MACKIE.

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# I N S I

## FEATURES

### 30 ALL MIXED UP, PART 2: TONE SCULPTURES

Mold your mixes into audio masterpieces! Our mixing master class continues with EQ and signal-processing enhancements for specific instruments.

*By Michael Molenda*

### 44 COVER STORY: TABLETOP ORCHESTRAS

General MIDI modules are standardized for consistency between units, but that doesn't mean all GM boxes are created equal. In a two-tiered face-off, **EM** pits Kawai's GMega against the Roland SC-88 Sound Canvas, while Korg's AG-10 Audio Gallery duels the Yamaha MU5.

*By Scott Wilkinson*

### 58 PRODUCTION VALUES: FLYING SOLO IN A DEEP CAVE

Our new series on the conceptual side of music production debuts with Patrick O'Hearn discussing his score for Sam Shepard's latest play, *Sympatico*.

*By Mary Cosola*

### 66 THE MIDI POLKA

Accordions are coming back! The instrument's funky wail and wheeze are all over recent television commercials, sitcom themes, and movie scores. And now, newfangled *MIDI* accordions are giving aficionados unprecedented performance versatility.

*By Scott T. Spence*



## DEPARTMENTS

- 6 FRONT PAGE
- 10 LETTERS
- 16 WHAT'S NEW
- 114 AD INDEX
- 138 CLASSIFIEDS



# DE

# Electronic Musician®

MARCH 1995 VOL. 11, NO. 3

## COLUMNS

- 29 PRO/FILE: Taylor-Made**  
Taylor 808 customizes the sound of his ambient dance tracks.
- 77 SERVICE CLINIC: Technician's Tool School**  
Discover the tools you need to become a workbench wizard.
- 82 MULTIMEDIA MUSICIAN: Spinning Through Kaleidospace**  
Fight for creative independence by putting your music online.
- 90 WORKING MUSICIAN: The Face Behind the Curtain**  
Learn how a personal manager can be an artist's best friend.
- 146 TECH PAGE: Zipply Doo Dah**  
An upstart network called ZIPI addresses the limitations of MIDI.

58



## REVIEWS

- 100 ENSONIQ KT-88** keyboard workstation
- 112 3D SOUND The Plano** CD-ROM
- 115 A.R.T. RXR Elite** stereo reverb
- 120 TURTLE BEACH Quad Studio 1.0 (Win)** hard-disk recorder
- 124 MASSEY SoundMorph 1.08 (Mac)** audio morphing
- 127 YAMAHA RY20** drum machine
- 132 PG MUSIC Band-in-a-Box Pro 6.0 (Win)** auto-accompaniment

66



Cover: Photo by Robert Perry.

Special thanks to Kawai America, Korg USA, Roland Corp. US, Yamaha Corp., and Coast Wholesale Music.



## Who's the Boss?

Isn't it funny that as soon as you think you know what you're doing, someone shreds the rulebook.

**M**y parents would never accuse me of embracing discipline. Oh, I wasn't a brat or anything, I was just terrorized by an inner voice that was as insistent—and as subtle—as a Marine drill sergeant. In other words, I always managed to do things *my* way. This behavior had nothing to do with machismo, intellectual snob-bism, or artistic whimsy. I simply couldn't help myself. My little demon out-ranked Mom, Dad, school teachers, and assorted other authority figures. That is, until now.

The demands of current music listeners have kicked the stuffing out of my determination and resolve. I mean, I *used* to know how to produce a commercial music project. You recorded alignment tones, mixed your tracks to stereo, and shipped a DAT master to the CD duplication plant. But today, making a CD isn't the only way to get your music heard. In fact, a CD that merely offers stereo music tracks may already be passé. Unlike my early fixation with recorded music, few listeners really sit mesmerized by an album anymore. The music experience for many consumers is now tied to interactive media, such as computer games, online sound bites, and CD-ROM scores. Action is everything; nothing is passive. This need for "audio adrenalin" is what's causing my crisis of will. I don't know how to best exploit these new sound stages and, um, I need some guidance here.

For example, I recently engineered some tracks for LucasArts' upcoming CD-ROM *Full Throttle*. The game is a hell-bent-for-leather motorcycle experience with a blistering, completely digital rock 'n' roll soundtrack. Obviously, the music tracks had to deliver maximum impact—even after the monaural score was converted to a sample rate that ensured seamless audio during gameplay. Believe me, it wasn't easy evoking the aural illusion of concert-volume aggression on a track that will ultimately be played through small multimedia speakers. I learned a few tricks on the fly—which I'll share in some upcoming features—but I sure could have used a multimedia mentor.

Discovering ways to produce kick-ass audio from the typical 8-bit, 22 kHz monaural game soundtrack is just the beginning. How can audio engineers best accommodate the needs of multimedia producers? What's the hippest way to produce a sound file for online downloading? Should producers be exploiting the explosion of audio systems armed with Dolby Pro•Logic decoders; and how do you mix for these "enhanced stereo" formats? Today, audio producers are challenged by new formats, new methods, and new audiences. We can't just close our eyes and do things the way we've always done. These new audiences deserve fearless wackos who are willing to push the envelope and expand the sonic vista.

So, if you have any great production tips for this brave new world, please share them with me so I can alert the other audio wackos who read **EM**. You can e-mail us at [emeditorial@pan.com](mailto:emeditorial@pan.com), or e-mail me directly at [lebetes56@aol.com](mailto:lebetes56@aol.com) or [orphee@eworld.com](mailto:orphee@eworld.com). Believe me, I'll be looking forward to the guidance of my peers. (Mom and Dad will never believe this.) See you on the outside edge of the envelope!



ROBERT PERRY

*Michael Molenda*

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**KT 88**

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**Easy-to-use performance controls** – like our new *Transpose Keyboard function* – are perfect for stand-alone playing or controlling other MIDI gear.

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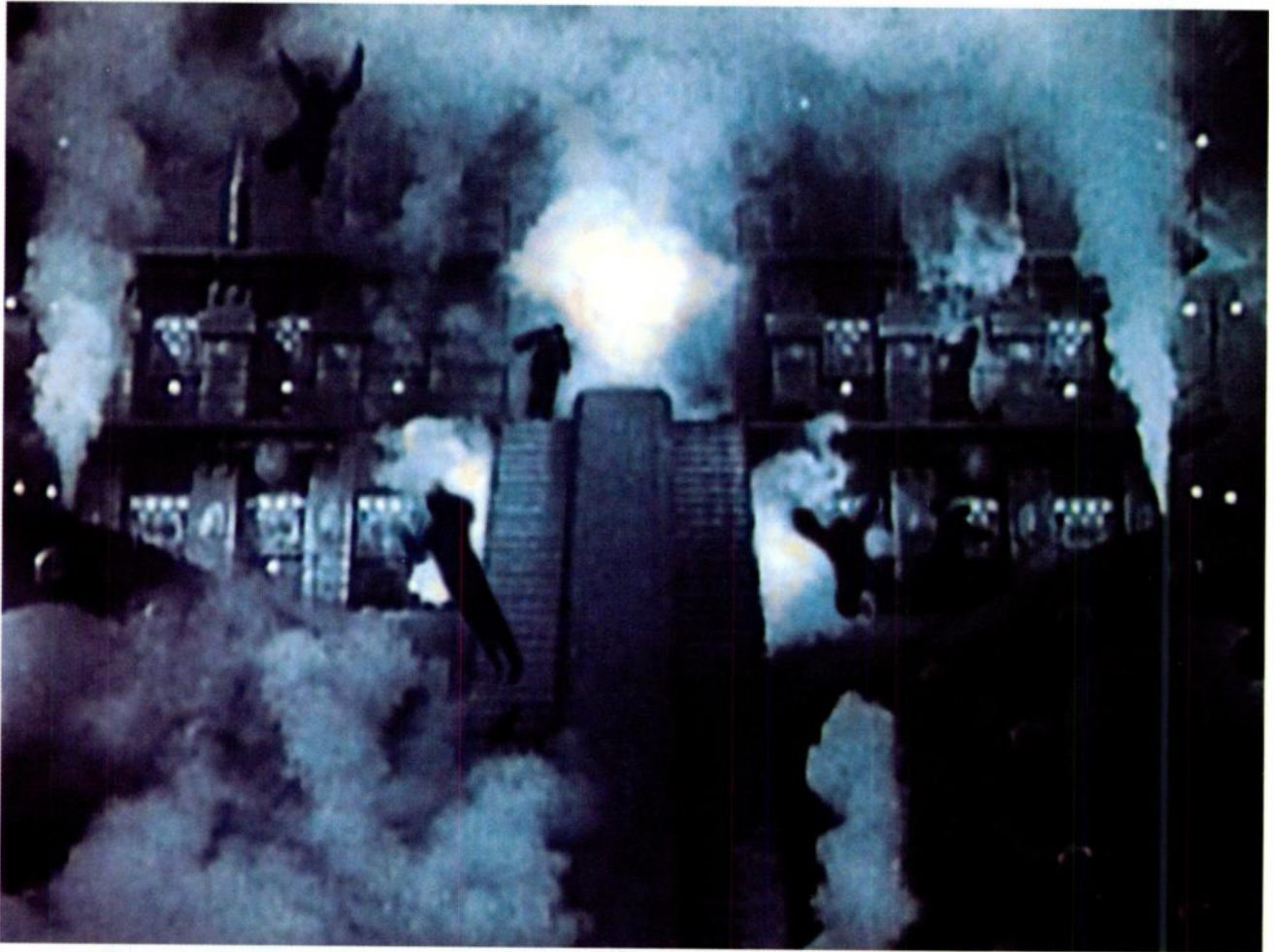
**ENSONIQ**

LEADING THE WORLD IN SOUND INNOVATION

WRH



**When creating  
an instrument of such  
concentrated power,  
a mishap now and then  
is inevitable.**



**X5DR Miniaturization Project, Korg Power Plant, 1995.**



The crater was a bit larger than we had anticipated. And our concrete walls may need a fresh coat of battleship gray.

But in 64 simultaneous voices, we now declare the latest Korg Power Plant project to be a raging success:

Presenting the new Korg X5DR.

Employing the latest miniaturization techniques, we found a way to put one of the world's most potent instruments inside a sound module that only takes up a half rack-space.

Despite its unassuming size, the X5DR contains a warehouse-full of Korg's most wanted sounds. We started with the X-Series ROM, then added our favorite sounds from the M1, 01/W, T-Series, Wave-station and PCM card libraries. And, taking advantage of its expanded 8MB of PCM memory, we were able to add 100 new programs and combinations, as well as 128 General MIDI programs.

That means you can play the X5DR like an X5DR – with its brand-new set of Korg-quality sounds. Or, by simply pressing a button, you can access the X5 and 05R/W factory presets.

And we added more. Like 64-voice polyphony, so you can sequence and

layer to your heart's content. Plus 47 effect algorithms that you can control in real time. And a built-in interface that allows you to connect the X5DR directly to a computer.

Not that any of this should surprise you, considering the X family history.

The Korg X2 and X3 Power Music Workstations™ have become a way of life on stages and in studios all over the

world. The X5 has made the sound and performance of the X family

(minus the disk drive and sequencer) available at a surprisingly affordable price. And the X3R has packed all the features of the X3 keyboard into one very neat rack-mount module.

Now that the Korg X5DR has been certified for civilian use, go hear one at your nearest authorized Korg dealer.

It's pure. It's concentrated. And be forewarned: In the right hands, it can be absolutely explosive.



Behold: music power in its most concentrated form. In a mere half rack-space, the Korg X5DR sports 64-voice polyphony, the sounds of the X-Series, classic Korg sounds, 47 effects and more.



We're miniaturizing prices as well. The Korg X5 is pure X for less than \$1100.

**KORG**

The power company.™





## SPACE CONTINUUM

**T**he article "Creative Space: Craig Chaquico" (January 1995) was music to my ears! It's nice to know that professional-quality music is being made on moderately inexpensive equipment in home studios. Please interview more of these home-studio gurus, and let us know about their equipment setups and any studio tips they might have.

**David Graham**  
djgraham@eworld.com

## OVER UNDER SIDEWAYS DOWN

**I**'d like to commend you on a fine magazine. I've extended my subscription far into the future, and I expect many good issues to come. In fact, it's because of **EM**'s high quality that I was taken off guard by two pictures appearing upside down in the January 1995 issue: the Fender PX-220 on p. 16 and the Genelec 1030A on p. 43. Was this intentional to see if you have observant readers? Or am I just nit-picky? Either way, fine mag; keep up the good work.

**Oliver Sampson**  
Raleigh, NC  
olsam@bnr.ca

*Oliver—Oops! Unfortunately, we aren't running a continuing "Where's Waldo?" program to see if our readers are observant (or awake!). Nope. We just blew it. The "Editors' Choice" feature contained so many color graphics that it was truly a Herculean task to ensure everything printed correctly. I'll spare you all the gory details, but ultimately some of the graphics pages were*

*proofed via fax transmissions. As it's very difficult to confirm photo details on a fax sheet, some photos went to press misaligned. We're actually lucky that only two photos were compromised. Good catch! And by the way, we like nitpicky readers; they keep us on our toes.—Michael M.*

## DISC, DISC

**Y**our "Disc-o-Mania" article (January 1995) missed discussing one very important aspect of using CD-ROM drives in the music studio. While it's true that you must have a SCSI drive to transfer CD-audio tracks over SCSI to your hard-disk drive, not just any SCSI drive will do.

Also, drives that *will* do the transfer don't require any special software, at least on the Mac. Apple's new *QuickTime* 2.0 includes a simple utility with the *Movie Player* application that lets you transfer audio tracks to the hard-disk drive in real time. It lacks the multi-tasking and file-management features of some of the other programs, but it works just fine.

**Paul Lehrman**  
lehrman@pan.com

## A DOZEN KEYS

**T**he electronic keyboard, and the technology that makes it possible, is largely a product of the past two or three decades. With this in mind, my question is: Why does the keyboard continue to use a purely "Key of C-Major" arrangement that has persisted for five hundred years? I am aware of the astounding number of great pianists who have risen above its limitations and have produced a wealth of beautiful music. But wouldn't a chromatic keyboard, reducing the number of different fingerings by a factor of at least twelve, aid in the teaching of perhaps better musicians, or at least reduce the travail of learning the old-fashioned way?

A number of "improved keyboards" have appeared through the years, from a doubtful arrangement of 12-note, all-white keys to the Paul von Janko de-

sign of around 1880, which has a complicated six tiers of curved-top keys but managed to stay in production until around 1910.

In 1950 there appeared a conversion-keyboard for the piano-accordion called the "Uniform" by its designer, John Reuther. This is a 3-tiered system, greatly simplifying the playing by making all scales, major and minor, as simple as playing the C-scales, because the fingering is exactly the same except for the "home" key.

I am not a musician, but a musical tinkerer. I do have a six-decade acquaintance with radio/electronics, so I do not feel this is just a "Why don't they?" protest but a serious questioning of the standard. At 83 years old, I am still trying to convince myself I am keeping up with things. This is hardly possible with how things keep changing, but it is fun trying.

**Rendall Bess**  
Dundee, OR

*Rendall—Actually, several companies have produced alternative keyboard designs for electronic instruments. Three such companies that come to mind are Vandervoort Keyboard Co., Bilt Technologies (tel. [706] 295-2530; fax [706] 290-1234), and Starr Switch Co. (tel. [619] 233-6715; fax [619] 233-1231). To my knowledge, however, public response has been lukewarm at best.*

*The Vandervoort controller was a free-standing keyboard with multiple, progressively raised tiers. Unfortunately, their phone has been disconnected, and I have not been able to locate a new number. Bilt's 4-Speed (described in the June 1993 "What's New" column) is factory-installed into certain existing synths. It uses a symmetrical pattern of twelve alternating flat and raised keys per octave, rather than the usual asymmetrical clusters. Both the Vandervoort and Bilt controllers are designed to offer identical fingerings in all musical keys.*

*The Starr ZBOARD is an attempt at guitar/keyboard hybrid, with twelve rows, offset by fourths, containing 23 buttons ("frets") each. Unlike the Vandervoort keyboard, the rows are all at the same height. The ZBOARD is intended to provide a 2-handed instrument with a large range (six octaves*

BUD PEEN



# Four Steps To Keyboard Bliss



## 1 Take The Test

Hear the new sounds in the Alesis QuadraSynth™ Master Keyboard and S4™ QuadraSynth 64 Voice Sound Module.

☐ Stay home and mope.

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True 64 voice polyphony for super-fat live playing or complex multitimbral sequencing. 16 MB of sample ROM featuring classic and modern synth textures as well as incredibly realistic instrument samples. Superior synthesis engine from the same team of synth designers who turned modulation routing into high art.

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



With the optional  
M-512E Memory Card,  
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512 user patches.

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

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

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

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





Roland SUPER JV SYNTHESIZER MODULE JV-1080 4x EXPANSION

PERFORM PLAY USER: 32 64 VoiceOrch Part = 1

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## ● LETTERS

and a fourth) for musicians who are comfortable with guitar fretboards.—Steve O.

### A ROLAND RESPONSE

I would like to respond to Mr. Whitehouse's "JV-90 Jive" letter and Mr. Yelton's comments (December 1994). First, I'd like to thank Mr. Yelton for the kind review of our JV-90. I hope the following helps to lessen Mr. Whitehouse's disappointment.

He correctly asserts that the JV-90's Voice Expanders do not increase the voices available to the internal processor and is disappointed he must use MIDI to take full advantage of the V-EXP. Although I understand his desire for a 56-note piano, I hope he can appreciate that if the internal processor were capable of 56 simultaneous notes, Roland would have released it that way and not gone to the trouble of offering optional user voice expansions. However, as it is not, and most of our customers use their instruments for sequencing applications, we believe the VE-JV1 represents an innovative sonic value, allowing users to expand and customize their instrument after the initial purchase.

Mr. Whitehouse also claims the JV-90 fails as a master controller because the assignable controllers, two pedals, and the C1 slider are not programmable per Performance. I don't know what MIDI setup he uses, but I want to ensure he understands that despite its global assignments, the JV-90 offers simultaneous access to Pitch Bend, Modulation, Aftertouch, Sustain, two assignable pedals, an assignable slider, plus eight Edit Palette sliders that can transmit Volume or Panning at the touch of a button—eight simultaneous controls, regardless of which performance you're in. In addition, like many sound modules, the JV-90 allows controller destinations to be saved within the sound patch. While no one keyboard is right for everyone, I and many of our users have found the master controller functions useful.

He also expresses concerns about audible delays when layering sounds. The JV-90 offers the user the ability to play all 28 voices from a single key, so depending upon how he is using the JV-90, it may be possible to generate a sluggish response playing the JV-90 in this manner. While this may be the most apparent means to layer sounds

from the front panel, there are more effective ways to do it, and I don't believe the JV-90 should be chastised for providing the user this flexibility.

Finally, I would agree with his assertion that the JV-90 is a "good synth for a first-time buyer," but I also contend that its quality sounds, programmability, expansion options, and overall value deserve consideration by advanced users, as well.

**Douglas Hanson**  
**Product Specialist**  
**Manager**  
**Roland Corporation US**  
**Los Angeles, CA**

### TRANSFER RATES

I noticed the discussion of hard-drive transfer rates with numbers like 3 MB/s to 10+ MB/s thrown about. As someone who has installed a non-linear video editor in my system, I can say these rates are *not* practical sustained limits for any current system.

Most top out at <5 MB/s sustained (say for five minutes). There are various video editing systems that are dependent upon the faster transfer rates and then some; thus, manufacturers are beginning to produce "AV" drives with limited thermal recalibrations and faster spin rates such as the Seagate Barracuda series. Any higher rates given by disk benchmarks are most often "burst" transfer rates. For example, my SCSI system has benchmarks of >5 MB/s but is barely able to sustain 1.5 MB/s. Thus, all this talk of 10+ MB/s is not attainable using the current drive technology, but we are moving in that direction. If we could obtain 10 MB/s, video editing would be easy because the 27 MB/s of data it produces would only have to be compressed by a factor of 3 to easily fit within the transfer bandwidth.

**Mike Clay**  
**Foster City, CA**  
**meclay@netcom.com**

*Mike—You don't need a drive with an "AV" label pasted onto it to achieve fast, sustained data-transfer rates and to avoid problems like thermal recalibrations. Many of the drives on today's market offer those design characteristics, and only a few of them are expressly marketed as "AV" drives.*

*However, if you're looking for high, sustained data-transfer rates—say 5 MB/second or more—you'll need more than just a*

*fast hard-disk drive; you'll also need a fast hard-disk drive controller and a computer with a high-bandwidth data bus. The reason is that the bottleneck is not in the drive as much as it is in the computer's bus and device controller.*

*For example, if you're using the SCSI port on a Macintosh IIci, the maximum sustained throughput you'll be able to achieve is around 2 MB/s. You can get around the Mac's SCSI-port bottleneck by installing a SCSI accelerator (such as Atto's SiliconExpress or FWB's JackHammer).*

*PC-compatible computers are a little more problematic. Many of these systems use an ISA bus, a design that dates back to the mid-1980s. In this case, it's the bus itself that is a major datastream bottleneck. Even if you were to install a high-speed device controller in one of these machines, your sustained data-transfer speeds will still suffer. The most common solution has been to build local bus slots (VESA and PCI being the most popular standards) into the computer's motherboard. Apple is expected to ship Power Macintosh models that use the PCI bus in May.*

*You're right about the difference between burst and sustained data-transfer rates. Many manufacturers cite only the former, which can be misleading. Burst rates are fine for determining if a drive is suitable for such applications as database management, where relatively small chunks of data need to be retrieved from the drive. For digital-audio and digital-video editing applications, it's more important that you know the maximum data-transfer rate that the drive is capable of sustaining for an extended period of time.—Michael B.*

### A GOOD IDEA

The first thing I turn to when my copy of **EM** comes in the mail is your "Multimedia Musician" column. I know a lot of musicians look down their noses at us multimedia geeks, but it's how I pay the rent. I think this dedicated forum to an exploding field is one of the best moves **EM** ever made.

**Hamilton Altstatt**  
**La Crescenta, CA**

### WE WELCOME YOUR FEEDBACK.

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



# WITH WORD-OF-MOUTH LIKE THIS, WHO NEEDS AN AD AGENCY?

"The ProMix 01 gives me the flexibility to control all the elements of a show from my computer. Superb sonic quality and remarkable features, you just can't beat it."

- Stan Miller, Sound Designer,  
Neil Diamond Tour

"I bought four of them for the Steely Dan Tour, and I haven't shut up about the 01 yet."

- Roger Nichols, Engineer, Steely Dan

"Bottom line, the ProMix really does live up to all the hype. It's very quiet, it sounds great, it operates very cleanly." "One of the most amazing introductions in years."

- Recording Magazine, October 1994

"I did my latest project on the ProMix. And it's one of my best sounding yet. The ProMix 01 is really great!"

- Hans Zimmer, Composer, The Lion King

"ProMix 01 stands every chance of becoming a landmark product, changing the way a lot of people currently work."

- Studio Sound And Broadcast Engineering, July 1994

"We're not normally violent, but in this case, we're willing to make an exception. We're not letting this mixer go."

- Mix Magazine, November 1994

"Premium sound quality with all the trimmin's. Yamaha has come through again."

- Steve Porcaro,  
Songwriter/Musician/Producer

"As a sound designer, I create illusions. Yet, the power and flexibility of the ProMix is no illusion. It most certainly contributes to the prestige of Machine Head."

- Stephen Dewey,  
Sound Designer/Founder, Machine Head

"After working with ProMix 01, I am convinced its sound, quality and flexibility rivals that of mixing consoles costing many times more."

- Calvin L. Harris, Engineer/Producer -  
Lionel Ritchie, Diana Ross, Stevie Wonder

"My two ProMix 01s store all the parameters of my mix and play it back exactly as I heard it at the moment of creation. More importantly, they sound great!"

- David Schwartz, Composer for Northern Exposure

"Yamaha has done it again, just as it did in the early '80s with the DX-7 keyboard. It has created a cool piece of gear that does more, does it better, and costs less."

- EQ Magazine, December 1994

"It took Yamaha to create a brilliant sounding digital mixer with full MIDI control. I have no doubt that the ProMix 01 will quickly become an industry standard."

- Jeff Bova, Keyboardist/Arranger/Composer  
- Vanessa Williams, Robert Palmer

"Clean, quiet, powerful. The best words I can think of to describe the ProMix 01, the latest addition to my toolbox."

- Tom Jung, Producer/Engineer/President, DMP Records



If you think the ProMix 01 sounds good here, wait 'til you hear it in action. Call our 800 # and send for your free CD of The ProMix Sessions, produced and engineered by Tom Jung, President of DMP Records. Our ad agency thought we needed to say something clever here, but we told them we had enough opinions already. To order your CD, call 1-800-937-7171, Ext. 450.

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**YAMAHA**  
Smart Mixing.



# WHAT'S

# NEW

By Steve Oppenheimer



## ▲ PEAVEY SPECTRUM SYNTH

**P**eavey has introduced the Spectrum Synth (\$399.99), a 1U rack-mount synthesizer module designed to emulate the sounds of classic analog and digital synths. The module includes 2 MB of 16-bit sampled analog and digital waveforms, plus digitally generated sawtooth and pulse waves. The 12-voice polyphonic, 4-part multitimbral instrument has 24 oscillators with hard sync and pulse-width modulation; twelve dynamically modulated, resonant, multi-mode filters; and 24 LFOs.

All parameters of the Spectrum Synth are completely programmable, with support for Pitch Bend, Channel Pressure, Control Changes, and System Exclusive. In addition to the expected modulation destinations, such as the oscillators, panning, ADSR envelopes, and filters, you can modulate the sample start time.

The unit comes with 256 presets, including 64 user locations, and programs can be saved and loaded via SysEx. Peavey has also developed a set of patches for its PC1600 MIDI fader box that turn it into a programmer for the Spectrum Synth. Peavey Electronics; tel. (601) 483-5365; fax (601) 486-1278.

Circle #401 on Reader Service Card

## ▼ STUDIOMASTER POWERHOUSE VISION

**S**tudiomaster has unveiled its Powerhouse Vision powered mixers. The Vision is available in three versions: the 8-channel Vision 8 (\$2,195), 12-channel Vision 12 (\$2,695), and 16-channel Vision 16 (\$3,195). The three models sport identical features except for the number of input channels and an optional rack-mount kit for the Vision 8 (\$105). The 350W/side (into 4 ohms) power amp has a variable-speed fan and a pair of insert points. The speaker outputs include both SPEAKON NL4 connectors and 1/4-inch jacks. An optional electronic crossover (\$160; choice of six crossover frequencies) can be added for use with a subwoofer.

The Vision 8 has six mono inputs with balanced XLR and 1/4-inch connectors. Channels 7 and 8 are stereo inputs with a L/R pair of 1/4-inch line inputs in addition to an XLR mono mic input. The Vision 12 has ten mono and two mic/stereo line channels, and the Vision 16 has twelve mono and four mic/stereo line inputs. Globally defeatable phantom power is provided for all XLR inputs.

All channels feature trim pots, pan, 3-band channel EQ with sweepable mid-range, a foldback (monitor) bus, and two effect buses with master faders. The reverb bus feeds the onboard effects, while the aux send can be routed to external processors and returned to a stereo aux input with rotary gain pot. The aux bus can be muted. The 60 mm channel and master faders are tapered to allow the same degree of control in the area around 0 dB as a 100 mm fader.

The output section includes one stereo group with master fader and L/R, 7-band, graphic EQ that can be assigned to the mains, group, or monitor. The main L/R outputs also include insert points. Eleven-segment, bar-graph LED ladders display the level of the main L/R outputs in Norm mode; in Split mode, the left meter shows the main (left and right summed) level, while the right meter displays the fold-back output level.

An onboard, 16-bit effects processor

provides 82 reverbs and delays. The onboard effects include a Regeneration control that affects decay time. Dedicated buttons set the pre-effects EQ for a low-end boost (Warm), high-end boost (Bright), or both. A Reverb-to-FB fader adjusts the effects return to the monitor mix.

The effects settings can be saved in fifteen user memory locations that can be named and recalled manually or via MIDI Program Change. Four additional "power memory" locations are provided; pressing one button stores the settings and pressing another recalls them. An alphanumeric LED display shows the names and program numbers.

The Vision sound-reinforcement consoles offer MIDI Start, Stop, and Continue functions for use with a sequencer or drum machine. These commands can also be used to mute and unmute the onboard reverb.

A rear-panel footswitch jack can be programmed to step through the fifteen Program locations and four "power" memories or toggle Reverb On/Off, Regeneration On/Off, or Standby. This last function lets you create a setup for the first song of the set, but with the console muted. A PIN button implements a user-programmable security system.



The context-sensitive Help messages can be displayed in English, French, German, or Spanish.

The mixer's frequency response is rated at 20 Hz to 20 kHz ( $\pm 0.5$  dB), crosstalk at 80 dB (@1 kHz), and S/N ratio at 86 dB for four channels and 84 dB for eight channels (@40 dB gain). Studiomaster; tel. (714) 524-2227; fax (714) 524-5096.

Circle #402 on Reader Service Card

(continued on p. 21)



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The Xp200A controller perfects the package—it can extend the overall bass output by up to 12 dB, without compromising sound quality.

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**Automatic Accompaniment has arrived!**

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**INTELLIGENT SOFTWARE FOR IBM (DOS/WINDOWS), MAC & ATARI**

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**Built-in sequencer allows you to record or edit melodies.**

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**Support for over 70 synths built-in.** Drum & patch maps included for over 70 popular synths. General MIDI, Roland GS & SoundBlaster soundcard support included.



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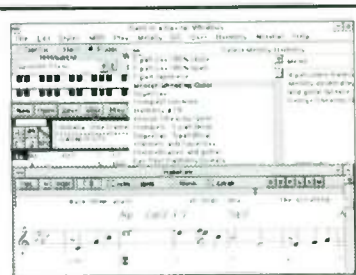
Band-in-a-Box 6.0 for Windows breaks new ground with over 50 new features...

**STANDARD MUSIC NOTATION** and leadsheet printout of chords, melody and lyrics. Enter your songs in standard notation & print out a standard lead sheet of chords, melody and lyrics. Make your own fakebook!

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## OUR CUSTOMERS LOVE THE VERSION 6 FOR WINDOWS UPGRADE...

"Wow!! ... Version 6.0 is marvelous ... I love the notation and harmonies ... this is so much fun ... you've added everything I wanted ... the lead sheets look great ... Bravo! ... Congratulations"



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"This amazing little program from PG MUSIC creates "music-minus-one" accompaniments for virtually any song any style. You simply type in the chords, pick a tempo and one of 24 styles, and the program creates nicely embellished chords, a bass part, and drums to be played on a MIDI synthesizer. Band-in-a-Box understands repeats, choruses and verses, and even varies the accompaniment, just as human musicians would. Peter Gannon, the author of the program makes no claim to artificial intelligence, but Band-in-a-Box is software that repeatedly surprises and delights you, especially in its jazz styles."

PC Magazine Jan. 15, 1991  
 Technical Excellence Awards

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Styles Disk #4.....\$29  
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"Regular" Upgrade PAK to version 6.0 for Windows.....\$49  
 This includes version 6.0 Windows upgrade + new Styles Disk #5, and Harmonies Disk #1. Order this if you already have the IBM Band-Box PRO version 5 or PRO version 1.0 for Windows.

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In addition to the regular upgrade PAK, this includes the 100 styles in the PRO version, and Styles Disk #4. Order this if you have an older version of Band-in-a-Box or a "bundled version", or are crossgrading from the MAC or ATARI version.

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



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**WINDOWS versions require 2mb RAM  
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A music program containing a huge collection of over 60 jazz standards, played on MIDI guitar by top jazz/studio guitarist Oliver Gannon

#### RECORDED IN REAL-TIME ON A MIDI GUITAR!

Hear the music with CD quality through your sound card or MIDI system. Most pieces have bass/drums as well as guitar so you get a full sounding jazz trio for the tunes!

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On-screen fretboard shows you exactly what notes & chords are being played on the guitar. Slow down the performance or, better still, step through the music chord by chord, so you can learn every note as it's played!

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Version 2.2

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Enter notes (MIDI), music in standard Music notation, intelligent automatic features such as: Correct naming (eg. of notes, intervals, rests, etc.), "Jazz Right Hand" option (this automatically allows jazz swing eighth notes & triplets to be notated properly), Results in any MIDI file & display of an notation.

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

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## ▼ CLAVIA NORD LEAD

**d**rum is distributing Clavia's Nord Lead, a 4-voice polyphonic, 4-part multitimbral synthesizer designed to digitally simulate analog-synth sounds. The synth is available in a 4-octave keyboard version (\$2,750) and a 4U rack-mount version (\$2,350). The company's upgrade kit (\$745) adds eight polyphonic voices and a PCMCIA slot that provides



300 additional user memory locations.

The Nord Lead emulates analog-synth architecture with a mathematical model. Two oscillators generate sawtooth waves, which the synth uses to derive square and pulse waves. This is designed to ensure full spectral bandwidth, even at very low pitches, so you can sweep the pitch smoothly over a wide frequency range. It also allows true pulse width modulation. Other analog-style sound-generation features include hard sync, a pitch envelope generator, and a noise generator. The oscillators can also be used for FM synthesis.

The resonant filter is variable-state, i.e., it is switchable between 12 dB/octave (2-pole) and 24 dB/octave (4-pole) operation. The filter and amplifier can be modulated from dedicated 4-stage (ADSR) envelope generators. The envelopes are updated with every calculated sample, which provides even higher resolution than many analog synths; if you set the attack time to zero, it really is zero. Modulation is also provided by two LFOs, which can be routed to the oscillators, filter, or amplifier. A

function generator can modulate the LFO, provide sample-and-hold functions, and control the arpeggiator.

All synth parameters can be edited from dedicated front-panel buttons and knobs, with no menus or software pages. The unit has 99 factory presets, 59 of which are in ROM and 40 in user RAM. Patches can also be saved via MIDI System Exclusive or as MIDI controller data.

Instead of a pitch-bend wheel, Nord Lead has a Pitch Stick, which has no dead zone. According to the manufacturer, this means you can implement a natural vibrato much like using your finger on a guitar or violin string. When released, the Pitch Stick returns to center very quickly.

The movements of the parameter knobs are transmitted via MIDI, and all parameters respond to Velocity control. MIDI "macros" are designed to re-create many of the effects produced by external triggering and patching on analog synths. *ddrum*; tel. (800) 882-0098 or (203) 380-0000; fax (203) 380-1780.

Circle #403 on Reader Service Card

## ▶ TASCAM 488 MKII

**T**ASCAM has announced the 488 mkII Portastudio (\$1,799), an 8-track cassette recorder that replaces the original model 488. The unit's input-assign switching allows the eight tape inputs and eight mono channel inputs to be routed to the main L/R bus simultaneously.

The 488 mkII features twenty line-level inputs, including eight tape inputs, eight mono channel inputs, and two stereo channel inputs. Mono channel inputs 1 to 4 are mic/line level, with mic preamps and 1/4-inch connectors. Channels 1 and 2 also have balanced XLR mic inputs, with globally defeatable phantom power. Mono channel inputs 5 to 8 and stereo inputs 9/10 and 11/12 are line-level, with 1/4-inch jacks. (If you use the stereo inputs for mono signals, the signals go to channels 9 and 11.)

The mixer section includes 3-band channel EQ with sweepable midrange, pan, two aux sends with stereo returns, and a Tape Cue bus with channel and master level controls.

The eight mixer channels are assigned to tape tracks via four groups, so that up to four tracks can be recorded simultaneously. One master fader controls groups 1 and 2 and the main L/R outputs, while the other master fader controls groups 3 and 4. The 2-track tape inputs and main L/R outputs are on RCA connectors. Two insert points access the master L/R buses. A separate RCA monitor output with level control is also provided.

The tape recorder offers globally defeatable dbx noise reduction and features a high-performance, Hysteresis Tension Servo Controlled (HTSC) tape transport with electronic braking. HTSC is designed to keep the tape at optimal tension, dynamically adjusting the back tension on the tape as it moves. According to the manufacturer, this provides precise tape-location, increases reliability, reduces tape slippage, and minimizes

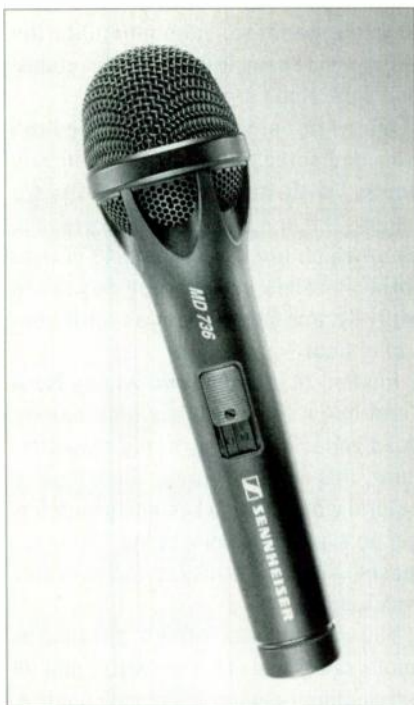


wow and flutter (which rated at 0.04%).

Additional recording features include automatic or foot-controlled punch in/out with a rehearsal function, a  $\pm 12\%$  pitch control, two auto-locate points with a repeat loop function, return to zero, and sync in and out. Frequency response for the recorder is rated at 40 Hz to 14 kHz ( $\pm 3$  dB, dbx NR out), and the S/N ratio is rated at  $>95$  dB (A-weighted, dbx NR in). THD is  $<1.3\%$  (400 Hz, 0 dB) and channel separation is 70 dB (1 kHz, 0 dB, dbx NR in). TASCAM; tel. (213) 726-0303; fax (213) 727-7656.

Circle #404 on Reader Service Card





## ▶ SENNHEISER MD736 PROFORCE

**S**ennheiser has introduced the MD735 and MD736 ProForce dynamic mics (\$179 and \$199, respectively). The two supercardioid mics are designed to provide maximum feedback rejection for onstage vocal applications.

Technical features include NdFeB (neodymium/iron/boron) magnets and extremely lightweight membranes and voice coils. Sennheiser's Spring Capsule Suspension isolates the capsule from the housing to greatly reduce handling noise. The housing is made of a high-tech glass composite, with a round, black, metal, double-mesh grille.

The MD736 has a noiseless on/off switch for onstage control; otherwise it is identical to the MD735. The mics can handle up to 136 dB SPL. Sennheiser; tel. (203) 434-9190; fax (203) 434-1759.

Circle #405 on Reader Service Card



## ▶ AKAI DR8

**A**kai has introduced the DR8 8-track hard-disk recorder (\$4,995). Like the company's DR4d, the DR8 is a self-contained system that includes a built-in 16-channel mixer and a 1 GB hard drive.

The new unit provides simultaneous 8-track recording and playback, providing up to three hours and seventeen minutes of recording time at 44.1 kHz with the standard 1 GB internal drive. External drives can be connected to the included SCSI interface, and the S/PDIF digital I/O (also included) allows backup to DAT. The A/D converters are 18-bit, 64x oversampling, while the DACs are 20-bit, 8x oversampling Sigma-Delta.

The programmable mixer can mix up to eight external channels with eight internal channels. In Mix mode, you can record the settings for level, pan, two effects sends, and bus on/off, which allows automated mixing. The DR8 offers internal ping-pong recording of six disk tracks and eight external signals that have been submixed to two channels. A Jog/Shuttle wheel is provided, and up to 109 locations can be stored in memory.

Nondestructive editing features include copy (with or without repeats), move, insert, delete, and erase, with Undo. The Take function lets you record up to five takes and keep the best one.

A word clock/video sync terminal is included for digital synchronization, and optional boards are available for SMPTE time code and MTC. Optional boards include an Alesis ADAT optical interface, an RS422 serial interface, and a biphasic interface for locking to film and video machines. The DR8 is completely file-compatible with Akai's DD1500.

In other Akai news, the company released operating system 2.0 for the S2800, S2800Studio, S3000, S3200, and CD3000S samplers. The new OS lets the units read Roland and E-mu CD-ROM libraries. Akai/IMC; tel. (817) 336-5114; fax (817) 870-1271.

Circle #407 on Reader Service Card

## ▼ FOSTEX FOUNDATION 2000RE

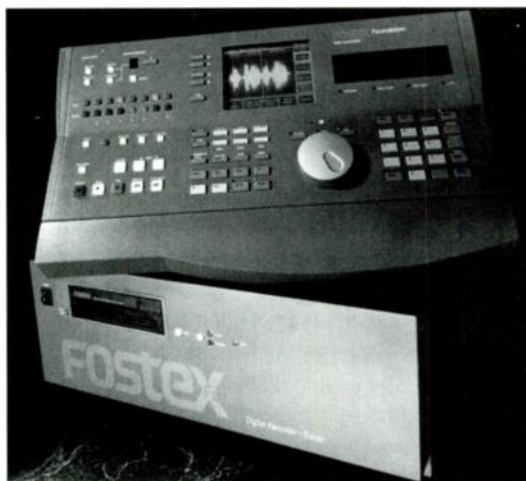
**F**ostex has announced the Foundation 2000RE (\$8,995), a lower-cost version of its Foundation 2000 digital audio workstation. The 4U rack-mount, 16-channel system includes eight analog inputs, eight analog outputs, and an 8-in/8-out Alesis ADAT optical digital interface. It offers all the original Foundation 2000's event-based audio editing, synchronization, and machine control features along with the same audio quality and user interface. Unlike the original unit, the RE is not modular, nor is it expandable. It also lacks the top-of-the-line unit's expensive DSP arrays, which will probably be unnecessary for most project studios and facilities with dedicated mixers.

The 2000RE uses the Foundation edit controller, with its weighted jog/shuttle wheel, touchscreen, and dedicated transport and editing buttons. The main unit has a docking bay for a removable disk drive and a SCSI port for additional drives. It supports master and slave 9-pin remote control, LTC, VITC, and MTC. Built-in ADAT sync ports offer sample-accurate machine control for up to sixteen 2000REs.

The Foundation's built in real-time editing software displays audio as waveforms on the touchscreen. You edit by touching the desired audio event and using the dedicated buttons. Up to 500 location markers can be dropped on the fly during recording or playback, and a built-in librarian organizes audio files.

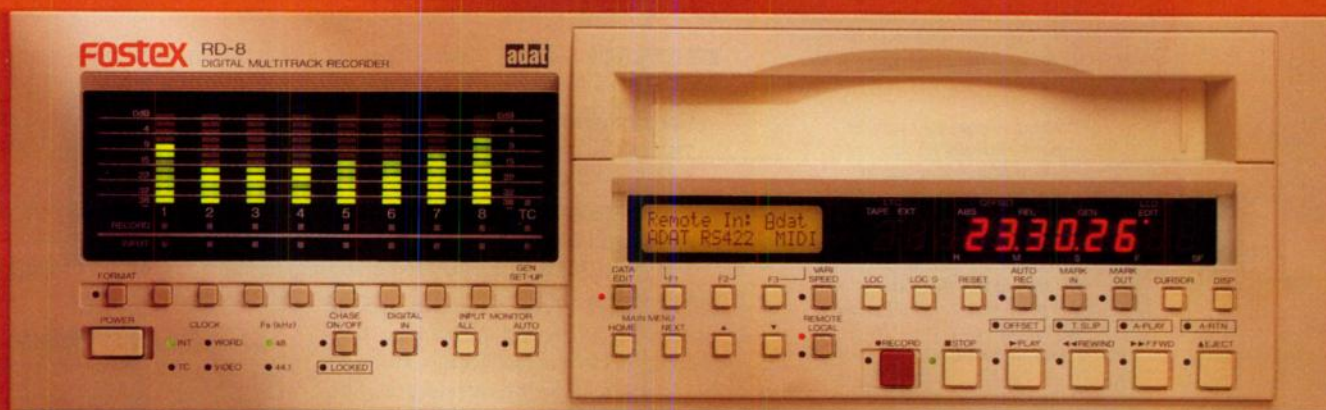
The Foundation 2000RE is also supported by The Synclavier Company's *EditView* audio-editing software and *S/Link* file-transfer and file-translation software for the Macintosh. Fostex Corporation of America; tel. (310) 921-1112; fax (310) 802-1964.

Circle #406 on Reader Service Card





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



## Audio for Video Projects

### Chris Taylor—Crossroads Studios

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

## Post Production Projects

### Brando Triantafyllou—Editel, Chicago

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

## The RD-8 Digital Multitrack Recorder

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

## MIDI Projects

### Frank Becker—Frank Becker Music

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

## Location Projects

### Paul Freeman—Audio by the Bay

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

## Composing Projects

### Christopher Hoag—Composer

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



**Fostex**



# WHEN IT COMES TO RECORDING, IT WILL PUT YOU IN A COMFORTABLE POSITION

Balanced mic and unbalanced line inputs with phantom power and 20dB pad accommodate the widest range of input signals.

The only console in this price range with true Split EQ, each assignable to monitor or channel. High-frequency shelving control at 12 kHz, low frequency at 80 Hz for smoother, more musical EQ results.

Dual sweepable mids on each channel let you apply 16dB of boost or cut at critical frequencies.

Setting up two independent stereo cue mixes is no problem. Try this with other mixers in this price range, it just won't happen or you'll have to compromise something.

The most versatile AUX section in its class; rivaling expensive high-end consoles. 8 sends total, 2 in stereo. Send signal in stereo or mono, pre- or post-fader. Available all at once. Return signal through any of 6 stereo paths.

Direct channel input switching. Assign to one of eight busses, or direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching. You won't find this kind of speed or flexibility in a "one-size-fits-all" board.

Feel those 100mm faders! Turn those smooth and responsive knobs! They feel and work better than any other in its class. The M-2600's physical design takes the aggravation out of recording and lets you focus on the process of creating music. Everything is 'right where it ought to be'. Try it for yourself.

Each M-2600 channel features advanced-design mic pre-amps with incredibly low-distortion specs. Plus you get phantom power on each channel. Feed anything into the M-2600 from condenser microphones to line input from synths and sound modules.

For your personal or project studio, don't settle for anything less than a dedicated recording console. Some may try to convince you that a "multi-purpose mixer" works fine for multitrack recording. But don't take their word for it. The compromises, hassles and workarounds just aren't worth it.

Want proof? Ask your salesman how a multipurpose mixer handles these common recording situations. But listen carefully for workarounds, repatching schemes and other compromises. Then compare it to how easily the M-2600, a true recording console, sets up and does things.

**SITUATION** Separate headphone mixes for the talent and the producer. The talent wants a reverb-wet mix, but the producer wants it dry. Everyone wants it in stereo.

**Compromise:** Multi-purpose mixers require you to sacrifice 4 AUX sends and tape returns to get 2 stereo headphone mixes; but you need those sends/returns for outboard effects! What a dilemma.

**M-2600 Solution:** With a few buttons, assign up to two, independent stereo AUXs to be used as headphone mixes. Everyone hears the mix they want — and you've still got four AUX sends and returns free for signal processing gear.

**SITUATION** You're EQing tape tracks to get just the right sound. You're using the shelving EQ for the monitor mix, and the sweepable mids for the channel buss. Still, the drummer wants a certain frequency out of his mix — a job for the sweepable mids.

**Compromise:** Few multi-purpose mixers have EQ assignment. You're stuck with the shelving EQ on the monitor mix, and the sweepable mids on the channels (if they even have split EQ). You've got no choice. Good luck trying to explain this to the drummer.

**M-2600 Solution:** Assign the shelving EQ, the sweepable EQ, or both to either the monitor or channel buss as necessary. The entire EQ section is splittable and assignable and can work in tandem.

**SITUATION** Mixdown. You're sending tracks to effects units for added studio polish. You want to take advantage of true stereo effects. How do you do it?

**Compromise:** Most multi-purpose mixers have fewer AUX sends than the M-2600's eight. Usually only in mono. And, some sends are linked, so you can't send them to different signal paths. So you settle for only a few effects, or forego stereo effects altogether.

**M-2600 Solution:** Pick one: 8 mono sends or 1 stereo and 6 mono sends or 2 stereo and 4 mono sends. Each with its own level control and separate output jack. So you can use true stereo effects and still have sends left over for effects. Send the effects signals back via 6 stereo returns.

**That's not all!** The M-2600 doesn't compromise sound, either. You'll appreciate the new TASCAM sound — low-noise circuitry and Absolute Sound Transparency™. It all adds up to the perfect console for any personal or project studio — combining great sound with recording-specific features you'll need when recording, overdubbing and mixing down. Features you can get your hands on for as little as \$2,999 (suggested retail price for the 16-input model).

So forget compromises. Invest in a true recording console. The TASCAM M-2600.



Available with 16, 24 or 32 inputs, the M-2600 is optimized for digital recording. Don't wait till your first session to discover the compromises and hassles other boards will put you through.





# DING, MOST OTHER CONSOLES MPROMISING SITUATION.



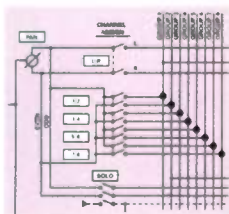
Only the M-2600 provides two independent stereo cue systems. Demanding performers can hear the submix or scratch tracks the way they want, so they'll perform better. Meanwhile, the control room or producer's mix is unaffected. You can accommodate everyone involved in the production — without interrupting the creative flow.

Best of all, using the cue mixes doesn't involve tying up your valuable AUX sends.



The incredibly flexible design of the M-2600 means signal routing is versatile and accomplished by the touch of a button, instead

of a tangle of wire. Our decades of mixer experience has resulted in an ergonomic design that's exactly what you need: a board that speeds and facilitates recording and mixdown. Everything is where you intuitively think it should be. Dedicated solo and mute indicator lights on every channel, on master AUX sends, stereo returns, and each of the 8 busses so you always know exactly what you're monitoring. Plus, SmartSwitches™ protect you against redundant or canceling operations.



Use more effects/signal processing gear on more tracks with the M-2600. Use two (count 'em) true stereo send/returns to support stereo effects units. Plus, you still have 4 fully-assignable AUX sends left over for other gear. A total of 8 AUX sends — more than nearly any other console — anywhere. Better yet, you can use them all at once. No compromises. At mixdown, you can actually double your inputs so you can mix in all those virtual tracks. Just press the "Flip" switch. No repatching. No need to buy expensive and space-eating expansion modules.



**TASCAM M-2600: THE CONSOLE DESIGNED SPECIFICALLY FOR RECORDING.**

Of course, the M-2600 sounds great. It's got totally redesigned low-noise circuitry, Absolute Sound Transparency™ and tremendous headroom. No coloration and virtually no noise. You will hear the difference. So, even during long mixdown marathons, you'll hear an accurate representation of what's been recorded.



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## *(Introducing Prisma Music)*

**P**risma Music is the Digital Audio Workstation worth buying for music production. Designed by Stephen St.Croix and the Spectral engineering team, it runs on our powerful new digital hardware platform. And as anyone who knows Stephen can guess, it's *FAST*.

It's fast because we paid obsessive attention to faithfully recreating the standard console functions at the heart of music work. And because we took advantage of a fine-tuned hardware and software interface to introduce new features that make fast even faster.

With Prisma Music, you won't need to hunt through layers of menus to do simple edits, nudges, or auditions. That's because the interface is powerfully focused on one type of work—music production. So doing a session on Prisma Music can feel a lot like touring the fast lanes in a custom alcohol-injected turbo-charged screamer. You *could* go back to the old way of getting around—but who'd want to?

Here's a quick look under the hood:

- Real mixer and editing screens that can be understood and operated at high speed without a manual.

- “Smart” functions like Audio Zoom and Auto Audition take into account your normal work patterns and make them faster.

- What you see is what you hear. Superb EQ, and spot-on metering, plus clear, intuitive automation displays that do what they show.

*A totally new, radically faster editing paradigm, with:*

- Track Layering—Each track is four layers deep. You just visually “peel back” the layers to reveal the sections you want from each one.

- Object Oriented Editing—gives audio “objects” (say, a guitar solo) *handles* you can grab to slip, position, nudge, stretch, or trim the objects on-screen.

- Free Form Editing—works in regions of time, with edit operations applying to the marked segment only.

—Each track can be viewed and edited in either OOE or FFE mode at any time, regardless of the edit mode of the other tracks around it.

- Spline-fit algorithms—automatically fit amplitude edits to Bezier curves, eliminating impossible dynamic shifts between samples.

- Literally hundreds of other interface and feature optimizations to let you do more work and do it faster.

**B**ecause we design systems from the ground up with hardware and software optimized for the job, you can typically expect to get a lot more power for your money with Spectral. Prisma Music is no exception.

*But don't just read the ad—sit down at a Prisma Music. Rev the engine, pop the clutch, and do a fast session. You won't even need an owner's manual.*



## SPECTRAL



## ▶ RANE DMS 22

**R**ane's DMS 22 Dual Mic Stage (\$549) is a dual-channel, studio-quality mic preamp with EQ and stereo mixer. The 1U rack-mount device is patterned after the company's FMI 14 Flex mic preamp. Each channel includes an input-gain pot, output-level pot, polarity-invert switch, 48V phantom-power switch, and 3-band EQ.

The equalizer is engaged with a front-panel switch and has switchable shelving frequencies for the highs (7 kHz or 12 kHz) and lows (50 Hz or 100 Hz). The midrange band is parametric, with



sweepable frequency (95 Hz to 4 kHz) and selectable bandwidth (0.3, 1, or 2 octaves). Rane's EQ uses the company's patented Accelerated-Slope circuitry, which provides steep, phase-corrected slopes that eliminate most of the interaction between shelving and midband controls.

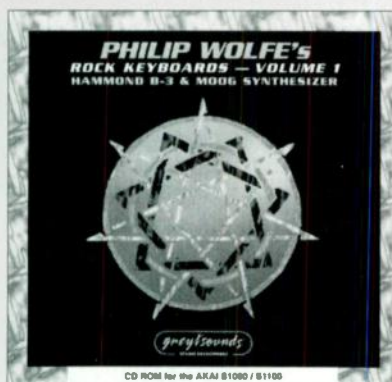
Each channel includes an XLR mic input; balanced, 1/4-inch line output; and 3-position, low-frequency filter switch on the rear panel. The low-frequency fil-

ter, which is designed to remove mic bumps and rumble, can be set at 15, 50, or 100 Hz.

Separate pan pots mix the two input channels to a pair of balanced, XLR outputs. A front-panel, stereo, output-level pot is also provided. The unit uses an external, "lump-in-the-line" power supply and includes a ground-lift switch. Rane Corporation; tel. (206) 355-6000; fax (206) 347-7757.

Circle #408 on Reader Service Card

## ZOUNDS! SOUNDS!



## ▲ GREYSOUNDS

**G**reysounds has released the *Philip Wolfe Keyboards Collection* (\$299.95), which includes over 400 MB of Hammond B-3 and Moog samples. The sounds are delivered on CD-ROM in Akai S1000, Digidesign SampleCell (Mac and PC), E-mu E-III/E-IIIx, Ensoniq ASR-10/TS, Kurzweil K2000, and Peavey SP formats.

The disk is divided into three volumes. Part 1 features the B-3 sampled directly from the organ's preamp (for use with a Leslie or rotary speaker simulator). In Part 2, the B-3 is sampled with stereo mics on a Leslie. Both volumes are sampled with and without percussion, using the 3, 4, 5, 6, and 9 drawbars. The Leslie is sampled at slow and fast speeds with light, medium, and heavy distortion. Both volumes include sam-

ples of B3 bass pedals and percussion harmonics. Part 3 is a collection of Moog synth sounds, with warm pads, filter sweeps, polysynths, polybrass, bass sounds, analog strings, and so on.

Also new from Greysounds is Scott Peer's *Sound Engineering Vol. 1* CD-ROM (\$199/95), available in Akai S1000, E-mu E-III/E-IIIx, and Peavey SP formats. This disk offers 89 banks (240 MB) of multisampled and processed synths and drum machines, looped with Jupiter Systems' *Infinity* software.

Sampled synths include the Sequential Prophet-5 and Prophet VS; Roland D-50, Sound Canvas, U-220, and MKS-70; Yamaha SY85; E-mu Proteus/1 and Vintage Keys+; Peavey DPM3se+, Spectrum Bass, and DPMsi; Korg 01/W and M1; Oberheim Xpander; Moog Minimoog; Kawai K3m; and Ensoniq TS-10. Sampled drum machines include the Akai XR-10; Yamaha RX5; Roland R-8, TR-808, and TR-707; E-mu ProCussion; Oberheim DMX; and LinnDrum. Greysounds; tel. (800) 266-3475 or (503) 347-4700; fax (503) 347-4163.

Circle #409 on Reader Service Card

## PATCHMAN MUSIC

**P**atchman Music has released two new sound banks that are programmed to be played with a wind controller or breath controller. Volume

3 for Yamaha DX7, TX7, and compatibles features 32 breath-controlled patches, including flute, clarinet, trumpet, trombone, and Moog bass, plus such leads as Chick Lead, Lyle Lead, and Breckertone.

Volume 1 for Korg M1/T1/T2/T3 includes 100 Programs and 100 Combinations, including tenor sax, pan flute, shakuhachi, EVI trumpet, distorted guitar, strings, Metheny leads, mandolins, basses, big-band horn sections, and Brecker-style chorded leads.

Formats include Opcode editor/librarian, Opcode *Galaxy*, Macintosh self-loading, and Macintosh or IBM Standard MIDI File. The Korg volume also is available on T1/T2/T3-format floppy disk.

Also new from Patchman is Volume 1 for the Yamaha VL1/VL1m physical-modeling synthesizer. The set is available on VL1-format floppy disk and includes 64 patches, which use the factory instrument models (i.e., these are not new physical models). The patches include layers and synth timbres as well as improved flute, trumpet, soprano and tenor sax, rock and jazz guitar, and more. Each volume lists for \$39.95, plus \$2 shipping in the U.S., \$10 shipping for foreign orders. Patchman Music; tel. (216) 221-8887. ●

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# MUSIC SOFTWARE

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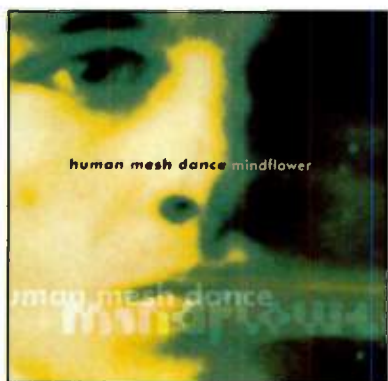
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PRO

FILE

## Taylor-Made

*Taylor 808 moves to his own ambient beat.*

By Mary Cosola

What is it about certain artists that they can make the most complicated tasks look so easy? Fred Astaire didn't just dance, his graceful, simple movements made it look as though he was gliding three inches above the ground. On the ambient/techno dance floor, solo artist Taylor 808 accomplishes a similar feat. At first listen, *Mindflower* (Instinct Records), Taylor's second release under the band name Human Mesh Dance, sounds like a serene wash of intertwining synth sounds. Closer examination reveals well-produced, multitextured layers of unusual custom patches.

Although his music has been described as techno-dance oriented, it isn't the driving, repetitive fare you hear at the average rave. "I try to capture a peaceful and tranquil feeling with my music," says Taylor. "Even if it's in a melancholy way, my music always sounds relaxing to me."

The album was recorded and produced at Taylor's home studio, The Aquasphere, where he also produces and performs with Prototype 909 and SETI. The studio is a separate bedroom

jam-packed with twelve synthesizers, two samplers, eleven drum machines, two 16-track mixers, a Mac 840 AV, and other assorted software and boxes.

"I like to use a mix of analog and digital synths, because one type does things the other can't," comments Taylor. "I'm a hardcore programmer. The first thing I do when I buy a synth is erase all the presets. For the past two or three months I've done nothing but program."

He not only works hard at programming, he also pays close attention to each sound as he places them in his songs. "I like to make my sounds malleable," explains Taylor. "As I'm writing, I'll place each sound in a specific spot in the stereo field and put effects on each one individually."

Despite the number of synths at his disposal, one of Taylor's favorite tools is his Korg S3 drum machine (which is no longer made). On the song "Soft System," Taylor mapped sounds from the S3's instrument card to his Korg Wavestation, employing the S3 as a sound module rather than a drum machine.

"I love the S3, it's my secret weapon. I don't know anyone else who bought one," says Taylor. "On 'Soft System' I played the opening, sustaining chords on my Roland D-50. Then with the Wavestation as my controller keyboard, I used the S3 to create some great, eerie piano and guitar-like sounds."

Taylor has found a way to make good use of many other antiquated drum machines. (He and a songwriting partner own 21 analog drum machines between them.) He discovered the hidden beauty of these dinosaurs when opening up his Roland TR-808 to fix it. Inside the machine was a world of knobs just begging to be twisted and tweaked.

"The analog machines sound great," he notes. "The sounds were synthesized, not sampled like current drum machines. The circuit boards have a lot of knobs and potentiometers that let you change the sound drastically. For instance, you can take a snare drum knob from white noise to a conga. Sometimes when we're writing we'll keep the front panel open with some screwdrivers sitting on the knobs and tweak the sounds as we go."

Taylor doesn't work solely with analog drum machines, but he enjoys the flexibility the older units provide. It's reassuring to know that you don't need the newest, fastest unit on the market to create a unique and vast landscape of sounds. 🎧



Taylor 808






Illustration by Nicholas Vitacco



By Michael Molenda

# Tone Sculptures

 the mysteries of creation. How long must an artist stare into space before inspiration starts to guide his or her hand? This is a question I ask myself every time I sit in front of a mixing console. The rows and rows of faders are like a silent army awaiting the orders of a brilliant strategist—an image that can be somewhat intimidating when you're just getting up enough nerve to check out the kick-drum track. Make no mistake about it, mixing is hard work; and it can be a chilling exercise in frustration and failure if you set out unprepared.

Fortunately, if you read last month's "All Mixed Up, Part 1," you already know how to steel mind and body for the rigors of mixing. In that feature, I discussed ideal gear choices, common goof-ups, the importance of rough mixes, sonic sanitation habits, and how to prevent your ears from shutting down. (If you missed the February 1995 *EM*, call Mix Bookshelf at [510] 653-3307 or [800] 233-9604 to order a back issue.)



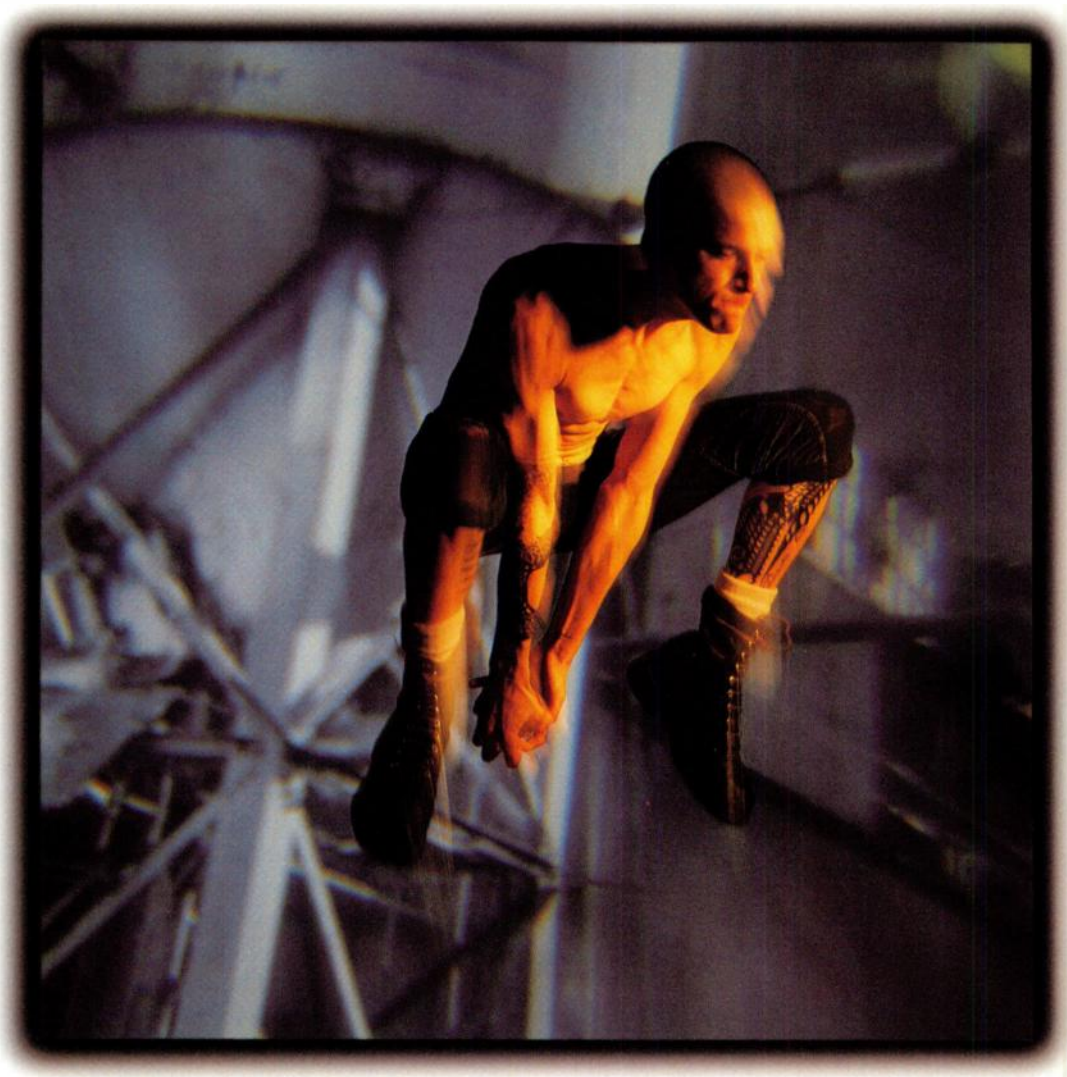
Although some of the information in Part 1 had the ring of self-help tips rather than recording applications, I'm a firm believer that mental and physical conditioning pays off. Many recordists forget that intellectual activity can be just as tiring as physical labor. The detail-intensive art of mixing can be absolutely exhausting, especially when you're trying to make creative decisions while being pummeled by roaring monitor speakers. Trust me; if you're not up to handling the gig, you'll only churn out less-than-wonderful mixes.

This month, however, the "get in shape" soapbox has been retired. We'll deal exclusively with production concepts and EQ and signal processing tweaks for specific instruments. We'll go through a mixing session fader by fader and reveal some tricks that professional recording engineers use to pump up the impact of their mixes. Hopefully, both parts of this mixing master class will provide all the information you need to produce absolutely ripping mixes.

*All Mixed Up, Part 2: Our mixing master class continues...*



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# Tone Sculptures

## BASIC MOVES

Let's start with the faders. I've taught a number of recording seminars, and it never ceases to amaze me how some musicians approach the mixing process. For example, several students would bring a fader up, make adjustments, then bring it down, and move on to the next fader. There would never be more than one track audible at a time. This method is hardly conducive to producing a harmonious blend of *all* tracks. It's critical that recordists not obsess on the tweaking of individual sounds, because a good mix is only achieved when each and every signal works together to produce a unified sonic spectrum. But creating such an alliance doesn't mean that you have to throw up every fader and tweak the entire mix at once.

Most professional engineers mix in sections. For example, I typically bring up the drums first, then the bass, main rhythm instruments (guitars, keyboards, etc.), lead vocal; background vocals, "sweetening" in-

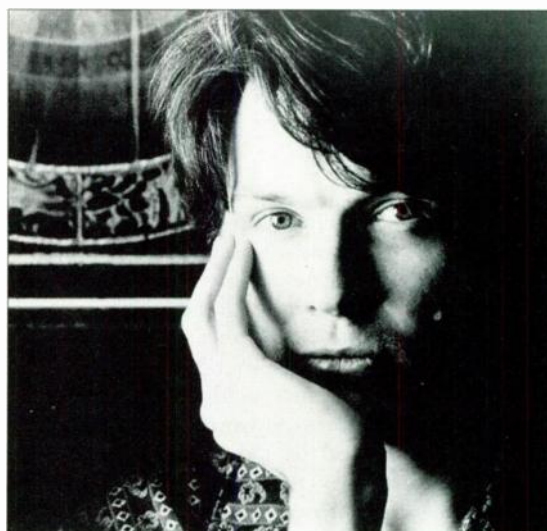
struments (strings, horns, etc.), and finally any instrumental solos. This mixing method allows constant referencing of one sound, or section, to another. No signal stands alone. To further maintain a sense of musical unity while sound sculpting, I often visualize the mixing board as a linear representation of a bandstand. Common instruments and tonal colors are grouped together: drums and percussion, vocals, guitars, keyboards, horns, and so on. When I record, I make sure my track assignments facilitate this approach (see the table "Linear Bandstand").

I never just throw instruments anywhere on the tape. If I'm mixing tracks for someone who is less fastidious, I repatch the track assignments to conform to my "bandstand."

Running out of headroom is another common mixing problem. Novice engineers tend to keep increasing fader levels until every fader on the console is all the way up. Vocal not loud enough? Oops, too bad. You've got everything blaring at maximum levels already.

Now, you could start moving faders down, but that can deconstruct sonic relationships you've worked on for hours. You could also boost the channel line level pot, but because you've already maxed out your console's gain stages, the increased level may introduce distortion.

A better solution is to visualize a 75 percent fader level as "full up." Yes, this takes a bit of discipline. On my Trident console, the last bus assignment button is positioned at approximately that 75 percent fader level. I simply consider the button as the end of the line for fader travel. If I don't cheat, I always have room to move when I need an



David Sylvian's lush, moody productions are enhanced by subtle usage of large reverbs with long decay times.

additional level boost. (For more on proper gain staging, see "Recording Musician: Gain Stages" in the November 1993 *EM*.)

## MIXING DRUMS

Popular drum sounds change almost as rapidly as seasonal fashions, so it's difficult to keep up with what's hip. I say, don't bother. Trendy signal processing typically dates the work and broadcasts the creative block experienced by the engineer and/or producer. A good, timeless drum sound is one that simply drives the track and enhances the mood of the song. Now, it's important to understand that the perfect treatment may *be* a trendy tweak. Just don't dial in a snare-with-gated-reverb for the sole reason that you hear the effect all over the radio, MTV, and VH-1. Take the time to determine exactly what you want your track to communicate musically and emotionally, then process the drum sounds to clarify the vibe.

For example, a dance track may beg for sharp, aggressive timbres, while a ballad might work best with softer tones that don't compete with the lead vocal. Or, you can invoke filmmaker Jean Cocteau's theory of musical "nonsynchronization" and put the slamming sounds into the ballad and wimp out on the dance groove. Don't be afraid to experiment.

A trend that I wholeheartedly support, however, is the return to organic drum sounds. The natural boom and bang of a drummer whacking his or

Frequency Follies	
Instrument	Approximate Frequency Range (unequalized)
Average Adult Hearing Sensitivity	50 Hz-16 kHz
Kick drum	40 Hz-750 Hz
Snare drum	75 Hz-2 kHz
Cymbals	1 kHz-15 kHz
Guitar	75 Hz-10 kHz
Bass	40 Hz-2.5 kHz
Piano	30 Hz-5 kHz
Bass voice	80 Hz-300 Hz
Baritone voice	150 Hz-440 Hz
Tenor voice	160 Hz-500 Hz
Alto voice	200 Hz-700 Hz
Soprano voice	300 Hz-1 kHz
Violin	200 Hz-3 kHz
Cello	60 Hz-1 kHz
French horn	80 Hz-1.5 kHz
Trumpet	150 Hz-1.5 kHz
Flute	250 Hz-2.5 kHz



# Stone Sculptures

her instrument is usually a good sonic fit for any track because it's *real*. Even if you're mixing sample-based virtual tracks, many sample libraries and drum machines offer excellent samples of real drum sounds. I recommend auditioning these samples first, before turning to heavily processed options. If you're not excited by the natural sound, you can always toss some wacky signal processing onto an organic drum timbre. Obviously, where you decide to take things will be somewhat genre-dependent.

The following are some EQ and signal-processing tips for specific drum tracks. Use them as starting points for your own tonal explorations. And remember, don't get obsessed by the timbre of individual drums. A sonically balanced rhythm section is the sum total of all its parts, not just a cool snare sound.

**Kick.** If you want a tight, snappy punch that accentuates the impact of the beater, try a 5 dB boost somewhere between 3 kHz and 7 kHz. It also helps to cut some of the low-mids (around 300 Hz to 500 Hz). A big boom can be

produced by cutting the low-mids again, but *boosting* 100 Hz by at least 10 dB. Just remember, when you're pumping the bass, take care not to overdo it and muddy the track.

Got too much cymbal and hi-hat bleeding into the kick track, and you don't want to use a noise gate? Try drastically cutting any frequencies above 10 kHz. The fundamental timbre of the kick is nowhere near that range (see the table "Frequency Follies"), so killing the high frequencies shouldn't compromise the track. However, the cymbal presence should be clearly diminished.

Because I often go for a natural drum sound, I don't worry about signal bleed unless it's obnoxious. Therefore, I seldom use dynamics processors on the kick. Noise gates tend to produce a clipped timbre that destroys the wonderful resonance of the drum heads, while compression can cause low-level sounds—such as cymbals and kick-pedal squeaks—to become annoyingly audible.

However, if you want just the sound of the beater impact, with no drum



Jane Siberry creates hypnotic tone poems by using sampled, repeated vocal lines as counterpoints to her main vocal melody.



Loud, brutally compressed guitars are the hallmark of a Smithereens mix.

tone, a noise gate is your ticket. Likewise, compression can help tighten performance dynamics when a drummer's footwork is less-than-sharp.

**Snare.** An aggressive crack can be tuned in by boosting anywhere between 2 kHz and 7.5 kHz. For some extra sizzle, try boosting 10 kHz by about 5 dB. Take care when accentuating high-mids, however, as cymbal bleed will also be highlighted. (Of course, on sampled or drum machine sounds, signal bleed shouldn't be an issue.) Keep in mind that cutting lows may be a sonically cleaner way to improve clarity than boosting mids. Tubby timbres can be tightened up by cutting low-mids (500 Hz to 750 Hz). Sometimes to add a touch of body to a limp snare sound, I boost 100 Hz by approximately 5 dB.

Noise gates come in real handy if hi-hat bleed is compromising the snare track. How can you *tell* if signal bleed is sabotaging your snare sound? I look for two main "warning signs": first, if any reverb assigned to the snare sounds washy or sizzly because the hi-hat performance is also being processed; and second, if you can hear the hi-hat loud and clear even when the hi-hat and (cymbal) overhead tracks are muted. It's usually acceptable to gate the snare track so brutally that only the fundamental snap is audible, because the overhead and tom tracks typically possess enough snare bleed to prevent





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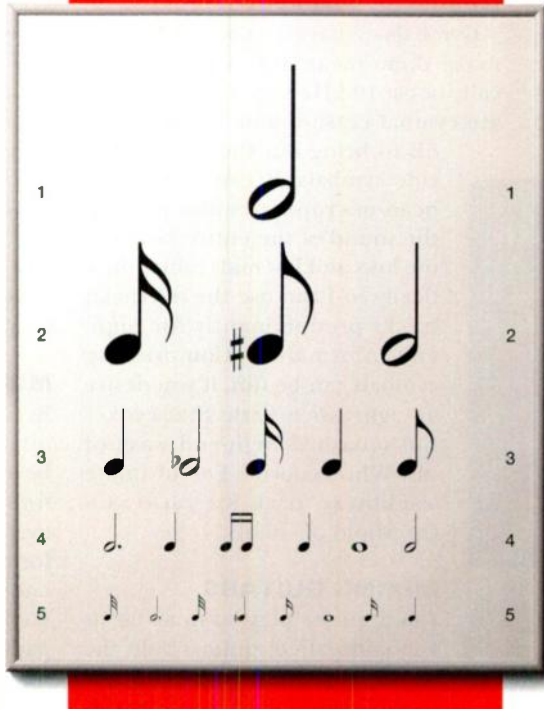
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# Tone Sculptures

such drastic processing from sounding unnatural.

Using compression to tame performance dynamics can be a tough call. If you compress the snare track, you will certainly raise the level of the hi-hat and cymbal bleed. Unfortunately, if the bleed causes a hurtful sizzle, trying a quick fix such as cutting highs can also destroy the sonic impact of the snare. In short, you're juggling less-than-wonderful options. I usually avoid compressing the snare unless the player's dynamics are so out to lunch the track is compromised anyway. If you must compress, be as subtle as possible.

**Toms.** As far as compression goes, toms are another story. Compressing toms can add impact and power to every drum fill. It still pays to go easy on the squash settings, however, because you don't want to raise cymbal crashes to deafening levels. Start out at a 2:1

ratio with a threshold of -5 dB. If you're digging the tom explosions, but the cymbals are starting to get uncomfortable, try patching a de-esser into the channel. De-essers are typically used to diminish vocal sibilance, but they also do a pretty fine job at taming cymbal sizzle. If all else fails, cut 10 kHz by at least 10 dB.

On the EQ side, to clarify the impact of the drumstick against the drum head, try boosting 7 kHz by 10 dB. For rack toms, I typically cut the low-mids and leave the lows and highs flat. This tonal adjustment usually produces a nice, sharp resonance that sounds aggressive, but natural. For floor toms that sound like earthquake rumbles, try boosting 100 Hz by 10 dB or more.

**Cymbals.** What can you do, except make them mean and bright? I typically boost 10 kHz by 5 dB to accentuate cymbal crashes and 7.5 kHz by 5 dB to bring out the ping of the ride cymbals. Because the overhead microphones also pick up the sound of the entire kit, I cut the lows and low-mids rather drastically so I can use the overhead tracks predominantly for high-end information. Compressing cymbals can be fun, if you desire an aggressive sizzle that evokes the squashed high-end wash of old Who records. For ultimate wackiness, try a 8:1 ratio at a threshold of -10 dB.

## MIXING GUITARS

I'm a guitar player, so as far as I'm concerned, guitars rule the world. However, be careful not to sabotage your mix with razor-sharp midrange frequencies. Go easy on the mid- and high-frequency boosts. I'll remind you again: If a signal isn't sharp enough, you can cut bass frequencies to improve articulation rather than boost mids and highs. Having said that, acoustic guitars sound very happy and jangly when boosted 10 dB at 10 kHz. The same tweak on a raging and distorted guitar, however, can get



Performance artist Laurie Anderson changes moods and characters by pitch-shifting her voice.

you arrested in three states for noise pollution. If you need more attack, try boosting between 3 kHz and 7.5 kHz. Warmer tones can be produced by boosting frequencies in the 100 Hz to 750 Hz range.

I always compress guitar tracks to ensure that the sound is right in the listener's face. A good starting point is a 2:1 ratio at a threshold of -10 dB. Single-ended noise-reduction units help diminish amp hiss, while noise gates can clean up entrances, exits, and other spots where the guitarist isn't playing.

## MIXING KEYBOARDS

Because most keyboards allow a lot of internal signal processing, mixing can be a breeze. Tone quality is usually very fine and many contemporary units deliver pristine sound. I usually just watch for audible hiss and patch in a single-ended noise-reduction device if necessary. Compression can help if keyboard pads are getting lost in the roar of a track. To punch up the dynamics, try a 2:1 ratio and a -5 dB threshold. Beyond that, the main thing you can do is ensure that stacked keyboard timbres don't fight each other. Tweaking each individual sound to support the other sounds in a keyboard stack should be Job One. If you're stumped by a muddy mess, try cutting 100 Hz.

## BASS

The big bottom lives down at 100 Hz, so if you're looking for a house-rattling tone, boost it by 10 dB or more. Those

## The Linear Bandstand

Here's how I plan my track assignments on a typical 16-track mixdown to facilitate "section" mixing and timbral comparisons. Please note that I'm using two modular digital multitracks with a synchronizer, so I don't need to dedicate an outer track for time code and an adjacent guard track.

Track	Instrument
1	kick drum2
2	snare drum
3	hi-hat
4	rack tom 1
5	rack tom 2
6	floor tom
7	overhead left
8	overhead right
9	rhythm guitar
10	acoustic guitar
11	guitar solos
12	organ
13	lead vocal
14	backing vocal 1
15	backing vocal 2
16	bass



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# Tone Sculptures

funky snaps and pops can be accentuated by boosting between 800 Hz and 5 kHz, but take care not to increase fret and finger noises.

I always compress the bass to produce steady and thumping performance dynamics. A typical starting point is a 2:1 ratio at a threshold of -10 dB, but the final setting depends on how hard the bassist is playing and what style of music is being performed. If audible hiss rears its ugly head, go ahead and drastically cut 10 kHz, because the bass doesn't travel in high (frequency) circles.

## MIXING VOCALS

There are thousands of vocalists and vocal styles bouncing around the audio world, and the tonal enhancements that work for one singer are usually a



Throbbing, multilayered keyboard tracks are the driving force behind Sparks' dance club hits.

death sentence for another. It's critical that the mixer be extremely sensitive to the vocalist's natural timbre and how it affects the overall sonic environment of the track. You may need to thin a vocalist out, or boost his or

her low-mids, to "seat" the voice into the backing tracks. But don't touch any knobs or buttons without critically auditioning the result.

To increase vocal presence, try boosting in the 3 kHz to 7.5 kHz range. A

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# Tone Sculptures

tiny boost at 10 kHz often adds a nice sheen to a voice, but take care not to increase sibilance. Plosives and boominess can be diminished by cutting at approximately 100 Hz.

Compression is typically a must for vocals, especially if the singer is trying to bust out of a dense musical track. To produce a tight, but open sound, try a 2:1 ratio with a threshold of -10 dB. Subtle compression settings allow some of the vocalist's dynamic phrasing to remain intact, while processing the signal just enough to prevent soft passages from getting swallowed by the backing tracks.

Dense, seamless vocal timbres can be achieved by increasing the threshold to -15 dB or more. Sonically butchered timbres—just ripe for that industrial dance track you're mixing—are delivered by a brutal compression setting

of a 10:1 ratio with a -20 dB threshold.

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Jazze B's minimalist productions for Soul II Soul used an extremely low, insistent bass groove to fill sonic space.

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schizophrenic lunatic when I'm mixing important projects. It's comforting to know that I don't have to be shackled to my mistakes. I can always clean up a big mess by moving all the faders back to their starting positions. And believe me, there's nothing shameful about falling back to ground zero; it's much more painful to release a final mix that makes your skin crawl every time you hear it. Mixing is one of the



**Mixing is  
one of the few  
things in life  
that offer you a  
second chance  
at capturing bliss.  
Don't blow it!**

few things in life that really offers you a second chance at capturing bliss, so don't blow it by being stubborn or lazy.

And speaking of blowing it, while writing this article, I discovered I had bit off a lot more than I could chew. Mixing is just too huge a subject to comprehensively cover in a two-part magazine feature. (Duh!) So if I didn't cover something that's baffling or bugging you, please feel free to query me online. There are **EM** folders in eWorld's Music Universe under "Gear Up" and in the Taxi forum's "Musician's Message Board" on America Online (keyword: TAXI). You may also e-mail me at lebete56@aol.com. I will be happy to answer any specific mixing questions.

**EM Editor Michael Molenda is currently mixing "Vambo Rools: A Tribute to the Sensational Alex Harvey Band" for Taxim Records in Germany.**

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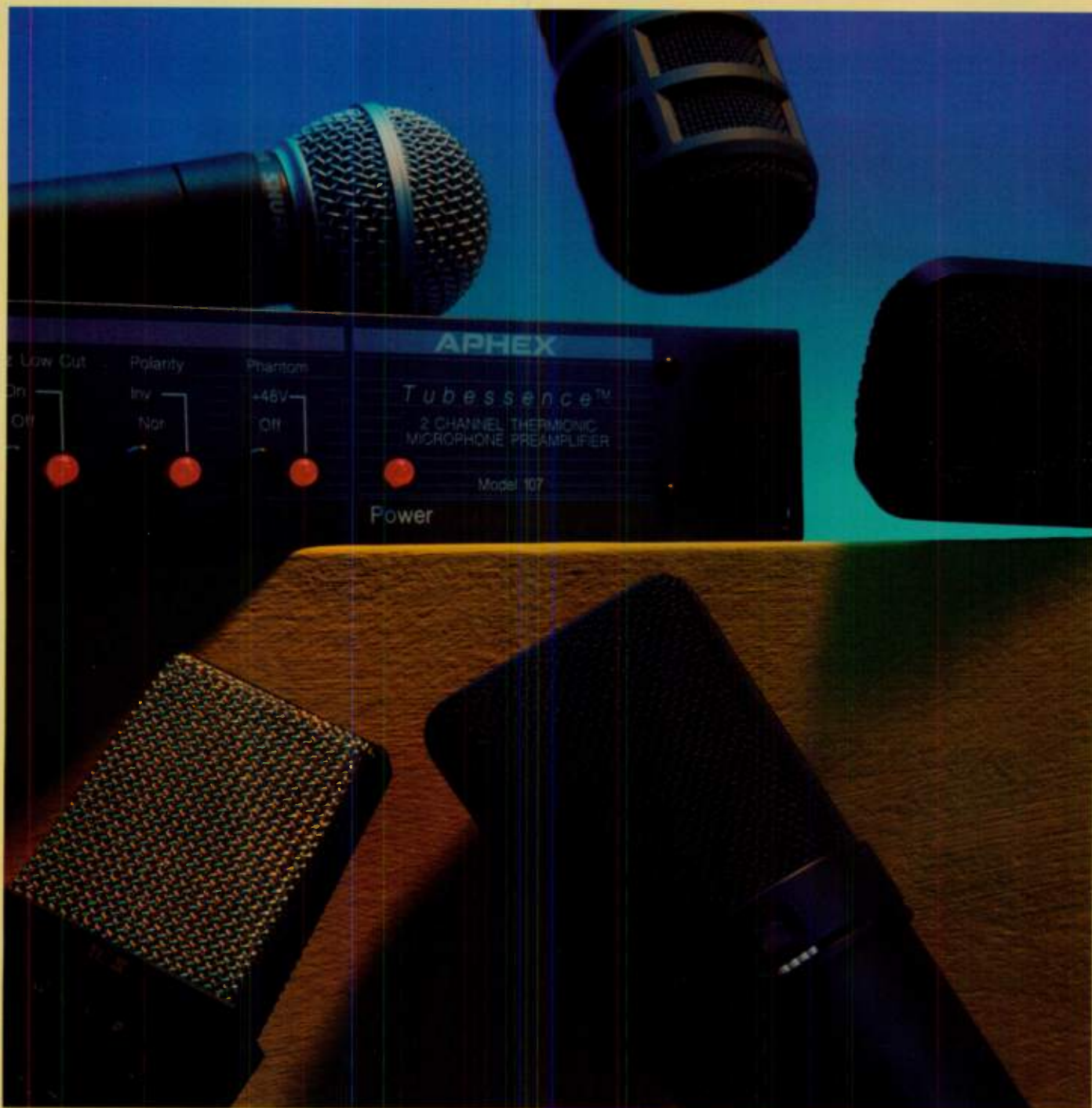
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*Under the direction of General MIDI, these sound modules play from the same score.*

## Tabletop

# Orchestras

I REMEMBER LISTENING to the radio with my father when I was a little kid. Being the inquisitive type, I wondered how the music came from such a small box. My dad patiently explained that a group of very tiny musicians lived in the radio and played whenever we turned it on.

Since then, of course, I have learned the truth: The tiny musicians live inside synthesizers, which are recorded on tape or other media and broadcast over the airwaves to radios everywhere. The musicians receive messages that tell them what instrument to play, what notes to play, how loud to play, and so on. These messages can come from the synth's own controls or via MIDI. Each tiny musician responds only to the messages on their assigned MIDI chan-

nel, ignoring any messages on other channels.

Until recently, the musicians in each synth have been organized in different ways, because each local branch of the MIDI union (Korg, Roland, Yamaha, etc.) established its own set of rules. Unfortunately, this made it difficult for musicians from different locals to share the same MIDI sequence. A particular Program Change message might tell a musician in one synth to play a flute, while telling a musician in another synth to play a marimba.

This situation resulted in chaos until the various locals got together and agreed to standardize the rules in some of their synths so they would all respond in the same way to a given MIDI sequence. They placed these synths under the

command of General MIDI, a military bandleader of great wisdom and insight.

Any synth that conforms to the rules of General MIDI (GM to his friends) includes the same basic set of 128 instruments. In addition, a particular Program Change message always tells a musician in a GM

**By Scott Wilkinson**

synth to play the same instrument. Finally, a GM synthesizer always has at least sixteen independent musicians inside who can play a total of at least 24 notes simultaneously. If you play a MIDI sequence that was created with GM in mind, it should sound more or less the same on any GM synth. (For the complete scoop on GM, see "MIDI For The Masses" in the August 1991 EM and "Generating General MIDI" in the September 1992 EM.)

*Photograph by Robert Perry*





## BATTLE OF THE BANDS

Even though GM synths from different manufacturers play GM sequences using the same instruments, there are subtle (and not-so-subtle) differences between them. For example, each manufacturer uses their own samples and tweaks the sounds in various ways, so the instruments sound slightly different. In addition, some GM synths include extra instruments and/or effects, such as reverb and chorus. Finally, some GM instruments are programmable by the user, while others are not.

Instead of trying to examine every GM module on the market, we selected four representative units—two in the \$1,000 range and two in the \$300 range—and compared them within their respective price ranges.

The two luxury contenders are the Roland SC-88 Sound Canvas (\$1,195) and the Kawai GMega (\$895 at press time, but the price will be reduced to \$499 by the time you read this). The budget contenders include the Korg AG-10 Audio Gallery (\$299) and the Yamaha MU5 (\$299). It should be noted that two of these manufacturers offer more expensive GM modules, including the Korg 05R/W (\$700; reviewed, along with Korg's X3 synth, in the December 1993 *EM*) and the Yamaha TG300 (\$895; reviewed in the August 1994 issue). In addition, most of these companies will introduce new models at the January 1995 Winter NAMM show.



The Korg AG-10 includes 128 sounds and features 32-note polyphony, 16-part multitimbral operation, and lots of useful software. However, it has no user interface to speak of.

All four modules include an 8-pin serial interface for direct connection to a computer. As a result, they can act as a MIDI interface. They also include an 1/8-inch mini headphone output, MIDI In and Out ports, a power switch, and a volume control.

During the evaluation phase, I played GM sequences in many different musical styles from several companies that sell Standard MIDI Files (SMFs) of popular tunes (see sidebar "GM SMFs"). This let me compare the sound of each module playing the same file.

## WHAT'S IN THE BOX?

As I unpacked the modules, I discovered that some of them come with cables, connectors, and other goodies. I started by reading the beginning of each manual to get a feel for the features of each unit, then took stock of the extras that came with them.

**Luxury.** The Roland SC-88 clearly came out on top of the features and extras category among the luxury units. Its basic specs include 64-voice polyphony, 32-part multitimbral operation (thanks to two MIDI Ins), and 654 sounds (called Instruments), in addition to 24 drum kits (which include two sound-effects kits). Instruments and MIDI channels are assigned to Parts, which form the basic multitimbral structure.

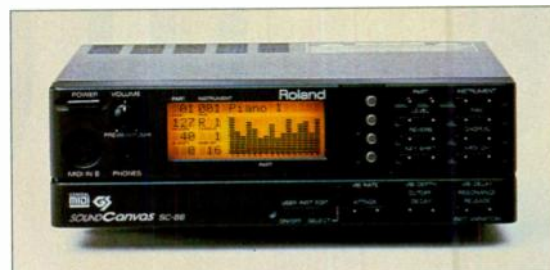
The Instruments are divided into two maps: one for the SC-88 and one that corresponds to the older SC-55. Each map is organized according to Roland's GS standard, in which each of the 128 Primary GM Instruments is accompanied by several Variations. These Variations can be called up with the MIDI Bank Select message. The SC-88 also includes an impressive signal processor that provides several types of reverb, chorus, delay, and a 2-band (high/low) shelving EQ.

Signals coming in through a pair of RCA audio inputs are mixed with the synth's stereo RCA audio outputs on the back panel, which also includes an input-level control. The two MIDI Ins are joined by a single MIDI Out/Thru.

The serial port can accommodate both PCs and Macs with the appropriate cable; a switch selects the type of computer. One minor quibble is the fact that the serial port is mounted upside down, so that the mark on the connector faces down instead of up, where you can see it. The power supply is internal, with a permanent power cord, which means no wall wart. (Yeah!)

The SC-88 comes with some nice extras, including a MIDI cable and a stereo audio cable with RCA plugs and a pair of 1/4-inch adapters. In addition, you get a 3.5-inch PC floppy disk of demo song files in SMF and MRC format. (The latter is Roland's proprietary format for their hardware sequencers.)

The Kawai GMega (reviewed in the



The Roland SC-88 features 654 sounds, 64-note polyphony, 32-part multitimbral operation, and an excellent user interface.

June 1993 *EM*) has a nice feature set, although it's not quite up to the SC-88's. The 32-voice polyphonic GMega includes two MIDI Ins and two MIDI Outs for 32-part multitimbral operation. A total of 384 sounds (called Singles) and 21 drum kits are organized into three banks of 128 Singles and seven drum kits each. Singles and MIDI channels are assigned to Sections, which correspond to Parts in the SC-88.

The first bank includes the standard GM sound set, while the second bank emulates the Roland MT-32, a precursor to GM. The third bank stores user Singles. You can use only one bank at a time, selecting it from the front panel or via SysEx. The unit doesn't respond to Bank Select, so you can't use Patches from different banks all at once. The effects include six types of reverb. Fifty-five different temperaments let you explore historical and other exotic tunings.

In addition to two pairs of MIDI In/Out ports, the back panel includes two RCA audio outputs. There are no audio inputs. The computer serial port is intended for Macintosh only.

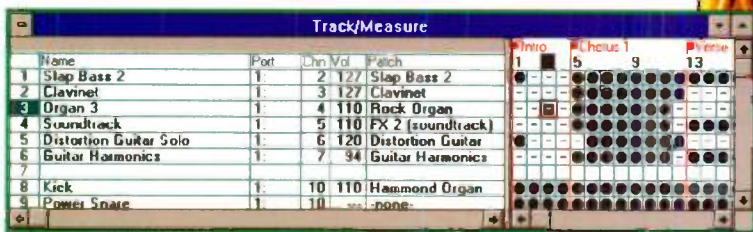
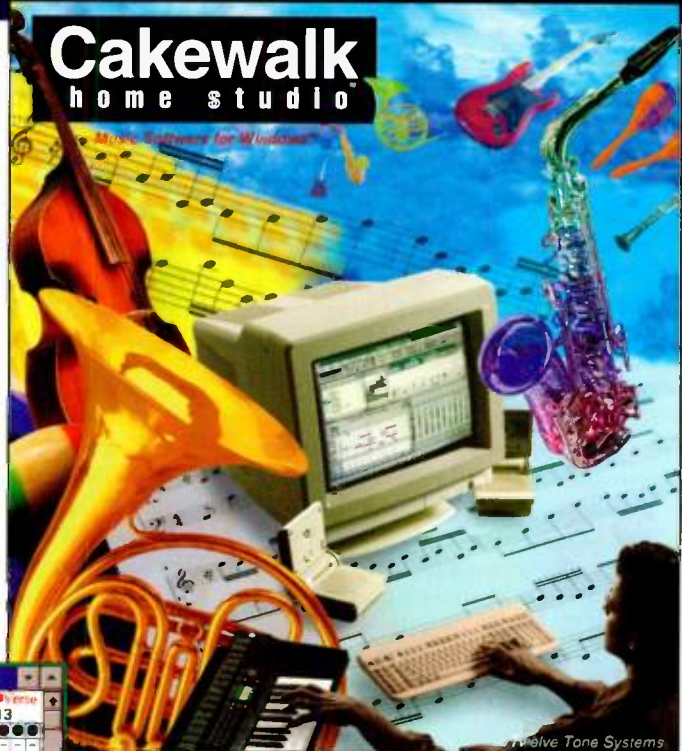


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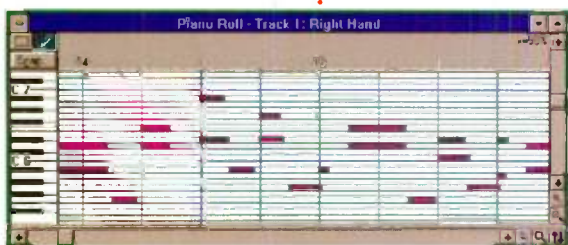
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A wall-wart power supply connects at the back panel. Extras include a MIDI cable and a stereo RCA audio cable with two 1/4-inch adapters.

**Budget.** The Korg AG-10 Audio Gallery comes in one of two packages: the AG-101 for PCs and the AG-102 for Macs. The AG-10 uses Korg's AI<sup>2</sup> synthesis, which it inherited from the 01/W family of synths. It offers 32-voice polyphony, 16-part multitimbral operation, and the standard set of 128 GM sounds, in addition to four drum kits. The effects consist of one type of reverb and chorus.

A pair of RCA audio inputs are mixed with RCA audio outputs on the back panel, but there is no input level control. A standard complement of MIDI In, Out, and Thru ports is joined by a computer serial port and a connector for the wall-wart power supply.

Although these specs are pretty standard stuff, the Audio Gallery really shines in the extras department. The package includes a stereo RCA audio cable, serial cable, and even two plastic stands to hold the AG-10 in a vertical position.

It also comes with lots of useful software, including Passport's *Trax* (a simple sequencer), *MIDI Player* (an SMF jukebox player), and QuikTunes song library. Korg's software includes *AG-10 SoundEditor*, which lets you edit the sounds; *SMF Format Converter*, which converts SMFs between Type 0 and Type 1; and the Korg MIDI Driver, which can be used instead of other MIDI drivers, if necessary. The MIDI File Translator is an *Apple File Exchange* document that is supposed to translate SMFs between PC and Mac formats, but it never worked for me; I used Apple's *ResEdit* instead. Otherwise, this is a complete package that gets you up and running with little else required (except a computer).

With 28-voice polyphony, 16-part multitimbral operation, and 128 GM sounds (called Voices), in addition to eight drum kits, the Yamaha MU5 ex-

ceeds the GM spec, but not by much. Voices are assigned to Parts, along with MIDI channels. It has no effects, except those that were sampled with the Voices. The back panel includes MIDI In and Out ports, a serial port that can be switched for use with a PC or Mac, and a wall-wart power-supply connector. A single 1/8-inch mini jack serves as the headphone and line output, and there are no audio inputs.

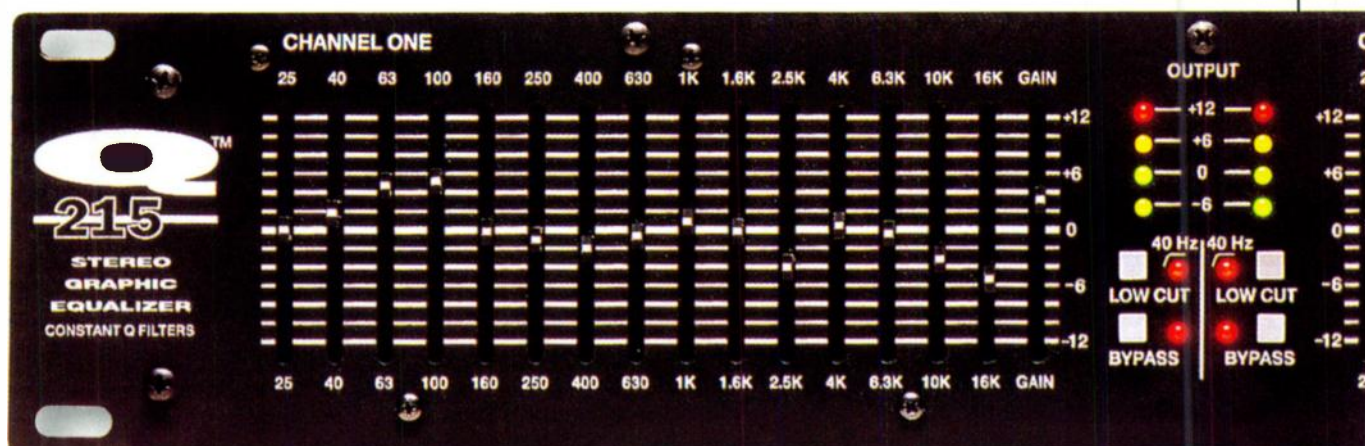
The MU5 is clearly designed for portability. It's about the same size as a VHS videocassette, and it can operate with six AA batteries. However, the unit comes with neither batteries nor a power supply. In fact, it comes with nothing but the manual: no audio cable, no MIDI cable, no serial cable. Not only that, it does not automatically power down if the unit remains unused for some period of time, which I discovered after leaving it on accidentally and wasting a set of batteries. Sheesh!

#### EASE OF USE

General MIDI came about as a way to make synths easier to use. You simply plug in the synth and play a GM

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sequence. All the modules in this face-off did just that, which is great. However, there is more to ease of use than this simple criterion. Let's face it, once most people have played a few sequences, they want to take a look at what's going on inside the module. (See any tiny musicians in there?) They might want to change some of the instruments used to play a certain tune, or alter the effects. The user interface becomes critical in these situations.

**Luxury.** The SC-88 wins the luxury division ease-of-use competition with a big, backlit LCD and well-organized controls. In normal Play mode, the display shows the currently selected Part number, Program Change number, and Instrument name across the top. In the left section are dedicated readouts for the selected Part's level, pan, reverb and chorus level, transposition, and MIDI channel. In the right section are real-time, bar-graph level meters for all sixteen or 32 Parts (depending on the mode), complete with peak-hold indicators. These meters double as value indicators in Edit mode. This is by far the most informative display of the lot.

The controls are similarly comprehensive. To the right of the display are four illuminated buttons that specify All mode (32-channel operation), mute the selected Part, select the SC-55 map, and enable/disable the EQ for the selected Part. To the right of these buttons are eight pairs of dedicated increment/decrement buttons that provide direct control over the parameters in the display: Part number, Instrument, level, pan, reverb level, chorus level, transposition, and MIDI channel.

This direct access to the basic parameters is great. For example, it makes assigning an Instrument and MIDI channel to a Part very easy. Below these dedicated buttons are several multi-function buttons that let you edit some of the vibrato, filter, and envelope parameters for the selected Part or Instrument.

The alphanumeric, backlit LCD display on the GMega measures 16 x 2 characters,

which provides much less information than the SC-88. In Play mode, the upper line indicates the Single number and Single name, while the lower line reveals the Section number, MIDI channel, level, and on/off status.

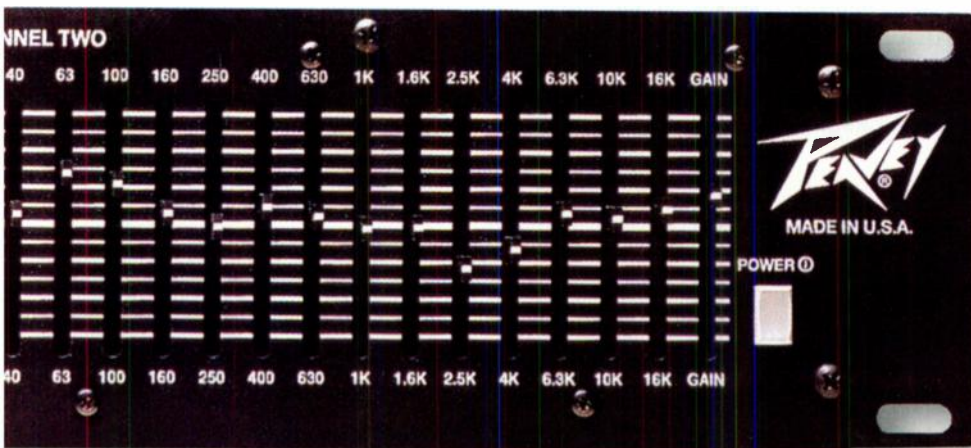
To the right of the display are six buttons and a large, detented alpha dial, all of which provide complete access to all parameters. To change any parameter value, you must navigate the cursor to that parameter with the cursor



The Yamaha MU5 can be battery-powered for portability. It features 128 sounds, 28-note polyphony, and 16-part multi-timbral operation.

EQs using inferior gyrator circuitry. **AND** since frequencies needing cut/boost are usually higher or lower than a frequency band's center, the constant Q is set to cover the immediate frequencies on either side. **AND** that's not all... **CHECK OUT THESE FEATURES:** 23 octave dual independent 15-band EQ channels • Constant Q filters on standard ISO centers • 40 Hz low cut switch with LED indicator, bypass switch with LED indicator, and overall gain control on each channel • 45 mm sliders with full-length dust shielding • 20 Hz to 20 kHz bandwidth •  $\pm 12$  dB cut/boost • Dual 4-step multicolor LED output indicators

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right/left buttons and turn the alpha dial (which feels quite stiff and rough). To edit Single, Section, or System (global) parameters, press the Single Edit, Section Edit, or System button; press the button repeatedly to cycle through the available parameters. To exit an Edit mode, press Exit.

These buttons do double duty when pressed in pairs. For example, pressing the cursor buttons together activates a MIDI monitor, which is very handy. Pressing the Single and Section buttons together plays the demo song. Pressing the Single and System buttons together sends a "snapshot" of the unit's current condition, including a SysEx message that identifies the selected bank, as well as Program Change, Volume, and Pan messages for Sections to which MIDI channels 1A through 16A are assigned. Pressing the Cursor Right and Exit buttons together resets the unit to standard GM mode.

Although it provides access to all parameters, I don't like the GMega's user interface as well as the SC-88. There's not as much information in the display, and you must remember how to get to the desired parameter. Navigating the cursor is a common paradigm, but it's not much fun.

**Budget.** Like the SC-88, the MU5 includes real-time level meters for all Parts in its LCD display, which is great, although they do not include peak-hold indicators. The meters also double as value indicators when editing parameters. The Part number, Program num-

ber, and Voice name appear across the top. Unfortunately, the display is not backlit, no doubt to conserve battery power. I found it a bit hard to read, and there is no contrast control.

A large section of the front panel lists the various categories of Voices, along with their Program Change numbers, which is handy. The Part buttons select the currently displayed Part, and two Value buttons increment and decrement parameters in Edit mode. The Mute button mutes and solos the selected Part, which is cool; none of the other modules can easily solo a Part. The Exit button returns you to Play mode.

As you would expect, the Octave Up/Down buttons transpose the entire module by as much as  $\pm 4$  octaves. A 2-octave, Chicklet-style keyboard lets you play the selected Part without an external controller, which is very handy. You can even enter notes into a sequencer, although playing this keyboard in real time isn't much fun. Nevertheless, it works in a pinch.

If you hold the Octave buttons simultaneously, you can select various Utility and Part parameters for editing with the white keys of the keyboard. In the Edit mode, the black keys become numeric entry buttons. Overall, this design is simple, elegant, and works well.

The AG-10 has no display whatsoever and no controls other than a power switch and volume knob. The only indicators are two LEDs, which let you know when the power is on and when MIDI data is being received. In addition, there is no user-interface software (other than *SoundEditor*, which lets you edit a sound; discussed shortly). Sounds

can only be selected via MIDI Program Change messages. Of course, the documentation lists the sounds and their Program Change numbers, but there is no way to scroll through the sounds from the front panel to find one you like.

In one sense, this makes the AG-10 extremely easy to use; all you can do is plug and play. However, I was frustrated that I couldn't see what sounds were called up by different sequences or look at any other parameter values. I wanted to examine what was going



The Kawai GMega features 384 sounds, 32-note polyphony, 32-part multitimbral operation, and full programmability from the front panel.

on in the module, and I simply couldn't. This might be comforting to technophobes, but I prefer more direct access to the unit's parameters.

## PROGRAMMABILITY

Although General MIDI is intended for applications in which the user simply plays a GM sequence and hears a predictable result, many users eventually want to explore the world of sound creation. Some GM modules offer this opportunity, while others do not.

**Luxury.** The GMega is the only module in this evaluation to offer complete access to all its synthesis parameters from the front panel. As mentioned earlier, one of its three banks lets you store up to 128 of your own Singles and seven drum kits. In addition, there are many programmable Section and System parameters. The six reverbs offer a few basic parameters, which are applied globally. The unit can also be fully programmed via SysEx; any editor/librarians that work with the Kawai K11 keyboard will also work with the GMega. By itself, however, this is the most programmable unit of the bunch.

The SC-88 offers access to several key Part parameters from the front panel, as described earlier, and a few Instrument parameters as well. The Instrument parameters—vibrato rate, depth, and delay; filter cutoff and resonance; and envelope attack, decay, and release—are accessed with the clever, multifunction increment/decrement buttons in the lower right area of the

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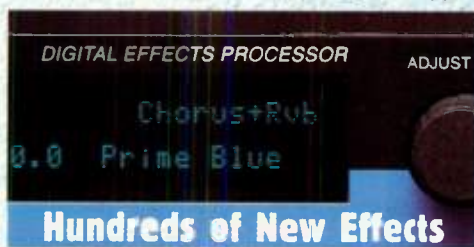
Perhaps the most impressive feature of the new PCM-80 is its unique Dynamic Patching™ matrix, which takes the PCM-80 into new sonic realms. Dynamic Patching provides incredibly powerful, synthesizer-like control over your effects. It maps data from external and internal controllers such as footswitches,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

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# KAWAI

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front panel. These parameters can be applied to the Part, as well. With 256 user Instrument locations and two user drum kit locations, you can do some serious experimentation.

However, the full programmability of the SC-88 is unavailable without SysEx. You can tweak a plethora of synth parameters this way, but unless you have an editor/librarian, it's not for the faint of heart. The SC-88 will work with any Sound Canvas or GS editor, although a few of its new parameters may not be available with older editors. With an editor, the SC-88 is extremely programmable, but on its own, that capability drops dramatically.

**Budget.** Neither the AG-10 nor the MU5 include any user sound locations, so the question of programmability is

moot (which is reasonable, considering the price). The MU5 offers several Part parameters, including volume, pan, MIDI channel, transposition, detune, and pitch-bend range. The Utility parameters include master tuning, transposition, mute lock, onboard keyboard Velocity, Local On/Off, SysEx dump all or one Part, and Initialize All (which restores the factory Part and Utility settings). These settings remain in effect until you change them.

The AG-10 comes with *SoundEditor* software, which lets you program all its synthesis parameters. However, you must save your sounds on your computer's disk drive, and you can hear them only by playing an external controller or the onscreen keyboard in real time). You can't assign them to MIDI channels within the AG-10 to be played by a sequence. The manual states, "For users who would like to explore the world of sound creation further, we recommend that you take a look at some of our other synthesizers and workstations." Fair enough.

## GENERAL MIDI SMFS

During this face off, I used many GM-compatible Standard MIDI Files (SMFs) from several manufacturers, including PG Music, Tran Tracks, and Tune 1000. (PG Music also offers a cassette with the output from 30 GM synths and sound cards playing various sequences for comparison.) These files covered many different styles, such as pop, rock, country, big band, latin, and fusion. Thanks to these companies, I was able to compare the sound quality of different modules as they played the same sequenced material. The wide variety of styles called up different sounds in the modules, giving me a comprehensive taste of their capabilities.

Most of the sequences are popular tunes, with the melody on one particular channel. This makes it easy to mute the melody and sing or play along, which is extremely useful for certain types of live performance. Any gig that requires popular tunes—lounge acts, weddings, bar/bat mitzvahs, etc.—can be easily filled by a single individual with a laptop computer, a GM module, and a sound sys-

tem. The arrangements are generally quite good, and the orchestrations sound like a complete ensemble that would otherwise be impossible to hire because of the expense. If you play such gigs, you owe it to yourself to check out these sequences.

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**SOUND QUALITY**

Everything else aside, sound quality is the most important aspect of any GM module. After all, its primary purpose is to emulate various musical ensembles as accurately as possible. As I mentioned at the outset, however, each manufacturer creates its own samples and tweaks them in its own way, which means that each module has its own unique sound. Which ones sound the best?

**Luxury.** There's no contest in this division. The SC-88 sounds uniformly excellent. The sound quality is rich and full. Each instrument is well defined, and most are surprisingly realistic. I particularly liked the acoustic guitars, basses, drums, and strings. Even the woodwinds and brasses sounded pretty good, which is saying a lot. The effects also sound excellent.

Unfortunately, the GMega did not fare so well in this category. It generally sounds a bit cheesy, particularly on big-band arrangements. (The saxes are particularly poor.) The acoustic guitars sound very electronic, with obvious looped sections. Overall, the instruments are not well defined, and the factory reverb setting sounds harsh and metallic. (There are several other reverb settings that sound much better.) On the plus side, the drums, basses, and strings sound very good.

**Budget.** The AG-10 sounds quite good overall. In particular, the saxes are excellent, which made the big-band arrangements sound great. The nylon-string guitar also sounds excellent, although the jazz guitar sounds more like an organ. In fact, many of the sounds are distinctly different than the other modules in this evaluation. This gives the AG-10 its own character, but it can be problematic. In one tune, for example, the lead is played by an overdrive guitar; on the AG-10, it sounded just like a piano. I couldn't verify the selected instrument, because the module has no display, but I suspect the AG-10's overdrive guitar simply sounds like a piano.

Without any system-wide effects, the MU5 sounds quite a bit thinner than the AG-10. It also has a very electronic

quality. For example, the nylon-string guitar has a buzzy looped section, the distorted guitar sounds like a super cheesy synth, and the rock organ sounds more like steel drums. However, the unit's brasses and saxes sound better than expected, and the basses and drums sound great. Unfortunately, the balance between instruments was inconsistent compared with the balance in the AG-10.

**FINAL RESULTS**

Now that we've finished the individual categories, it's time to tally up the scores. The envelope please....

**Luxury.** The Roland SC-88 wins the luxury division hands down. With the best feature set, user interface, and sound quality, the SC-88 would make a fine addition to any GM setup. Of course, it's the more expensive unit, but in this case, you get what you pay for.

The Kawai GMega has a good feature set, and it offers the most programmability without a computer editor. However, its user interface falls a bit short, and its sound quality can't match that of the SC-88. Nevertheless, it's worth a look, especially at its new price of \$499.

**Budget.** The Korg AG-10 Audio Gallery easily wins the budget division, with lots of useful extras and very good sound quality. With no user interface to speak of, it's difficult to use in some respects, although technophobes will probably find this to be a blessing instead of a curse.

The Yamaha MU5 is designed to be extremely portable, and it succeeds in this beautifully. With the MU5, a laptop computer, and a few GM sequences, you can hit the road. You can even enter new sequences from the MU5's keyboard, although this would quickly get tedious. The user interface is simple and elegant, but the sound quality leaves a lot to be desired. In addition, it comes with nothing extra, not even a source of power.

Under the command of General MIDI, the concept of plug-and-play synthesizers has finally become a reality. The tiny musicians in each synth are now reading from the same score, which can only help to bring more music into the world. I only hope their union dues are current.

**EM Technical Editor Scott Wilkinson** believed everything his father told him as a child.



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The move to rural North Caroli-

na was a way to take refuge from the chaos of the big city, but it was also an opportunity for O'Hearn to focus on the most important things in his life: his music and his family.

This back-to-basics move has affected the way O'Hearn creates and produces his music. For example, O'Hearn was recently commissioned by playwright

(and sometime actor) Sam Shepard to create several musical pieces for his play *Simpatico*. But rather than lock himself away for weeks with a synthesizer and a sampler trying to program the perfect soundtrack, O'Hearn played the score live, recording and mixing 55 minutes of music in just one 8-hour session.



Patrick O'Hearn  
goes underground to score  
Sam Shepard's *Simpatico*.

By Mary Cosola





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"Recording the music for *Simpatico* was a whole lot of fun," enthuses O'Hearn. "It was an ensemble production, recorded live with just a couple of overdubs. The quick recording and interaction of the players was great, especially compared to me tinkering away on a techno album for four months. I was ready to use my Macintosh as a doorstop after that."

O'Hearn is probably best known as the bassist/keyboardist for the popular Los Angeles-based new wave band Missing Persons, but that was just a blip in his long and impressive musical career. In the early and mid-1970s, O'Hearn toured as bassist with such jazz greats as Joe Henderson, Dexter Gordon, and Joe Pass. After that came three years in Frank Zappa's band, followed by a short run with Group 87, a jazz fusion group he put together with Peter Manu, Mark Isham, and Terry Bozzio. O'Hearn signed a solo artist deal with the Private Music label while still playing with Missing Persons, but finally left the group in 1986 to fully concentrate on his career as a composer and instrumentalist.

## THE PLAY IS THE THING

In addition to his six solo albums (with another on the way), O'Hearn has branched into the field of original film and television music. It was his score for Shepard's movie *Silent Tongue* in 1992 that led to the *Simpatico* project. As he did with the film project, Shepard pretty much left the *Simpatico* music to O'Hearn's discretion.

"Sam's instructions regarding the music were pretty vague," recalls O'Hearn. "I got an advance copy of the script, read it, and let it incubate for a few months. I thought the music should have a haunting jazz sound to it, and Sam agreed. Stylistically, I was thinking along the lines of some of the more open and moody pieces by Charles Mingus, Duke Ellington, or Billy Strayhorn."

For the recording session, which took place at the Sound Chamber in North Hollywood, O'Hearn assembled a quintet of some long-time musical associates. The players included Manu on electric guitar; Isham on trumpet and flugelhorn; Steve Tavaglione on tenor

sax, soprano sax, and clarinet; and Kurt Wortman on drums. O'Hearn played acoustic bass and brought some prerecorded piano parts and synth samples to the session.

"Patrick is a true synthesist. He can sit down with a synth like the PPG and start manipulating waveforms and create a unique sound, rather than just playing preset programs," says Stephen Krause, who engineered the *Simpatico* sessions. "He creates some great sounds on the PPG, and then samples them with an Akai S1000 to ensure a reliable storage medium for his custom sound. That way, he can just pack up some cartridges and a couple of S1000s and fly to L.A. for a session. All he needs to do is rent a master controller when he gets to the studio, which is far better than hauling a PPG around."

## SETTING THE MOOD

You might think that producing nearly an hour of original music in just eight hours would require military-like precision, but quite the opposite was true of the *Simpatico* project. O'Hearn didn't use any charts; he came prepared with a couple of arrangements and some basic chord progressions, but the ensemble collaborated and improvised the rest. Because the group worked so well together, none of the pieces required more than three or four takes to track a "keeper," with two takes being the norm.

"These guys go way back together, to playing in garage bands when they were teenagers," notes Krause. "The musical connection when they get together is immediate. I've done a lot of work with Patrick, Mark, and Peter on their solo projects, so everything clicked."

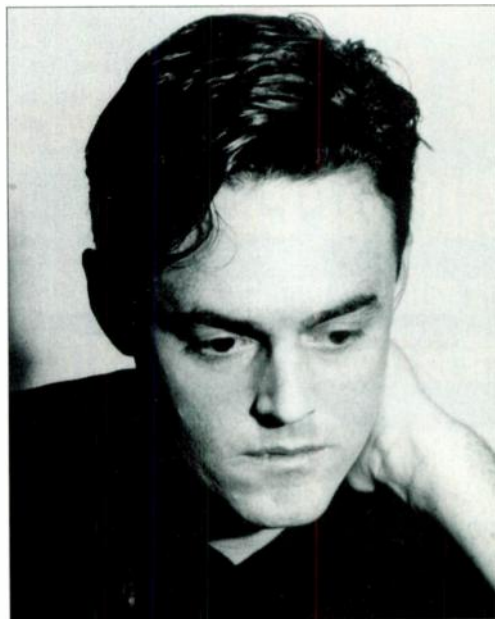
O'Hearn agrees that the key to the project's success was the ease with which the players came together. "We had a fantastic ensemble. It had been about fifteen years since we all performed together," he says. "The only thing that slowed us up was the amount of fun we had working together again. Other than that small hitch, we had no production problems whatsoever."

In addition to fashioning the project after the stylings of Mingus and Ellington, O'Hearn suggested that the team

listen to Miles Davis' *Nefertiti* album for a refresher course on the signature 1960s jazz sound—a sound that O'Hearn believed would enhance the mood of *Simpatico*'s background music.

"None of us really had to sit down and study *Nefertiti* because we all know it so well," comments Krause. "But what I took from the record was more of an attitude than any kind of technical information. We worked a little in that jazz style; for instance, we only used three microphones on the drums, and we didn't use much isolation. You can hear the other instruments bleeding into all the mics. This project was more about creating a vibe from the player's interaction than trying to document something musically."

To capture the sound of jazz eras past, Krause's mic selection tended toward reissues of '60s designs, such as the Neumann U67 and the AKG C12. For Isham's trumpet he used the U67. The C12s were used as drum overheads, while a Neumann KM130 was



Patrick O'Hearn

positioned directly in front of the kit. The C12s were also used for miking sax and acoustic bass. "I just love the U67s and C12s," says Krause. "They have all the qualities you want in great tube mics. They have warmth and clarity, and they sound so *real*."

As for any special engineering or production tweaks, O'Hearn and company kept things simple. They used straightforward mic positions; compressed the



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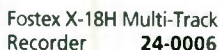
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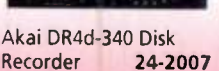
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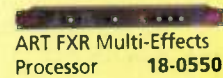
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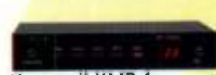


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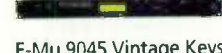
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bass, drums, and trumpet; and recorded everything on two Tascam DA-88s. The final mix was done manually, without automation. All-in-all, the *Simpatico* project was a pretty low-tech production for musicians famous for their high-tech ways. "This project was a return to the way I used to record about fifteen or twenty years ago," comments O'Hearn. "And it made me realize how much I miss and enjoy this style of recording."

Krause echoes O'Hearn sentiment, "It was a totally live production: no MIDI, no time code, no demons. It was the first time I worked with multiple DA-88s, and I was knocked out by how good they sounded."

## A WORK IN PROGRESS

Tucked away in the beautiful countryside of North Carolina is Deep Cave Records, Patrick O'Hearn's new record label and studio. The studio is only set up for MIDI productions at the moment, but O'Hearn expects to be up and running with live recording before long.

"I'm in the process of overdubbing and mixing my next solo album, which should be the first release on Deep Cave," says O'Hearn. "The second release will probably be the music for *Simpatico*. I also plan to do more collaborations, of which I have several irons smoldering in the fire for 1995."

His current studio setup consists of an ARP 2600, two Sequential Circuits Prophet-5s, an Oberheim Xpander, two Oberheim SEM 4-Voices, one PPG Wave 2.2, one Studio Electronics MIDI Mini, two Akai S1000s, and other bass, guitar, and percussion instruments.

O'Hearn uses three Tascam DA-88s to pump up his modular digital multitrack system to 24-tracks and routes signals through a Mackie 48-8 console. For signal processing, he uses two Lexicon PCM70s, two Lexicon PCM42 delays, and an Eventide H3000SE Harmonizer.

"I have been a fan of the

## FREE AT LAST

By freeing himself from his MIDI tether, O'Hearn was able to run the *Simpatico* session fast and loose. Part of the play's action takes place in Lexington, Kentucky, so the group decided to turn out polar-opposite renditions of "My Old Kentucky Home." One version features O'Hearn, Isham, and Manu in a thoroughly ambient, hypnotic rendition of the standard, and the other is a more traditional, swinging, full-ensemble Dixieland number.

"As for the music in general, I only brought in a couple of pieces with the length, form, and general structure all set," says O'Hearn. "Much of the remaining pieces were freely improvised, including trios, duets, and solos. Occasionally we worked around a theme from the play, such as 'My Old Kentucky Home.'"

Lexicon products for a long time. My PCM70s and PCM42s have vastly extended memories," he says. "The Harmonizer is a fun little box, especially because it's infinitely adjustable. You can get in there, twiddle away, and come up with all sorts of interesting sounds."

Tape and MIDI tracks are mixed to a Panasonic SV-3700 DAT recorder, and all monitoring is done through Genelec 1031A monitors. O'Hearn uses Digidesign's Pro Tools for editing and assembly. For storage he uses DAT backups, SyQuest cartridges for his S1000 files, and a Seagate 1.2 GB hard drive.

His MIDI system consists of a Mac Quadra 650, running Mark of the Unicorn's *Performer* 4.2 and EMAGIC's *Logic Audio* 2.0. MIDI and SMPTE are distributed via MOTU's MIDI Time Piece II and Digidesign's SMPTE Slave Driver. A Roland MPU-101 is employed to convert MIDI to gate and CV.

"Last but not least," adds O'Hearn, "electricity is supplied to all this stuff through a couple of Tripp Lite model 180 line conditioners, whose gallant efforts have saved the fuses, capacitors, and power supplies of all my gear more times than I care to recall."

Of the 55 minutes of music created for *Simpatico*, Shepard only used fifteen minutes for the performance. O'Hearn is not disappointed, as this is standard operating procedure in the world of film and theater scoring. He plans to release the entire work on Deep Cave after he finishes mixing the label's first release, which also happens to be his next solo album.

Not only did O'Hearn come away from the *Simpatico* project with an album's worth of material, he relearned some old ways of working and creating. "I've wrestled with this thought a lot in the last two years, but I have become a prisoner of technology," comments O'Hearn. "I've finally come to the realization that I was able to move more quickly, care less about detail, and therefore have a little more *life* in my music ten years ago. I'm talking about before I had any kind of MIDI-technology equipment, before I ever laid hands on a Macintosh, back when I was using an FSK-based Roland MC-4 to do any kind of sequencing and mathematical musical stuff."

"The technological advances in equipment are a double-edged sword," he continues. "It's amazing what you can do now with hard-disk recording systems and current MIDI sequencers, but at some point you have to move beyond the tools and just finish the task at hand."

## BACK TO THE CAVE

O'Hearn's concerns about the music industry's preoccupation with tools rather than creativity is shared by many electronic musicians. Fortunately, the rapid advances in music technology have made affordable many products that were recently only available in high-priced professional studios.

"I think it's great that the prices on these products are being driven down," says O'Hearn. "I say, 'Let the good music happen.' That's why I'm making my foray into independence, establishing my own label and studio. This is certainly what I want to do at this point in my life, just grab the helm and steer the course. Musicians don't have to grovel at the hindquarters of record executives anymore just to get their music heard."

**Mary Cosola**, associate editor of *Electronic Musician*, is heavy with child, but not as heavy as she's going to be.



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# The MIDI

You have a big gig playing a debutante's party at the country club, and your drummer and keyboardist just quit to join a Japanese heavy-metal band. Can you replace them by MIDIifying your trusty accordion?

Good. You're smiling already. Isn't the accordion a novelty instrument that your great aunt learned to play in the old country? Well, future great aunts and uncles throughout the world are learning this much-maligned, Old World instrument. The jokes and knowing winks may continue, but the accordion has been a respected instrument in both Eastern and Western Europe for more than 100 years. It remains the family's central instrument, much as the piano and guitar are in North America.

From the late 1960s through the 1980s, the accordion's popularity declined, and every American accordion manufacturer except Petosa Accordions closed its doors, leaving only Petosa accordions and European imports available. (The instrument's decline was primarily due to the increased popularity of rock 'n' roll and the guitar.) Recently, however, the accordion has en-

joyed renewed popularity in the New World. While no one has

**By Scott T. Spence**

opened a new accordion manufacturing plant in the U.S.—the necessary accordion-manufacturing skills no longer exist here—sales of new accordions are reaching levels not seen in 30 years. In part, the reason may be the introduction of MIDI-equipped accordions that offer tremendous performance versatility.

## The accordion enters



# POLKA

## WHO PLAYS ACCORDION?

Generally recognized as the Rolls Royce of U.S. accordions, the Petosa stands well above the others in terms of quality and price. Building a Petosa accordion can take as long as one year, with its 5,000 handmade parts, and can cost more than \$10,000 per instrument. The company's president Carl Petosa proudly displays an accordion-related Gary Larson *Far Side* cartoon in his office. Signed by the artist, the cartoon panel depicts saints receiving harps at the gates of heaven and sinners receiving accordions at the gates of hell.

Petosa laughs at the joke and rattles off dozens more. Then he cites the names of well-known musicians who play accordion, including Elton John, John Mellencamp, Angelo DiPippo, and Buckwheat Zydeco. He goes on to name recent television commercials that employ accordion music to promote *People* magazine, Dodge and Isuzu automobiles, Ace Hardware and Sears stores, Whirlpool appliances, and Pepsi Cola.

Accordion-player societies exist on regional, national, and international levels. One of

**ILLUSTRATION BY VALERIE SPAIN**

the biggest topics of discussion at these groups' meetings and in their newsletters is MIDI for the accordion. The focus of these discussions typically centers on the lack of standardization between accordion manufacturers rather than specific MIDI applications. To date, three design philosophies have evolved, and each has its own set of passionate

the electronic age.



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portable unit can plug it directly into a computer or keyboard to give you the most out of General MIDI for a minimum price.



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# THE MIDI POLKA

supporters. Before diving into a discussion of the attributes of each design philosophy, however, we need a quick lesson in accordion construction and the performance principles that effect its adaptation to MIDI.

## ACCORDION CONSTRUCTION

A standard piano accordion has 41 piano-style keys that are played by the accordionist's right hand and six rows of twenty buttons each that are played by the left hand. In between these are the bellows that provide air movement through the reed plates and the reeds that produce the sound. The accordion is a chromatic instrument, which means that unlike most harmonicas, the tone or note is the same regardless of whether the bellows are pulling air into the instrument or pushing it out. Each note played by the right hand requires a minimum of two reeds: one for air in and one for air out. (The instrument has a 5-octave range.) Most accordions have multiple reed plates, so that a single note is formed by the composite sound of multiple, virtually identical reeds.

The left hand plays 120 buttons. The first two rows of buttons (those farthest from the accordionist) are the bass buttons, each of which plays one bass note. The remaining four rows of buttons are the chord buttons. Each 3-note chord button allows up to nine reeds to open. Friedrich Buschmann, the German who invented the accordion in 1829, laid out the buttons in a circle-of-fifths pattern.

MIDI accordions transmit open or closed key position based on the open or closed position of magnetic (Hall effect) or contact switches mounted on the buttons and keyboard keys. The 41 black and white keys are fitted inside the accordion with one switch each. If the instrument supports key Pressure (Aftertouch), a second switch is provided for each key (for a total of 82 switches for the black and white keys). Key Velocity, if supported, does not require an addi-

tional set of switches. Instead, the Velocity is determined by the time interval between depressing and releasing a key (i.e., closing and opening a switch).

There are 24 switches for the 120 buttons on the accordion: twelve switches for the two bass rows (to produce a chromatic scale) and twelve switches for the chord buttons (three of the twelve switches are opened to produce a 3-note chord). A complex system of levers enables the buttons to share switches.

With a maximum total of 106 switches within a MIDI accordion, the instrument needs an internal microprocessor section to sort out the key positions and combinations and then send MIDI information to a sound module. Typically, MIDI-equipped accordions transmit MIDI information on four channels: one channel for the two rows of bass buttons, one channel for the four rows of chord buttons, and two channels for the black and white keys. Some MIDI accordions, such as the Petosa S-2000, transmit on seven or more channels simultaneously.

Other MIDI accordions incorporate an air-pressure transducer into the bellows section. The idea is to offer the accordionist dynamic, expressive control that is relative to the bellows action. While some manufacturers tout this feature as the breath control that most conventional MIDI keyboards are missing, debate exists regarding the usefulness of this feature.

The controversy centers around the fact that comparatively low pressures are developed within the bellows section when the accordion player holds five notes with the right hand, three chords with the left, and walks a bass line on the bass buttons. This fairly common combination results in low bellows pressure due to the number of reeds open—at least ten reeds—but the volume of air is huge. The total sound volume is large because of the sheer number of reeds vibrating. (To play a single G note on the keyboard at a similar bellows pressure results in a small sound.) Following this logic, if the combined volume of the

reeds' sound determines the instrument's volume, measuring the volume of the reeds would be a preferable method to an air-pressure transducer in the bellows.

## DESIGN PHILOSOPHIES

Since the first MIDI accordion was introduced in 1985, three fundamental styles have dominated the marketplace. The first is the all-in-one accordion that consists of the accordion, a specially designed sound module, and a control panel on the grille of the accordion.

The second approach is a hybrid system that allows for some limited control over the sound module from the accordion's grille. The bulk of the MIDI program parameter-change controls are on the sound module.

The third system is the bare-bones MIDI transmitter, in which the accordion sends note numbers, as well as Velocity and Pressure on those models offering these features.

The common element is the accordion itself. Rarely is the accordion used simply as a MIDI controller; instead, MIDI sound modules are used as background accompaniment for the accordion-dominated sound. The tonal quality of the accordion is at least as important as its MIDI capabilities and features.

## BARE BONES

With no MIDI controls on the accordion, all parameters and Program Changes are accomplished through the



A standard, piano-style Petosa accordion: 41 keys for the right hand and 120 buttons for the left.



# THE MIDI POLKA

sound module, or with a series of footswitches. The MIDI connection on the accordion is simply a standard MIDI Out port that transmits Note On and Note Off information. This combination offers a great deal of flexibility, because the accordionist can use any sound module that has greater than 4-part multitimbral operation and at least 16-note polyphony. The accordionist is afforded the same flexibility as a MIDI keyboard player and can plug his accordion into almost any MIDI system. Add a drum machine, multipedal foot controller (for on-the-fly Program Changes), sound module, amplifier, and speakers, and the accordionist becomes a complete country-club band.

Accordions are often considered to

be lifetime instruments, sometimes handed down from one generation to the next. Although they desire new capabilities, MIDI accordionists do not want to give up their traditional instruments, so retrofits have become important. In general, it is more common to

add MIDI to a medium-quality accordion, rather than modify an extremely fine instrument.

## ALL IN ONE

A few MIDI accordion manufacturers offer instruments with extensive MIDI



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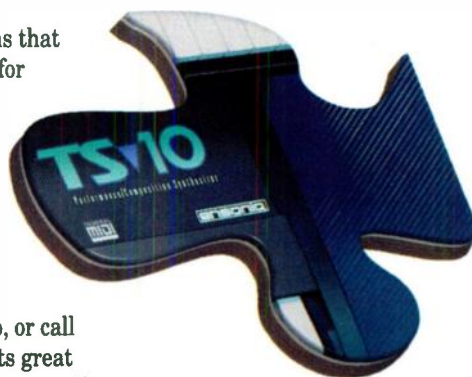
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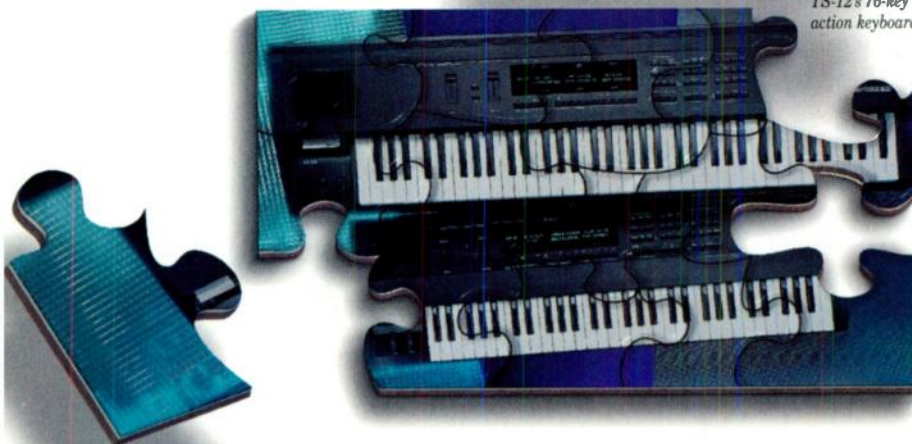
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# THE MIDI POLKA

features, which are accessed on the accordion's grille. Typically, the accordion is fitted with one or more LED or LCD displays and all of the buttons typically found on a keyboard or sound module. The accordion connects to the sound module (which has no buttons or knobs) via a multiconductor cable with something other than 5-pin DIN plugs on each end.

The sound module is a black box containing all of the circuitry and ROM sounds that are too bulky or heavy to fit inside the accordion. Often, these systems are 16-part multitimbral, with 32-note polyphony, three drum kits, and 256 sounds. The advantages of this scheme include fewer or no footswitches (although a volume pedal can be added) and the inclusion of drum sounds in the sound module.

With the MIDI controls mounted on the grille of the accordion, the accordionist has to look around the corner of the instrument to see the MIDI settings or initiate control changes. Unfortunately, the inability to change sound

modules limits the system's flexibility. Unless the original manufacturer offers future upgrades, in a few years the accordionist is left with inadequate MIDI capabilities in a lifetime instrument. Because of these drawbacks, this type of MIDI accordion is rapidly losing ground to the hybrid MIDI accordion system and will soon be unavailable on the new-accordion market.

## HYBRID MIDI ACCORDIONS

As the name implies, the hybrid MIDI accordion offers features from both the bare bones and the all-in-one MIDI accordions. The accordion is connect-

two Banks of 128 outgoing Program Changes, bellows dynamic control, MIDI Tempo control, Transposition, movable keyboard splits, key Velocity for both treble and bass parts, and Channel Pressure. Footpedals and switches can be programmed to send up to five Banks of 99 Program Changes, 128 Control Change messages, and Pitch Bend.

In short, most of the features found on the average keyboard controller are available on the hybrid MIDI accordion. An additional feature of the hybrid system is that the accordionist doesn't need to look around the corner



FIG. 1: Front-panel MIDI controls on the Petosa S-2000 MIDI accordion.

ed to a control box that acts as a "MIDI traffic cop," in that it sends and receives MIDI information to and from a number of sources in addition to the accordion (see Fig. 1). Typical of many systems, the features offered include support for up to sixteen MIDI channels, 99 user preset locations, up to

of his instrument to see the grille-mounted MIDI control panel.

Most hybrid accordions are new models. One notable exception to this trend are the retrofits offered by MIDI-MAX (see sidebar "MIDI Accordion Resources"). This company provides complete retrofit packages for new and old

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# THE MIDI POLKA

accordions alike. The retrofit results in a hybrid MIDI accordion that offers many of the features found on the new models plus a few extras, such as retrofitting the accordion's buttons and keys with Hall effect (contact-less) switches.

## WHAT'S A POLKA KING TO DO?

The accordionist's first decision is whether to buy new or to have the family accordion retrofitted. Virtually any accordion can be retrofitted for MIDI. You need to remember that any MIDI retrofit that involves modifications to the tone (sound) chamber will change the sound of the accordion. Before agreeing to a retrofit, ensure that you are aware of any potential changes that may affect the sound of your instrument. Once you feel

a retrofit is right for you and your accordion, the decision boils down to features and cost. Bare-bone MIDI retrofit kits are available for less than \$650. (Owner installation is not recommended.)

New MIDI accordions (both the hybrid and the all-in-one) cost from \$3,395 to well over \$10,000. Of course, the largest part of this price difference is the relative quality of the accordions, not the MIDI features. The choices are further widened if the buyer first chooses a new accordion with the desired acoustic sound and then has the accordion retrofitted. For further consideration, the accordionist can check out the electronic accordion keyboard which combines an electronic keyboard with a 120-button left-hand section on what looks like an electronic piano. Some companies are now offering just the 120-button left-hand assemblies with a MIDI Out port.

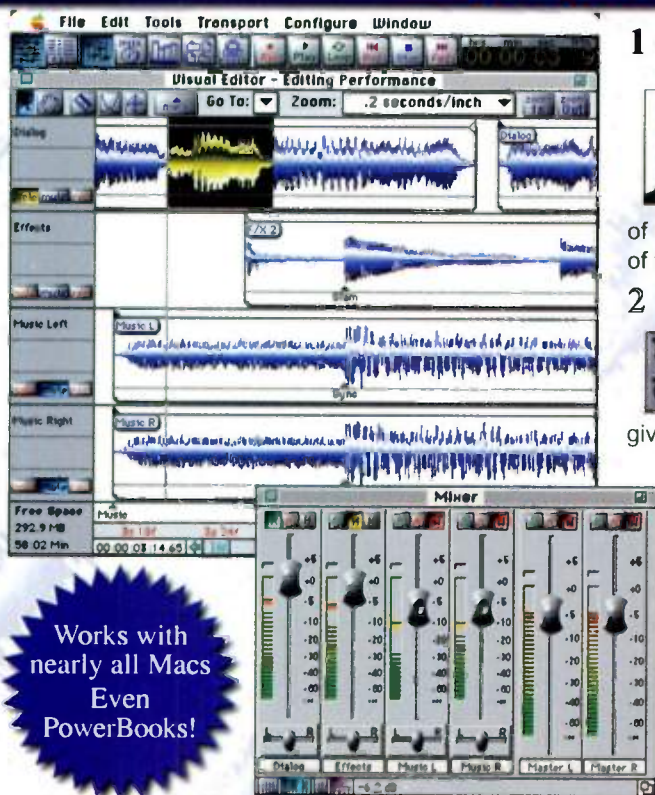


MIDI-MAX retrofit packages produce a hybrid MIDI accordion with a few extras, such as contact-less switches.

Where's a good place to get started? Call a few of the companies listed in the sidebar, but your best source may be your local accordion society. Other MIDI accordionists can offer suggestions wrought with experience.

**Scott T. Spence** is a musician and writer who has just recently gained a new appreciation for accordions and the talented artists who play them.

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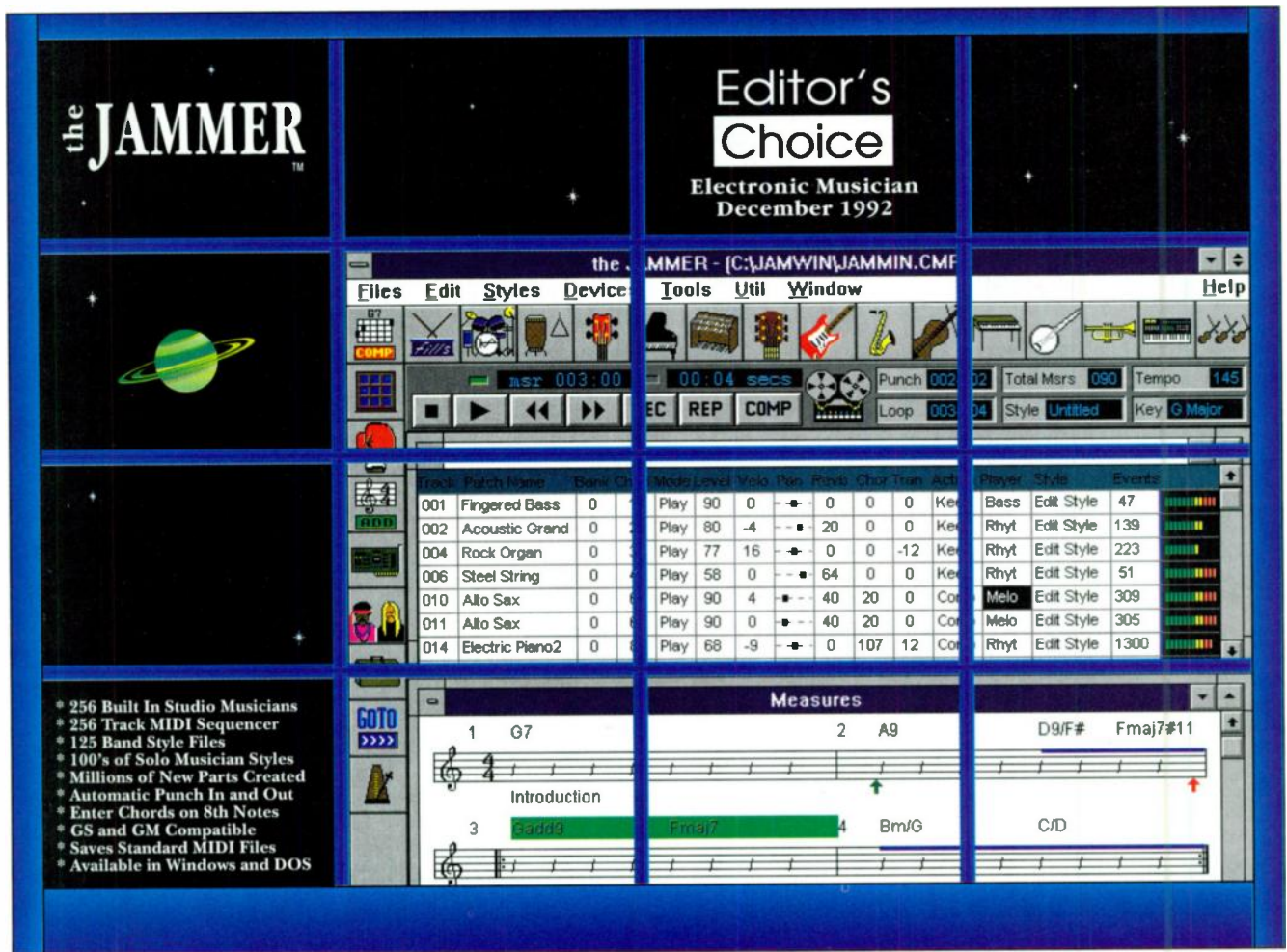




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# Technician's Tool School

*Give us the tools, and we will do the job.*

By Alan Gary Campbell

**M**any EM readers have modest hardware knowledge but considerable interest in learning more about self-service, as evidenced by the continuing requests for do-it-yourself advice. While a full-blown self-service course is beyond the scope of "Service Clinic," we can do justice to the basics. The place to start is tools.

## IT'S FASTEN-AIDING

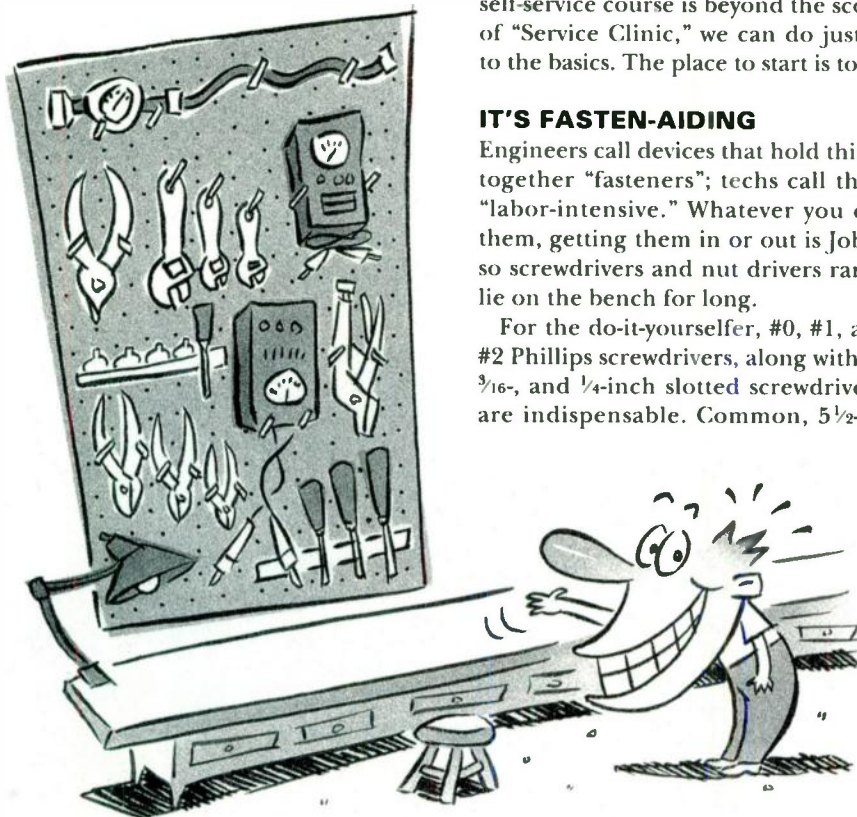
Engineers call devices that hold things together "fasteners"; techs call them "labor-intensive." Whatever you call them, getting them in or out is Job 1, so screwdrivers and nut drivers rarely lie on the bench for long.

For the do-it-yourselfer, #0, #1, and #2 Phillips screwdrivers, along with  $\frac{1}{8}$ ,  $\frac{3}{16}$ , and  $\frac{1}{4}$ -inch slotted screwdrivers, are indispensable. Common,  $5\frac{1}{2}$ - to

$7\frac{1}{2}$ -inch lengths are fine for most applications. Cheap screwdrivers should never be used for electronics work, as they have imprecise tip geometrics and provide poor tip wear, which can result in damaged screw heads. Quality screwdrivers are worth the cost and can last indefinitely. (I have a 23-year-old, Rigid brand, #2 Phillips that is still going strong, though the embossed logo on the handle has worn off.)

Unfortunately, average tool quality has diminished since the 1970s. Screwdrivers sold by department and hardware stores are rarely sufficient for tech work. Sears Craftsman tools retain acceptable quality standards, but a direct comparison of a 1974 Craftsman screwdriver and its 1994 equivalent is telling. High-end screwdrivers sold by electronics and industrial distributors are your best bet. Consider brands such as Rigid, SK, and Xcelite.

A full complement of nut drivers is also strongly recommended. Hollow-shaft nut drivers are preferred, in order to facilitate removal of potentiometer mounting nuts. Xcelite's HS6-18 set is ideal. For those on a tight budget who wish to buy nut drivers individually, the  $\frac{1}{4}$ -,  $\frac{5}{16}$ -, and  $\frac{1}{2}$ -inch sizes are mandatory. Metric sizes are also useful, though requirements vary. A socket set can augment available nut drivers, but the worn and grimy sockets you used to rebuild Aunt Martha's carburetor should not be allowed near electronic gear.



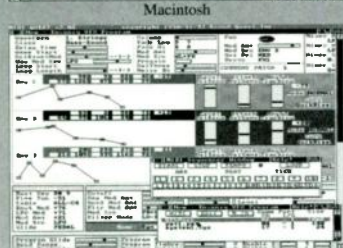
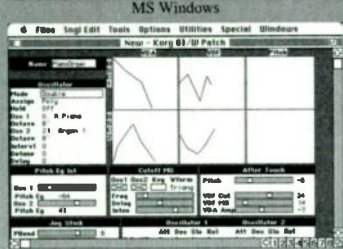
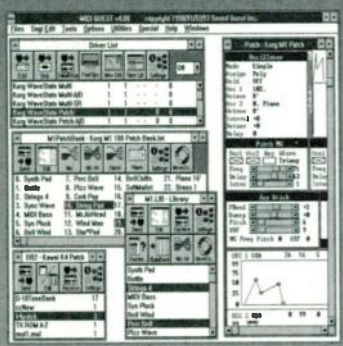
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## • SERVICE CLINIC

### DRIVERS ED

Unusual drivers can be valuable problem-solvers. Interchangeable screwdrivers—either the blade-in-handle or handle/torque-amplifier type—make handy supplemental tools. Extremely large and small screwdrivers have special uses; the former double as substitutes for pry bars, which can damage stubborn, but fairly soft, sheet-metal components in electronic equipment. Beware of inexpensive, miniature “precision” screwdrivers, which are often flimsy and can break and damage equipment. Radio Shack’s nifty Mini Driver set, catalog number 64-1969, is a better choice.

My favorite oddball driver set is the Xcelite PS-90-MM, which comprises ten Allen-wrench (“hex-key”) mini drivers and a torque-amplifier handle. What a timesaver!

Power screwdrivers seem irresistible to some aspiring techs. They have their place. Screwdriver-wielding technicians who also play keyboards or type will quickly and painfully discover that the pronator muscle is stressed by all three jobs. Power drivers can help reduce muscle strain and avoid repeated-use injury. But they can also easily damage the work and are not recommended for the novice.

### PLIER FOR HIRE

Alongside basic drivers, basic pliers are constantly required. Miniature electronics pliers, about five inches long with moderately tapered jaws and insulated grips, are the tech’s best friend. Radio Shack’s affordable Techline series includes an ideal electronics plier, catalog number 64-1807.

It’s a beautiful tool, manufactured by the Diamond Tool Company.

A larger electronics plier, about 6.5 inches, is also desirable. The Channel Lock CHK 1106 is a good choice and is available at many department and hardware stores. “Needle-nose” pliers, with long, thin jaws, are useful for tight work, forming wire, and retrieving errant parts. A Sears Craftsman is a good choice, though the quality of this plier can vary among production runs. It’s advisable to peruse the store stock for the tool with

the best alignment. A common, 6-inch slipjoint plier, available from most any source, also comes in handy.

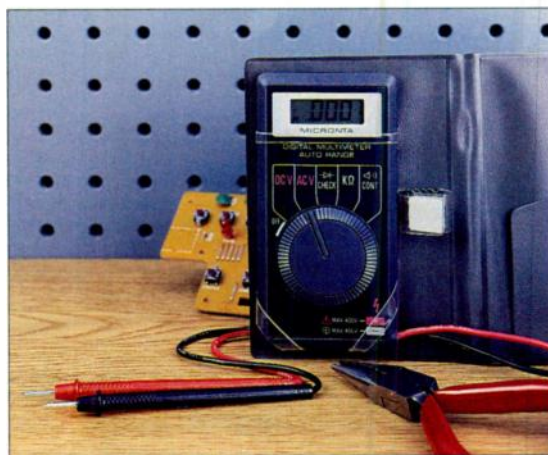
### THE CUTTING EDGE

Quality wire cutters, or “diagonal cutters,” are mandatory. A small, approximately 4.5-inch cutter—Radio Shack’s 64-1808, another Diamond tool, is ideal—and a larger, 6-inch cutter are needed. Small cutters should never be used to cut wire larger than 20 gauge, and neither cutter should be used to cut hard-drawn copper wire or any wire other than soft copper or aluminum. Cutting piano wire is out!

An ingenious specialty cutter from the Diamond Tool Company, model ST55R, incorporates three wire-stripping orifices, one each for 18-, 20-, and 22-gauge wire, spaced along the cutting surface. It performs superbly and makes an affordable alternative to expensive, professional wire-stripping devices. It’s far superior to inexpensive, stamped-metal wire strippers and gives excellent service life when reserved for stripping only.

### OTHER TOOLS AND METERS

Keeping to basics, a 6-inch, adjustable crescent wrench is a must. Also highly desirable are 5.5-inch Vise Grip pliers, a selection of needle files (Radio Shack 64-1985 or equivalent), a fuse puller/insertor (Radio Shack 270-1199, or equivalent), a heat sink (Radio Shack 276-1567), an IC pin aligner (Radio Shack 276-1594), a grounded wrist strap (Radio Shack 276-2397), and a set of antistatic alignment tools (Radio Shack 64-2230).



Radio Shack's model 22-171 digital multimeter offers auto-ranging, diode testing, audible continuity testing, AC/DC voltage metering, and resistance measurement.



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As with our 8•Bus Console series, the LM-3204 is one of those mixers that we've always wanted to have around. Mackie Designs abounds with keyboard nuts, sequencing fanatics and other Line Level Input Challenged types. Thus we boldly set out to create a line mixer that could handle more hot stereo inputs than nature ever intended. Complete with dedicated control room outputs and tape monitoring features.

But we also wanted to satisfy the Official Musician's Minimum Daily Requirements for microphone inputs. For sampling. For vocals. For live single and duo club acts.

So we supplemented the LM-3204 with two of our highly-regarded mic preamps. They have the same very impressive specs, can't-bust-'em headroom and switchable phantom power as our 8•Bus, CR-1604 and MS1202 mic preamps. Each can be patched to any of the LM-3204's 16 stereo channels.

If you currently have more inputs than channels to put them in, call us toll-free today. We'll send you detailed information on the mixer that packs the most inputs into the least space ever.

The LM-3204 from the rain forest fanatics at Mackie Designs.

# 40 BALANCED LINE INPUTS. 16 STEREO CHANNELS. 2 MIC PREAMPS. NOW SHIPPING.

NEW & NIFTY! Source Alt 3/4 switch routes Alt 3/4 bus to AUX 3 returns, creating 2 submix buses for remixing back into the main L/R buses.

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4 AUX sends per ch. accessed via two knobs & SHIFT button. AUX 1 & 3 are true stereo; 2 & 4 are mono.

5 RACK SPACES

## LM-3204

3-band EQ (80Hz, 2.5kHz & 12kHz like our CR-1604).

MUTE ALT 3/4 doesn't just mute...it assigns the channel to a separate stereo bus. Especially handy when multitracking.

Stereo In-Place Solo monitors channel without affecting main or AUX outputs. It also lets you read channel operating levels via the LM-3204's 13-segment LED meters.

Forgiving UnityPlus gain structure, adds headroom, cuts noise & gives you 30dB more gain above Unity.

Studio-quality, high-headroom, low-noise balanced mic preamps with -129.5dBm E.I.N. Complete with trim controls and switchable phantom power, they're assignable to any LM-3204 stereo channel via 1/4" TS Mic Out jacks.

Not shown but extremely important in terms of noise & headroom: Professional +4dBu internal operating levels throughout (versus wimpy, hobbyist -10dBV levels found in many competitive line mixers).

Hypersensitive  
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Solo level control and conspicuous, Rude Solo LED

Aux Return to Control Room switch routes AUX 4 returns to separate Control Room/Headphone bus so you can "wet monitor" (listening with effects without applying them to the main L/R outputs) or play along with a cue track without having it go to tape.

Elaborate monitoring: Separate Control Room & Headphone outputs w/level controls. Source from main L/R buses, tape output (when Tape Monitor button is pushed) or stereo In-Place Solo bus when any solo button is pushed.

Built-in power supply (no hum-inducing, outlet-eating wall wart) uses standard IEC cord.

Channel inserts on Channels 1 thru 4.

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Suggested retail price. Slightly higher in Canada and uncharted regions of Cygnus XI.

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Control Room outputs so you don't have to tie up your headphone output to drive a monitor amp.

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## • SERVICE CLINIC

A no-frills, 3.5-digit, digital multimeter (DMM) is a fundamental troubleshooting aid. (Simple analog multimeters are not intended for measurements in high-tech gear.) Radio Shack's affordable model 22-171 is a great little pocket meter, offering auto-ranging, diode testing, and audible continuity features, as well as the expected AC/DC volts and resistance functions. (Like most slimline meters, it lacks current-measurement capability.)

A basic logic probe is also invaluable. The BK Precision model 21, available by mail from Digi-Key, is a good choice. Write or call for a catalog and ordering information: Digi-Key, 701 Brooks Ave. South, PO Box 677, Thief River Falls, MN 56701-0677; tel. (800) DIGI-KEY.

## A LITTLE KNOWLEDGE

The above information is merely an overview of the most basic tool requirements. We will take a look at more specialized tools (and tricks of the trade) in an upcoming "Service Clinic."

Bear in mind that a basic set of tools is only one of many prerequisites to safe, effective, do-it-yourself service. No one should open or otherwise attempt to service electronic equipment without a thorough background in service techniques. Don't be impatient. We'll get to basic, safe do-it-yourself service in the next few columns.

## DON'T GIVE ME STATIC

Ensoniq has produced a very informative white paper. "Musicians Wage War Against Invisible Enemy!" details static safety considerations for electronic musical instruments. Get a copy from your service center or dealer.

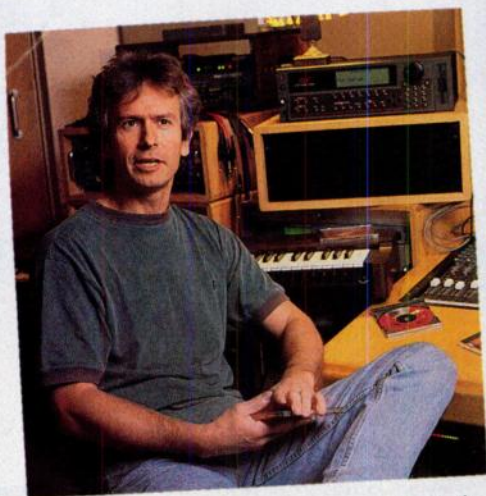
## TOUGH DOGS

Okay, super-techs, here's your chance to show off. Send in your best anecdote regarding those impossible repairs, and we might choose it for a special, upcoming "Service Clinic." Include a complete, detailed description of the equipment symptoms, all troubleshooting techniques that were tried, and the final solution to the problem. Write to "Service Clinic: Tough Dogs," c/o Electronic Musician, 6400 Hollis St. #12, Emeryville, CA 94608.

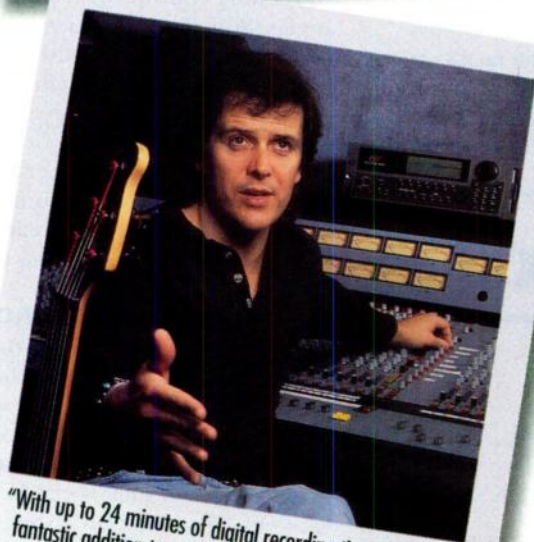
**EM contributing editor Alan Gary Campbell** is owner of Musitech, a consulting firm specializing in electronic music product design, service, and modification.



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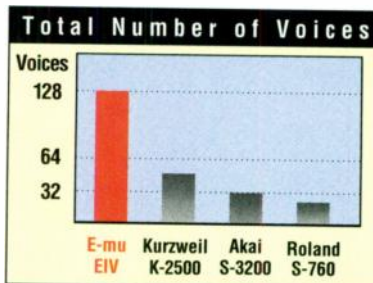
The company that pioneered digital sampling technology now redefines it for the fourth time with unparalleled functionality, elegance, and brute force power. But don't just take our word for it; Emulator IV speaks for itself.

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Emulator IV is designed to allow for easy hardware and software upgrades. Planned options include a second MIDI interface for 32-channel multi-timbrality, built-in digital effects, non-volatile flash sample memory (up to 16MB!), or an 8-channel multitrack digital audio interface.

EIV's power truly lies in what it will do for you. EIV's massive polyphony virtually eliminates voice rip-off limitations, while enormous sample memory and load-while-play functions radically reduce load time during studio or performance gigs with instant access to your sounds. And of course, EIV features the same pristine, warm audio resolution that professionals globally have come to depend on from the Emulator family.

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# Spinning Through Kaleidospace

*Independent artists are 'net surfing over marketing obstacles.*

By Michael Brown

**J**ust for a moment, close your eyes and imagine a world in which you pitch your tunes directly to more than 30 million people in 130 countries. No record labels, no agents, no starmaker machinery. Such a beautiful fantasy!

The biggest hurdle you face as an independent artist is marketing and distributing your work. Fortunately, the music business has fundamentally

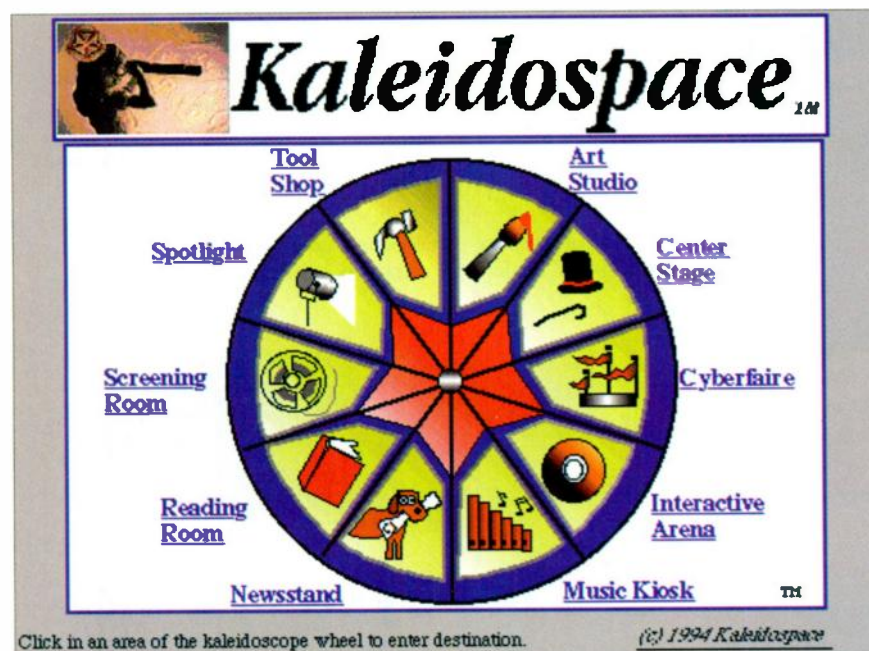
changed over the last decade. The major record labels, while still a potent force, no longer control the entire market. You don't have to choose between fighting for a big record deal and selling your music from the stage at gigs. Still, getting your music widely played and distributed without strong label support can be a tough challenge.

Okay, now open your eyes, turn on your modem, and take a ride with us on the information superhighway, where entrepreneurs Jeannie Novak and Pete Markiewicz have created Kaleidospace to make your fantasy a reality.

## CYBERSPACE COMMERCE

Kaleidospace is a way station on the Internet where musicians and other artists can showcase and sell their work directly to the consumer. Thanks to the multimedia capabilities of the World Wide Web, 'net surfers can hear small samples of a musician's songs, watch clips from music videos or concerts, listen to interviews with the artists, and more. If they like these clips, they can order a tape or CD right from their computer screen. It's like Home Shopping Club for the high-tech set. (See the April 1994 *EM* for an introduction to the Internet and the World Wide Web and the October 1994 *EM* for a guide to music resources on the 'net.)

A composer and pianist, Novak conceived of Kaleidospace after she recorded her first independent CD,



Kaleidospace is a site on the Internet's World Wide Web where independent artists, including musicians, can showcase and sell their work.



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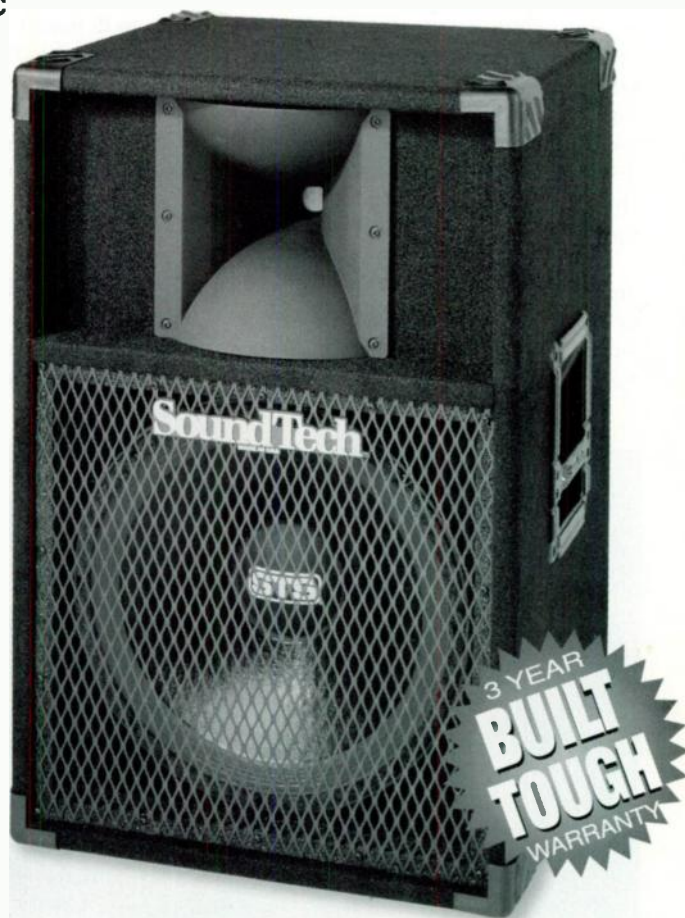
With over 25 speaker enclosures in the SoundTech line, there's one perfect for your application.

Crossovers are engineered to match our STS components

"Domed" back plates allow for extra long cone excursion. Delivers more bass because the voice coil can't "bottom-out".

Speaker cones are specially poly-coated to eliminate cone distortion and to resist moisture.

Computer tuned cabinets are made of Duraply™ and Marine grade, solid-core plywood.



### Watts in a Name

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*Reign of Fire*, in December 1993. "When I saw the multimedia capabilities of the World Wide Web," says Novak, "I realized that it was the perfect distribution medium for independent artists." Novak, who studied user-interface and game design while earning a degree in Mass Communication at UCLA, teamed up with writer, animator, and theoretical biologist Markiewicz to form Kaleidospace in January 1994.

"I call my style of music contemporary classical," says Novak, "just because I can't think of anything better. It's solo piano, but it's not new age. As a niche artist, it's very difficult to slap a label on my music. But if you were to hear a few snippets of my compositions, you'd know whether you liked it enough to buy my CD. It makes more sense for me to market and distribute my work directly to the consumer than it does to chase down a conventional record deal. Kaleidospace makes that possible."

There are about 100 artists displaying and distributing their wares on Kaleidospace, the majority of whom are musicians, followed by visual artists. Kaleidospace also showcases the work

of established artists through their Artist-in-Residence (A-i-R) program. Thomas Dolby recently participated in the A-i-R program by providing excerpts from his soundtrack to the computer animation video *The Gate to the Mind's Eye*.

"Musicians are very progressive," says Novak. "They understand how a service like this can benefit them." Although fewer in number, novelists, filmmakers, animators, scriptwriters, CD-ROM developers, and even a Croatian sculptor are also using the service.

"Writers and filmmakers are accustomed to putting together long narratives to demonstrate what they can do," Novak explains. "It's harder for them to see how a 30-second video clip or a 10-page excerpt from a novel can reach people. Music and the visual arts are more abstract; people can gather a lot after seeing or hearing only a small portion of these types of works."

#### SPINNING WEBS

When you log onto the Kaleidospace home page using World Wide Web client software such as *Mosaic* or *Netscape*,

John Sokoloff's Web page had been posted for just five days before he began receiving electronic fan mail from Spain, Russia, Brazil, and France.

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you encounter the Kaleidospace wheel. (Kaleidospace's Web address is <http://kspace.com>. Their telephone number is [310] 399-4349.) Clicking on any spoke in the wheel takes you deeper into the site, where the artists' work resides. Musicians can be found in the Music Kiosk, graphic artists in the Art Studio, writers in the Reading Room, and so on.

Once you've entered the Music Kiosk, you'll find musicians grouped by genre. "That's still pigeonholing them somewhat," Novak admits, "but people visiting the site still need to know where to look for the things that they're interested in. We don't force artists to choose a genre from a list; they can call their music anything they want. One person describes their music as 'futuristic,' another as 'hypno-romantic,' and another as 'bizarre.'"

Singer-songwriter Nancy Gaian was the first musician to market and dis-

tribute her work on Kaleidospace. She describes her new CD, *The Hero's Journey*, as "mythic pop." Gaian's Web page is typical of what you'll find in the Music Kiosk. It includes her name, a digitized photograph of her CD jacket, and the prices of her CD and audio cassette. Screen buttons display additional information, e.g., song lyrics and comments from fans, when the user clicks on them.

"Kaleidospace is a dream-come-true marketing tool for the independent artist," says Gaian. "It gives me exposure that I wouldn't be able to get any other way."


John Sokoloff and his band Twilight Blue would surely agree with Gaian's sentiment. As difficult as it is to get exposure in the U.S., most new artists don't even consider marketing their music in other countries. After being on Kaleidospace for just five days, Twilight Blue was receiving fan mail from Brazil, Spain, France, Mexico, and Russia. Another Kaleidospace client, Jamie Rio and Newmatic Slam, has been getting radio air play in Russia and in Hungary as a result of their Internet exposure.

## SURFING THE 'NET

The feature that makes Kaleidospace and the World Wide Web so cool is that you can download 30-second clips of several songs into your computer. If you like what you hear, you can order the CD. Novak says they decided to limit the length of the clips to 30 seconds for practical and business reasons.

"There are a lot of home users," she says, "who are accessing the Internet with slower modem connections. We didn't want them to spend time waiting to download files. We also wanted to avoid any problems with piracy. Our objective is to empower the artist to sell their work, not give it away. We're into teasing the audience and getting them interested in the artists' work enough that they'll buy it."

Kaleidospace is the perfect home for artists who resist being categorized by A&R reps, radio stations, and retailers. "If the industry *likes* you, but can't fit you into an existing category, they'll label you as 'alternative,'" says Gaian. "When you get right down to it, every artist's style is an alternative. With Kaleidospace, you don't get stopped by those A&R bottlenecks. There's no gatekeeper making judgments about who






### Music Kiosk

**Bartz - Interactive Ordering Quiz**

If you're uncertain about whether or not you're "right" for Bartz's music, take this short quiz and we'll let you know!

1. Which of the following images are you drawn to? (One of them is a visual representation of Bartz's music.)

2. Which of the following well-known musicians do you prefer? (One of them was the primary source of inspiration for Bartz's music.)

☐ Jim Anderson (Yes)

☐ Mark Modersheugh (Devo)

☐ Robert Plant (Led Zeppelin)

3. Which of the following gives you the best view of the world? (One of them is where Bartz would go for inspiration.)

☐ back

☐ computer screen

☐ window

4. Which of the following adjectives describes you the best? (One of them is the type of person who would not benefit from Bartz's music.)

☐ flexible

☐ pessimistic

☐ cynical

5. If you were Bartz, which of the following best describes why you're interested in getting your album on Kspace? (One of them is Bartz's primary reason.)

☐ position to so many people as possible

☐ do every with record companies and sell directly to your audience

☐ sign with a record label who underwrote your music

Answering a series of questions on Kaleidospace's "interactive ordering" page helps the artist determine if the customer is compatible with his or her style of music.

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deserves to be heard and who doesn't."

Kaleidospace exhibitors pay a \$100 one-time fee for setting up the artist's Web page. For a musician, that includes one audio clip from their CD or tape, a copy of the album cover, excerpts from the album liner notes, and the artist's photograph and bio. It might also include a short clip from a music video or concert footage, an audio clip from a radio interview, the artist's tour schedule, and comments from fans. More audio and video clips can be embedded into the page, but

they cost an additional \$25 each. Exhibitors also get an Internet e-mail address so that they can correspond with fans and other interested parties. (If the artist doesn't have direct access to the Internet, Kaleidospace will act as an intermediary.)

After their page is activated, the artist can choose between two fee structures: A monthly flat fee of \$50, or a ten percent commission on sales. In both cases, the artist is allowed an unlimited amount of storage on the Kaleidospace server.

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### Tube Technology So Quiet, It's Great for Guitar

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☐ Most Wanted - Nancy Gaian

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That we can't perceive  
Are you feeling it too?  
Don't walk away

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Singer-songwriter Nancy Gaian's Web page includes a photo of her album cover, lyric sheets, and information about the artist.

"I prefer the flat fee," says Novak. "Taking a percentage of the artist's sales sounds too much like a record company deal." Each of the artists with whom we spoke, however, had chosen the commission deal. Both Kaleidospace and the concept of purchasing goods and services over the Internet are very new. Although no one was dissatisfied, no one reported astounding sales results, either. "I'm confident it will work," says Gaian, "but it's so new that we're just hanging with each other right now."

### START ME UP

Kaleidospace's Web server runs on a Sun SPARCStation 2 workstation and several Intel Pentium-based computers, all running the UNIX operating system. Video, audio, and still photographs and slides are digitized on Macintosh Quadra AVs and Power Macs.

"This type of business doesn't require nearly as much capital as most other audio- and video-related operations," Novak admits, "because you're working with material that's going to be delivered over the Internet. The maximum resolution of your graphics need be only 72 dpi, and your digital audio need be recorded at only 8-bit



resolution and a 22 kHz sampling rate.

"There's no question 16-bit audio sounds better," Novak continues, "and some of us provide 16-bit samples for those people who can take advantage of them, but it takes the user twice as long to download clips of that nature. There are also many systems out there that are not capable of playing back 16-bit audio."

Novak and Markiewicz have invested \$30,000 into Kaleidospace and report that the company is already profitable. "We're self-financed," Novak boasts. "We hocked our credit cards to get started, but we're solvent, which is more than you can say for most start-ups." Most of Kaleidospace's current revenues, however, come not from Kaleidospace commissions, but from the consulting fees the partners collect for helping other companies develop Web sites.

Kaleidospace doesn't keep an inventory of the artists' works, although they plan to do so eventually. Instead, when customers decide to buy a CD or some other work, they fill out an order form right on their computer screen. The

Kaleidospace staff takes the order—yes, they accept credit cards—and gives the customer's shipping address to the artist, who ships the product to the customer. After the order is shipped, Kaleidospace sends a check to the artist, less any commission owed.

### COMPATIBILITY TESTING

In order to make it even easier for customers to decide if they might be interested in purchasing an artist's work, Kaleidospace recently implemented what they describe as an "interactive ordering" system. This system lets the artist and potential customer compare creative influences to determine whether they're appropriate for each other or not.

"When I was asked to visualize a scene, object, or creature that could be associated with our music," says Sokoloff, "I responded with 'the Sierra Nevada mountains, late summer dusk, cold air, warm smiles, fog-shrouded bridges, forbidding waters, illusion of security, and Peru's Machu Picchu.' The object is to help the potential customer feel more comfortable with the type of art or music that you produce."

### SLEEPLESS IN HOLLYWOOD

Does Kaleidospace represent the future of the record industry? Or is it just another form of vanity press for recording artists who can't make it in the mainstream?

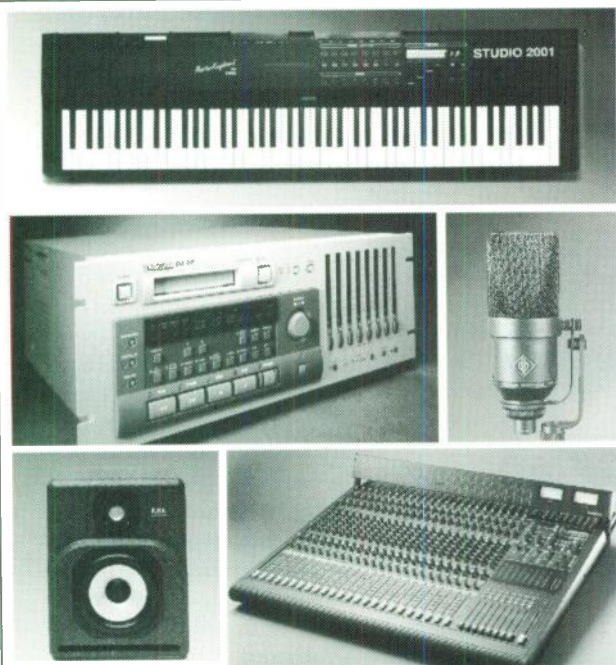
Well, it's doubtful that any mainstream record labels are losing sleep over Kaleidospace. The Internet and the World Wide Web are still in their infancy, and no one knows their commercial potential. On the other hand, surveys indicate the typical Internet surfer is less than 30 and is either a college graduate or a student. It's hard to imagine a more ideal demographic for record buyers, especially for new artists.

As for being a vanity press, there's certain to be an element of that, simply because no one is filtering out all the whackos who think they were born to be the next King. But that's also the beauty of it: The people who buy the records are the ultimate judges of who deserves a shot at becoming a star.

**EM Associate Editor Michael**

*Brown has never been published in a vanity press. Honest.*

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# The Face Behind the Curtain

*Personal managers are the unseen heroes of artistic triumphs.*

By Michael Brown with  
Michael Molenda

**A**lthough a personal manager may be the critical factor in an act's success, surprisingly few musicians really know what a manager does. Don't panic, I'm not going to quiz you. There's a reason why so many artists—whose careers may ultimately depend on the business acumen of a savvy manager—are ignorant to the whys and wherefores of artist management. You see, managers do most of their work *behind* the scenes.

Chances are, you'll never even hear about an artist's manager unless you read the music trades or some juicy scandal erupts. Because most managers try to get publicity for their clients,

rather than themselves, it's easy to see why a number of myths and misconceptions about personal managers have developed. (And why normally talkative musicians go absolutely silent whenever someone asks a question about representation.)

Luckily for you, **EM** can peek behind the scenes and reveal the nuts and bolts of artist management. Read on, and we'll tell you exactly what a manager does, when you should seek management, and how much you'll pay for career guidance.

## WHAT MANAGERS DO

A manager's primary objective is to advance his or her client's career. During an artist's development phase, that often means providing constructive criticism and mapping out a career strategy. A good manager/artist team works together to set realistic goals and ensure that songwriting, image presentation, and other creative and marketing factors are as strong as they can be.

"In the beginning, the manager should be trying to generate interest in the act," says management consultant Nadine Condon, whose clients include Melissa Etheridge and Craig Chaquico. "When the musicians are working day jobs and trying to make a demo, the manager should be printing flyers, issuing press releases, and talking up the band to local magazines and newspapers."



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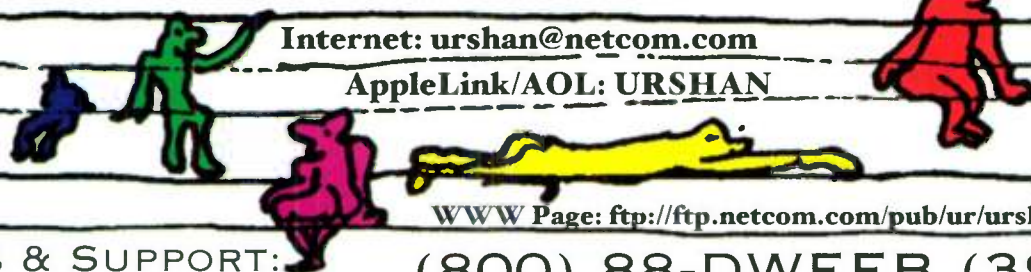
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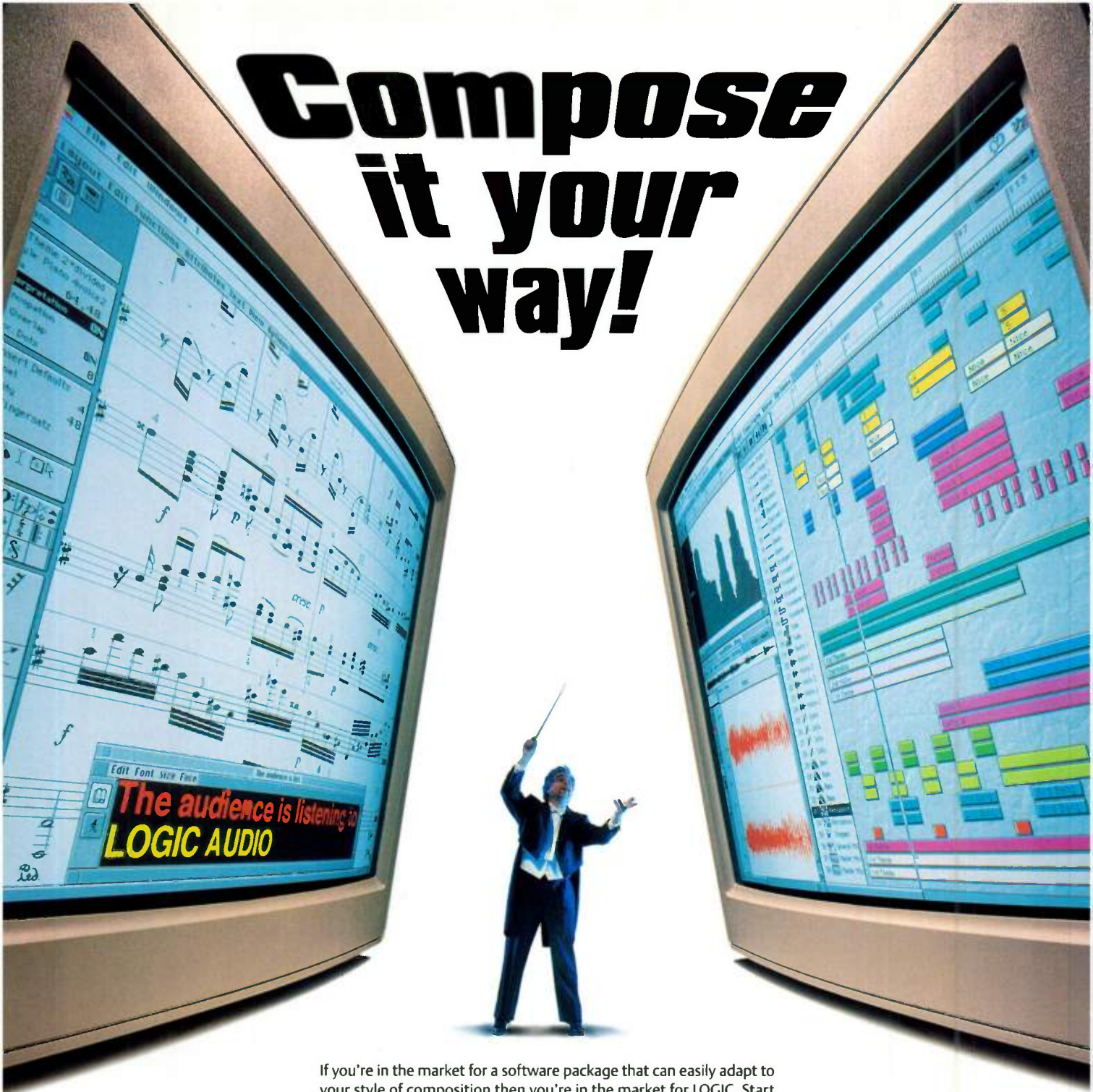
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## ● WORKING MUSICIAN

Managers also work to set their clients apart from the crowd. "It's important to understand everything that's going on in the industry at a given time," maintains David Lefkowitz, who manages Primus. "If one style of music is flooding the market, there's going to be tremendous competition for radio play, press coverage, and opening slots on big tours. You must point the artist toward a stylistic niche that isn't over-exploited. The artists still define their image, of course, but the manager can certainly help refine that image until it is something fresh and unique."

One of a manager's most obvious—and most important—tasks is shopping an artist to record labels. Few artists can hope to score a label or publishing deal without representation. And

because of the huge investment needed to develop successful recording acts, labels typically deal only with industry veterans who have proven track records. An unrepresented artist seeking his or her first record contract is hardly an attractive prospect. In other words, it's probably easier to win the state lottery than to score a record deal with an unsolicited demo.

A reputable manager who has handled or "discovered" commercial talent, however, can walk into just about any record company office and get a demo tape played for the right ears. Unlike artists, who always think they deserve a deal, a manager won't waste an executive's time with an act that's subpar or not yet ready for the market. Smart managers often increase their

### MANAGEMENT MYTHOLOGY

Let's dispel a few fables here. Managers are not sycophants, thieves, or power-trippers who can nonchalantly make or break a band's career with a wave of a hand. Nor are they booking agents, bankers, or loan sharks.

"One of the biggest myths about management," says artist manager Michael Aczon, "is that a manager will bankroll your career. Artists bankroll their *own* careers with the royalties and advances they earn. But when prospective clients ask me to manage them, many will also ask, 'How much money will you invest in my career?' Even if I answer 'yes' to the first question, my answer to the second is always going to be 'nothing.'"

Most personal managers won't even touch a band's finances. Instead, the task is delegated to an accountant or a business manager. "The manager should stay out of the day-to-day handling of the band's money," advises Primus manager David Lefkowitz. "As soon as the manager starts writing the checks, the opportunity opens for an atmosphere of paranoia and mistrust to develop."

Speaking of paranoia, what about all those stories of bands that failed because they were ripped off by greedy managers? That's a myth, too, according to management

consultant Nadine Condon. "In most cases, there's really not *that* much money to be stolen in the first place," she maintains, "and very few managers would risk destroying their careers by making such a move."

Another persistent myth is the perception of the manager as a booking agent. In reality, these roles are usually played by two different people and, to prevent conflicts of interest, many states legally bar managers from booking the acts they represent. "A booking agent's sole responsibility is to find live gigs for the artist," explains Aczon. "Unlike the manager, the booking agent never has to consider the big picture."

Of course, some myths sprout from a seed of truth. For example, some managers *will* occasionally invest money in a client's career. "In some cases, it's a long-term investment," says David Gross, who manages guitarist Harvey Mandel. "If it's a pet project, or if I'm really behind the artist, I'll put my time—and sometimes my money—into a new act. But I've got to see that spark."

In addition, industry heavyweights can sometimes break a few rules and substantiate certain myths. "Some managers are so heavy," says Lefkowitz, "that they generate myth-making. But very few people are really that powerful."

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## MUSICIAN



## ● WORKING MUSICIAN

clout by entering a relationship with a heavyweight music lawyer. If the lawyer has enough industry connections and power to seal a deal, the manager may even step aside and let the legal counsel handle the actual pitch. All-in-all, a manager's talent for assembling a team of influential people to champion an artist is often the critical factor in securing record labels.

Finally, a good manager strives to save artists from themselves. Too often, an artist falls victim to a terminal case of self-importance, which can result in tragic creative decisions. In these instances, the manager should be an objective and trusted advisor, who always tries to steer the artist back to the agreed-upon career path.

"A manager can't be afraid to tell the artist when something isn't good," says David Gross, who manages legendary guitarist Harvey Mandel (Canned Heat, Rolling Stones, and countless other sessions).

### DEAL-MAKING MACHINERY

The counsel of a strong, savvy manager is critical when an artist is ready to sign

his or her first record contract. Too often, the excitement of an impending deal overwhelms an artist's business sense, which can make contract negotiations a dangerous game.

"Part of a manager's job is to educate their client to make the right choices when it comes time to deal," says entertainment lawyer Michael Aczon, who also manages the bands Midnight Voices and LCD. "For example, one reason why there are so many one-hit wonders in the music industry is because thousands of record companies, publishing companies, production companies, and management firms are just waiting to pounce on the 'flavor of the month.' These acts are usually promoted like crazy and then abandoned when the promoter moves on to the *next* big thing. As exciting as it may seem for an artist to make the quick kill, it's not the best way to establish a long, fruitful career."

Obviously, getting the artist

signed is only half the battle. The manager must ensure that a label is solidly behind their act; otherwise the artist will never get the exposure needed to build a fan base.

"A manager must push the record label to do everything they can for the artist," stresses Condon. "First, there



Management consultant Nadine Condon, shown with million-selling rock diva Melissa Etheridge, says the most common mistake artists make is to turn *everything* over to their managers.

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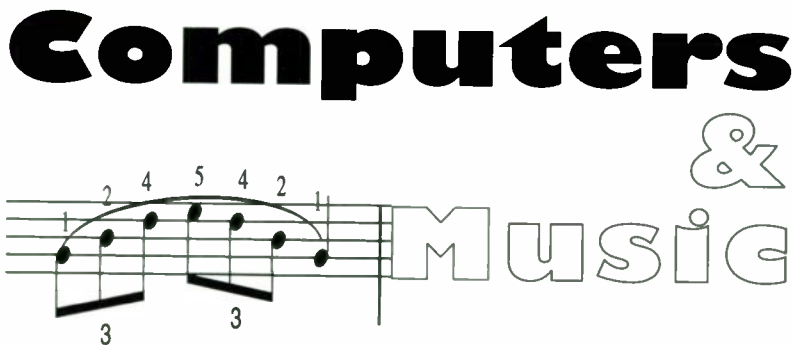
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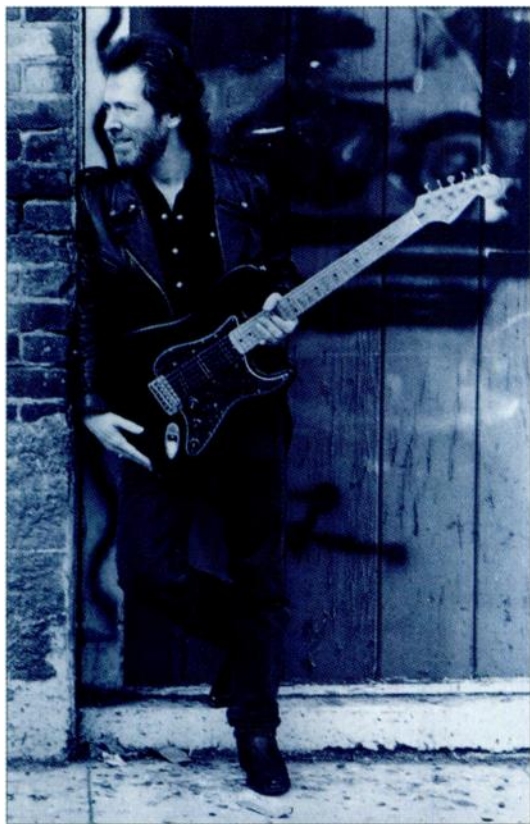
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Blues guitar legend Harvey Mandel is managed by David Gross, who believes, "if artists do what they love, the money will follow."

needs to be an adequate recording budget and money to promote the act. The label might be handling 20, 30, or 50 acts. You want to be one of the *five* acts that they're actually working. It's the manager's job to ensure that label executives stay interested in the artist, otherwise, the project will get lost in the shuffle."

The manager's job doesn't end there, either. They also coordinate the other members of the artist's team, including the lawyer, accountant, booking agent, road manager, and business manager. In addition, they must interface with all the label personnel working the act, such as A&R executives, promotional reps, and the business-affairs staff. Despite all this, some artists tend to forget the critical role a manager plays in a project's success.

"I've seen it happen far too many times," says Aczon. "When an act is offered a record deal, the musicians get collective amnesia about the manager's contribution to winning that deal. The band just grumbles about 'this person' who is coming in and taking a chunk out of *their* deal."

## ARE YOU READY?

Having a manager sounds like a pretty good deal, huh? It's nice to have someone handling all the business aspects of your career, while you concentrate solely on being an *artiste*. However, if your creativity isn't producing any revenues, you'll find it very difficult to convince a reputable manager to work with you.

"Developing artists often look for management too early in their careers," says Condon. "The rule of thumb is, if you can do it yourself, you should do it yourself. You certainly don't need a manager when you're playing the local club circuit. But when a label calls and expresses interest in your demo, *then* you need a manager."

Some musicians may refute Condon's advice, believing that their obvious talent should be enticement enough for a manager. These artists should take a hard look at where they stand in the industry. If you're consistently

playing to the bartender and six disinterested winos at trashy clubs and can't even get it together to record a demo, face it, you're probably not ready to burn up the album charts.

Look at your career from the manager's perspective. Before a manager commits his or her resources to develop an act, they must believe there's a chance at some kind of return. Believe me, no one would undertake the constant, crippling headaches of artist management if there wasn't the prospect of a big payday. Even in best-case scenarios where an artist does possess commercial talent, there's no guarantee they'll find a large public and sell massive amounts of records. Many managers understandably hedge their bets by seeking out clients who are already making some noise at the record labels.

"Many managers won't take on an act unless the artist already has something going on," says Gross. "So don't even look for a manager until you establish a local following and have enough material to put out at least one album."

Unfortunately, not every band starts its career with an industry buzz. The

Beatles were turned down by just about every label in England before that fateful meeting with George Martin at EMI Records—a meeting that was arranged by the band's manager, Brian Epstein.

"I think that a band certainly needs to manage itself for awhile and hone its performance skills before seeking management," says Aczon. "But having said that, I also believe that an act needs to find a manager who believes in them when nothing is happening and is willing to wait it out."

## HAPPY TOGETHER

The artist-manager relationship is an extremely close one. Therefore, it's critical that the parties involved are compatible. "Artists hire lawyers," says Condon, "but they *marry* their managers. That's how much time they spend together."

Forging a long, successful alliance with a manager requires starting off on the right foot. Be sure to quiz potential managers on their industry clout, past and current successes, and musical tastes. ("I always compare record collections with the artist to see if there's a musical match," says Aczon.)

"A band should ask about the manager's connections with the industry, and how he or she would go about representing the band to labels," advises Lefkowitz. "Ask what the manager would do first: shop a demo, book showcases, or help develop the act. You should also get the manager's take on the band's potential and the day-to-day protocol he or she follows when working with artists."

Successful creative relationships require vision, so test the manager's strategic chops by asking for a tentative long-term plan. The manager should be able to articulate where he or she sees the artist in one year, and again in five years. Aczon asks the same question of his potential clients. "I'll often turn career-planning queries back to the artists," he says. "I want to know where *they* see themselves in both short- and long-term scenarios. Visualizing career strategies is another way to ensure the artist and I are compatible."

The manager-artist relationship is far from one-sided. Managers also have career concerns, and they seek out artists who have the drive to succeed. "I look for lifers," reveals Condon. "I want to work with people who see themselves performing music for a living when



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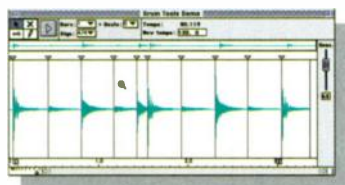
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## ● WORKING MUSICIAN

they're 50 years old. I also look for loyalty and hard workers. I have the most respect for artists who do a lot of the career footwork on their own and don't whine. Those are the people who are going to go somewhere.

"Of course, the bottom line is that the product has to be there," Condon continues. "You can work on everything else, but if the artist doesn't have good songs, you're dead."

### THE CONTRACT QUESTION

We've already established that managers don't work for free. However, there is no hard-line industry standard for what they do get. Generally, management fees run between fifteen and twenty percent of the artist's *gross* income. If that seems like a lot, keep in mind that Colonel Parker reportedly pocketed 50 percent of Elvis Presley's earnings.

"It's fairly common," says Lefkowitz, "for an established artist to pay their manager fifteen percent and their booking agent ten percent. But if a band is new, and they know the manager isn't going to see any money at the front-end of the relationship, they might be inclined to give the manager a higher commission to shop a record deal, find an agent, and do the whole routine."

The revenue streams on which management commissions are based are not necessarily limited to record sales and live gigs. "Everything is negotiable," points out Aczon, "but management fees typically cover everything that the artist does in the entertainment industry. That includes commercial endorsements, music publishing, producing royalties, film contracts, and other creative properties."

As for management contracts, most lawyers advise getting everything in writing. However, some managers are comfortable working with verbal agreements. (Technically, a verbal agreement is as legally binding as a written one, although if a dispute arises, the terms of a verbal agreement can be difficult to verify.)

"Some of my clients are under written contract," says Gross, "and some of my agreements are verbal. A few relationships are even based on a handshake. In many cases, I might work with an artist for some time before we mutually decide to put something in writing. Usually, it's just to protect each other in case either of us gets hit by a truck. We'll write something that covers

all the points, stick it in a file cabinet, and hopefully never look at it again."

On the other hand, Condon believes written contracts are extremely important once a record deal is on the table. "Until then," says Condon, "everything can be done on a handshake. But as soon as a record company gets interested, it's imperative that a management contract be written up to protect both parties."

Every contract is different, but the typical agreement covers five years. Some contracts carry a clause that terminates the contract if specified revenue projections are not achieved. Other contracts might cover only a single project, or span a two- or three-record deal, with options available to extend the relationship.

It's also important to remember that any contract—even a written one—can be broken or renegotiated. "The bottom line," says Aczon, "is that any contract can be busted up. The real key is, do the manager and the act have a good relationship? If they do, the relationship can last forever."

### CLOSING THE DEAL

Having a manager doesn't guarantee success, but artists who go it alone are usually a good bet for failure. Sure, some alternative acts are having success with the DIY approach—recording and distributing their own records, booking their own "van" tours, and coordinating home-grown promotional efforts—but few of these pioneers will achieve lasting careers without some sort of management. Today's music industry is just that hard.

So if you have trouble getting the attention of a desired manager, be gently persistent. The best managers are extremely busy, but they're also on the look-out for future prospects. Don't give up. Invite the manager to your gigs, and be sure to keep him or her on your mailing list until you establish a connection.

When you do enter a relationship with a manager, hopefully it will be a union of mutual respect and honest friendship. However, a trustworthy and loyal alliance doesn't mean that you should abdicate personal accountability for your business affairs. Instead, consider Nadine Condon's sage advice: "If most artists were more responsible *earlier* in their careers," she says, "they'd have more money *later* in their careers." ●

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- 100 • Ensoniq KT-88
- 112 • 3D Sound The Piano CD-ROM
- 115 • A.R.T. RXR Elite Stereo Reverb
- 120 • Turtle Beach Quad Studio 1.0 (Win)
- 124 • Massey SoundMorph 1.08 (Mac)
- 127 • Yamaha RY20 Rhythm Programmer
- 132 • PG Music Band-in-a-Box Pro (Win)

## Ensoniq KT-88

By Geary Yelton

**Digital piano  
meets mature synth  
workstation.**

As soon as I began playing the Ensoniq KT-88, I recognized its market niche. It's a synthesizer for any kind of piano player, whether a cocktail pianist, church musician, music educator, pop musician, or symphonic composer.

As a digital piano, the KT-88 is nearly ideal. It has 88 keys, a piano-like action, and a fine variety of acoustic and electric piano sounds. (Ensoniq's KT-76 offers a similar 76-key weighted action.) You get enough polyphonic voices—64—to prevent obvious voice-robbing, even when playing arpeggios with the sustain pedal down. Its tough plastic and metal body resembles the texture of painted wood, contributing to its dignified look and feel. There's even an

(just like an acoustic piano), and it never gets very warm.

As I explored the KT-88, however, I found that what appears to be a digital piano is also a fine synthesizer whose forte is emulating acoustic instruments. With 64 voices, up to three voices per key and six megabytes of waveform ROM, this 8-part multitimbral synth is capable of some thick sound layers. As the heart of a sequencing system, there are plenty of voices to go around. An onboard sequencer and a stereo effects processor make the KT-88 a self-contained MIDI production studio.

Many of the KT-88 features remind me of the comparably priced TS-10 (reviewed in the November 1993 issue) and more expensive TS-12. However, the KT-88 has no Patch Select buttons, no Hyper-Waves, and no ability to edit and play ASR/EPS samples.

### ARCHITECTURE

Except for the number of keys, the KT-88 is identical to the KT-76. Both instruments are descendants of the Ensoniq KS-32 (reviewed in the November 1992 *EM*), but with twice the number of voices, new waveform ROM, new effects, General MIDI, and dynamic stereo panning. The KS-32 inherited its architecture from Ensoniq's SQ-1, SQ-2, and SQ-R synthesizers, so if you liked those instruments, there's more to like in the KT-88. Each sound uses three voices, and each voice contains an oscillator; two nonresonant, multi-mode filters; three envelopes; one LFO; and matrix modulation from any of fifteen simultaneous sources (see Fig. 1).

Up to four banks of sounds can be accessed with the Bank button: ROM, Internal, and—if you have a RAM or ROM card—two banks of card sounds. Each bank contains 80 sounds. Four banks, twenty drum kits in ROM, and 128 General MIDI sounds total 468 sounds available from the KT-88 with a card at any time. These sounds can be arranged into as many as 100 presets, each combining up to eight sounds.

The ROM wave catalog contains 211



Ensoniq's KT-88 and KT-76 combine the best features of a digital piano with a quality synth-based workstation. The two instruments are identical except for the size of the keyboard.

optional music stand (MS-1; \$49.95), which pops into place with no assembly or tools.

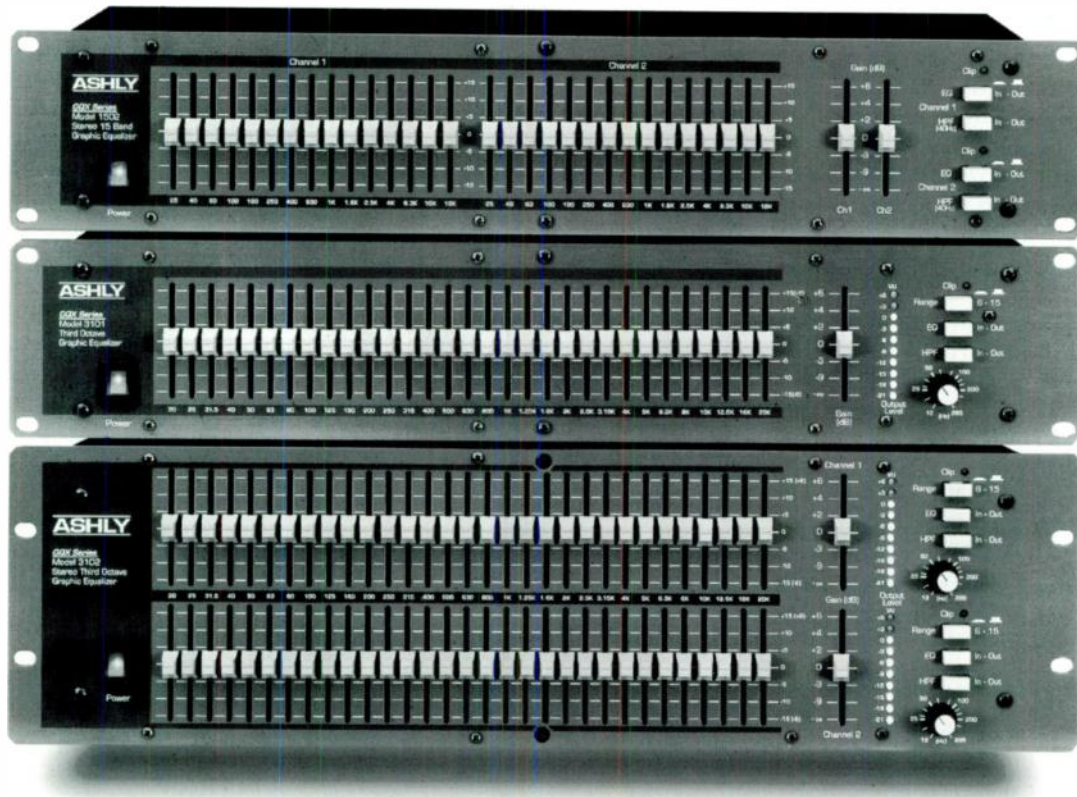
With six or seven keyboard instruments of my own, there's no room for the KT-88 in my bedroom studio, but it looks right at home in my living room. I can leave it turned on all the time



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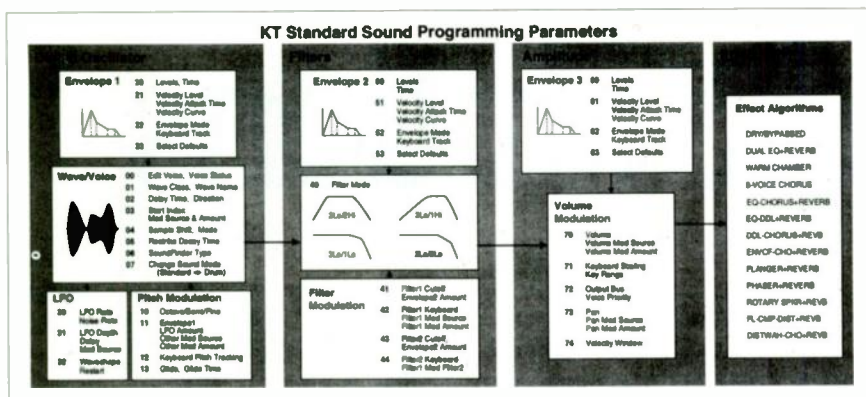
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**FIG. 1:** The KT-88/76 programming parameters will be familiar to KS-32 and SQ-series veterans. A sound uses three voices, each containing these parameters. (Courtesy of Ensoniq Corp.)

different waveforms divided into fourteen categories. These include acoustic sounds, analog and digital synth waves, and Ensoniq Transwaves. Waves can be played backward, or offset to begin playing somewhere other than the beginning. An unusual feature called Sample Shift can move the multisample split points, which alters the samples' range, creating timbral variations such as munchkinization.

You can also affect tuning with pitch tables, making it possible to play music with nonstandard temperaments. The 34 pitch tables include alternate historical tunings, Middle Eastern, Far Eastern, twentieth-century composers, and one that reverses the keyboard. The alternate pitch tables are easily turned on and off but aren't saved with individual sounds. You can't, for example, automatically call up the Indian Raga tuning every time you select the Sitar sound. You also can't create your own tuning tables within the KT-88.

## CONTROLS AND CONNECTIONS

Designed and built by Italian keyboard-maker Fatar, the KT-88's keyboard feels exceptionally good for a synthesizer. Its flying-action, weighted-key mechanism rocks to simulate the movement of a piano hammer.

The action felt piano-like to me, but when I put it in the hands of my favorite piano teacher, she could detect differences in both ends of the key's travel. She said the key's initial resistance to movement and the moment the imaginary hammer strikes the imaginary strings distinguish it from the real thing. She complained of some slight unevenness in the touch response from one key to the next, something I was

unable to detect no matter how hard I tried. Nonetheless, she admitted it feels more like an acoustic piano than any synth she's played.

The keyboard is Velocity-sensitive, of course. Although the KT-88's synth section doesn't recognize Release Velocity, the keyboard can transmit it. Ensoniq has provided fourteen Velocity curves for customizing the keyboard's touch response. Six curves are designed specifically for piano; pressing down a key slowly and softly will not trigger a sound, as with an acoustic piano. The six Synth curves are identical to the Piano curves, except that a very soft, slow touch triggers a sound with a low Velocity value. The other two curves produce fixed Velocities of 64 and 127. Clearly, Ensoniq designed these curves based on human responses, rather than the more common mathematical (linear/sine/cosine) approach. It's literally a nice touch.

Like other Ensoniq instruments, the KT synth section receives both Channel and Poly Pressure (Aftertouch), but the keyboard only sends Channel Pres-

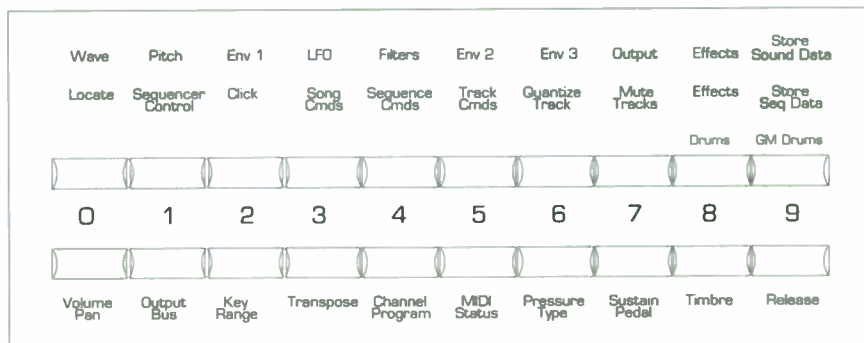
sure. Pressure is adjustable to four levels. At the softest setting, little pressure is required to trigger Aftertouch, and the hard setting offers the widest range of control.

The obligatory pitch bend and modulation wheels are set at a slight angle to make them more comfortable to reach when you're playing at the high end of the keyboard. The mod wheel can be assigned to modulate pitch, volume, effects depth, and the like. You can adjust the pitch bend so that only the notes from keys held down are bent, without bending notes that are sustaining but not held down. This is perfect for emulating pedal steel guitar. (Incidentally, the KT-88's pedal steel sound is very cool.)

The front-panel controls are laid out in a logical fashion. There are two sliders for volume and data entry and 48 buttons. The LED display is the best I've seen on an Ensoniq instrument, capable of displaying 32 large, well-lit characters.

The twenty buttons directly below the display serve quadruple duty, altering their functions depending on the mode (see Fig. 2). When the Select Sound button is pressed and its LED lit, they're program select buttons. In the Select Seq/Preset mode, they're sequence select buttons. When the Edit Sound button is pressed, they're used to change waveforms, alter envelopes, tweak filter settings, access effects parameters, etc. When the Edit Seq/Preset button is pressed, the same buttons let you maneuver your way around most of the sequencer functions.

By pressing the Edit Track button, you can alter MIDI assignments, volume, panning, transposition, key ranges, and so on, for each part. The



**FIG. 2:** Depending on the mode, the twenty buttons directly below the display can select programs or sequences, edit the synth and effects parameters, and negotiate the sequencer functions. (Courtesy of Ensoniq Corp.)



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The CBX-D5 is well connected with the major recording software programs on the Macintosh and Windows platforms. Emagic, Mark of the Unicorn, Opcode and Steinberg's CuBase Audio all feature CBX-D5-specific advantages.

The CBX-D5 is equally well connected

in hardware: Analog in/out via balanced XLRs. AES/EBU in/out. SPDIF in/out. Y2 in/out (for connecting to other Yamaha digital audio products like the DMC1000). In short, the CBX-D5 makes it possible for you to send your music to any destination in any manner. Anything less and you risk major compatibility problems.

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Here are some of the new 3.0 features:

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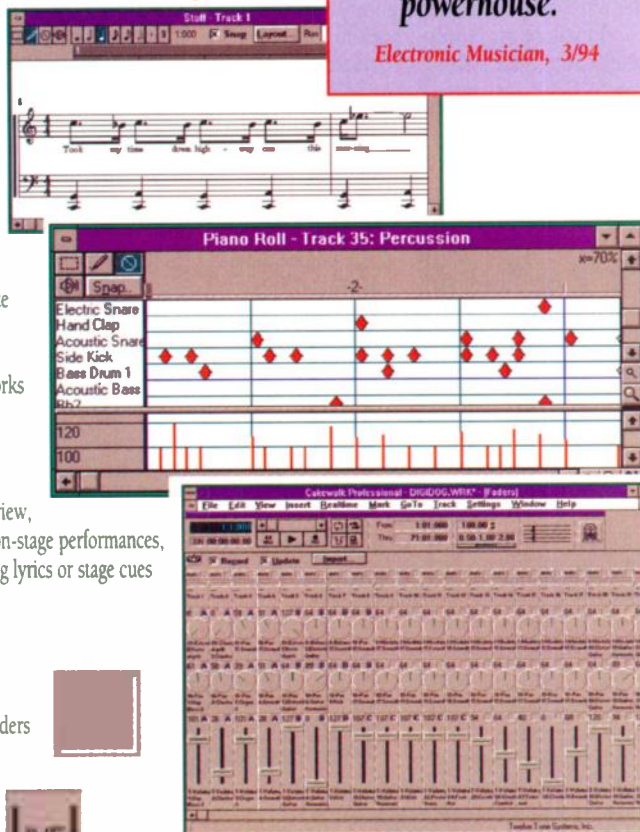
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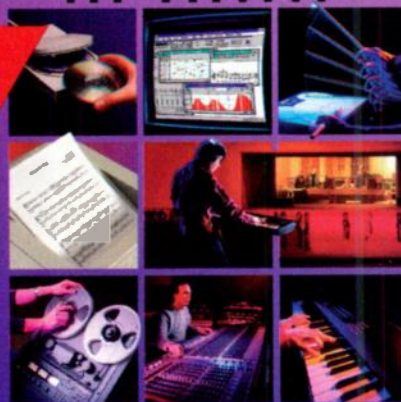
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text labeling these twenty buttons is color-coded, so you're always aware of each button's function, no matter what the mode.

In the Select Sound mode, the left and right cursor buttons enable the unique SoundFinder function. SoundFinder lets you group similar sounds, such as acoustic pianos, vintage synths, or pitched percussion, so that you can easily scroll through every sound in a group. SoundFinder serves as a sort of database where sounds are sorted by type. Sounds can be user-assigned to any of 31 predefined SoundFinder types. The SoundFinder function is handy when you're arranging a song and want to try, say, every electric bass to find the one that works best.

One of the KT-88's handy new features is Transpose Keyboard, which globally transposes the entire keyboard by anywhere from +5 to -6 semitones, regardless of splits and layers. You just hold the button, play a note on the KT-88 keyboard to pick the amount of transposition (actually an interval relative to C), and you're ready to go. A set of eleven LEDs indicates the amount of transposition in semitones.

Just above the pitch bend and mod wheels is a card slot that accepts standard PCMCIA cards, the kind used with many laptop and notebook computers. (No, PCMCIA has nothing to do with pulse code modulation or the Central Intelligence Agency. It stands for Personal Computer Memory Card International Association.) PCMCIA cards are a convenient way to store sequencer data offline.

Once formatted by the KT-88, a static RAM card can store two banks of 80 sounds and two banks of 70 sequences and 30 songs. One sequencer bank can store 6,500 events, and the other holds up to 112,000 events. RAM cards ranging from 512 kilobytes to two megabytes can be used, but they're always formatted to 512 KB. A 1 MB card is probably the easiest to find and most cost-effective. RAM cards can also be erased by removing the battery for at least five minutes.

The KT-88 also reads smaller KTC Series ROM cards (\$99.95 ea.), which hold the same number of sound Banks as RAM cards. The cards can be backed up to any device that records MIDI System Exclusive data.

The KT-88's back panel is simple and clean, adding to the synth's unobtru-

siveness in the school, church, or living room. There are only one pair of audio outputs; MIDI In, Out, and Thru ports; a dual-footswitch jack; and a footpedal jack. The headphone jack is out front, below the wheels. Though this bare-bones approach keeps the back panel uncluttered, it presents obvious limitations if you need additional audio paths or are using the KT-88 as a master controller for a large MIDI rig. Would another pair of outputs, another controller jack, and maybe even an extra MIDI Out port be too much to ask?

## PIANOS AND ORGANS

Some of the KT-88's sounds also are TS-like, except that the new synth has almost no purely electronic timbres. The first sounds I wanted to hear were the acoustic grand pianos. After all, the pianos are the KT-88's *raison d'être*.

Two pianos are sampled: a Bösendorfer and a Baldwin. All eleven grand pianos are variations of these two sets of samples, with various filter settings. Some are too dark, some are too bright, and some are just right. Depending on the mix and the musical

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## KT-88 Specifications

SYNTHESIZER							
Polyphonic Voices	Multitimbral Parts	ROM Waves	Wave ROM	Drum Kits	Total Sounds	Effects Algorithms	Pitch Tables
64	8	211	6 MB	20	468	13	34
SEQUENCER							
Tracks	Resolution		Events in RAM				
16 (8 regular + 8 Song)	96 ppqn		6,500 (expandable)				

context, you're liable to find a piano sound that suits your needs.

Both sampled pianos are fine-sounding instruments, and the samples are at least as good as, if not better than, most dedicated digital pianos. It's very difficult to detect split points in the multisamples, and the loops are almost perfect. (In fact, the loops in all the KT-88's sounds are excellent.) The multisampling is extensive enough that there are no artifacts of munchkinization.

Unfortunately, all the samples are too short. Also, as with many dedicated digital pianos, the sustain portion of each note comes too quickly. Hearing the sustain loop so soon after the attack cues the ear that this piano is sampled. To make matters worse, the decay is too quick when you sustain a note either by holding down a key or pressing on the sustain pedal. Unless you're listening with a critical ear, you probably won't notice, but these are obvious shortcomings. Of course, these problems are by no means unique to the KT-88; any ROM-based synth has them to varying degrees, because the manufacturers can't fit a wide variety of large samples in limited ROM. Most users want variety, so sample size is sacrificed.

Many of the eighteen electric pianos are among the best I've heard. The Rhodes and its variations are actually an improvement on the real thing, with a very consistent sound and predictable touch response. Most of the electric pianos, in fact, sound like processed Rhodes. The Hybrid El. Piano and Soft El. Piano are reminiscent of the Roland D-50, and the FM Tines is obviously DX7-inspired, though I wish it barked when you spank the keys. The Real Wurlitzer sounds wonderfully authentic as long as you don't play higher or

lower than the pitch range of the real thing. There are two great Clavinets, but no RMI electric piano. I guess its sound is just too passé.

The organs are another standout of the KT-88, and one that will make it popular with church musicians. There are twenty organs, half pipe organs, and half Hammond B-3s. All the B-3s are quite good, with enough variety to serve most musical demands. Still, it's not like dialing up any drawbar combination you like.

In many of the B-3s, the speed of the rotary-speaker effect is modulated by keyboard Pressure. Press down on the keys, and the rotation speeds up until you press down again to slow it down. In at least one sound, the amount of key click can be controlled with the mod wheel.

Along with the pianos, church bells, and Hammond B-3, the pipe organs make the KT-88 an ideal, all-around keyboard instrument for churches. Some are evocative of mammoth pipe organs in huge cathedrals, and others belong in an intimate chapel setting for weddings and funerals.

### SYNTHS AND TUNED PERCUSSION

Most of the ten synth sounds are pads, and all are potentially useful. There are no frivolous patches merely designed to show off programming prowess. I particularly liked Lush Pad, a unique blend of breathy "oohs" and harp harmonics. The best monophonic solo sound is Analog Syn Lead, with the mod wheel opening up the filter and Aftertouch controlling a complex vibrato that sounds like it modulates pulse width, as well as pitch.

There aren't a lot of tuned percus-

sion sounds, but those that are here are pretty good. The Tuned Percussion bank includes two fine bells, mallet percussion, and oddly enough, two accordions and a harmonica. Apparently, to make everything fit in the instrument, Ensoniq had to put the timpani in the World/Ethnic bank and the accordion in Tuned Percussion. It's a bit odd, but once you know where to look, it's no big deal.

I was especially interested in the glockenspiel, a tough instrument to sample. I happen to own a glockenspiel, and though I still hear the usual high-pitched artifacts that surface whenever I try to sample it, this glock isn't a bad effort.

### STRINGED THINGS

For the most part, I don't care for the guitars. The Studio Guitar is processed enough to make it useful for electric arpeggios, but the acoustic guitars are too bright, and they go to the sustain loop much too soon, making them somewhat lifeless. The Muted Guitar isn't muted enough. A sound called This Goes to 11! is a good screaming lead guitar, but it's flawed by vibrato that bends the pitch a semitone upward, making it sound more like a trill.

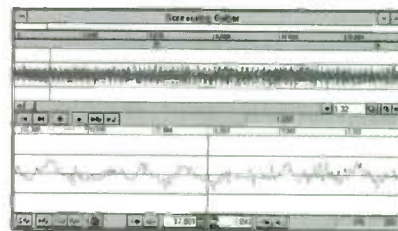
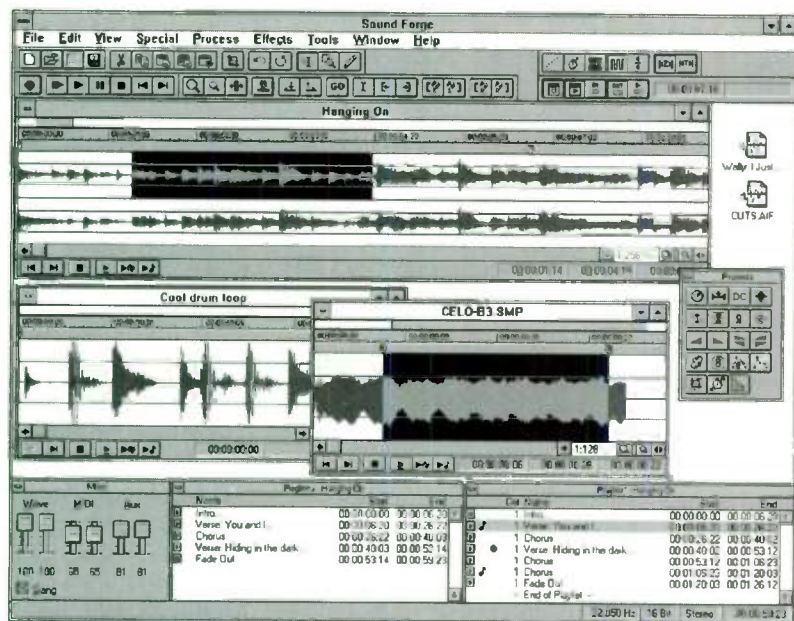
The pedal steel, as mentioned earlier, is quite good, with Glide (portamento) and an attack that's almost clav-like. Like a saxophone, a real pedal steel can produce a variety of sounds, and this is just one of them, with no harmonics or other fancy stuff.

I'm also disappointed in the basses. The Stand-up Bass has a familiar problem: a short attack and quick sustain loop. The Finger Bass doesn't have enough multisampling and doesn't sound like a real electric bass. The



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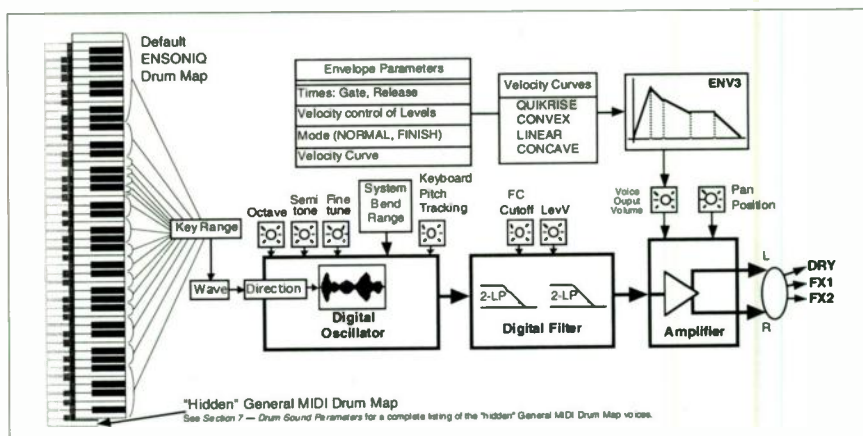
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## ● KT-88



**FIG. 3:** Unlike standard sounds, which can layer up to three voices, a KT drum sound uses one voice per key range, and the multimode filters are fixed in a 4-pole, lowpass mode. The pitch table does not affect drums. (Courtesy of Ensoniq Corp.)

Picked Bass is better, but nothing to write songs about. The Slap Bass is good, but the vibrato is too fast. The Fretless Bass is the best of the lot. The synth basses are all okay or better, with Syn-Sweep Bass the fattest of the bunch.

The strings are the biggest letdown. String Section is good for some parts but is not terribly flexible. It has a fast attack, with a slight pitch bend at the beginning. Violin is very synthy, sounding like one of Wendy Carlos' additive emulations. The same holds true of the artificial-sounding String Quartet, which uses the same waveform.

The Cello isn't rich, but it isn't thin, and its splits are too obvious. One range of ten notes has a pitch bend in the attack that sounds like a whimpering dog. Unfortunately, the Contrabass also uses the cello waveform, and the whimpering-dog effect is extremely pronounced just above middle C.

String Machine is extremely buzzy and probably doesn't sound like a string machine you'd allow on your recordings. Harp o' Monix, on the other hand, is an excellent concert harp.

## VOCALS, WINDS, AND BRASS

The vocal sounds are all very good. Mixed Choir is an outstanding combination of male and female voices, with a medium fast attack and a slow release. Breathly Oohs is very pretty; it's similar, but superior to, a D-50 vocal chorus. Space Voice sounds like Mellotron flutes in the Grand Canyon.

The Soprano, Alto, Tenor, and Baritone Sax are some of the most realistic sounds in the KT-88. They probably are the best saxophones I've heard from a synthesizer. Too bad there's no

sax ensemble. The brass is also uniformly excellent. I was startled at the realism of the French Horns and the Solo Flugelhorn. The solo reeds are also very good, though I was a little disappointed in the English Horn. The multisampling is good, though.

I was also surprised that the Orchestra sound is so good, useful, and flexible. It proves that the strings work okay when layered with other sounds. Other combinations include layers of Strings & Brass, Choir & Flute, and Voice Vibe. Awaken is a sound that transmutes from bells to birds.

Like other Ensoniq synths, there's a smattering of ethnic sounds, including Shamisen, Goto, and Koto. The Sitar is pretty good, but it's swimming in reverb, and the Kalimba has too much click.

## DRUM KITS

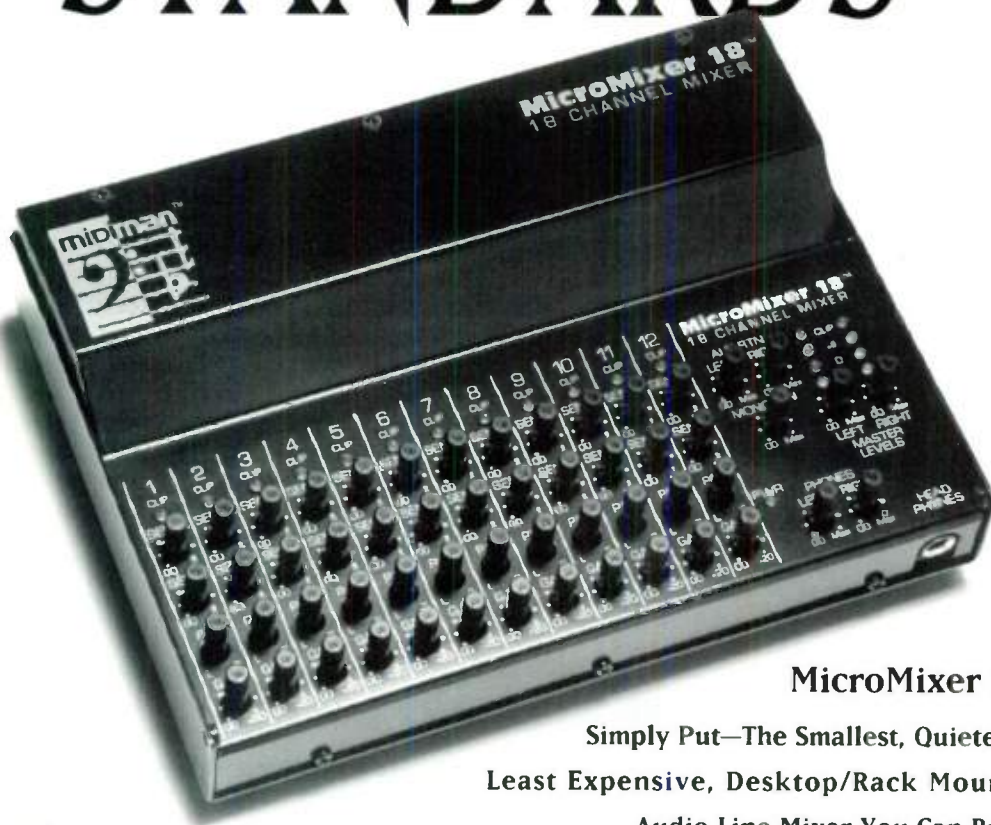
All the drum kits are available as sounds 80 through 99, whether you're in the ROM, Internal, or Card banks. Unlike other sounds, which let you layer up to three notes per key, drums are limited to one note per key.

Drum sounds have a different architecture than standard sounds (see Fig. 3). One oscillator produces drum-related waveforms, which go through two 4-pole, lowpass filters and a set of envelope and output parameters specific to drum sounds. There is a maximum of seventeen sounds in each of ten drum kits that use the Ensoniq drum map. The second set of ten drum kits in ROM conform to the General MIDI drum map, which contains 53 sounds, but you're limited to one key per sound.

You can use any drum kit as a starting point for creating your own kit, which



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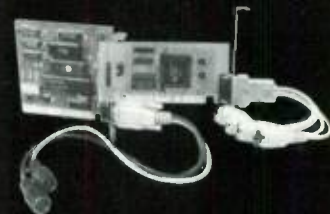
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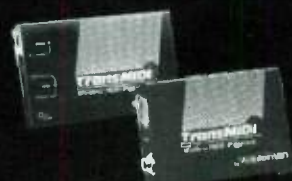
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can then be saved to an Internal or Card memory location. Each sound can be assigned to any range, as long as they don't overlap.

I have no complaints about the KT-88's drum sounds. The Rock Kit is the most all-purpose drum program, containing excellent snare drum and dry toms, as well as very good kick drum, hi-hat, cymbals, tambourine, and clap. If there were more than seventeen sounds at a time, alternate snares would be desirable.

Most of the other Ensoniq-mapped kits are variations on the Rock Kit, using the same hi-hats and cymbals. The Country Kit, for example, has alternate kick and snare and substitutes cowbell for clap. The Gated Kit features an electric kick and processed snare and toms. The Jazz Kit has two hollow-sounding kicks, a snare roll, and no clap. The Synth Kit, Dance Kit, and Loop Kit all incorporate Roland TR-808 sounds along with real drums and cymbals.

The GM drum kits offer more variety. Among these are the Orchestra Kit, which has an applause effect and

thirteen pitches of timpani, and another TR-808 kit that offers much more than the original Roland TR-808.

### GENERAL MIDI

GM compatibility is one of the KT-88's selling points. The advantage of General MIDI is predictability—each instrument is always located at the same Program Change number and MIDI channel—resulting in ease of use. Therefore, you can play any sequence arranged for GM, and the tracks will play their intended instruments: The tuba track always plays a tuba, the dulcimer track always plays a dulcimer, and so on, no matter what GM-compatible synth or sequence you use.

General MIDI capability is turned on by pressing a button, which disables access to the standard sounds. For each MIDI channel, you can also turn reception on and off, which lets you set up a "music-minus-whatever" situation for playing along with the sequence. None of the GM sounds can be edited like standard sounds.

Overall, the General MIDI sounds are inferior to the standard sounds,

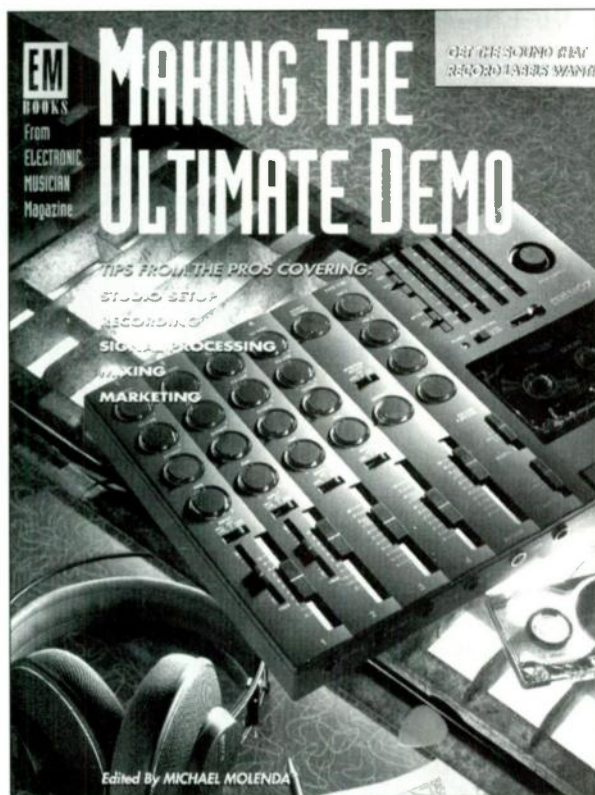
with only a few exceptions. This is a common problem with GM synths and results from the need to be as consistent as possible with the Roland Sound Canvas, which is the *de facto* standard. The GM piano sounds thin and lack-luster compared to every other acoustic piano. In fact, contrasting the GM piano with the others shows just how full and rich they sound. The GM guitars are different, the strings are different, and even the glockenspiel is different. In fact, even though the GM sounds use the same waveforms as the standard sounds, none of them sound like the same. Oh well, that's GM for you.

If you are authoring multimedia projects and want to hear your project with a "typical" GM set, the KT-88's version probably will serve the purpose. For my applications, I wish could substitute standard sounds and still retain the advantages of GM compatibility. Of course, you can always remap the program numbers to conform to GM.

### EFFECTS

The stereo effects processor in the KT-88 is only slightly different from its

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recent predecessors. Like other current Ensoniq instruments (the ASR-10, KS-32, and TS-10/12), it uses the 24-bit ESP chip. Most of the effects parameters can be modulated in real time from the performance controllers, external MIDI sources, and six fixed effects envelopes called "Ramps."

Effects are stored as part of each sound, though each preset and sequence/song can have an overriding effect of its own. There are thirteen multi-effects algorithms, incorporating reverb, chorus, delay, equalization, resonant filter, flanger, phase shifter, rotating speaker, compression, distortion, and wah.

One improvement is that some algorithms place EQ before the other effects. There are sixteen preprogrammed reverb variations—templates, if you will—in all effects containing reverb. These range from Early Reflection to Canyon. The reverb variations are a welcome new wrinkle to Ensoniq effects architecture.

## SEQUENCING

The sequencer is also similar to those in other Ensoniq instruments. The clock resolution is still 96 ppqn, and tempo can be slaved to external MIDI Clock. Notes can be recorded in real time or via step entry. You can punch in parts and edit individual events.

Each sequence has eight tracks, each with separate sounds, MIDI channel, modulation routing, and so on. Up to 99 individual sequences can be linked into songs. Eight additional tracks run the entire length of the song, result-

ing in a 16-track sequence. Volume changes and panning can be recorded in Song mode. Internal RAM limits sequences and songs to a total of 6,500 events, but this can be expanded with RAM cards.

## CONCLUSIONS

I was surprised the KT-88 isn't more expensive. It's every bit as good as some dedicated digital pianos costing much more, and in many ways, it's better. As a synthesizer, it offers a wide selection of emulative sounds, flexible effects

processing, and an easy-to-use onboard sequencer.

With more waveform ROM, 64 voices, 88 keys, and 36 kHz audio outputs (rather than Ensoniq's usual 30 kHz outputs), the KT-88 is a definite step up from the KS-32. If you're a piano player who craves a synthesizer designed with your needs in mind, play a KT-88, and see what you think.

Geary Yelton's books include *The Rock Synthesizer Manual*, *Music and the Macintosh*, and *The Musical PC*.

## Product Summary

### PRODUCT:

KT-88 Keyboard Synthesizer

### PRICE:

KT-88 \$2,695

KT-76 \$2,495

### MANUFACTURER:

Ensoniq Corp.

155 Great Valley Pkwy.

Malvern, PA 19355

tel. (610) 647-3930

fax (610) 647-8908

CIRCLE #437 ON READER SERVICE CARD

EM METERS	RATING PRODUCTS FROM 1 TO 5			
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AUDIO QUALITY	●	●	●	
VALUE	●	●	●	●

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## 3D Sound The Piano

By Gerry Basserman

**Three-dimensional  
piano recordings differentiate  
this CD-ROM.**

**M**ore has been written on, for, and about the piano than any other musical instrument. And for good reason: The piano is more powerful than any other acoustic instrument, surpassing its relatives in both dynamic and note range. Many a sound designer has embarked on a quest to capture the essence of the grand piano, seeking to bottle its sound in digital form.

3D Sound's attempt is embodied in a CD-ROM simply called *The Piano*, which is distributed by InVision Interactive. The disc is available in versions for Akai S-series, Digidesign SampleCell, E-mu Emulator IIIx, Kurzweil K2000,

and Roland S-700-series samplers.

*The Piano* features fifteen banks of samples gleaned from just two pianos: a 9-foot Bösendorfer concert grand and a 7-foot Yamaha C7 grand. These are certainly wonderful specimens, but the characteristic that sets this disc apart from the pack is the manner in which the samples were recorded.

3D Sound miked each piano using a custom-designed, binaural, artificial-head microphone system. The artificial head replicates the physical properties of the human head and outer ear. A microphone inside each of the ears captures ambient acoustics, with information about distance, direction, and perspective, to achieve the effect of 3-dimensional sound.

### LIKE MAGIC

I triggered the Emulator IIIx samples using both plastic and weighted wooden keyboard controllers and found the experience almost magical. I also recorded solo piano work to tape and played back prerecorded sequences, with the same result. As I played and listened to playbacks, I felt as though I

was hearing the whole box, an experience I have never before encountered with an electronic or sampled piano.

The Bösendorfer banks feature samples recorded from three positions: player, singer, and big band. The Yamaha is offered only from the player position. The position settings create the illusion that you're hearing the piano from different locations in the room. In addition, each sample was recorded with three different attack dynamics: soft, medium, and hard. The recordings are rich and completely satisfying, especially on headphones.

Each bank contains multiple presets, so that the sounds can be loaded into either 8, 16, or 32 MB of memory. Most of the banks have the same format: One preset Velocity-switches from a layer of soft- or medium-attack samples to a layer of medium- or hard-attack samples. Thus, subtle performances trigger the soft-attack samples, more aggressive playing triggers the medium-attack samples, and pounding the keyboard triggers the hard-attack samples.

Other presets have single, non-switching layers of both 8 and 16 MB samples. Obviously, the larger samples sound better, but 3D Sound has made some wise sound-design decisions that enable the 8 MB samples to deliver much of the same experience as the 16 and 32 MB versions.

In general, there are a lot of sounds on the disc, and they've all been recorded in stereo at 16-bit resolution and a 44.1 kHz sampling rate. The 16 MB banks sport an average of 25 samples each, and the 8 MB banks offer about twelve. The Bösendorfer is definitely the main event, not only because several 3-dimensional perspectives are presented, but also because the source instrument sounds very warm, rich, and, well, *wooden*.

The Yamaha is the absolute opposite: bright, present, with almost a lacquered transient. 3D Sound must have selected the Yamaha to complement the Bösendorfer; otherwise, the whole CD-ROM would have consisted of one relatively mellow sound. In any event, if you enjoy playing solo piano, you'll find it hard to move beyond the Bösendorfer sample banks.

### CLINICAL ENCOUNTERS

Capturing the sound of the piano is a challenge because doing so usually shines a spotlight on the limitations of



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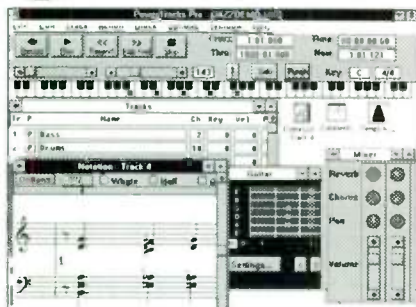
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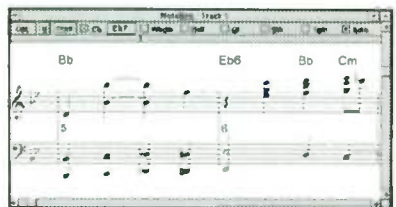
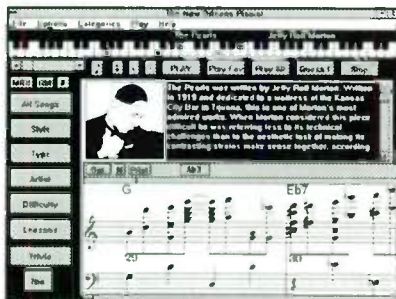
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Advertiser	Reader Service #	Page	Advertiser	Reader Service #	Page
Air Force Reserve Band	501	133	Mix Bookshelf	548 110, 137, 127	
AKG	-	32	Musician's Friend	549	62-63
Alesis (QuadraSynth)	502	11	Music Quest (NOTEable MIDI)	550	42
Alesis (Monitor One)	503	55	Music Quest (8Port/SE)	551	70
Alesis (SR16)	504	73	Music Supply	552	99
Aphex Systems	505	43	Opcode	553	37
Ashly	506	101	The PAN Network	554	108
Aware	507	123	Peavey Electronics	555	48-49
Bananas at Large	508	125	PG Music (Band-In-A-Box)	556	18-19
BASF	509	85	PG Music (PowerTracks Pro)	557	113
Blue Ribbon SoundWorks, Ltd.	510	38	PolyQuick	558	122
Caruso Music	511	118	QCA	559	121
Century Music Systems	512	129	Quik Lok/Music Industries	-	60
Computers & Music	513	94	Rack Accessories	560	87
Cool Shoes	514	42	Rhythm City	561	137
dbx	-	86	Rich Music	562	121
DGS Pro Audio	515	122	Roland (JV-1080)	563	12-13
Digital Expressions	516	74	Roland (V-Guitar)	564	97
Disc Makers	517	105	Sam Ash Professional	-	133
Discount Distributors	518	116	Samick	565	39
Drum Trax	519	84	Shure	566	95
Ebtech	520	135	Sonic Foundry	567	107
Effective Video Solutions	521	123	Sound Quest	568	78
Electro-Voice (EV)	522	17	SoundTech	569	83
EMAGIC	523	92	Soundtrek	570	76
E-mu Systems	524	81	Soundware	571	28
Ensoniq (KT-76/88)	525	7	Spectral Synthesis	572	26
Ensoniq (Sampling 1, 2, 3)	526	65	Speir Music	573	117
Ensoniq (TS-10/12)	527	71	Spirit	574	56-57
Ensoniq (Sound Bytes)	528	119	Steinberg/Jones	575	98
Europadisk	529	54	Studiomaster	576	41
Eye & I Productions	530	117	Sweetwater Sound (Music Technology)	577	40
Fostex	531	23	Sweetwater Sound (Retailer)	578	89
Full Sail Center for the Recording Arts	532	111	Sydney Urshan Music	579	91
Howling Dog Systems	533	131	Tascam (M-2600)	580	24-25
Hughes & Kettner	534	88	Tascam (PA-20 MKII)	581	53
Kawai	535	52	Taxi	582	93
Key Electronics	536	80	Thoroughbred Music	583	112
Korg	537	8-9	3M Corporation	584	35
KRK Monitoring Systems	538	20	Twelve Tone	585	47
Kurzweil Music Systems	539	147	Twelve Tone #2	586	104
Leigh's Computers	540	116	Vestax Musical Electronics	587	75
Lexicon	541	51	West L.A. Music	588	135
Lil' Johnny Enterprises	542	118	WinJammer	589	129
Mackie Designs (8•Bus)	543	2-3	The Woodwind & The Brasswind	590	131
Mackie Designs (LM-3204)	544	79	Yamaha (ProMix 01)	591	15
Mark of the Unicorn	545	148	Yamaha (MU80)	592	68
MiBAC Music Software	546	125	Yamaha (CBX-D5)	593	103
MIDIMAN (Micromixer 18)	547	109			

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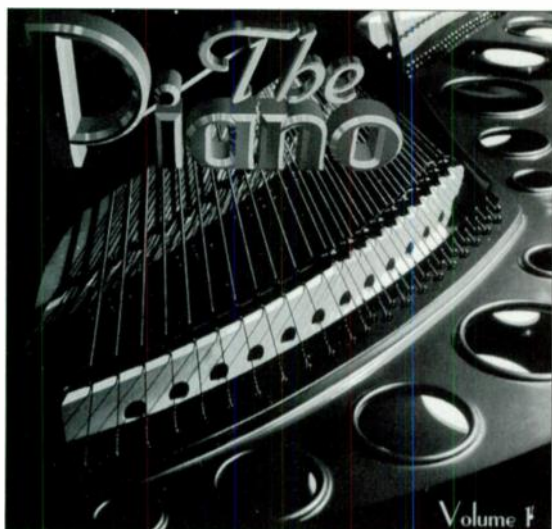
MARCH 1995

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	Very Helpful	Somewhat Helpful	Not Helpful	Didn't Read
a. "All Mixed Up, Part 2: Tone Sculptures," p. 30	701	702	703	704
b. "Cover Story: Tabletop Orchestras," p. 44	705	706	707	708
c. "Production Values: Flying Solo in a Deep Cave," p. 58	709	710	711	712
d. "The MIDI Polka," p. 66	713	714	715	716
e. "Multimedia Musician: Spinning through Kaleidospace," p. 82	717	718	719	720
f. "Working Musician: The Face Behind the Curtain," p. 90	721	722	723	724





3D Sound's *The Piano* CD-ROM features Bösendorfer and Yamaha C7 grand piano samples that were recorded binaurally to achieve the effect of 3-dimensional sound.

sampling technology in general. After being blown away by the full, rich sound of the Bösendorfer banks in performance, I decided to check out the sounds from a more clinical stance.

Here's the poop: Traveling up the keyboard on the Bösendorfer presets reveals a variance in timbre from one sample zone to another. I found the biggest anomaly in the region around D#3, which lacks the higher harmonics of the rest. I found the Yamaha more consistent. Not surprisingly, touch sensitivity was smoothest when played from a weighted controller.

## Product Summary

### PRODUCT:

3D Sound *The Piano* sample CD-ROM

### PRICE:

\$295

### SYSTEM REQUIREMENTS:

Akai S-series, Digidesign SampleCell, E-mu E-IIIx, Kurzweil K2000, or Roland S-700-series sampler

### DISTRIBUTOR:

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CIRCLE #438 ON READER SERVICE CARD

The combination of Velocity-switching dynamic layers and modulating both volume and filter cutoffs works well in the E-IIIx, but I would have found it much more useful if the developer had included more presets for a variety of feels and controllers.

When I first played these banks, I searched for presets that had been enveloped to sustain longer, but there is no variety in this type of preset either. The envelopes that exist close down so that the loops sustain in the background, instead of oscillating against each other at full volume when large chords are held out. This

is a typical scenario in sampled pianos.

*The Piano* includes sustain banks that contain much longer samples (before looping) for each piano and therefore ring out stronger and longer. Unfortunately, these banks feature only one layer of dynamics, and you must program envelope variations yourself.

Finally, the soft and medium dynamic samples of both pianos exhibit a high level of noise, which is eventually masked by the lowpass filters in the presets. This low signal-to-noise ratio is a byproduct of the ambient binaural miking, which, in the case of the big-band position, placed the mic head nearly ten feet from the piano.

## WHAT MATTERS MOST

None of the clinical complaints I've voiced get in the way of the basic beauty and fullness of these recordings. 3D Sound obviously aimed for the most natural musical experience for player and listener alike. Most of this CD's problems are limitations in the general state of the art.

Still, I would have appreciated more programming variations for expression and envelope shapes, a few banks with optimized memory (i.e., sample-rate conversions that don't affect timbre but allow more and longer samples per bank), and a few mono banks, which would have increased the E-IIIx's polyphony from 16 to 32 notes, albeit at the expense of the 3-D ambience. I could also have done with fewer sound-effects banks.

However, knowing that I can program all those banks and presets anyway, I'm just glad *The Piano* came my way in the first place. It is simply the most satisfying sampled piano experience that I have ever had.

And just as I'm finishing up this review, the cast of TV's *Northern Exposure* is catapulting a piano into Alaska's sunlit, midnight sky. There it goes: over the trees, out of the frame, and into oblivion.

Gerry Bassermann is a composer and sound designer working in the San Francisco Bay Area.

## A.R.T. RXR Elite

By Richard Chycki

**True stereo  
reverb at a bargain  
price.**

**M**ost low-priced stereo effects processors have one annoying drawback: They aren't true stereo. Oh sure, they have two inputs and two outputs, and their outputs are stereo. But this type of processor often sums the left and right inputs to mono to feed the processor. If you run these units off a mixer or guitar amp effects bus with a 100% wet mix, you get a stereo effect, but lose the original stereo image of the input signal.

A.R.T. took a different approach when it released its FXR Elite multi-effects processor (reviewed in the February 1994 **EM**) and DXR Elite delay. These processors provided true stereo processing at rock-bottom prices. Not content to rest on its laurels, the company continued to develop the Elite series, offering the RXR Elite stereo reverb.

Concentrating solely on reverb and ambience algorithms, the RXR Elite delivers a variety of halls, rooms, chambers, plates, dual ambiances, and gated/inverse reverbs. Up to six parameters may be edited in each patch, and there are 128 memory locations.

The Dual Room and Plate ambiances showcase the RXR's powerful processing capabilities, delivering true dual-channel performance. The signal paths

EM METERS	RATING PRODUCTS FROM 1 TO 5			
AUDIO QUALITY	●	●	●	●
VALUE	●	●	●	●

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## ● RXR ELITE

of the left and right channels remain discrete throughout the unit. For all other algorithms, however, the RXR sums the left and right inputs to mono to feed the processor and then mixes the stereo effect output back with the discrete direct signals. At \$349, the RXR is a consummate example of bang for the buck.

### FULL METAL JACKET

The RXR shares many physical similarities to its DXR sibling. Conservative, no-nonsense graphics garnish the smoke-colored, shallow, steel chassis. A.R.T. used copious amounts of tongue-in-groove design to make the case structurally sound with a minimum of hardware.

I had a problem with the sharp edges around the rear-panel jacks, though. They stick up far enough from the rear of the case to do bodily damage. (Yes, I was wounded in action.) I also had some difficulty inserting MIDI cables fully into the jacks, because they caught on the metal wraparound from the unit's bottom. It was necessary to apply a healthy amount of upward force to work the connector's plastic edge past the metal and insert the MIDI connector completely, which no doubt strained the MIDI jack connections on the PC board inside. I'm concerned about eventual failure from this type of repeated stress.

There are few rear-panel connections. The unit has MIDI In and Out/Thru jacks, as well as a stereo pair of unbalanced, 1/4-inch, high impedance (500 kΩ) inputs and corresponding outputs. A fifth 1/4-inch phone jack accepts a programmable footswitch.

Like the other Elite processors, power is supplied by a wall-wart AC adapter. Unlike many manufacturers, A.R.T. is using 3-prong AC adapters, providing a superior chassis ground that minimizes ground-loop problems

and seating the adapter more securely in its plug. I wish manufacturers would attach a more rugged cable to the wall-wart and provide some sort of a loop-around strain relief on the rear of the unit to lock the connector in place.

The front-panel layout is particularly clean. Global input and output levels are adjustable via dedicated controls. Visual feedback for optimum level adjustment is provided by a signal-present indicator for each channel and a global clip LED. A Dry Kill switch eliminates the wet signal, which is handy if you want to go from an in-line situation, such as a simple live rig, to a parallel application, such as connecting the RXR to a mixer's aux bus. Thanks to Dry Kill, you don't have to rewrite the wet/dry mixes for all patches.

An easy-to-read, green, 3-digit LED display indicates Bank, Program, and parameter values. The display is augmented by an angled row of six LEDs (called "the Slash") that indicate the selected parameter for editing and mode status.

The Preset control scrolls through the sixteen Presets in each Bank. Banks can be advanced (A to H) with the Bank button and can be scrolled by pressing and holding the Bank button and simultaneously turning the Preset control. The new Bank is not engaged until the Bank button is released.

The numeric display defaults to a display of the patch's memory allocation after approximately four seconds of no encoder adjustment. You can return to the parameter being edited by clicking the value encoder once. Unfortunately, there is no MIDI reception indicator; a simple flashing decimal would have been helpful for MIDI system setup and troubleshooting.

You can save some time onstage by using the Recall button to access a preloaded patch without scrolling. A useful Compare button lets you toggle



**The A.R.T. RXR Elite specializes in digital reverbs and ambiances. The Dual Room and Plate ambiances deliver true dual-channel performance, while the other algorithms sum the left and right audio inputs to mono.**



between the stored version of a patch and the version in the edit buffer, or swap between the current patch and the last patch loaded into memory.

## PARAMETERS

A.R.T. restricted the number of adjustable parameters to five for all but the reverse reverbs, which have six parameters. Reverb decay time is adjustable for all algorithms: up to five seconds of decay for rooms and plates, 1.2 seconds for the Dual Room, two seconds for plate ambiences, and 12.8 seconds for all others. Up to 127 ms of predelay time may be added to separate the reverb tail from the direct sound in any of the algorithms. A maximum of 400 ms of gate time may be set to hack off the reverb tail in the gated and reverse reverbs only, for that characteristically abrupt effect.

A dual-function EQ control tapers the reverb's frequency response via an integrated lowpass and highpass filter network. The full counterclockwise setting is a lowpass filter cornering at 800 Hz, for a very dark sound. Turning the value control clockwise raises the cutoff frequency, so that in the center position, no attenuation takes place, and turning the control to the right engages the highpass filter. The highpass cutoff frequency can range from 80 Hz all the way up to 15 kHz. An additional lowpass filter is provided for the reverse reverb algorithm. Twelve levels of damping are available for all but the gated and reverse algorithms.

## Product Summary

### PRODUCT:

RXR Elite Programmable Stereo Reverberation Effects Processor

### PRICE:

\$349

### MANUFACTURER:

Applied Research and Technology  
215 Tremont St.  
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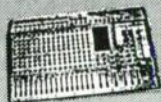
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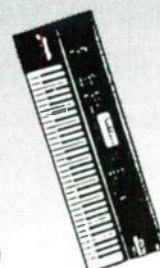
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## ● RXR ELITE

A Mix control adjusts the wet/dry balances in all patches. When the Dry Kill switch is engaged, the Mix control regulates the wet output level. The programmable footswitch accepts normally-open or normally-closed momentary switches (which I recommend), or a push on/push off switch. The footswitch can be assigned to bypass the RXR, engage the Dry Kill function, access the Compare feature (which is way cool), and scroll down a user-defined preset list.

### MIDI FEATURES

The MIDI area of the RXR sets the MIDI channel or Omni mode, toggles the dual purpose MIDI Out/Thru jack, and enables SysEx dumps and loads. The unit supports MIDI Volume for the output level, but unfortunately, the Volume controller cannot be switched to control the effects input for effects mutes that don't amputate the reverb tail. You also can trigger Dry Kill and Bypass with a MIDI Control Change.

Finally, A.R.T. has implemented a full MIDI Program table for remapping Program Changes. The Program table also lets you create Program chains, which you can step through with a footswitch.

### DOCUMENTATION

Overall, the RXR's manual is concise and is loaded with connection application diagrams. A handy, laminated quick-start card is included for impatient types.

The manual's quality deteriorates somewhat when the MIDI implementation comes into play. For example, the list of features at the front of the manual clearly indicates that you can control two parameters in real-time via MIDI. But there is no explanation of how to engage this feature. As it turns out, the RXR does not support real-time MIDI parameter control, aside from Volume, Bypass, and Dry Kill.

Apparently, the RXR manual was written at the same time as the DXR manual, and the DXR offers some real-time MIDI control. A.R.T. promises to correct this oversight.

### AURAL EXAM

I used the review unit in a variety of situations including a live guitar rig, a demo studio, and a full-blown studio mix extravaganza. The RXR can accept and pump out up to +14 dBv of level, making it at home in any situation. I found that padding the output by 10

or 20 dB is a good idea if your intention is to drive high-sensitivity inputs, such as a guitar-amp front end.

A.R.T. has made a dramatic improvement by reducing program and algorithm switching noise. I've complained in the past of the nasty thump previous A.R.T. processors belch out when changing programs. It's finally gone! Switching between Programs in the same Bank—and thus, switching algorithms, as Programs in the same Bank use the same algorithm—adds a flutter to the reverb for an instant. Changing banks (and algorithms) yields a complete mute for about 300 ms and a very quick fade-up of the processed audio. While not inaudible, these artifacts are considerably preferable to the old "thunk," which could turn speaker paper into confetti at high listening levels.

A word of caution: Resetting the RXR to its factory default presets by simultaneously depressing the Bank, Dry Kill, and Bypass buttons results in a *loud*, repeating click. If you need to reset the unit, mute whatever piece of gear the RXR is feeding.


A.R.T.'s proprietary ASIC packs a huge amount of processing power into a single chip. The 16-bit effects are clean out to 16 kHz. Although the noise level was negligible in studio applications, driving a guitar amp's input directly (via a 10 dB pad) provided less-than-ideal results. The amp's top boost was the culprit. Using the RXR in an amp's effects loop, or between a preamp and power amp in modular rigs, is recommended for optimum signal-to-noise performance. Otherwise, the noise was not apparent in the studio unless the returns were cranked up.

### THE SOUNDS

Bank A is loaded with sixteen Room settings. Sadly, these presets did not create an ideal first impression. On drums, the Room algorithms were anemic and unsatisfying. At shorter decay settings, typically 0.6 seconds and under, the rooms became particularly metallic and brash. Short decays with small predelay times resulted in tremendous low-end phase cancellation that sucked loads of lows from the signal source.

The Room algorithms were more suited to guitars once set to midsized rooms. They sounded best when used judiciously to add a little "air," especially

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when I inserted the RXR into the effects loop of a Marshall amplifier.

The Hall algorithms fared far better, offering good general tonal balance and spread in the listening field. Testing the halls on drums, guitars, and vocals added a palatable general ambience, with an insignificant amount of ringing as long as the decay time remained above 1.2 seconds. Longer decay times revealed a faint, rolling echo that sounded very good on vocals and absolutely huge on those "guitar-player-on-the-side-of-a-mountain" leads.

Simulating a plate is difficult because of the tremendous amount of early reflections and diffusion present in a good plate. The diffusion of the RXR's plate algorithms was very good, with a minimal amount of grain and flutter. That pesky, metallic "zing" was prevalent in all Plate settings. The limited effectiveness of the Dampening parameter in the plate algorithm, where it would have been handy to tame that zing, was very odd. Although the manual recommends setting the RXR's input level so that the clip indicator flashes occasionally on transients, slightly underdriving the unit for this algorithm softened the sound somewhat. Of course, this came at the expense of a few dB of noise floor.

Bank D is loaded with Chambers. The Chamber is the drum algorithm. It has the roundness of the Hall algorithm, with more meat and density in the low-frequency spectrum, producing a more explosive character. Although more grainy than the Hall algorithm, the audible reflections added life to snare and other drum tracks. When I extended the decay times, echo reflections became audible. Vocals? You bet. Patching the RXR into the guitar rig, I had a tendency to roll off the low end slightly for this algorithm. It was quite aggressive.

Gated reverbs are commonly used to impart a stereo image to a mono signal (often snare), without an apparent reverb tail. Bank E is home to sixteen gated reverbs. This algorithm remained ringy and metallic at any decay and gate-time setting. With such an outside sound, these gates may find themselves at home creating ultra industrial, grating snare drums, or raunchy guitars. Remember that underdriving trick for the plate? Overdriving the RXR accentuates the gated reverb algorithm's metallic quality for some very left-of-

center effects. The stereo imaging here is quite good and proved useful for fattening up and extending kick drums. Rolling off the highs with the lowpass filter and EQ controls tamed that high-end zing for this application.

Reverse reverbs build up in intensity and reflections over time, just like the old inverted tape trick does. This algorithm was far less metallic than the gated reverbs. Preset F3, in particular, proved an excellent image-widener on snare, especially after I reduced the predelay and gate times almost to the minimum.

The Room Ambience algorithm, located in Bank G, uses the RXR's dual-channel technology to maintain a discrete left- and right-channel signal path from input to output. Because of the increased processing power involved, decay times are restricted to 1.2 seconds. This algorithm was almost zing-free, even at short decay times, making it ideal for thickening drums (e.g., kick and snare, or a stereo tom mix), or for fattening up double-tracked guitars.

The decays for the left and right channels are so precisely matched that feeding a mono input to both sides of

the RXR yielded a fully mono output when listening to the effects-only return in stereo. Therefore, stereo input is highly recommended for maximum benefit from this program.

Finally, the Plate Ambience algorithm has much in common with Room Ambience. It has the same decay tail accuracy for both channels, but with slightly longer decay time options (up to two seconds). The overall tone was very round, suitable for multitracked background vocals or guitars.

## IN THE END

With a bit of ingenuity, it was possible to find dozens of situations where the RXR was at home. The trick is to experiment. The RXR Elite is a feature-packed processor suitable for use with a live instrument, small P.A., or demo studio. Sure, there are some limitations and sonic shortcomings. But at \$349, the RXR is a head above the crowd.

**Richard Chycki** is a producer/engineer/guitarist in Toronto, Canada. He has worked with Skid Row's Sebastian Bach, James LaBrie of Dream Theater, and Jeff Healey.

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## Turtle Beach Quad Studio 1.0 (Windows)

By Zack Price

### Digital multitrack recording at ministudio prices.

**T**raditionally, the price tag for multitrack hard-disk recording technology has been in the thousands of dollars, well beyond the reach of many musicians. However, Turtle Beach Systems has changed that by introducing Quad Studio, an affordable multitrack hard-disk recording package that costs less than many analog ministudios.

Quad Studio bundle starts with *Quad*, a 4-track hard-disk recording program with a main screen that resembles a typical 4-track cassette ministudio (see Fig. 1). *Quad* even behaves like many ministudios in that it records a maximum of two tracks simultaneously, but it can play all four tracks at once.

However, *Quad* has other features not found on analog multitracks. For example, the program lets you offset each track's start time. The program can also digitally bounce or mix tracks together, with the ability to recall the original tracks (files), if necessary.

Still, *Quad* doesn't pretend to be anything more than a multitrack recording and playback program with a few sophisticated features. That's why the wave-editing program *Wave SE* is also included with the Quad Studio package. (For more about *Wave SE*, see the review of Turtle Beach's MultiSound Monterey in the October 1994 EM.)

On the hardware side, Quad Studio comes with a Tahiti sound card to record and play back digital-audio data. The Tahiti includes digital-audio I/O and a built-in MIDI interface. However, it is possible to add a synth daughter-board (such as Turtle Beach's Rio or Creative Labs' WaveBlaster) to the Tahiti card. Like its MultiSound siblings, the Tahiti provides excellent audio recording and playback. The package also includes a MIDI interface adapter and an audio cable with a stereo mini plug at one end and two mono RCA jacks at the other.

If you already own a MultiSound,

MultiSound Monterey, or Tahiti card, you can buy the *Quad* program separately. Even so, you should consider buying the entire Quad Studio package, because the program provides support for two sound cards simultaneously (more on this in a moment).

Users of other sound cards must purchase the complete package, because *Quad* only works with Turtle Beach cards. Nevertheless, you won't have to remove the non-Turtle Beach cards from your system just to accommodate *Quad*. As long as there are no IRQ, port, or address conflicts, the other cards should work just fine in other applications.

### SYSTEM REQUIREMENTS

According to the information on the box, Quad Studio requires a 80486/33 IBM-compatible running Windows 3.1, with 4 MB of RAM and a hard drive with an access time of 16 ms or faster. Because *Quad* doesn't use a math co-processor, it will work with either a DX or SX computer.

However, these specs don't tell the whole story. For instance, if you plan to run a sequencing program in sync with *Quad*, you'll need at least 8 MB of RAM. On the other hand, if you want to use *Quad* as a stand-alone, 4-track recorder without any sync functions, it will run without any problems on a slower '486/25 with 4 MB of RAM. In any case, you will probably want a second hard drive dedicated to digital audio files (see "Diving Into Digital" in the October 1994 EM).

### INSTALLATION

Installing the entire Quad Studio package isn't difficult. During program installation, *Quad* installs new sound-card and system drivers that override any existing Turtle Beach drivers. Although *Quad* doesn't eliminate the previous drivers, it does disable them.

If you plan to use two cards, you need to go



FIG. 1: *Quad*'s main screen is laid out much like a ministudio. Its various modes, functions, and channel settings are controlled here.

through a few extra steps. (Fortunately, the directions for doing so are detailed in the manual.) The process involves setting each card to its own IRQ, port, and RAM address, then installing the driver for each card. You have to also make several changes to the CONFIG.SYS and SYSTEM.INI files to accommodate each card. If both cards are made by Turtle Beach, *Quad* automatically recognizes both of them when you install the program.

When I first tried to run *Quad* using the supplied Tahiti card and my own MultiSound card, *Quad* and my other digital audio programs failed to recognize the MultiSound. However, the Tahiti card was recognized by all my digital audio programs.

To solve the problem, I installed the Tahiti card and driver first, followed by the *Quad* program. Next, I altered the SYSTEM.INI file to indicate that the Tahiti card was the WAVE1, MIDI1, and AUX1 device. I changed

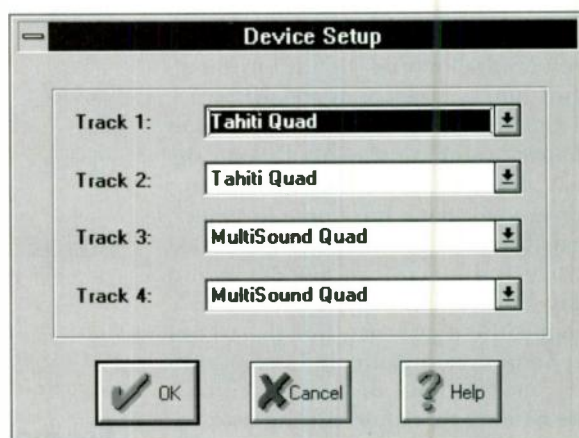


FIG. 2: Track output can be routed to the desired card from within the Device Setup dialog box.



the NOEMS setting to the RAM addresses each card would be using. Then, I installed the MultiSound and its driver, designating it as the WAVE, MIDI, and AUX device.

Finally, I reinstalled *Quad*, which recognized the presence of both cards without any problems, along with my other digital audio programs. However, the process of repeatedly opening and closing the computer was a real drag. I wasn't able to physically install the cards at the same time because *Quad* found them both during the first installation, which caused the problems mentioned earlier.

Although the initial setup may cause some headaches, two cards provide extra signal-routing flexibility. Ordinarily, all audio output is routed to the stereo outs of one card. However, two cards provide two buses that can be assigned from within *Quad* itself (see Fig. 2). For example, you can assign different tracks to each card and set each card's outputs hard left and right. This creates individual outputs for each track, which lets you control panning, volume, and effects processing through an outboard mixer.

Another mixing option is to group digital audio tracks and sequencer tracks for separate effects processing. Simply route the digital audio information (*Quad* tracks) through the Tahiti card, while keeping the other card's synth output (sequencer tracks) effects-free.

#### RECORD, BOUNCE, AND MIX

Each track is saved on disk as a separate file. After naming a new track file, you are ready to record. The Record Track dialog box lets you give a different name to the track; assign the file to one of *Quad*'s four tracks; and set the sample rate, bit resolution, and file status (stereo or mono). In addition, you can include descriptive comments (see Fig. 3). If you're recording a mono file, direct the source material to the card's left input channel only.

Before recording or loading a stereo file, make sure there are two tracks available for playback. Although it looks like you're recording a stereo file on one track, *Quad* splits it into two mono files after you hit the Stop button. (*Quad* also automatically splits a preexisting stereo file when you load it into a track.) This process takes an extra 80% of the original recording

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## • QUAD STUDIO

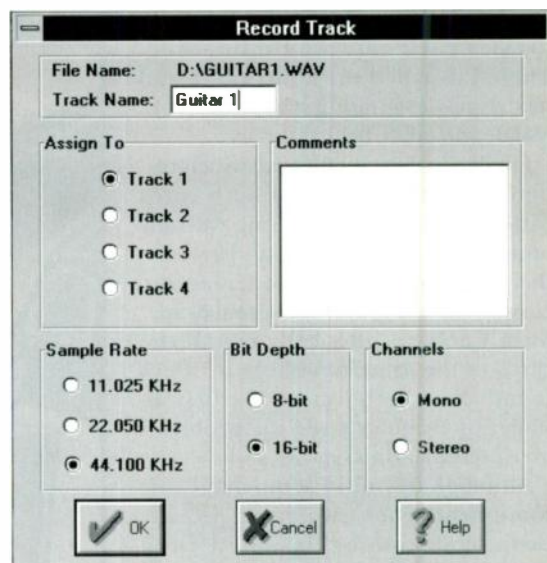
time to perform. For example, if recording time is four minutes, it takes another three minutes and twelve seconds to process the stereo file into two mono files. The two mono tracks are given default names (Left and Right, which you should immediately change to avoid later confusion), and the corresponding tracks are panned hard left and right automatically. In addition, you can elect to keep the original stereo file.

While it may seem like an unnecessary extra step, there is a good reason for this splitting process. In most wave-editing programs, it is not possible to cut and paste data between mono and stereo files. By automatically splitting stereo files, *Quad* lets you share data between any files.

Once you fill all the tracks, you can bounce and/or mix them to free up more track space. Just go into Mix mode and select Bounce from the Tools menu (see Fig. 4). Select the tracks you want to bounce and the destination tracks. If you want to preserve the stereo image, you can bounce four tracks into two. *Quad* processes the tracks accordingly, puts them in the destination tracks, and turns off the remaining tracks. Best of all, the original files are still on the drive if you need them, and there is no sound degradation because the mix is done digitally.

If you prefer, you can digitally mix tracks, rather than bounce them. The only difference is that the Mix tool automatically mixes the tracks to a separate stereo file that isn't routed to a destination track.

As with splitting stereo files, bouncing and mixing tracks creates a new file. These files are given default names that seem reasonable at first glance (Right, Left, Bounce, Mix, etc.). However, this can cause problems. I strongly recommend that you re-



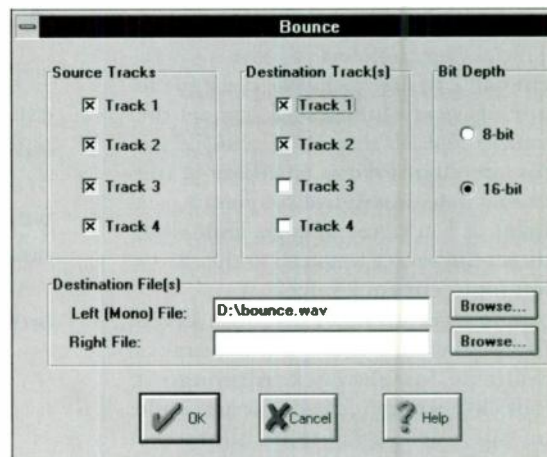
**FIG. 3:** Before tracks can be recorded, their file parameters must be entered into the Record Track dialog box.

name them in the dialog box that automatically appears before they are saved in order to avoid confusion. Otherwise, you might unintentionally overwrite them, or worse. When I failed to do this on one occasion, it actually crashed the system!

## ADVANCED FEATURES

*Quad* has some advanced features that turn your desktop computer into an all-in-one music-production workstation. For starters, you can establish a path between *Quad* and your favorite sequencing program, run them simultaneously, and switch between them at will.

*Quad* can also create a path to your



**FIG. 4:** In the Bounce dialog box, up to four tracks can be digitally mixed to a single track (creating a monophonic file) or two tracks (left and right channel files) to preserve the stereo image.

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favorite wave-editing program. If that program is *Wave SE*, the wave file automatically loads into the program whenever you push the Track Edit button in *Quad*. (*Quad* will open other editing programs, but it will not load wave files into them.) Unfortunately, I used *Wave SE* 1.1, which doesn't load *Quad* tracks into file windows. According to Turtle Beach, this feature does work in *Wave SE* versions 1.2 and higher.

*Quad* generates MIDI Time Code, but doesn't receive it. Even so, it's easy to sync your sequencing program to *Quad* within *Windows*. Unfortunately, *Quad* reliably syncs at only 25 fps, which is the PAL (European television) frame rate. That's bad news for doing video and film work in North America.

In addition to a limited choice in sync settings, I found that the sync function didn't always work in certain situations. For example, my sequencer (Twelve Tone Systems' *Cakewalk Professional*) wouldn't play whenever *Quad* was in Punch-In mode. I discovered this problem while punching a harmony vocal with sequenced music as my guide track. The punch-in was ruined because I couldn't keep the harmony tight without hearing the sequenced music. (Turtle Beach is aware of this

problem and should have a bug fix available by the time you read this.)

The sync function also behaved strangely whenever *Quad* was set up to loop between two location points. The sequencer chased to the start of the



**Quad is a good, solid program with few surprises.**

cycle the first time around, but it then continued on instead of looping back to the first location point the second time through. However, that's a minor annoyance compared to the punch-in problem.

Another available feature is the ability to control the transport, faders, and buttons with assignable MIDI Control Change messages. (*Quad* is also supposed to work with MIDI Show Control, but this feature didn't make it into the version I tested.) This works well with a sequencer or MIDI fader box, which sure beats using the mouse to manage the mix. However, I wish there were more computer keyboard equivalents for the transport controls in addition to the space bar for starting and stopping playback.

One of *Quad*'s best features is Turtle Recall, which records mixer movements in real time and plays them back during mixdown. When activated in Mix mode, Turtle Recall records all volume and pan movements, as well as mute-button switching for each track. If you want to change or redo the mixdown, simply clear Turtle Recall. If you remix without clearing, any new data is added to the existing data. Unfortunately, there is no way to view and edit the moves you record in Turtle Recall; if everything is perfect except one move, you must start over. As a result, I recommend a few practice runs before you actually record the mix. You can also save the file in a sequencer format and edit it in the sequencer, but that's pretty awkward.

When you finish working, you can save your session in a Project file, which contains all the information for all tracks and their associated files, names,

## Product Summary

### PRODUCT:

Quad Studio 1.0

### PRICE:

Quad Studio \$499

Quad program \$199

### SYSTEM REQUIREMENTS:

33 MHz 80486SX or DX  
PC-compatible running  
*Windows* 3.1; 4 MB RAM (8 MB recommended); hard drive with 16 ms access time or faster (second drive recommended for audio files)

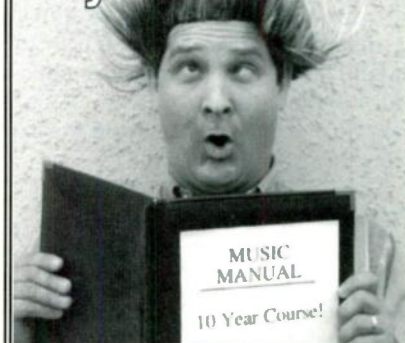
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## THE BOTTOM LINE

*Quad* is a good, solid program with few surprises. It's easy to learn, thanks to good documentation and a familiar tape-based metaphor. Still, *Quad* doesn't take advantage of all the potential inherent in hard-disk recording, even with the inclusion of *Wave SE* in the package. For instance, there's no playlist editing. If you like to manipulate and organize sound chunks from many files, or trigger digital audio files, *Quad* is not ideal.

However, *Quad* is certainly not featureless, either. It records and plays audio much more cleanly than any similarly priced analog ministudio. And *Quad*'s tracks are real tracks you can pan, mute, and control in real time, unlike the locked-in stereo tracks in some other programs. In addition, each track is a separate file, so bounces and submixes are nondestructive. As long as you have enough space on your hard drive, you can always record new tracks or try alternate mixes.

Furthermore, it's great to do all your work from one platform. Even with its sync limitations, you can work in *Quad* while synched (more or less) to your favorite sequencing and wave-editing programs. This makes *Quad Studio* a great package for low-end spot-production facilities, songwriters, and home recordists.

To put it all in perspective, you must judge *Quad* for what it is rather than what it isn't. At the budget level, no single digital audio program includes *all* the tools needed to perform hard-disk recording properly. There is a real need for an inexpensive *Windows* program that records and plays back digital audio like a multitrack tape deck. *Quad* does that and, for the most part, does it well. I've yet to see any other program for *Windows* that does so at such a low price.

*While testing this product, Zack Price managed to record many excellent, lengthy jackhammer samples, courtesy of the city work crew in the alley.*

## Massey SoundMorph 1.08 (Mac)

By John Duesenberry

**A budget audio-waveform morphing program.**

**M**orphing is sort of like the blues: No one can really define what it is, but that doesn't stop people from jiving about it. The visual transformations in certain popular videos have led to an attempt to discover a sonic equivalent, resulting in some interesting products. In the past year or so, we've seen the introduction of E-mu's Morpheus synth and Lexicon's Vortex effects processor. Both devices do something called "morphing," yet the two do entirely different things. In fact, the "morph" buzzword is the biggest thing these boxes have in common.

Well, here comes another morphing product, this time in the form of a Macintosh program. *SoundMorph* is the brainchild of software engineer/composer Lance Massey. Massey hopes that *SoundMorph* will appeal to musical experimenters, naturally. But he also wishes to reach a wider market. The program's low price point and exceedingly simple user interface are intended to attract the growing legion of multimedia hobbyists who are fond of graphic effects products, such as Gryphon's *Morph*.

The version I reviewed would not run on a Power Macintosh, even in emulation mode. Apparently this is due to the use of the ProGraph programming language, which is hostile to Power Mac. Fortunately, by the time you read this, the developer expects to have a new version that will run on a Power Mac in 68040 emulation.

## HOW SOUNDMORPH MORPHS

When a manufacturer claims its product morphs sounds, it's reasonable to ask how this morphing differs from simple crossfading. *SoundMorph*'s manual says that the program creates transitions between two signals "through microscopic interpolation of their harmonic content."

This "microscopic interpolation" combines a rather complicated analy-

sis/resynthesis process with ordinary crossfading. The program starts with a Source sound file and a Destination sound file. *SoundMorph* performs a Fourier analysis on a user-selected region of each file and then attempts to determine which components of each signal are to be considered "harmonics." ("Partials" might be a better term here; the components in question need not be harmonically related. But for simplicity's sake, we'll stick with Massey's terminology.) Components with relatively higher amplitudes are considered harmonics, while the other components are assumed to be noise.

The "noise" components are simply crossfaded. The treatment of the harmonics is the key to the sonic result. *SoundMorph* scans over each harmonic in the Source and attempts to find a corresponding harmonic in the Destination (or the most closely matching one.) It then generates a harmonic in the output signal by calculating frequency and amplitude values somewhere between the Source and Destination values. This match-and-interpolate process is what makes *SoundMorph* different from an ordinary crossfade tool. It can generate frequency components that were not present in either of the original signals.

The results can surprise you. Morphing two signals that do not have many common frequencies can lead to the interpolation of a series of rising or falling components. For example, I



FIG. 1: *SoundMorph*'s Morph Settings dialog provides access to the program's few parameters. Strict Matching activates a more precise algorithm for identifying and matching harmonics.



tried morphing a 440 Hz flute note into a sine wave an octave higher. The result was an interesting combination of a timbral change with an odd-sounding glissando.

## PERUSING THE PARAMETERS

The Morph Settings dialog (see Fig. 1) allows you to set several control parameters. For example, the Frequency Limiters parameter restricts the morph processing to a specified frequency band. Components outside this band are simply crossfaded. This enables you to only morph, say, the middle two octaves of your signals.

The Warp parameter (which will be renamed "Effect Multiplier" in version 1.1) scales the amplitude of the new harmonics generated in the output. At Warp 1, the morph will not differ from a simple crossfade. The manual likens the effect of high Warp values to a "disturbed harmonic enhancer." "Psychotic" would be a better term than "disturbed," in many cases!

Morph Volume is a gain factor for the morph region; at higher Warp values, it may be advisable to back this off to avoid clipping. When Strict Matching is enabled, *SoundMorph* uses a tougher algorithm to determine whether a

## Product Summary

### PRODUCT:

*SoundMorph* 1.08

### PRICE:

\$89.95

### SYSTEM REQUIREMENTS:

Macintosh II or better, except Power Macintosh (FPU highly recommended); System 7.0 or higher; 2 MB RAM (4 MB recommended); *Sound Manager* 3.0

### MANUFACTURER:

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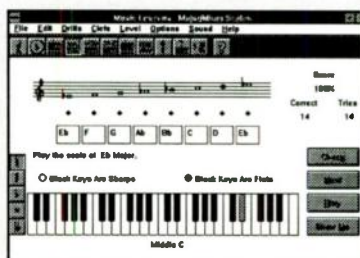
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component is a "harmonic" and conducts a more extended search for matching harmonics.

Finally, the Number of Bands pop-up controls the frequency versus time resolution of the analysis. Higher values give better frequency resolution, whereas lower values give better time resolution.

## A SONIC CRAPSHOOT

The sonic results of all this are highly dependent on the nature of the input signals and can be unpredictable. As a gross generality, I would describe the typical *SoundMorph* transition as something similar to a traditional crossfade, but with a certain amount of roughness or "fuzz" produced by the interpolated frequencies.

These artifacts can be screamingly prominent at high Warp values. At lower Warp values you often get nothing more than a crossfade with a glitch in it. It helps if the input signals themselves have a somewhat raunchy quality. For instance, among the examples supplied with the program is a particularly effective morph between a lion's roar and an automobile engine.

Don't expect *SoundMorph* to produce a smooth and subtle transition between a gong and an oboe. Not quickly, anyway. It is possible to achieve interesting and varied effects with this program, but patient and systematic experimentation with the parameters is required. Generating a morph can be extremely time-consuming and something of a crapsheet. There is no guarantee that the result will please you.

## WORKING WITH SOUNDMORPH

*SoundMorph's* user interface, while not visually elegant, is extremely simple.

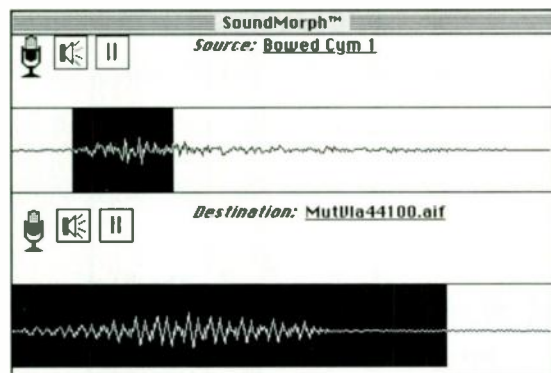


FIG. 2: The main *SoundMorph* window with two sound files open and morph regions selected. The window is empty at startup.

The *SoundMorph* window, initially empty, is displayed when the program starts up. To begin morphing, you must provide Source and Destination sound files in mono AIFF format (see Fig. 2).

The next step is to define a "morph region" in each file. Dragging the mouse in the Source file area selects a portion of the Source file and automatically selects a region of equal length in the Destination file. (The program requires regions of equal length.) You can relocate the region in either file by clicking the mouse.

Having selected the morph regions, you can generate a Preview, which is a simple crossfade between the regions. *SoundMorph* generates a Preview soundfile, plays it back once, and then deletes it. An obvious improvement would be to allow the Preview to be saved like any other output file for times when you just want a quick 'n' simple crossfade. (This will be implemented in version 1.1.)

To generate the actual morph between the two selected regions, you just select Morph from a menu. *SoundMorph* goes to work, displaying various progress indicators. Like every other analysis/resynthesis program I've seen, *SoundMorph's* processing time is lengthy. The program can run in the background, but it degrades the performance of the other applications. When processing is complete, *SoundMorph* opens the output file so you can hear the results.

One feature I really wished for was the ability to save a set of parameters from the Morph Settings window as a preset. Fortunately, this feature is promised for the next version. As it stands now, you'll need to have a notebook (or its digital equivalent) on hand to keep track of the settings that generated a particular effect.

You can playback and record sound files in the *SoundMorph* window by clicking on icon buttons. The Speaker button starts and stops playback; to its right is a Pause button. Clicking on the Microphone button brings up the Recorder window. As Fig. 3 shows, this offers crude recording controls, without even so much as an input-level control. The de-

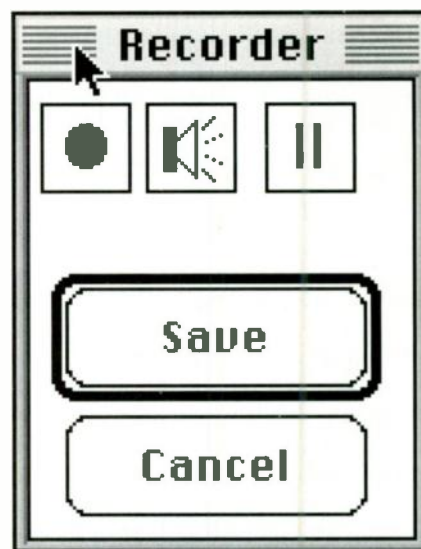


FIG. 3: *SoundMorph's* Record Settings window reveals the sparseness of the program's recording features. You can't even adjust the record levels.

veloper recommends doing your recording prior to using *SoundMorph*, if you have a better tool, such as *Sound Designer*.

The playback and recording features use the Apple *Sound Manager* 3.0 and whatever audio facilities are built into your Mac. If you have Digidesign hardware and the appropriate Digidesign *Sound Manager* drivers, you can hook *Sound Manager* up to your Digidesign board instead. (For some reason, Massey Publishing does not recommend doing this, but I had no problems using *SoundMorph* with my Audiomedia II card.)

*SoundMorph's* user interface is acceptable, but no more than that. It is simple to learn and operate but has annoying limitations. For example, you can only have two input files and one output file open at any time. In addition, the program really needs some precise way of locating the morph region in terms of seconds and/or samples. It is also inconvenient to have to open and close the Morph Settings dialog over and over again; this window should be available at all times.

The documentation is skimpy: a 16-page manual and a small set of demo sound files. The manual is just enough to get the user started, with a few additional hints. The sound files provided, unfortunately, are output files, with no information on how they were generated.

*SoundMorph* badly needs improved documentation in two areas. First, there should be more information



about how the morphing algorithm works and the exact effect of the control parameters. Second, there should be numerous practical examples, complete with Source/Destination sound files and parameter listings. Such information would make it easier for the user to predict the outcome of a morph and to use the program more effectively.

## CONCLUSIONS

*SoundMorph* is the product of roughly two years of effort and thought about audio morphing, and the developer's approach to the problem is interesting. The initial release is a bit rough around the edges; the user interface isn't great, and the documentation is weak. (Massey Publishing promises improvement in these areas.) But regardless of flaws, the program is so inexpensive that anyone interested in the idea of morphing will probably want to take a shot at it.

*John Duesenberry is a composer and programmer. His music can be heard on CDs from the Neuma and Aerial labels. E-mail johndu@world.std.com for info.*

## Yamaha RY20

By Jim Pierson-Perry

### A budget drum machine with big-time sounds.

**L**ong a major player in the drum machine market, Yamaha began its RY drum machine line in 1991 with the RY30 and followed it the next year with a budget version, the RY10. Surprisingly, despite its model number, the new RY20 is not a midline offering between its older siblings. While retaining their high-quality sound, the new bang box introduces a more sophisticated pattern structure, larger preset voice palette, onboard effects, and Groove algorithms for adding rhythmic nuances to drum tracks.

In addition, although the RY10 (reviewed in the February 1993 *EM*) and RY30 (reviewed in the November 1991 issue) were generally well received, criticism was leveled at their 24 ppqn res-

olution. With the release of the new RY20, Yamaha has moved to the industry standard 96 ppqn. All this and General MIDI compatibility, too.

## LOOK AND FEEL

The RY20 is lightweight (1.5 pounds), with rubber feet that do a good job of keeping it anchored, even on a slant. Its layout is compact and clean, with all controls clearly labeled and readily accessible from the front surface.

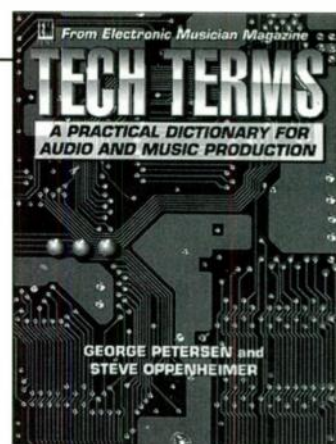
The 40 control buttons are made of firm rubber that is easy on the fingers. Yamaha used size, location, and color to effectively differentiate between drum pads, transport controls, mode selection, track selection, and editing buttons. The twelve comfortably large drum pads are Velocity-sensitive. Four global Velocity curves are available to match pad sensitivity to your touch.

The large LCD is a major improvement over the dinky displays used in earlier models. It offers graphical representations of patterns, acts as a VU meter for drum voices, and shows all prompts and parameters for editing and operation. The LCD is not backlit and can be difficult to see, depending on lighting. This seems to be common for drum machines, but a lighted display would be a major improvement, especially on stage, and would give a visual reminder that the unit is on. There is no power indicator LED, and I accidentally left the unit on several times.

Audio output comes via a set of L/R 1/4-inch jacks and a 1/8-inch headphone minijack. This is pretty bare bones, even for a consumer drum machine. Competing units, such as the BOSS DR-660, Alesis SR-16, or even Yamaha's earlier RY30, offer a stereo pair with two extra audio outs.

The back panel also holds the MIDI In and Out jacks and power input from an external wall-wart supply. Unfortunately, there is no strain relief on the panel to prevent accidentally yanking out the power cord. This could be a problem, because even though user data is protected by a battery-backed memory, you could lose data if power is turned off while recording.

Unfortunately, Yamaha chose to drop support for the external ROM cards used by the RY30. While the waveforms on these cards would not be usable in the RY20, there was a nice series of preset Patterns featuring styles of well-known drummers. Maybe these could



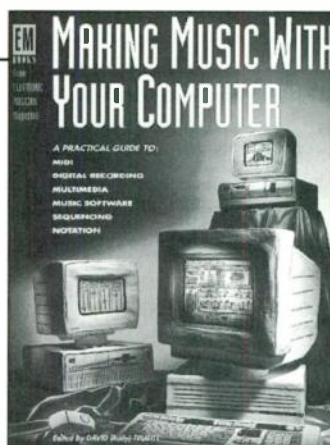
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be released as MIDI files or in a pattern book. More disappointing is the lack of a footswitch control for Start/Stop and Continue, especially because both the RY10 and RY30 supported it.

## MODES

The RY20 uses seven functionally defined operating Modes: Drum Kit, Pattern, Song, Tempo, MIDI, Effects, and Pad Bank. You can move between Modes during editing or playback and make changes on the fly. The modes are accessed with dedicated buttons, and their functions are displayed in discrete pages of information and parameters.

In addition to the usual increment and decrement buttons, two data wheels aid parameter entry. The Jog Dial is a typical data-entry alpha wheel. The Shuttle Dial is spring-loaded, with a center detent (like a pitch-bend wheel), and allows more rapid scrolling.

The Mode-Page-Job hierarchy is intuitive and works smoothly. My only complaint is that flipping through all Pages in a Mode, parameters on a Page, or values of a parameter does not return you to the start.

I often complain about user manual shortcomings, so it's only fair to note the excellent job Yamaha did in this case. The manual provides clear and accurate operating and reference information that is easily understood, even by first-time users. It also contains appendices with descriptive listings of the Preset Patterns, drum kits, and ROM voices.

## PATTERN BASICS

The RY20 supports a more sophisticated Pattern structure than many drum machines that cost considerably more. A Pattern consists of six independent Sections that cut across four Tracks (Bass Drum, Snare Drum, Hi-Hat, and Other). You can mute the Tracks independently during playback. The Sections—Intro, Main A, Main B, Fill AB, Fill BA, and Ending—use the same structure as in Yamaha's QY20 portable music sequencer.

You do not have to use all Sections in a Pattern, and any Section can be from two to sixteen measures. Holding down the Section button turns the lower set of drum pads into selection keys for individual Sections. This one-handed operation lets you easily change between Sections while recording, editing,

or playing back. You can stay with the programmed Pattern or manually override it at any time.

This worked well for playing live, as the unit's small footprint fit neatly atop my keyboard case. If I wanted to take extra choruses or stretch out on some parts, I manually changed Sections with my left hand while keeping the right hand going on the synth, providing complete freedom of choice.

The unit comes with 50 Preset Patterns and allows for another 50 User Patterns and 50 combinations. The Preset Patterns range from good to excellent and cover the gamut from standard rock and pop grooves to jazz, rap, latin, and reggae.

Combination Patterns, a new feature, are created by pulling Tracks from existing Preset and/or User Sections. No matter what manipulations you do to a Combination Pattern, the parent data remain untouched. This lets you recycle Pattern data without eating up user memory and easily experiment with different Swing and Groove settings.

One of the more useful applications of Combination Patterns is to change the time signature or length of Preset or User Patterns, a feature that is not supported by standard Pattern edit commands. Simply set up an empty Combination Pattern with a new time signature or Section length, then copy an existing User or Preset Pattern into it. The Pattern data is "poured" into the new mold, repeating as necessary to fill, or truncated if there is too much. Being able to concentrate on overall Pattern parameters (e.g. meter, length, Swing, Groove), rather than tediously entering individual hits, kept my creativity flowing. I quickly built up a variety of useful and unusual rhythmic Tracks.

Patterns are displayed graphically on the LCD at all times except during playback, when the Pattern display changes to a VU meter that shows the output levels of the sounds assigned to the twelve drum pads. Hits are shown as marks on the appropriate track against a beat:tick axis, the resolution of which depends on the Pattern quantization setting. Hits are also displayed as text

events on the LCD for precise editing of level or pad number values.

The time signature is global to all Sections in a Pattern and must be set prior to recording. The default is 4/4, but the time signature can range from 1/4 to 32/16. Pattern length is set independently for each Section but also must be set prior to entering data. These parameters cannot be changed once you have recorded data into a User Pattern, although Combination Patterns provide a viable workaround, as described earlier.

Pattern parameters for drum kit, tempo, and quantization can be set and changed at any time during recording or playback. All sounds in a Pattern must come from a single drum kit, but each Pattern can use a different kit. The tempo value can range from 40 to 250 bpm, but it is fixed for each Song, with no provision for accelerandos or ritards. (Of course, you can chain



The Yamaha RY20 Rhythm Programmer provides plenty of quality sounds, a recording resolution of 96 ppqn, and a sophisticated Pattern structure.

Songs of various tempi, but you wouldn't get a gradual change.)

When quantization is active, the quantization value can range from eighth notes to 32nd-note triplets. With quantization off, the RY20 operates at its base resolution of 96 ppqn.

The RY20 allows both step- and real-time Pattern recording. Tapping the drum pads enters the time, level (Velocity), and pad number for each hit. The machine automatically assigns drum voices to the correct Track as you record.

Transport buttons move you forward and backward through the Pattern, and you hear previously recorded hits as you scrub over them. With real-time



recording, you hear all previously recorded Pattern data as it cycles through playback. Combining the approaches provides the flexibility to enter hits with exact timing, or to play along and build on top of a groove.

### PATTERN EDITING

Editing Pattern data is as easy as recording. Use the dials or transport buttons to locate the desired hit, then change the parameter. You can alter only the hit level or pad number (drum sound). I was disappointed there was no provision for nudging hits ahead or back in time, either individually or by track. The only recourse is to delete hits and reenter them at new timings, or through the Groove function (discussed shortly). This is not fun to contemplate when you'd like to play with track timing to hit a groove.

Moving up from individual hits, several editing functions are available at the Pattern level. Selected Tracks can be copied to a new User Pattern, one Section at a time. Values for Pattern-related parameters (e.g., tempo, swing, etc.) are copied along with the Track data. Individual Tracks, or all Tracks in a Section also can be cleared. There is no provision for clearing or copying an entire Pattern, however.

More musically interesting are the three Macro edits: Swing, Velocity Modify, and Groove. Swing acts by slightly delaying even-numbered eighth and sixteenth notes according to a user-specified percentage. Velocity Modify lets you scale all Velocity values in the Pattern by a fixed percentage (0 to 200%), functioning as a compressor/expander and/or add a constant Velocity offset. Unfortunately, this does not extend to ramping Velocity for fades.

Groove lets you apply one of fourteen preset algorithms that affect level, quantization, and timing of hits. The intensity of the effects are user-programmable. Groove operations affect the rhythmic structure of a Pattern. It would be exciting to extend this concept in future offerings to also affect drum-kit timbres, e.g., pitch, pan, and balance. As it stands, the algorithms are well described in the manual and will provide hours of useful experimentation.

All three Macro edits operate as playback modifications; they do not change the underlying Pattern data. The settings for these Macro functions are



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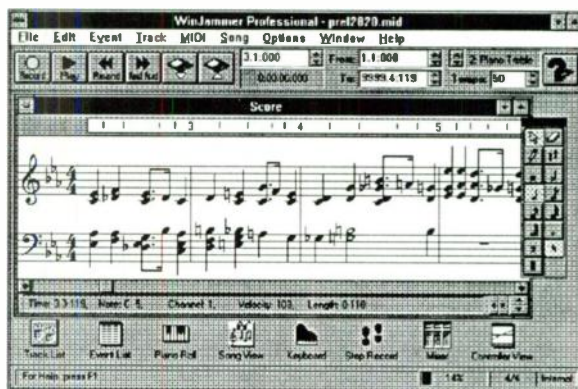
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stored with the Pattern, similar to tempo.

Considering the general state of drum-machine Pattern editing, it seems that Roland has the lead with innovative features such as the Roll and Flam buttons, Aftertouch-sensitive pads, and even "intelligent" Pattern generation. Although Yamaha has provided the RY20 with a competent set of basic Pattern-editing tools, little has changed since the RY30 debuted three years ago.

## SONGS

The RY20 allows for 50 Songs, using up to 4,000 Parts total, and comes with one demo. You create Songs by assembling a string of Sections from Preset, User, or Combination Patterns. This can be done in step time, real time, or both.

Individual Song elements are called "Parts." You select a Song number, then specify the Section and Pattern for the first Part. The Song pointer updates the measure count and the Part index; then you continue entering the Section and Pattern for subsequent Parts. Fills are the exception to this process; they can be added into a Part at any specified measure:beat:tick.

Songs have a single, selectable tempo that overrides the tempo in the parent Patterns. The tempo is not copied into Parts from the parent Pattern, nor can it change from one Part to another. Settings for Swing, Velocity Edit, and Groove, however, are copied with Pattern data and can change between Parts. The system-level parameter Chase determines whether a single drum kit is used for the entire song, or if the drum kit changes with each Part, following the parent Pattern.

Song-editing functions are as basic as those in Pattern editing. You can copy, clear, insert, and delete Parts. There are no provisions for RY30-style expressive capabilities, such as tempo or volume ramps across Parts. Fortunately, the RY20 recognizes MIDI Volume and Expression controller messages. You can program Volume fades through an external sequencer, or manually work a controller in real time.

Songs have two parameters that can enhance playback. Repeat continuously plays the active Song until manually halted, while Chain plays the Songs in memory consecutively until reaching an empty position. Using these features together continuously plays through a set of Songs, effectively adding another level of Song structure.

## SOUNDS AND DRUM KITS

Like the earlier RY10, the RY20 is based on sample-playback technology. This contrasts with the RY30, which was a percussion synthesizer. The RY20 is 28-note polyphonic and offers 300 preset sample waveforms in AWM2 format, with no provision to add more. This is of minor concern, given the wide assortment of preset voices: 57 bass drums, 93 snare drums, 19 hi-hats, 29 cymbals, 30 toms, 13 sound effects, 51 latin and other percussion sounds, and 8 basses. These include representatives of standard, rock, jazz, electronic, and techno sounds, sampled dry and with different forms of ambience. World percussion comes up short, with only a few offerings.

Overall, the drum sounds are great, particularly the core bass, snare, hi-hats, toms, and cymbals. There are so many useful variations that you're bound to find appropriate sounds to fit your grooves. Only in the more esoteric sounds did the quality fall off a bit. Some of the metal percussion, such as the triangle and bell tree, seemed to take overly long to decay or had a noticeable overtone. The acoustic, electric, and synth bass sounds are very good, with a lot of bottom and punch. I didn't care much for the sound effects beyond mild novelty value and would willingly sacrifice them for more world percussion.

Sounds are assigned to drum pads through drum kits. A drum kit consists of a Bass Bank and five sets of Pad Banks containing twelve drum pads each. You can assign any of the preset voices to the drum pads across the five Pad Banks. In contrast, the Bass Bank spans five octaves of a single voice. One drum kit, therefore, defines 60 drum voices and 60 bass notes. The RY20 supports twenty preset drum kits and twenty user-assigned kits.

Drum-kit programming is limited to a few parameters. These parameters are tied to the drum pads, rather than the sounds themselves, and offer little influence over voice timbre. If you change the voice assignment, the other parameters continue with the new voice in a manner similar to the Part concept in multitimbral synths. An Audition button lets you play drum sounds without recording them to help select the right sound.

Beyond voice selection, you can specify level, pan, pitch ( $\pm 2$  octaves, with

10 cents resolution), decay time, mono/poly play, and how pad Velocity affects level, pitch, decay time, and balance. Balance only applies to voices made from two waveforms (over two-thirds of the presets) and controls the extent of crossfading between them as you tap the pad harder. Although this serves to enhance realism, I wish Yamaha had gone the extra step of putting this parameter under real-time MIDI control.

You can further emulate real-world drums by assigning pads to an Alternate Group, where only one pad in the group (the last played) can sound at a time. This is most effective with hi-hats.

## EFFECTS

The RY20 includes reverb and delay effects for additional sonic tailoring. The onboard effects processor provides four flavors of reverb and two delays. The quality is average for budget tone generators, which is good enough to add presence.

One effects algorithm is applied to all sounds, with global control of the wet/dry mix and reverb time, feedback gain, or delay time. A nice touch is that the delay effect can be synched with tempo. You have to be careful where you apply effects, though, as some drum sounds were sampled with ambience, and indiscriminate combinations can be a mess.

## MIDI IMPLEMENTATION

The RY20 supports a respectable MIDI command set for use as a sound module, but it's more limited than that of

## Product Summary

### PRODUCT:

RY20 Rhythm Programmer

### PRICE:

\$495

### MANUFACTURER:

Yamaha Corporation of America

6600 Orangethorpe Ave.

Buena Park, CA 90620

tel. (714) 522-9011

fax (714) 739-2680

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EASE OF USE	●	●	●	●
AUDIO QUALITY	●	●	●	●
VALUE	●	●	●	●



the RY30. It allows separate MIDI channels for drum voices, bass voices, and reception of Program Change messages and recognizes MIDI Start, Stop, Continue, Clock, Song Position Pointer, Song Select, Volume, and Expression. The machine also supports SysEx dump and load.

External MIDI note commands are mapped to RY20 voices through the default General MIDI note table or any of three user-definable tables. The tables relate MIDI note number to a pad number; the actual sound depends on the active drum set, which can be set through Program Change messages. The RY30's ability to trigger Pattern selections via MIDI notes was not retained in the RY20. Too bad; it was extremely cool for real-time interaction.

The unit can be synched to its internal clock or MIDI Clock. It has the same "feature" that plagued the RY30: Receipt of a MIDI Start command automatically triggers playback, even when the unit is set to internal sync. This is not fun when using the unit as an expander with an external sequencer. This problem can be avoided by keeping the unit set to an empty Pattern.

#### CODA

Overall, the RY20 is a solid contender as a consumer drum machine, particularly as a General MIDI drum module. Its editing function set seems a little dated, but what's there is adequate for most needs. It overcomes the low timing resolution of its RY siblings and delivers a full palette of quality drum sounds with effects. Combining its sophisticated Pattern structure with permutations from the Groove algorithms and Combination Patterns gives a lot of potential for rhythmic exploration.

This would be an excellent unit for beginner to semipro MIDI musicians, or guitar players looking for a portable drum machine. Although the sound quality is pro level, more demanding users might miss additional audio outs and the ability to nudge Tracks in time. But even without these features, the RY20 is a terrific bargain, sounds great, and gets the job done.

**Jim Pierson-Perry** is a scientist, musician, and writer. He lives in radio-free Elkton, Maryland, with assorted cats, lizards, daughters, and other wildlife.

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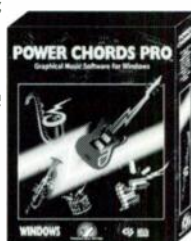
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## PG Music Band-in-a-Box Pro 6.0 (Windows)

By Allan Metts

### Your ego-free backup band.

As a child, I remember staring in amazement at the cheesy organ salesman at the mall. He could play all sorts of show tunes and other standards with only one finger, as the organ's auto-accompaniment feature obediently backed him up with those electronic "boom-chucka-boom-chucka" sounds we've heard too many times.

I had a feeling I was about to relive those memories with PG Music's *Band-in-a-Box*. Fortunately, I was wrong. *Band-in-a-Box* is a comprehensive composition and accompaniment tool, with plenty of features for both professionals and MIDI newcomers.

*Band-in-a-Box* is based on a simple concept: Type in some chords, pick a Style, and click on the Play button. Your computer then becomes an instant rhythm section, playing remarkably real-sounding drum, bass, guitar, piano, and string Parts. (You can also select other instruments.) But *Band-in-a-Box* doesn't stop there. You can create new Styles, record and edit a melody, automatically apply complex harmonies, and print lead sheets.

### ASSEMBLING THE BAND

I installed the program onto my 80486 Windows machine with no difficulty. PG Music ships both the DOS and Windows versions of the program in the same package, and you must install both to gain access to all the preprogrammed Styles and songs. (The program is also available for Mac and Atari.) This wasn't much hassle, but people who install before reading the documentation can get thrown for a loop.

*Band-in-a-Box* sends five accompaniment Parts, a melody, and a Thru Part (real-time MIDI input) to your sound devices. You specify all Program Change assignments using a General MIDI Program number. If you use non-GM synths, you can convert the GM Program number to a synthesizer-spe-

cific Program number using one of the included patch map/drum kit files. If you need to use more than one patch map at a time (that is, you want to use more than one type of synth), you have to use the Windows MIDI Mapper. You also have to use MIDI Mapper if you want to use more than one MIDI port from within *Band-in-a-Box*.

The use of General MIDI simplifies things, but too many places require a Program Change number instead of allowing selection from a list of names. (The main screen is the only exception.) A General MIDI patch reference is always available, but you can't click on it to select your patches.

Those gripes aside, *Band-in-a-Box* makes it reasonably easy to get the software and your synths on speaking terms. You can create your own patch maps and drum kits, set up Combos, and pick ten Favorite patches for each Part. The ten Combo slots contain user-defined patches for each of *Band-in-a-Box*'s Parts (piano, guitar, etc.) and can be retrieved all at once with only a few mouse clicks. The Favorite instruments appear in handy drop-down lists, so you don't have to scroll through 128 patch names to find your patch.

### PLAYING AROUND

The main screen of *Band-in-a-Box* is easy to understand (see Fig. 1). Across the top of the screen are radio buttons for each Part. Click on a Part, and you can change its program (Bank Select is supported), volume, and panning. You can also alter reverb and chorus on instruments that understand these controllers, such as the Roland GS synths.

Below the instrument settings are two keyboards that provide a visual representation of what each Part is playing. Plenty of buttons and pick lists are scattered on the main screen for quick access to the software's features.

You can have a lot of fun with *Band-in-a-Box* without composing a single song or

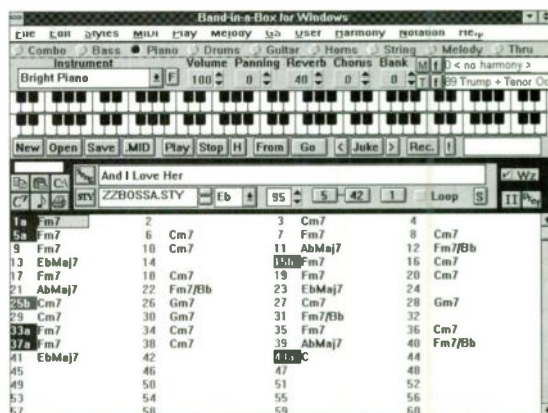


FIG. 1: *Band-in-a-Box*'s main screen provides plenty of visual feedback and control.

creating a Style. The program ships with well over 200 songs that cover everything from ragtime to rock. You can play the songs and change their Styles, instrument patches, and tempos. Most settings can be changed while your song plays (changing the Style or a chord in the song are two of the exceptions).

You can use your MIDI keyboard to play along with *Band-in-a-Box* as the Thru Part. The live Part's channel can be mapped, the patch changed, and the Part displayed onscreen, just like all the other Parts. If you don't have a MIDI keyboard, your computer's keys will suffice. The program even makes sure you don't hit a sour note from your QWERTY keyboard: The bottom row of keys play chord tones, and the second row plays passing tones. Because the notes mapped to my computer keyboard changed whenever the chord did, I had trouble playing predictable melodies with this method. Still, I had fun trying.

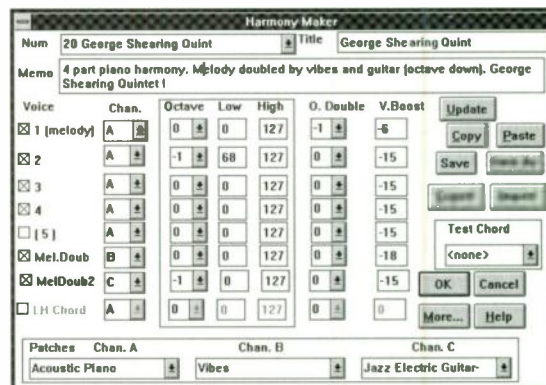


FIG. 2: New in version 6.0 is the ability to automatically play complex harmonies with the Melody and Thru (live) Parts, using the Harmony Maker.



Speaking of having fun, *Band-in-a-Box*'s Jukebox feature plays your songs one after the other and can operate as a "Guess the Song" game. It can play songs in random order and not show you the title until you ask it to. I started the Jukebox, then switched to *Quicken* to balance my checkbook. *Band-in-a-Box* kept playing in the background without a hitch.

*Band-in-a-Box* ships with over 100 Styles. My biggest problem was figuring out which one to use. The Styles are excellent and cover a variety of musical genres. I really liked the jazz and ballad Styles, especially the 12/8 ones. Blues Shuffle, Eurobeat 3, Chuck Berry, and Fats Domino were also among my favorites. The piano on the country Styles is very well done, as are most of the bass lines. If you're into latin music, you can choose from fifteen Styles that include everything from the mambo to the merengue.

#### ENTERING CHORD CHANGES

Getting chords into *Band-in-a-Box* is much like using a spreadsheet, where each cell in the spreadsheet represents half a measure. You simply move from cell to cell with the mouse or cursor keys and type in up to four chords per measure. PG Music obviously took great pains to make sure that entering chords was easy, and their efforts were successful. You never need to hit the Shift key to enter chords, and all sorts of shortcuts are available.

Even though a lower case "b" is used as the "flat" symbol, *Band-in-a-Box* had no trouble interpreting "bb7" as a B $\flat$ 7 chord. However, the program did have trouble recognizing B $\flat$ 13sus#5#9#11/E $\flat$ . (The manual said this chord is supported.) Oh well, I didn't really want to use it, anyway.

The software supports well over a hundred chord types, and even more if you consider the program's ability to handle alternate roots (such as C7 over F). Every type of diminished, half-diminished, augmented, suspended, major, minor, and dominant chord you could dream up is included.

Even though entering chords is always easy, I needed a little more help picking them. For instance, it took me a while to realize that my C chord with the third removed and ninth added was really an inverted Gsus chord. A "What's this Chord?" window and a readily available chord pick-list would

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have been most appreciated. (The list of supported chords is buried deep in the online help.)

## CHANGING YOUR CHANGES

If you'd like to tweak what you've entered, *Band-in-a-Box* gives you plenty of editing commands. You can cut, copy, and paste your chords. Measures can be inserted, deleted, compressed, expanded, and erased. You can change the tempo or time signature at any measure boundary. You can also change the Bass or Piano patch. Still, I wish the programs's developer had gone a bit further and allowed patch changes on any Part.

You can push chords ahead of their intended beat by an eighth or sixteenth note. Individual instruments can rush or drag the beat and can play rests, held chords, or shots. You can also click a check box to "humanize" the amount of instrument rushing or dragging. This feature really enhances *Band-in-a-Box*'s ability to sound like a real band.

You can place Part Markers at any measure boundary. These markers serve two purposes. First, they trigger a drum fill on the preceding measure.

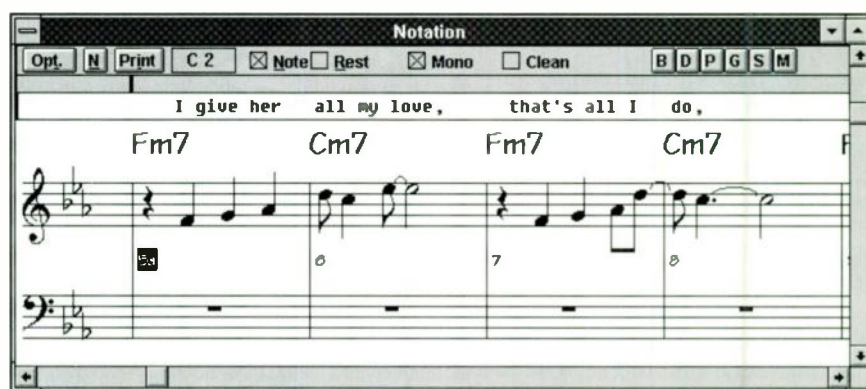


FIG. 3: *Band-in-a-Box* 6.0 adds standard music notation with limited editing capabilities. It prints very good lead sheets but is not a substitute for a notation program.

(I used a Part marker every eight measures.) Second, they select which of the two Substyles to play. *Band-in-a-Box* lets you select either the "a" or "b" variation of the current Style, which spices things up a bit. When you hear the ride cymbal and strings kick in, chances are good the program switched to the "b" Substyle. Unfortunately, you cannot change to a completely different Style in midsong.

Songs are structured into an intro, a chorus that can be repeated up to

ten times, and a 2-bar ending. While this song structure may seem strange to some pop music lovers, it's quite common in the jazz world. Jazz combos typically play the song's melody on the first chorus, trade solos for several choruses, then repeat the melody and end the song. *Band-in-a-Box* even includes a Tag feature that allows the user to jump to a coda consisting of different measures on the last chorus. I prefer working with verses, choruses, and a bridge,

## LIL' JOHNNY ENTERPRISES' SOLO ASSIMILATOR

Ever want to play blues guitar just like the masters? Want to work on your ability to create realistic guitar emulations with your keyboards? If so, Lil' Johnny Enterprises' *Solo Assimilator* may be just what you need.

The *Solo Assimilator* (\$29.95) is a collection of eleven 8-, 12-, and 16-bar solos from some of the greatest names in the blues business. According to the manual, they were all played in real time, using a MIDI guitar controller.

You get the solos in four different formats: printed notation, guitar tablature, *Band-in-a-Box* Song and Style files, and Standard MIDI Files. The *Band-in-a-Box* files and SMFs provide appropriate 4-part accompaniment tracks for your solos. In every format, each solo is broken into individual phrases for endless looping and practicing.

The *Solo Assimilator*'s discography is impressive. Some of the solos come from such well-known

names as B.B. King, Muddy Waters, and ZZ Top. Blues aficionados will also recognize the others: Lonnie Brooks, Albert Collins, Son Seals, Buddy Guy, Hound Dog Taylor, Fenton Robinson, The Chris Cain Band, and James Thackery and the Drivers. The *Assimilator*'s discography lists specific sources for each of the solos.

I went to my local record store and purchased Alligator Records' *20th Anniversary Collection*, which contains three of the songs used in the *Assimilator*. I'm happy to report that the transcriptions are excellent (at least on these three solos), although the *Anniversary Collection*'s version of Lonnie Brooks' "Eyeballin'" is slightly different than the *Live from Chicago* version Lil' Johnny Enterprises used. Son Seals' "Going Back Home" is particularly well done and even includes his slides, bends, and vibrato, which are implemented as individual notes, not continuous controllers, in the SMFs. Even the accom-

paniment tracks mirrored the actual recordings quite well.

Armed with the knowledge that I wasn't about to learn any historically inaccurate solos, I picked up my Strat and loaded *Band-in-a-Box*. Because I'm really a keyboard player, I started with the easier solos. After practicing the individual phrase files for quite some time—even the dogs left the room—I was able to load the complete solos and make a decent go of Hound Dog Taylor's "Taylor's Rock" and B.B. King's "Please Love Me."

Just for kicks, I loaded the Standard MIDI Files into my sequencer to see what they looked like. They are well labeled and include separate tracks for each accompaniment instrument, the individual solo phrases, and the complete solo.

I'm still practicing the other solos. Maybe I should stick to keyboards. Lil' Johnny Enterprises; tel. (800) 645-7697 or (804) 359-5917; fax (804) 353-8405.



so I had to duplicate blocks of measures when I entered my songs.

### SWEET MELODY

Entering a melody is quite similar to recording in a typical sequencer, except you only get one track. *Band-in-a-Box* plays its accompaniment Parts, and you play along with your MIDI or computer keyboard. You can overdub an existing melody, punch in and out, quantize your recording, transpose it, shift it in time, or edit it with a rudimentary step editor. You can also convert a melody from straight to swing time and back again. If you already have a good melody recorded in your sequencer, you can import it into *Band-in-a-Box* from the clipboard or a Standard MIDI File.

While we're on the subject of Standard MIDI Files, *Band-in-a-Box* makes a great front-end for a sequencer. Sketch out your song with *Band-in-a-Box*, save it as a Standard MIDI File, then switch to your sequencer to do the final editing and tweaking. Each *Band-in-a-Box* Part will appear as a nicely labeled track. If your sequencer supports it, *Band-in-a-Box* can also send a Standard MIDI File via the Windows clipboard.

### ADDING HARMONIES

PG Music added a couple of really cool features with version 6.0. Cool feature number 1 is *Band-in-a-Box*'s ability to automatically play complex harmonies with both the Melody and Thru Parts. Using the Harmony Maker, you can double the melody using different octaves or instruments and add up to four more voices that appear in the currently playing chord (see Fig. 2). The four chord voicings can be octave-doubled and can use different instruments.

You can even boost the Velocities of individual notes and limit the note range in which the harmony Part plays. I managed to set up a harmony that mapped one note into a 14-note chord! True, the harmony was not musically useful, but the program let me create it if I wished.

If all this harmonic power is too much for you, *Band-in-a-Box* provides over 100 predefined harmonies to help you get started. You can pick different harmonies for the Melody and Thru Parts, and each harmony can use up to three different MIDI channels. Add up all the Parts, and you'll realize that

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## CREATING LEAD SHEETS

Cool feature number 2 is *Band-in-a-Box's* support of standard music notation. When you bring up the notation window, you can display Parts with notes and staves (see Fig. 3). You can enter and edit your chords and melodies here, too. Entering melodies is particularly easy in the Notation window, as the software makes plenty of simplifying assumptions that are correct 90% of the time. With monophonic phrases, I could enter entire songs with only one mouse click per note. I could drag and drop notes and use the right mouse button to edit the nitty-gritty details of a particular note.

*Band-in-a-Box* also allows entry of lyrics, although I had a little trouble getting them lined up with their asso-

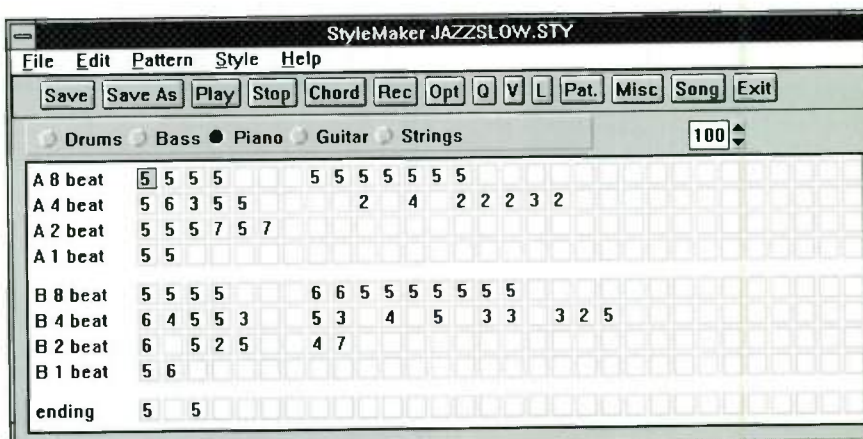


FIG. 4: The StyleMaker lets you record many patterns and specify when each pattern will play.

ciated notes. You can enter one line of lyrics for every four measures, but there's no way to link individual words with particular measures or notes.

These basic notation capabilities are

designed to print lead sheets, and for that purpose the program is more than adequate. But I wouldn't throw away your high-priced notation package just yet. Resolution is limited to sixteenth

## NORTON MUSIC USER STYLE DISKS 2 AND 3

As *Band-in-a-Box* increases in popularity, the market for third-party user Styles and fake books continues to expand. As part of the *Band-in-a-Box* review, I took a look at a couple of Style disks from Norton Music.

Norton Music's User Style Disks 2 and 3 (\$29 ea.) each contain 30 Styles in a variety of musical genres. Each Style comes with an associated demo song that lets you hear what the author had in mind when he or she created the Style. Most of the demo songs emulate popular songs and even have hints for titles to let you know what they're emulating. ("Bad, Bad, Leroy Blue" and "Sentimental Jaunty" come to mind.)

Neither of these disks have more than two Styles of the same type of music, so variety is the theme here. Disk 2 contains plenty of Styles for your ballroom-dancing class. The bossa nova, cha cha, rumba, and fox-trot are all represented. There are a couple of country & western Styles, some funk, new age, rock, R&B, and jazz. For latin music lovers, you get two sambas, a salsa, and a merengue on Disk 2.

Disk 3 is a bit more esoteric. You get the sounds of Dixieland,

Key West, Memphis, Motown, and New Orleans. There's hard rock, big band, gospel, two-step, modern jazz, and techno-funk. The ballroom dancers are represented here, too, with Styles for the samba, rumba, mambo, tango, and waltz.

I found things I liked and things I didn't like about both disks. On the positive side, many of the Styles are quite complex and really show off the capabilities of *Band-in-a-Box*. An instrument will carry a musical theme in one section and a different instrument will pick up or enhance the theme in another. New instruments come in for the "b" Substyle. Some fills are set up so that all instruments stop except the drums.

Some Styles (BluBrake and Dixie in Particular) seem relatively tame and then break wide open with all sorts of instrumentation in the "b" section. Some of my favorites are the new age and FatBackStyles from Disk 2 and the big band, jazz rock, and Prima Styles from Disk 3. Almost all the latin Styles are well done.

All Styles use a wide variety of instrument selections; Norton Music apparently doesn't feel bound by the Piano, Guitar, and String labels

in *Band-in-a-Box*. There are vibes, organs, synthesizers, and orchestra hits. I highly recommend using a good General MIDI synthesizer with these Styles.

On the down side, some Styles sound a bit repetitive, and others are too complex to be musically useful in your own songs. On a couple of the demo songs, I noticed that certain measures sounded dissonant while playing nondissonant chords; in other words, the instruments seemed to clash with each other. According to Bob Norton of Norton Music, this is a function of *Band-in-a-Box's* chord-embellishment feature (specifically, its method of selecting ninths) and has nothing to do with the Styles. Fortunately, you can turn the chord-embellishment feature off.

There aren't a lot of bread-and-butter Styles on these disks, and some people may not have a good use for the wide variety of musical types. But all in all, the Style disks are a good buy. Many of them do a great job of showing *Band-in-a-Box's* capabilities, and one of them just might give you an idea for that next million-dollar song. Norton Music; tel. (407) 464-4609; fax (407) 467-2420.



notes or eighth-note triplets, and getting around some of the program's simplifying assumptions can be tricky. Technically, you can edit accompaniment Parts in the Notation window, but your edits will be lost as soon as you hit Play again. You can save your edits in a Standard MIDI File, however.

*Band-in-a-Box* prints some pretty nifty lead sheets. Any Part can be printed out, and a wealth of print options allow you to get everything situated just right on the page. The program always prints four measures per staff and makes every effort to put your entire song on one page. Lyrics can print above or below the staff, or at the end of the song. I had a little trouble with high notes running into my chord markers, but with a little tweaking of the print options, I got a lead sheet that was quite readable.

## ROLL YOUR OWN

*Band-in-a-Box* provides all the tools necessary to create your own Styles. When I started digging into the StyleMaker, I began to understand why the program sounds so realistic. This program knows that musicians play differently on chords that are eight beats long than they do on 2-beat chords. They play differently on the measure before a fill and on the first bar of a new section.

(continued on p. 145)

## Product Summary

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*Band-in-a-Box Pro 6.0*

### PRICE:

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### SYSTEM REQUIREMENTS:

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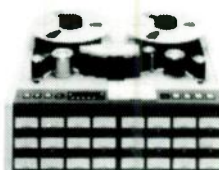
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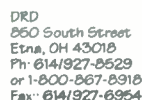
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(review continued from p. 137)

Bass players know to walk up to the next chord, and pianists usually play dominant seventh chords differently than major seventh chords. All of this intelligence and much more can be built into your *Band-in-a-Box* Styles.

Creating your own Styles isn't nearly as difficult as I anticipated. You simply record a bunch of Patterns for each Part, set masks to determine when each Pattern is permitted to play, and set weights that determine a Pattern's probability of playing when it has permission. Drum Parts are recorded in step time by populating a 1-measure grid with Velocities, much like programming an old Roland drum machine.

All other Parts are recorded in real-time from a MIDI keyboard. You can record 8-, 4-, 2-, or 1-beat patterns for all nondrum Parts. You can record separate patterns for the "a" and "b" Sub-styles and for the two ending bars. The more Patterns you record, the more variety your Styles will have (see Fig. 4). There's lots more you can do, but suffice it to say you have plenty of programming power here.

### WRAP UP

It's hard to dispute the sheer music-making power in *Band-in-a-Box*, but the program's user interface needs a little tidying up. Part of the problem is a deviation from the certain "look-and-feel" elements I've come to expect from *Windows* programs. I expect Alt-H to give me Help, not Harmony. I expect keyboard shortcuts to press the buttons in dialog boxes. To be fair, I've seen this problem often in *Windows* MIDI programs that are offered on multiple platforms. There are a ton of settings and parameters in *Band-in-a-Box*, and it took me a while to learn where to find what I needed. To name a few, there are Preferences, Song Settings, Bar Settings, Chord Settings, Options, Miscellaneous settings, MIDI settings, and Harmony settings. There are three ways to load a Style, four ways to load a Song, and six ways to change a patch.

I think a cleaner program organization would help tremendously. Several settings are rarely used, while others are remnants from older versions of the program. One example is a Horn Part and its associated settings. You can't make Styles with Horn Parts any

more, at least, not in that manner.

Like the program itself, *Band-in-a-Box*'s documentation is thorough, but poorly organized. I received a manual for the previous version of the program and another (just as thick) that covered just the new features in version 6.0. The online help is context-sensitive, but it uses the same text as the manuals. This may not sound like a problem, but it sometimes made information difficult to find in the Help file. Topic searches for "Part Markers" weren't successful, because the header in the Help file read "Using Part Markers."

Overall, it's hard for any musician to dislike this program. It was obviously written by someone who knows music well and knows how musicians think. If you can overlook a less-than-tidy user interface, you'll be rewarded with an incredibly powerful music-making machine. Whether you use it as a toy or a tool, this is one great program.

**Allan Metts** is an Atlanta-based musician, MIDI consultant, and systems designer. He got depressed when he heard how well *Band-in-a-Box* played his songs.

# TECH PAGE

## Zippity Doo-Dah

*A new control network goes way beyond MIDI.*

*By Scott Wilkinson*

Although MIDI was originally designed for keyboard instruments, it has been adapted to accommodate many different applications. Unfortunately, some of these applications are not served well by MIDI. For example, guitar controllers generate *lots* of MIDI data, which can easily clog MIDI's bandwidth of 31.25 kbps. In addition, the timing, pitch, and initial loudness (Velocity) of each note are inexorably integrated. This is fine for keyboards, but what about instruments for which these parameters are separate? Then there's the problem of Channel Voice messages. With the exception of Note On, Note Off, and Polyphonic Pressure, the Channel Voice messages affect all notes on a particular channel equally. For example, you can't normally bend the pitch of one note without similarly affecting the other notes on the same channel, although there are workarounds in some instruments.

These limitations led Zeta Music Systems, Gibson Western Innovation Zone (G-WIZ) Labs, and the Center for New Music and Audio Technologies (CNMAT) at the University of California, Berkeley, to develop a new network for electronic musical instruments called ZIPI. This network can accommodate up to 253 devices, each of which includes one 7-pin DIN connector; a single cable carries ZIPI data and clock signals bidirectionally between devices.

Several ZIPI devices are connected to a central hub. Multiple hubs are easily linked, and each cable can be up to 300 meters long. If one device fails, the others can still function as a network. Logically, the devices form a token ring (see Fig. 1). Only the device that currently has the token can send a message to another device, which assures that the message gets to its destination without interruption.

The bandwidth is completely variable, with no upper limit. The minimum bandwidth is 250 kbps, and currently available hardware allows a maximum of 20 Mbps. The network automatically adjusts to the fastest speed that all devices can handle.

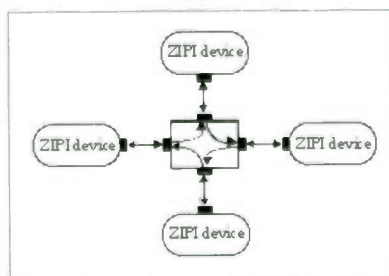
ZIPI's hierarchy includes three levels: notes, instruments, and families of instruments. There can be up to 63 families, each of which can include up to 127 instruments, and each instrument can play up to 127 notes. Each note, instrument, and family has a unique identifier, or *address*. In the case of a note, this address is completely independent of its pitch or other attributes. (In MIDI, a note's

pitch is its address.) This lets you affect each note's pitch, volume, pan, and other attributes individually. You can also affect groups of notes by sending messages to an instrument or family, which is very efficient.

Messages are encoded in the Music Parameter Description Language (MPDL). Any number of Note Descriptor bytes in a message describe how to affect the specified note(s). There are many defined Descriptors, such as Articulation; Pitch; Loudness; Brightness; Inharmonicity; Pan L/R, Up/Down, and Front/Back; and Program Change Immediate and Future (not applied to sounding notes). There are also many undefined messages for future expansion.

MPDL also includes many controller messages. Some of these include Velocity; several Mod Wheels; Pitch Bend; several Switch and Continuous Pedals; Pick/Bow Velocity, Position, and Pressure; Fret/Fingerboard Position and Pressure; Wind Flow; Lip Pressure and Frequency (brass buzz); and Drumhead Striking Position. This provides a lot of latitude in controller design and implementation.

G-WIZ is working on several ZIPI devices. For example, the Infinity box accepts up to six analog inputs (e.g., from a guitar), performs an FFT analysis, and converts this information into ZIPI pitch and timbre messages in real time. A ZIPI sound module based on Oberheim Digital's F•A•R technology (see "Tech Page: FAR Out" in the February 1995 EM) is also under construction. These developments will likely advance electronic music into the twenty-first century. ☺



**FIG. 1:** Although ZIPI devices are connected to a hub in a star configuration, they actually form a token ring that continues to work even if a device fails.



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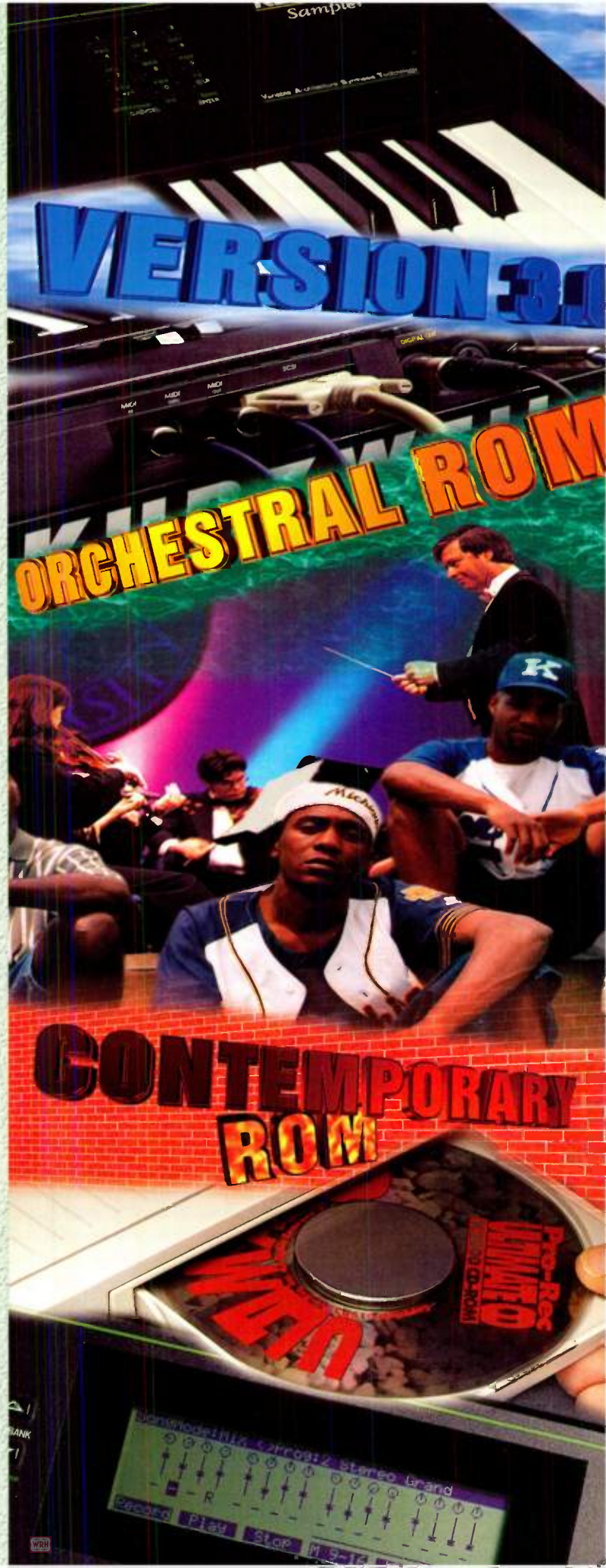
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